THE SOUND OF WARNINGS

A MUSICAL APPROACH TO INTERNAL AUDIT EFFECTIVENESS

Leon Yap

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Internal audit effectiveness

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GLOSSARY

(IS) Project escalation	**Continuing with a failing project, even when there are clear signs it should be stopped.**
Auditee	The person or organizational actor being audited; typically responsible for the process, project, or area under review.
Cognitive bias	A mental shortcut or systematic pattern of thinking that can lead to flawed judgment, such as overconfidence, confirmation bias, or the sunk cost fallacy.
Deaf effect	When recipients fail to acknowledge, understand, or act on risk warnings issued by auditors.
Decision-making	The process of choosing between different options, often under pressure or uncertainty.
Dynamic (element of music)	Changes in loudness that add contrast, urgency, or emphasis, whether in a musical performance or in the delivery of spoken messages.
Internal audit effectiveness	The extent to which audit findings are heard and acted upon, leading to meaningful changes in risk management, controls, or governance.
Internal auditor	A professional working within the organization who evaluates risks, controls, and governance processes, and reports findings to management.
IS project	A project in which an organization develops or implements an information system (IS) to support business goals, such as planning, administration, or customer service.
Perceived message relevance	How important, timely, or applicable a message is perceived to be by its recipient.
Perceived risk	How an individual or decision-maker subjectively judges the likelihood or severity of a risk.
Pitch (element of music)	The perceived height of a sound, influencing how it is interpreted emotionally and how credible or expressive it appears.
Prosody	The combination of pitch, tempo, rhythm, and dynamics that gives spoken language its emotional tone and communicative power.
Rhythm (element of music)	The pattern of timing, accents, and pauses that gives structure and flow to both music and speech.
Risk warning	A verbal or written message that communicates a potential threat or concern, often issued by an internal auditor to prompt awareness or action.
Tempo (element of music)	The speed at which sound unfolds over time (measured in BPM), shaping how calm, urgent, or confident a message or performance feels.


“IS THIS THE REAL LIFE?”

CHAPTER 1
INTRODUCTION

1.1 INTRODUCTION

The Institute for Internal Auditors (IIA) continues to emphasize the importance of the internal audit function for organizations. According to the IIA, internal audits can enhance and protect organizational value (IIA, 2024). To achieve this objective, auditors need to be effective: in other words, audit findings need to be acknowledged and acted upon. However, auditors still face the challenge of not being heard and their recommendations being disregarded. In information systems (IS) projects this phenomenon is known as the deaf effect and it hinders decision-makers from responding to crucial audit findings, ultimately leading to project failures. However, internal auditors often find themselves in a frustrating position: they see the risk, they hear concerns and they issue warnings, yet they face decision-makers who behave like the three monkeys, refusing to see (Mizaru), hear (Kikazaru) or speak (Iwazaru).

The saying "see no evil, hear no evil, speak no evil" stems from the Buddhist moral teachings. Although, in Western interpretations, this expression has come to mean ignoring wrongdoing to avoid responsibility, the original ancient Japanese story included four monkeys and it encouraged people to avoid all evil.

Over time, the fourth monkey, Shizaru, fell into oblivion. Shizaru represented "do no evil" and symbolized the need to take action when faced with risks and challenges. This is in contrast with Iwazaru, the third monkey, which embodied silence. Auditors should identify with Shizaru and restore the role of the fourth monkey, recognizing risks and acting accordingly. Like Iwazaru, decision-makers may consciously or unconsciously ignore auditors' risk warnings, not out of malice, but to avoid responsibility or discomfort. In this context, Shizaru symbolizes the moral obligation to act upon these risk signals. Like Shizaru, this dissertation serves to emphasize the importance of shifting from passive awareness to active engagement in risk-related decision-making. It is precisely this shift that is obstructed by the deaf effect, which is why this dissertation aims to shed light on why decision-makers often ignore clearly communicated risk warnings, even when risks are imminent.

The purpose of this dissertation is to bring the fourth monkey back into the spotlight, as depicted on the cover. Logically, no action can be taken if risk warnings go unheard. Therefore, this dissertation explores how auditors can enhance their spoken risk warnings.

Although much of the existing literature on the deaf effect primarily focuses on the question of why decision-makers ignore risk warnings, this dissertation adopts a new and complementary perspective by asking: when do they actually listen?

In domains such as religion, the military and political activism, sound and rhythm are deliberately used to attract attention and prompt action, through church bells, marching

drums or emotionally charged speeches. In contrast, auditors rarely reflect on how their vocal delivery might influence the receptivity of their messages. This study seeks to fill that gap. By investigating how elements of music can enhance the impact of the spoken risk warning, this dissertation moves from speculation to the systematic investigation of a musical perspective.

To accomplish this, the author is inspired by one of the most unconventional songs of all time: Queen's Bohemian Rhapsody. Much like the auditing profession, music adheres to certain rules and structures. However, Queen, and particularly Freddie Mercury, succeeded in creating a song that was unpredictable and deviated from the norm. One of the most distinctive hallmarks of Bohemian Rhapsody is that it lacks a traditional chorus. Instead, it uses different musical sections to tell its story. Similarly, this dissertation attempts to break away from rigid, standardized audit communication and explore a more engaging and emotional approach, which aims to enhance decision-makers' receptiveness to the auditor's message.

In this dissertation, music is not only a metaphorical source of inspiration, but also serves as a conceptual and methodological framework. Elements of music, such as rhythm, dynamics, tempo and pitch, are used to analyze, design and manipulate spoken risk warnings, with the aim of evoking emotion and enhancing the effectiveness of the risk warning.

The following section summarizes the main themes of this dissertation: IS project escalation, the deaf effect, and internal audit effectiveness.

IS Project Escalation

IS project escalation is a commonly known issue in organizations. It occurs when decision-makers continue a failing project even when evidence indicates that the project is in serious trouble (Brockner, 1992; Korzaan & Morris, 2009). According to the CHAOS Report of The Standish Group (2020), only 31% of IT projects succeed, while 50% face challenges (time overruns, budget constraints or lack of required features), and 19% fail completely.

Keil (1995) identifies four key drivers of project escalation to better understand why decision-makers continue failing IS projects despite clear warning signs:

1. Project factors: cost, benefit, complexity, and duration
2. Psychological factors: cognitive biases, managers' previous personal experiences, and expertise
3. Social factors: competitive pressure, external justification, and commitment to prior decisions
4. Organizational factors: structural and political pressures

While later studies (e.g., Sleesman et al., 2012) have refined and expanded upon these insights, Keil's framework still remains relevant.

The decision to continue with a failing project is often not due to the clarity of the risk warning but rather is the result of poor risk perception or the disregard of risk warnings. In this sense, the deaf effect is not an isolated phenomenon, but an important explanatory factor in understanding project escalation.

The Deaf Effect and Internal Audit Effectiveness

Keil and Robey first coined the term deaf effect in 1999, which described the situation in which decision-makers turn a deaf ear to risk warnings. They refined this concept in 2001, describing it as a phenomenon where decision-makers fail to hear, ignore, or overrule reports of bad news, leading to the failure of an IS project. Subsequent research has identified multiple factors that influence the deaf effect in IS-related projects. Studies have shown that messenger characteristics play an important role in how risk warnings are received (Cuellar et al., 2006; Lee et al., 2014). Similarly, recipient characteristics influence whether risk warnings are acknowledged or disregarded (Nuijten, 2012; Nuijten et al., 2016). In 2016, Nuijten et al. indicated that the framing of the message has a significant impact on the reception of the risk warning. When a risk warning was presented as a potential loss, decision-makers were more likely to pay attention to the warning than when it was presented as a potential gain.

Furthermore, the relationship between the auditor and the manager appears to be important in mitigating the deaf effect. Nuijten et al. (2016) demonstrated that managers were more likely to heed risk warnings if the auditor was seen as a partner, rather than an opponent. More recently research has shown that when risk warnings were aligned with accepted norms of the decision-makers' peers, the risk warnings were perceived as more persuasive, and the likelihood of taking corrective action increased. Since the deaf effect directly affects whether audit findings lead to action, it is a key factor in improving internal audit effectiveness. The effectiveness of an audit is not solely determined by the quality of the report but also by the extent to which its findings lead to meaningful organizational change and its recommendations are successfully implemented (Drogalas et al., 2015; Endaya & Hanefah, 2016; Erasmus & Coetzee, 2018; Lenz & Sarens, 2012b).

Despite these insights, it remains challenging for internal auditors to effectively communicate their findings and thereby improve their audit effectiveness.

The central problem addressed in this dissertation is that risk warnings are often ignored or downplayed, even when they are well-founded and clearly communicated. The deaf effect hinders the auditor's ability to influence decision-making within organizations, and thereby to contribute to timely and adequate corrective actions. Ignoring the auditor can lead to project escalation, waste of resources and ultimately to the failure of a project.

As previously mentioned, the deaf effect is an important factor that affects the audit effectiveness. Consequently, this dissertation will examine how to increase the likelihood that risk warnings issued by internal auditors will be heeded and acted upon. This raises a broader question central to this dissertation: how can we ensure that spoken risk warnings actually prompt action?

Tuning the Audit Message: from Risk Warning to Action

The central challenge in this dissertation lies in the communication chain between internal auditors and decision-makers within organizations. Ideally, auditors identify a risk, communicate a warning and action is taken. In practice, however, this chain often appears to break. Decision-makers may choose to ignore the warning, downplay its importance, or postpone taking action.

This break in the chain is referred to in the literature as the deaf effect: a valid risk is either not acknowledged or not acted upon. This deaf effect disrupts the potential impact of internal auditors, as their effectiveness is not only assessed based on the accuracy of their findings, but also on their ability to influence decision-making and bring about organizational change.

One of the most visible consequences of the deaf effect is project escalation: continuing to invest in failing projects. This often does not occur because the risks are invisible, but because the risk warnings are not heard. In this sense, escalation reflects not only a failure of risk management, but also a failure of communication.

This dissertation positions itself at the intersection of these three concepts: audit effectiveness, the deaf effect and IS project escalation. It proposes a novel approach: the strategic use of elements of music in audit and risk communication. Elements such as rhythm, dynamics, tempo and pitch are examined for their potential to make spoken risk warnings resonate more strongly with decision-makers. Strengthening the auditor's voice may offer a means to increase their effectiveness and to prevent escalation before it takes root. To explore this potential, the next section outlines the central research question and the scope of this dissertation.

1.2 RESEARCH OBJECTIVE AND SCOPE

This dissertation will explore an innovative approach to mitigating the deaf effect and increasing internal audit effectiveness. Drawing on insights from music, it investigates why individuals tend to be more receptive to music cues than to spoken risk warnings from internal auditors. This leads to the following central research question:

How can internal auditors improve the effectiveness of spoken risk warnings in IS projects by using elements of music as a communication strategy to mitigate the deaf effect?

To answer this question, this dissertation examines the main causal and interaction effects through experimental studies of how rhythm, dynamics, and emotional tone influence the perception and effectiveness of spoken risk warnings. this dissertation uses Q-sort analysis to explore the subjective perceptions of chief audit executives (CAE) and senior auditors to determine which musical elements are the most likely to mitigate the deaf effect.

Specifically, this dissertation investigates the following:

1. The role of elements of music, rhythm and dynamics, in influencing the perceived relevance of risk warnings.
2. The impact of emotions, hope and fear on evoked through elements of music, on decision-makers' willingness to act on risk warnings.
3. The musical elements CAEs and internal auditors consider most important for effectively delivering spoken risk warnings.

This dissertation adopts a stepwise, exploratory approach to investigate how musical elements influence the reception of spoken risk warnings. The first experimental study focused on the use of rhythm and dynamics, two elements that can be used to convey urgency and importance (Douek, 2013).

The decision to focus on the emotions of hope and fear in the second experiment was informed by the findings of the first experiment. While manipulating rhythm and dynamics of the spoken risk warning, it became clear that vocal delivery also evokes emotional responses in the listeners. This finding led to a follow-up study exploring the extent to which the emotions of hope and fear influence the perception of the risk warning and the willingness to act upon it.

Together, these studies form the research backbone of this dissertation. Their structure is summarized in Table 1-1 below.

Table 1-1. Overview of Research Questions and Chapter Structure

	Research Questions	**Chapter**
1	How do cognitive biases contribute to the deaf effect in internal audit risk warnings?	2
2	What conceptual foundations can be drawn from the literature on music, psychology, and decision-making for applying elements of music in internal audit risk warnings?	3
3	How does the use of dynamics and rhythm in a spoken risk warning affect the willingness to continue as failing IS projects?	4
4	How do the emotions hope and fear, evoked through musical elements, affect the effectiveness of spoken risk warnings in IS projects?	5
5	How do internal auditors and Chief Audit Executives (CAEs) perceive the use of musical elements in spoken risk warnings?	6

Furthermore, this dissertation refines its scope as follows.

- The IS project owner is the primary decision-maker and represents the unit of analysis.
- The person delivering the bad news acts as an internal auditor, following the professional guidelines of the Institute of Internal Auditors (IIA, 2024). Cuellar et al. (2006) indicate that the auditor is credible and has the appropriate expertise to make accurate assertions. Furthermore, it is important that the internal auditor operate independently from management to remain objective (Keil & Robey, 2001).

In Table 1-2, the main characteristics of the conceptual and technical designs of the studies are presented.

This stepwise research design enables both the experimental testing of vocal delivery effects and the exploration of auditors' and CAEs' perceptions regarding effective communication practices. This offers a comprehensive perspective on how spoken risk warnings can be enhanced and how vocal communication can strengthen the auditors' influence on risk perception and decision-making.

1.3 PROPOSED CONTRIBUTION OF THIS STUDY

Proposed Contribution to Research on Escalating IS Projects

This dissertation aims to explore a new, unknown territory by investigating the potential of musical elements to mitigate the escalation of IS projects. By integrating musical elements into the risk warning, we seek to enhance decision-makers' receptiveness to the messenger. Therefore, this dissertation presents research that demonstrates how a fear-based risk warning increases the risk perception, thereby increasing the likelihood of decision-makers abandoning a failing project. Conversely, a hope-based risk warning reinforces the project escalation by fostering a more optimistic feeling, thus eliminating the sense of urgency. Consequently, this study extends research in the field of project escalation by incorporating musical elements and emotions into risk warnings to potentially reduce or prevent project escalation.

Proposed Contribution to Research on the Deaf Effect

Project failures and escalations often occur when decision-makers ignore or disregard risk warnings, a phenomenon referred to as the deaf effect (Cuellar et al., 2006; Keil & Robey, 2001). Building on previous research on music cognition (Juslin & Laukka, 2003), this study examines whether the musical elements of tempo, rhythm, dynamics, and pitch, which influence perception, attention, and emotional engagement, can enhance the persuasiveness of audit risk warnings and mitigate the deaf effect.

Another study within this dissertation examined the impact of rhythm and dynamics on the relevance of spoken risk warnings. This study aims to demonstrate that rhythm and dynamics can enhance message relevance, thereby increasing the likelihood that

Table 1-2. Summary of Conceptual and Technical Research Design

Conceptual Research Design	Chapter 2	Chapter 3	Chapter 4	Chapter 5	Chapter 6
Research type	Descriptive	Descriptive	Explorative	Explanatory	Explorative
Research design	Quantitative	Qualitative	Quantitative	Quantitative	Mixed-Methods Design
Relations	Correlations	Literature streams	Main and interaction effects	Main and interaction effects	Perceptual patterns
Dependent Variable	Ostrich Effect (as a proxy for Deaf Effect)	not applicable	Willingness to Continue (indicator of the deaf effect)	Willingness to Continue (indicator of the deaf effect)	Deaf Effect (indicator of IA effectiveness)
Independent Variable	Status Quo Bias, Mum Effect, Student Syndrome, Authority Bias, Groupthink	not applicable	Rhythm (low vs. high) Dynamics (low vs. high)	Emotion evoked by spoken warning (Hope vs. Fear) (Manipulated via vocal musical elements: tempo, pitch, dynamics)	Elements of music in vocal delivery (e.g. rhythm, pitch, tempo, dynamics, emotion) as reflected in 23 Q-statements
Control Variables	Age Work Experience Risk Propensity	Not applicable	Age Work Experience Risk Propensity	Age Work Experience Risk Propensity	Not applicable
Additional (covariates / explanatory variables)	Bias Blind Spot, Need for Justification				
Theoretical Foundations	Heuristics & Biases	Music Theory, Heuristic-analytical theory	Music theory, speech prosody and emotional communication	Emotion theory (hope and fear), Music theory	Q-methodology Music theory, speech prosody and emotional communication
Problem-Specific Literature	Risk warnings, cognitive biases	Deaf effect in IS projects, internal audit effectiveness, escalation of commitment	Deaf effect in IS projects, internal audit effectiveness, escalation of commitment	Deaf effect in IS projects, internal audit effectiveness, escalation of commitment	Deaf effect in IS projects, internal audit effectiveness, escalation of commitment

Technical Research Design	Chapter 2	Chapter 3	Chapter 4	Chapter 5	Chapter 6
Research Method	Survey	Critical literature review	Laboratory Experiment	Laboratory Experiment	Q Methodological study
Participants	44 Dutch Professionals	not applicable	165 Dutch Professionals	305 Dutch Speaking Professionals	27 Senior Auditors/CAEs
Data Analysis	Pearson correlations	PRISMA checklist	PLS-SEM	PLS-SEM	Q method factor analysis
Data Validity	Cronbach Alpha, Exploratory & Confirmatory Factor Analysis, Pearson Correlations	PRISMA checklist	MANOVA, Cronbach Alpha, AVE, Exploratory & Confirmatory Factor Analysis	MANOVA, Cronbach Alpha, AVE, Exploratory & Confirmatory Factor Analysis	Statement set database
Tool	SPSS 29.0.2.0	not applicable	SmartPLS 4.1.1.1	SmartPLS 4.1.1.1	Ken-Q Analysis (KADE), Version 3.0

decision-makers will pay attention to the risk warning. Consequently, increased message relevance increases the likelihood of corrective action, preventing a project from being derailed. By shifting the focus from what is communicated to how it is communicated, this study expands the research on the deaf effect by demonstrating that the delivery of a risk warning significantly influences decision-makers' responses.

Proposed Contribution to Research on Internal Auditing

For internal auditors to be effective, their findings must lead to corrective action (Arena & Azzone, 2009; Mihret & Yismaw, 2007; Sarens, 2009). However, despite their critical role in governance, decision-makers often fail to heed risk warnings, which thereby reduces audit effectiveness. Preliminary findings suggest that the use of musical elements and the evocation of the appropriate emotion can enhance message relevance, thereby increasing the likelihood that decision-makers will heed the audit findings, and, ultimately, improving audit effectiveness.

Auditor independence, audit quality, senior management support, and stakeholders' expectations always seem to be the focus areas with regard to improving internal audit effectiveness (Cohen & Sayag, 2010; Drogalas et al., 2015; Endaya & Hanefah, 2016; Erasmus & Coetzee, 2018). However, these studies overlook the role of communication in audit effectiveness. By providing empirical insight into how risk warnings can be more persuasive, this study extends internal auditing research and introduces novel strategies to improve decision-makers' engagement.

Proposed Scientific and Practical Contributions per Chapter

In addition to the domain-level contributions, this dissertation also makes chapter-specific contributions. These contributions, which are exploratory in nature, are further elaborated in the respective chapters and in the final chapter of this dissertation.

Chapter 4 (rhythm and dynamics) investigates how variations in rhythm and dynamics influence the perceived relevance of spoken risk warnings. The proposed scientific contribution is found in the shift in focus from the content of the auditor's risk warning or message to the manner in which it is delivered. We aim to demonstrate that variation in vocal delivery can enhance attention and cognitive processing of the message. The practical contribution lies in the insight that auditors can adapt their speaking style to increase the likelihood that they are heard and thereby reduce the risk that their message is ignored.

Chapter 5 (hope and fear) builds on the theories of emotion and decision-making to explore how the emotional tone of the auditor's voice, specifically regarding hope and fear, influences the risk perception of auditees and their willingness to intervene in a failing project. The proposed scientific contribution is the integration of affective framing into the existing models of risk communication within IS projects. The practical contribution could be that auditors gain guidance on selecting the appropriate emotional tone to either amplify urgency or sustain a hopeful outlook, depending on the context of the situation.

Chapter 6 (Q-study) explores the subjective preferences of experienced auditors and CAEs regarding vocal communication of risk warnings. The proposed scientific contribution lies in clarifying how auditors and CAEs conceptualize the effectiveness of vocally delivered risk warnings, which thereby enhances the theoretical understanding of internal audit communication. The practical contribution may lie in stimulating reflection and awareness within the profession regarding the impact of vocal delivery, as well as developing training modules to improve auditor's vocal communication skills.

1.4 STRUCTURE OF THE DISSERTATION

In addition to its empirical contributions, this dissertation draws inspiration from Queen's *Bohemian Rhapsody*. The song is not a subject of the study but serves as a narrative and metaphorical framework for the dissertation. Just as the song deviates from traditional song structure, lacking a chorus and blending multiple genres, this dissertation seeks to challenge the existing practices of auditors in the field of communication. Moreover, like the song, this dissertation aims to explore new and unexpected perspectives to improve the effectiveness of internal audits. Thus, Bohemian Rhapsody provides a guiding structure for the thematic organization of the chapters.

Chapter 1: Introduction – "Is This the Real Life?"
(Ballad Introduction)

Bohemian Rhapsody opens with an introspective, dream-like question: *"Is this real life? Is this just fantasy?"*. This chapter similarly sets the stage by questioning reality with regard to the reception of risk warnings in audit communication. Though auditors may expect that risk warnings will be heeded by decision-makers, empirical research suggests a different reality. Auditors' risk warnings are often ignored, which can lead to project failure. This chapter introduces the terms IS project escalation, the deaf effect, and internal audit effectiveness. In addition, it outlines the research problem, the research objective and the expected contribution of this study to the fields of internal audit effectiveness and deaf effect research.

Chapter 2: Prelude – "Mama, Just Killed a Man"
(Confession and Crisis)

This section of the dissertation aims to evoke the same element of surprise as Freddie Mercury's sudden confession in *Bohemian Rhapsody*. The surprise lies in the revelation that warning signals are often ignored not due to their content or timing, but because of underlying cognitive biases. Auditors acknowledge that persuading decision-makers to heed their risk warnings is a persistent challenge in projects. Drawing on a survey conducted among members of IIA-NL, this chapter explores the cognitive biases that may lead to the dismissal of warning signals. Much like Freddie Mercury's somber vocal

delivery, this chapter presents the 'somber' empirical evidence that certain cognitive biases may contribute to the deaf effect, thereby undermining the effectiveness of internal auditors. Although this chapter primarily focuses on the role of cognitive biases, it serves as a necessary prelude to the experimental studies that follow. It provides critical insight into why audit messages are sometimes disregarded, even when their content and timing appear to be appropriate.

Chapter 3: Literature Review – "Too Late, My Time Has Come"
(Reflecting on the Past)

After the confession comes a moment of reflection. Just as *Bohemian Rhapsody* transitions into a reflection on fate and regret, this chapter reflects on the existing theories and research on decision-making, audit effectiveness, and the deaf effect. This analysis provides a foundation for identifying opportunities for improvement. The chapter starts with a presentation of theories, such as prospect theory, that explain why individuals respond differently to risk warnings. Studies on internal audit effectiveness are also discussed to highlight how concepts such as framing, credibility, management support, and timing of risk warnings influence internal audit effectiveness. The chapter subsequently shifts its focus to music, exploring how elements such as rhythm, tempo, pitch and dynamics shape emotions and behavior. By drawing this connection, this chapter builds a foundation for a novel approach that uses music to make risk warnings more persuasive.

Chapter 4: Experiment on Rhythm and Dynamics – "Thunderbolts and Lightning, Very, Very Frightening Me!"
(The Opera Section)

Like *Bohemian Rhapsody's* unexpected operatic interlude, Chapter 4 also involves experimentation. The first experimental study is introduced, wherein auditors' risk warnings are delivered with varying rhythm and dynamics to assess their effectiveness. This study investigated the impact of rhythm and dynamics on the perceived relevance of the message and, consequently, on the decision-makers' willingness to listen and take corrective action to change the failing course of the project. Similar to the operatic part of Bohemian Rhapsody, which surprises the listener with an unexpected change in rhythm and dynamics, this chapter introduces a novel approach in communicating risk warnings.

Chapter 5: Experiment Involving Hope and Fear – "So You Think You Can Stone Me and Spit in My Eye?"
(The Hard Rock Section)

The operatic section of Bohemian Rhapsody suddenly turns into an intense hard rock section, characterized by a high level of energy and emotion. Chapter 5 explores the effects of such intense emotion, specifically, the influence of hope and fear on decision-makers.

In an experiment that manipulates the tempo, volume, dynamics, pitch and intonation of risk warnings, we investigate whether evoking hope or fear affects the extent to which a risk warning is perceived as urgent and whether it leads to the redirection of a project. In this chapter, music was not the sole source of inspiration; the chapter also incorporates the findings of political and psychological studies on persuasion.

The hard rock section of Bohemian Rhapsody exhibits an intense and compelling tone, which could be important in effectively issuing a risk warning.

Chapter 6: Q-Sort Analysis – "Nothing Really Matters to Me"
(The Reflective Coda)

Bohemian Rhapsody eventually winds back again into a somber, introspective coda, this time reflecting on the journey taken. Similarly, this chapter reflects on the findings of the studies presented in Chapter 4 and 5. In addition, Q-sort analysis is used to identify key musical elements that contribute to the effectiveness of spoken risk warnings. CAEs and internal auditors participated in this study, prioritizing the musical elements they find most effective at conveying risk warnings and enhancing audit effectiveness.

Chapter 7: Conclusion – "Any Way the Wind Blows"
(Final Resolution and Future Directions)

The final section of the song is in F major, and by the time the final chord sounds, there is no harmonic tension; the piece is completely resolved within its key. Similarly, this chapter serves as the final cadence of this study, confirming that musical elements can significantly improve the effectiveness of audit communication.

The key insights are evident; using rhythm and dynamics and evoking emotions can influence decision-makers' perception of and response to risk warnings. The theoretical contributions position this research firmly within the fields of IS project escalation, and internal auditing. Concurrently, the practical implications offer actionable recommendations for auditors to improve their spoken risk warnings.

Just as Bohemian Rhapsody does not leave the listener with harmonic ambiguity, this dissertation ends with clarity and finality. The findings indicate that musical elements can be purposefully applied in audit communication, providing preliminary empirical support for this novel approach. In addition, this dissertation highlights the need for further research to increase the robustness and generalizability of the findings.

When the final F chord strikes, the research stands on firm ground. The journey may inspire others to pursue further research, but this thesis ends with a complete and stable resolution—just as the last sustained chord of Bohemian Rhapsody brings the song to a close.

The overall structure of this dissertation is presented in Figure 1-1.

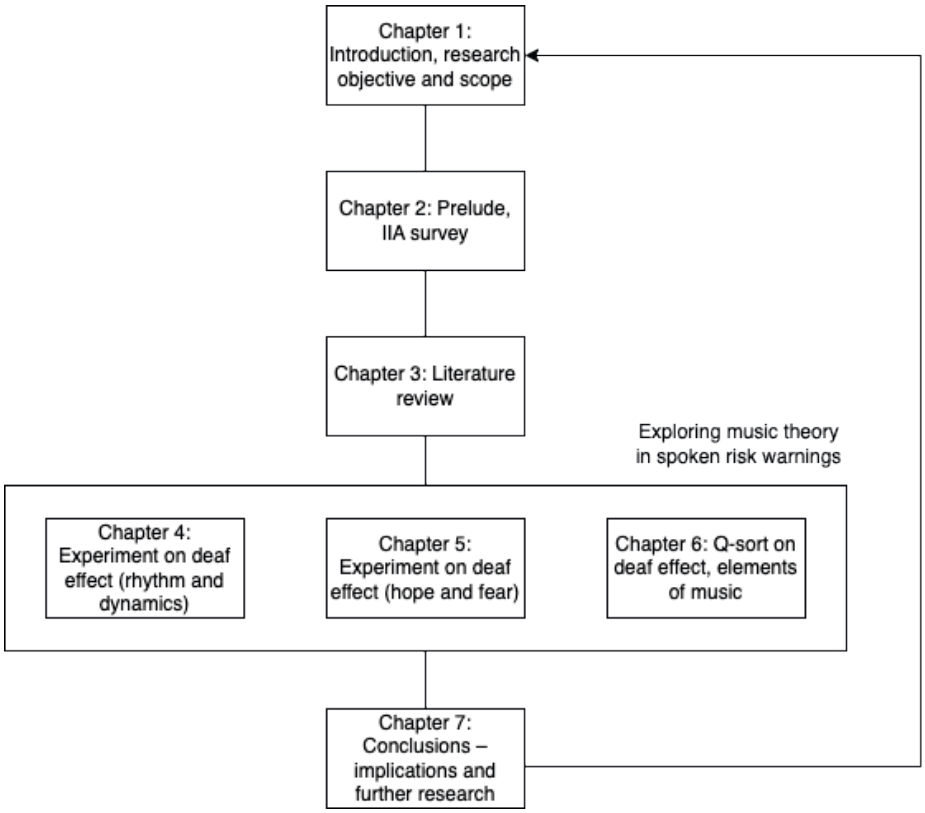


Figure 1-1. Structure of the dissertation

This dissertation adopts a multi-method approach to studying internal audit (IA) effectiveness. All four studies have been accepted for presentation at the European Conference on Internal Audit and Corporate Governance. One study has been submitted to a journal and is currently under review. Two of the remaining studies are in preparation for submission to peer-reviewed journals in due course. Table 1-3 below provides a detailed overview of the results and publication status of the studies included in this dissertation.

Table 1-3. Overview of the individual chapters of this dissertation and their status

Chapter	Title	Results	Status	Outlet
1	Introduction			
2	Biased Harmonies: When Cognitive Biases Amplify the Deaf Effect in Internal Audit	This study investigates how cognitive biases can contribute to warning signals being ignored. Based on a survey among internal auditors and project professionals, five specific biases were identified that impede the reception of risk warnings: status quo bias, mum effect, student syndrome, authority bias and groupthink. These biases contribute to risk warnings being ignored, downplayed or dismissed. The findings show how psychological obstacles undermine decision-makers' willingness to listen to and act upon audit findings. This study also provides a starting point for further research into how auditors can adapt their communication to overcome these obstacles.	Based on a published research report for IIA Netherlands (Van Twist et al., 2024)	Presented at eIACG 2024 (Athens) and RO Masterclass 2024 – IIA Netherlands
3	Critical Literature Review: Enhancing Internal Audit Communication Through Music (It's the Music, Stupid)	This literature study investigates how musical elements such as pitch, rhythm, dynamics and tempo can contribute to improve the impact of oral risk warnings by auditors. Where previous research mainly focused on the content of the message and the characteristics of the sender and receiver, this article introduces a new perspective: the emotional and psychological effect of music. Musical elements can help to attract the attention of decision-makers, activate emotions and allow the message to resonate more strongly, thereby reducing or even preventing the deaf effect.	Presented	16th European Conference on Internal Audit and Corporate Governance, Naples, Italy
4	Reducing the Deaf Effect for Risk Warnings on Failing Information Systems Projects: A Music Theory Perspective	This experimental study investigates whether musical elements, rhythm and dynamics, can help to reduce the so-called 'deaf effect' in IS-projects. In a 2x2 design, 122 professionals listened to a risk warning, varying in rhythm and dynamics. Dynamics were significantly associated with less boredom, more interest and a higher perceived relevance, which increased the willingness to heed the warning. Rhythm was also associated with a higher perceived relevance and willingness to heed the warning, but also increased the emotion hope. Although not significantly, hope could, in some cases, reduce the willingness to abandon a failing project. The key finding: vocal dynamics in risk communication can meaningfully enhance the effectiveness of risk warnings.	Presented Under second review	17th European Conference on Internal Audit and Corporate Governance in Paris, France. Journal of Information Systems

Chapter	Title	Results	Status	Outlet
5	Auditors' Resonance: Tuning into Hope or Fear in Risk Warnings	This study used an experiment to investigate whether spoken risk warnings that evoke hope or fear can reduce the deaf effect in IS-projects. In a scenario-based experiment with 168 professionals, two versions of a risk warning were tested, one evoking hope and the other evoking fear. In both cases, the risk warning was perceived as relevant, but only fear appeared to significantly influence the risk perception. The hopeful message did not. The key finding: by evoking fear through the use of the voice, auditors can enhance the effectiveness of risk warnings by increasing the sense of urgency and perceived risk. While hope increases perceived relevance, it does not affect risk perception.	Presented	20th European Conference on Internal Audit and Corporate Governance in Athens, Greece.
6	"Nothing Really Matters to Me": Exploring the Role of Vocal Delivery in Risk Warnings	This study used Q methodology to examine how internal auditors and Chief Audit Executives (CAEs) assess the use of elements of music, such as rhythm, dynamics, pitch and tempo, in a spoken risk warning. 27 experienced auditors and CAEs ranked the 23 statements based on their perceived importance in conveying an oral risk warning. Two dominant viewpoints emerged: 'Calm Conviction' and 'Urgent Alert'. The first group preferred a calm and convincing speaking style, while the second group preferred a more urgent speaking style. Both groups agreed that a fearful, monotonous, or overly emotionally charged voice undermines the effectiveness of the risk warning. The key finding: although the communication style differs, auditors agree vocal delivery determines the impact of a risk warning.	Presented	21st European Conference on Internal Audit and Corporate Governance, Sicily, Italy – Awarded Best Paper
7	Conclusions			

1.5 CLARIFICATION OF CONTRIBUTION

This dissertation is the result of a collaboration involving me, the author (Leon Yap), my promotors (Prof. Dr. A.L.P. Nuijten, Prof. Dr. H.R. Commandeur), and my co-promotors (Dr. N. Benschop). The following is a summary of the specific contributions for each chapter.

Chapters 1 and 7 were drafted by the author, and improved based on feedback from the supervisor and co-promotors.

Chapter 2, the prelude, was based on data originally collected for an IIA-NL study. The author wrote the article with statistical input from Dr. N. Benschop. Prof. Dr. A.L.P. Nuijten supervised the entire process and provided feedback.

Chapter 3 consists of a literature review and examines the possible ways music could be used to improve internal audit effectiveness. The literature review addressed the topics of the deaf effect, internal audit effectiveness and the influence of music on perception and behavior. Prof. Dr. A.L.P. Nuijten and Dr. N. Benschop provided feedback on the method of literature selection and theoretical positioning. Additional input for the revision was provided by Prof. Dr. H.R. Commandeur.

Chapter 4 examines the influence of rhythm and dynamics on the perception of risk warnings. The study was designed and conducted by the author, with Dr. N. Benschop supporting the author with methodological input and statistics, and supervision and feedback by Prof. Dr. A.L.P. Nuijten.

Chapter 5 extends the results of the previous chapter by examining the impact of emotions, specifically the emotions of hope and fear, in spoken risk warnings on audit effectiveness. The author himself was responsible for designing the experiment and conducting the initial statistical analyses. Dr. Benschop contributed statistical expertise, and Prof. Nuijten supervised and provided feedback. Feedback for revision was also provided by Prof. Dr. H.R. Commandeur.

Chapter 6 used Q-sort analyses to further refine the findings from the previous chapters. The author designed and conducted the study, including the statistical analyses of the results. Prof. Dr. A.L.P. Nuijten and Dr. N. Benschop provided feedback on the research design and methodological approach. In addition, Dr. N. Benschop validated the statistical analyses performed by the author. Prof. Dr. H.R. Commandeur contributed to the revision process through his feedback and input.

"MAMA, JUST KILLED A MAN"

CHAPTER 2
PRELUDE

This chapter is based on a previously published research report for IIA Netherlands (Van Twist et al., 2024), to which the author contributed. This report was presented at the European Internal Audit and Corporate Governance Conference (EIACG, Athens, Greece, 2024) and discussed during the RO Masterclass of IIA Netherlands (2024).

This chapter outlines the motivation for this dissertation, which originated from a survey among professionals with various roles in internal auditing and project management. The survey revealed that warnings from auditors are not always heeded and acted upon, even when they are factually correct. This chapter explores why some risks are heard and others are not.

2.1 ABSTRACT

Cognitive biases can significantly impact decision-making in information systems (IS) projects, particularly in the context of risk warnings from internal auditors. This study examines how various cognitive biases are associated with the 'deaf effect', a phenomenon where decision-makers ignore or dismiss risk warnings. Using survey data from 44 internal auditors and project professionals, we identified the most frequently mentioned cognitive biases in projects and analyzed their relationship to the deaf effect. Our findings suggest that status quo bias, the mum effect, student syndrome, authority bias, and groupthink are potential obstacles that may prevent internal auditors' risk warnings from being sufficiently heard and acted upon.

This raises the question of whether the way internal auditors communicate risk warnings influences their impact. While the content of a message is obviously important, *how* it is delivered may be equally, or even more, important with regard to overcoming the deaf effect. This study provides a foundation for future research on how internal auditors can mitigate cognitive biases in IS project decision-making through more effective communication strategies.

Keywords: internal audit effectiveness; deaf effect; information systems projects; risk warnings; bias; IIA; music; rhythm; dynamics

Article Classification: Research Paper

Ethical Compliance: All procedures performed in this study involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

2.2 INTRODUCTION

Internal auditors are expected to act as a 'critical partner' within the organization, an independent voice that identifies risks, questions assumptions and issues timely warnings when threats emerge. However, the effectiveness of an internal audit does not depend solely on the technical accuracy or quality of the findings. Increasingly, the most important question is whether auditors are actually heard and whether their risk warnings are heeded and acted upon by the organization.

One of the challenges internal auditors face in such settings is the deaf effect, a phenomenon in which decision-makers ignore or dismiss risk warnings, even when they are valid and well-founded (Cuellar et al., 2006; Keil & Robey, 2001; Nuijten, 2012). Despite the relevance of these warnings, decision-makers' cognitive and psychological barriers may prevent them from being heard.

Although decision-making is often assumed to be rational and deliberate, empirical research suggests that this is frequently not the case. According to Simon (1972), individuals have a limited cognitive capacity to process large amounts of information, particularly under time pressure or conditions of uncertainty. Research indicates that decision-makers often rely on heuristics in their decision-making, which can lead to systematic biases (Benschop, 2016; Kahneman, 2012; Nuijten et al., 2020a; Sleesman et al., 2012). This study aims to identify which cognitive biases are most strongly associated with the deaf effect in IS project decision-making.

This chapter explores how various cognitive biases relate to the deaf effect in a project setting.

The central research question of this study is as follows:
How do cognitive biases contribute to the deaf effect in internal audit risk warnings?

Through a survey study, we identified the most frequently mentioned cognitive biases in projects and examined which of them functioned as potential obstacles for internal auditors. The following section presents an overview of the key cognitive biases that are relevant to project decision-making and discusses how they may contribute to the deaf effect.

2.3 DESCRIPTION OF COGNITIVE BIASES

The section briefly introduces the cognitive biases that were examined in this study.

Decision-making is a complex, dynamic, uncertain, and individualized process. Some decision-makers tend to rely on data, while others depend more on intuition and emotions. Some combine both approaches, whereas others prefer to rely on trusted advisors. Studies on decision-making indicate that individuals use heuristic processes to address uncertainty and complexity (Fischhoff & Broomell, 2020; Kahneman, 2012; Lerner et al., 2015).

The effect of these heuristics is that decision-makers may ignore risk warnings or fail to take action, even when they are fully aware that intervention is necessary. Two biases that are directly related to this phenomenon are the ostrich effect and the deaf effect. The ostrich effect is considered an emotional reaction that leads to the avoidance of negative or project-threatening information, particularly when such information undermines positive expectations about project progress or success (Ashford, 1986; Tuckey et al., 2002; Webb et al., 2013). The deaf effect, by contrast, occurs when decision-makers ignore explicit risk warnings after they have already been delivered (Cuellar et al., 2006; Keil & Robey, 2001; Nuijten, 2012). Although both biases result in the neglect of relevant information, the difference lies in the timing: the ostrich effect occurs before the warning is received, whereas the deaf effect occurs after the warning has been issued.

In addition to the ostrich and deaf effect, several other cognitive biases may also explain why risk warnings are disregarded. In some cases, decisions are influenced by authority figures. Although decision-makers may see that a project is deviating from its course, *authority bias* may lead them to accept the statement of the authority, even when the issue falls outside the authority's area of expertise (van Woensel, 2020).

Decision-making does not always depend on one individual; it often occurs within groups. Group members may be reluctant to disrupt group consensus, and individuals may experience pressure to not intervene and share their critical opinions. Consequently, the group may fall into a pattern of uniform thinking, a phenomenon known as *groupthink* (Janis, 2013; Riordan & Riordan, 2013; Sims & Sauser, 2013).

A similar reluctance to speak is also reflected in the *mum effect*, where individuals hesitate to report bad news due to fear of negative consequences or a desire to avoid conflict (Keil & Robey, 2001). This bias can manifest at both the group and individual level.

Such avoidance or evasion behaviors may also lead individuals to postpone or resist change. This tendency to prefer previously made choices over new ones, even when those choices are no longer reasonable, is referred to as *status quo bias* (Burmeister & Schade, 2007).

Finally, not all decisions are driven by well-known cognitive biases. In some cases, tasks are simply postponed, behavior known as *student syndrome*. It is characterized by procrastination, where individuals delay action until the last possible moment (Goldratt, 2001). While not always formally classified as a cognitive bias, it displays characteristics of one and is treated as such in the analysis.

2.4 METHODS

We conducted a survey to examine participants' views on decision-making and cognitive biases in the project context. The participants completed an online survey consisting of both closed- and open-ended questions.

Survey Setting and Procedure

The survey was designed in Qualtrics and distributed digitally to participants, who completed it in their own environment. The survey consisted of the following questions:

- Close-ended questions: These Likert-scale items were used to assess risk and decision-making behavior in project settings.
- Open-ended questions: These questions were designed to reflect on participants' personal experiences and insights, but are not analyzed in this paper.

Participants

The participants were recruited through the Institute of Internal Auditors, Netherlands (IIA-NL) and included attendees of the ESAA symposium and the IIA annual conference. The participants consisted of professionals with diverse roles in internal auditing and project management. Of the 56 individuals who initiated the survey, 44 completed it in full (78.6% completion rate). The analyses reported below are based solely on the 44 fully completed responses. Participants included professionals with varying levels of internal auditing experience. Professional experience ranged from less than a year to over 30 years, with the largest group of participants (42.8%) having between 3 and 10 years of experience. Of all the participants, 73% were male and 27% were female. Ages spanned a broad range, with 55.3% falling between 25 and 44 years.

Ostrich effect as a proxy for the deaf effect (dependent variable)

In this study, we use the survey items that were originally designed to measure the ostrich effect as a proxy for the deaf effect. Although the ostrich effect strictly refers to an earlier stage in the decision-making process (pre-warning rather than post-warning), the underlying behavioral mechanisms show sufficient similarity. We therefore consider these items an acceptable and useful proxy for the deaf effect, which plays a central role in the remainder of this dissertation. Moreover, the deaf effect does not stand alone: other biases may amplify or increase the likelihood of ignoring risk warnings. In the questionnaire, the ostrich effect was measured with three Likert-type items (1 = very strongly disagree, 7 = very strongly agree), following the definition by Moosa and Ramiah (2017). The exact item

texts are provided in Appendix 2A. For the analysis, the three items (OE_1–OE_3) were combined into a single scale, which showed good internal consistency (Cronbach's α = .85; N = 44; see Table 2-2).

Measurement of other cognitive biases (independent variables)
The cognitive biases in question were measured using validated items adapted from prior studies, all rated on a 7-point Likert scale (1 = very strongly disagree, 7 = very strongly agree). Specifically, groupthink (3 items) was measured based on Kroon et al. (1992), while mum effect (3 items) was measured using items adapted from Park et al. (2008) and Marler et al. (2012). Authority bias and status quo bias were measured using 3 items each, following definitions by Moosa and Ramiah (2017). Finally, student syndrome (3 items) was measured using statements adapted from Tuckman (1991). A detailed overview of the measurement items for all five of these cognitive biases can be found in Table 2-4 (Appendix 2A).

2.5 HOW COGNITIVE BIASES SHAPE THE DEAF EFFECT

In this section, we investigate the relationship between the ostrich effect, as a proxy for the deaf effect and the cognitive biases mentioned in the previous section. Bivariate Pearson correlations were calculated between each the ostrich effect scale, as a proxy of the deaf-effect, and the scale for each of the other biases. Given the modest sample size (N = 44), the analysis should be regarded as exploratory.

Construct Validation: PCA and Reliability
To gain insight into the degree to which the various cognitive biases are interrelated and to assess whether they represent distinct constructs, a Principal Component Analysis (PCA) with Varimax rotation was conducted. Although our sample size was modest (N = 44), the high communalities observed in the analysis (.749 to .960) justify the use of PCA (see Table 2-1). According MacCallum et al. (1999), smaller samples can yield stable factor solutions when communalities are high and each factor represented by multiple strongly loading items.

PCA extracted five factors, each corresponding to a cognitive bias that was associated with the deaf effect. One item related to groupthink (GrTK_3) was excluded due to weak factor loading (< 0.5). Details on all loadings are provided in Table 2-5 (Appendix 2B). This adjustment improved construct validity, ensuring that only strongly loading items were retained in each bias category.

To further assess internal consistency, Cronbach's alpha was calculated for each bias. Table 2-2 shows that all reliability coefficients meet or exceed the commonly accepted threshold of .65 for exploratory research (Nunnally & Bernstein, 1994). This supports the internal coherence and robustness of the bias constructs.

Table 2-1. Extracted Communalities per Item

	Initial	Extraction
SQB_1	1	0.957
SQB_2	1	0.915
SQB_3	1	0.96
ME_1	1	0.825
ME_2	1	0.878
ME_3	1	0.784
SS_1	1	0.902
SS_2	1	0.867
SS_3	1	0.814
AB_1	1	0.752
AB_2	1	0.808
AB_3	1	0.846
GrTk_1	1	0.869
GrTk_2	1	0.749
OE_1*	1	0.774
OE_2*	1	0.816
OE_3*	1	0.812

**: OE_1 – OE_3 are used to measure the ostrich effect, which serves as a proxy for the deaf effect in our study.*

Table 2-2. Internal Consistency (Cronbach's Alpha) of Cognitive Bias Scales

Bias	Items	Cronbach's Alpha
Groupthink	GrTk_1, GrTk_2	0.675
Authority Bias	AB_1, AB_2, AB_3	0.693
Mum Effect	ME_1, ME_2, ME_3	0.870
Status Quo Bias	SQB_1, SQB_2, SQB_3	0.942
Student Syndrome	SS_1, SS_2, SS_3	0.885
Ostrich Effect	OE_1, OE_2, OE_3 (proxy for the deaf effect)	0.853

Note: Reliability threshold for exploratory research set at $\alpha \geq .65$ (Nunnally & Bernstein, 1994).

Correlation between the ostrich effect, as a proxy for the deaf effect, and other biases

Following the validation of the cognitive bias constructs through PCA and reliability checks, we conducted a correlation analysis to examine the extent to which the different biases are associated with the deaf effect. Table 2-3 presents the Pearson correlation coefficients between the deaf effect and the five identified cognitive biases. The results show that all the biases are positively correlated with the deaf effect, suggesting that these biases are associated with a greater tendency to ignore or dismiss risk warnings issued by internal auditors. Among these, authority bias and mum effect showed the strongest correlations with the deaf effect ($r = .427$ and $r = .413$).

These findings informed the next step of our analysis, in which we explored how each bias acts as a potential obstacle to effective risk warnings.

Table 2-3. Correlation between other cognitive biases and the deaf effect

		Status Quo Bias	Mum Effect	Student Syndrome	Authority Bias	Group Think	Deaf Effect
Status Quo Bias	Pearson Correlation	1	0.430**	0.292*	0.255	0.045	0.348*
	Sig. (2-tailed)		0.002	0.044	0.080	0.772	0.021
Mum Effect	Pearson Correlation	0.430**	1	0.217	0.325*	0.129	0.413**
	Sig. (2-tailed)	0.002		0.138	0.024	0.403	0.005
Student Syndrome	Pearson Correlation	0.292*	0.217	1	0.270	0.217	0.330*
	Sig. (2-tailed)	0.044	0.138		0.063	0.158	0.028
Authority Bias	Pearson Correlation	0.255	0.325*	0.270	1	0.355*	0.427**
	Sig. (2-tailed)	0.080	0.024	0.063		0.018	0.004
Groupthink	Pearson Correlation	0.045	0.129	0.217	0.355*	1	0.326*
	Sig. (2-tailed)	0.772	0.403	0.158	0.018		0.031
Deaf Effect	Pearson Correlation	0.348*	0.413**	0.330*	0.427**	0.326*	1
	Sig. (2-tailed)	0.021	0.005	0.028	0.004	0.031	

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Cognitive Biases as Potential Obstacles to Recognizing Risk Warnings

Our study suggests, based on the observed correlations, that internal auditors may encounter various psychological obstacles rooted in cognitive biases when delivering risk warnings. In the following section, we offer an exploratory reflection on how and why these biases might contribute to the deaf effect in project environments. It is important to emphasize that these reflections are interpretative in nature and do not directly stem from our statistical analysis, but are intended to explore possible explanations for the observed relations. Only statistically significant correlations that are considered meaningful are discussed[1].

Status quo bias is an obstacle identified by internal auditors that shows a strong relationship with the deaf effect ($r = .348$, $p = .021$). Decision-makers tend to resist change and are more likely to ignore a risk warning rather than adjust the current approach of the project.

1 Following Cohen's (1988) guidelines, correlation coefficients between .10 and .29 are considered small, between .30 and .49 moderate, and .50 or higher strong.

Example: Despite evidence that a legacy IT system poses security risks, management ignores warnings because upgrading requires a major operational shift.

Status quo bias is related to the deaf effect because it prompts decision-makers to intuitively reject signals that imply the need for change. Notably, it also correlates strongly with the mum effect ($r = .430$, $p = .002$), suggesting a broader pattern of avoidance behavior that suppress critical reflection.

The *mum effect* is another obstacle to addressing risks. Internal auditors state that team members experience fear or reluctance to report bad news about the project, which further exemplifies the deaf effect. The bias shows a significant correlation with the deaf effect ($r = .413$, $p = .005$), suggesting that suppression of risk related information may directly contribute to its dismissal.

Example: A junior auditor identifies significant compliance issues and feels the need to report them. However, the junior auditor carefully frames the report, omitting some of the more severe consequences, to avoid alarming senior management. Consequently, the urgency of the necessary interventions is reduced.

The mum effect causes risk signals to be softened, delayed or omitted, thereby reducing the perceived urgency. Notably, it also correlates modestly with the authority bias ($r = .325$, $p = .024$), indicating that hierarchical dynamics may contribute to the suppression or softening of risk signals.

Internal auditors also identified *student syndrome* as a significant bias that increased the deaf effect by delaying action until the last possible moment. The survey results indicate that project teams delay critical tasks, even when they recognize their importance. Although not directly associated with the deaf effect, delaying risk-related tasks until the last minute may increase time pressure and reduce attention to risk warnings, thereby contributing to the deaf effect ($r = .330$, $p = .028$).

Conversely, it is also conceivable that the deaf effect reinforces delaying behavior. When risk warnings are consistently ignored or not taken seriously, this may create the impression that such risks are less urgent. This, in turn, legitimizes delaying necessary actions.

Example: A project team delayed the required compliance check despite auditors' concerns. By the time they took action, the issue had escalated into regulatory violations. Under deadline pressure, cognitive overload may have reduced their ability to process new risk information, leading the team to downplay the severity of the situation.

While the correlation with status quo bias is relatively weak (*r = .292, p = .044*), its statistical significance suggests that even small effects may play a role in shaping avoidance-related behavior.

Furthermore, internal auditors identified *authority bias* as a key obstacle, as it showed the strongest correlation with the deaf effect (r = .427, p = .004) among all measured biases. Participants were more likely to dismiss risk warnings when these conflicted with decisions made by authoritative figures within the project. This suggests that superiors and experts' opinions were valued more highly than those of the other team members, highlighting how authority may shape the reception of risk warnings. This may lead teams to favor the views of respected figures, ignoring those who are perceived as lacking such status.

> *Example: An internal auditor identifies financial irregularities in a project, but is hesitant to raise concerns because the CFO has publicly stated confidence in the project's financial health.*

It also correlates significantly, though moderately, with groupthink (r = .355, p = .018), suggesting a possible association between respect for authority and the tendency to align with group consensus.

Finally, *groupthink* was found to increase the likelihood of disregarding risk warnings, particularly in environments where collaboration is important for project success (r = .326, p = .031). The findings indicated that project team members often conformed to the opinions of the project team in order not to impede project progress or to ensure that the project was completed on time.

> *Example: The team members of an important IT-project collectively decided that the risks related to cybersecurity were minimal despite the auditor's views.*

Groupthink may sustain the deaf effect by pressuring individuals to conform, even when warnings contradict the dominant group narrative.

Taken together, these findings indicate that the deaf effect may be reinforced by multiple interrelated cognitive biases, shaping how risk warnings are perceived, evaluated, and addressed in project settings.

2.6 IMPLICATIONS: THE SHOW MUST GO ON – REFRAMING RISK WARNINGS FOR INTERNAL AUDITORS

Our findings indicate that certain cognitive biases may complicate efforts to improve internal audit effectiveness. These findings provide a conceptual foundation for the chapters that follow. The focus shifts from understanding the psychological barriers that prevent auditors from being heard, to exploring how the delivery of the risk warning may

help to ensure that it is heard. Auditors may find important risk warnings fall on deaf ears, not due to the lack of relevance, but because psychological filters cause decision-makers to disregard them. Traditional communication techniques and the internal auditor's role often appear insufficient to prompt action.

In response to our research question, this study shows that cognitive biases contribute to the deaf effect by creating psychological obstacles that prevent decision-makers from acknowledging or acting upon internal audit risk warnings. Specifically, status quo bias, the mum effect, student syndrome, authority bias, and groupthink each contribute in distinct ways to the deaf effect, either by reinforcing existing choices, softening critical information, encouraging delay, overvaluing authority, or promoting conformity. Together, these biases create an environment where well-founded warnings are more likely to be ignored or downplayed.

This raises an interesting question: How can internal auditors increase the likelihood their risk warnings resonate?

In the remainder of this dissertation, we move beyond the ostrich effect, which has served as a proxy, and turn our attention to the deaf effect. Specifically, we focus on how auditors' verbal risk warnings can be delivered more effectively to reduce it. Drawing on principles from music cognition and speech communication, Chapter 3 investigates whether variations in prosody, such as pitch, rhythm, stress, and intonation, can improve auditors' ability to effectively communicate risk.

- Chapter 4 investigates whether rhythm and dynamics in vocal delivery influence how risk warnings are perceived and processed.
- Chapter 5 examines the role of hope and fear as emotional drivers to enhance or mitigate the deaf effect.
- Chapter 6 presents a Q-sort study in which experienced internal auditors and CAEs reflect on what kind of vocal delivery they find most suitable to communicate risk warnings as an auditor.

Finally, in our closing chapter, we reflect on the broader implications of our findings and discuss the practical implications for internal auditors and directions for future research. If internal auditors wish to be truly heard, they must combine both science and art, because otherwise "*nothing really matters*".

2.7 SUMMARY

This chapter examined how cognitive biases contribute to the deaf effect in risk warnings within project decision-making contexts. The survey results suggest that the deaf effect is not primarily the result of irrelevant or poorly formulated messages, but rather stems from psychological mechanisms that cause recipients to ignore or downplay risk warnings. Biases such as status quo bias, authority bias, the mum effect, groupthink, and student syndrome emerged as persistent obstacles that undermine the impact of audit warnings. These biases influence how decision-makers process and prioritize information, often leading to avoidance, delay, or rationalization of risks, regardless of the objective quality of the message. These insights shift the focus of the dissertation from improving the content of risk messages to exploring how auditors deliver these warnings. This raises the central question: how can auditors ensure that their message truly resonates? This question forms the starting point for the chapters that follow, which investigate whether, and how, the vocal delivery of a risk warning, including variations in rhythm, dynamics, and tone, can increase the likelihood that the message is heard, processed, and acted upon.

APPENDIX 2A. MEASUREMENT ITEMS PER BIAS AND SOURCES

Table 2-4. Measurement Items per Bias and Sources

Item	Item code	Source
The project team prefers things to stay unchanged.	SQB_1	Moosa and Ramiah (2017)
The project team prefers the "status quo".	SQB_2	Moosa and Ramiah (2017)
I feel like the project team prefers to keep things the way they are.	SQB_3	Moosa and Ramiah (2017)
Members of the project rather avoid reporting bad news to their boss, even when they feel like there is a serious problem.	ME_1	Park et al. (2008); Marler et al. (2012)
When reporting bad news about the project, members of the project wouldn't go into too much detail about the negatives.	ME_2	Park et al. (2008); Marler et al. (2012)
When reporting bad news about the project, members of the project leave out some of the negative information.	ME_3	Park et al. (2008); Marler et al. (2012)
The project team needlessly delays finishing jobs, even when they are important.	SS_1	Tuckman (1991)
When the project team have a deadline, they wait till the last minute.	SS_2	Tuckman (1991)
The project team gets stuck in neutral even though we know it is important to get started.	SS_3	Tuckman (1991)
The project team attributes greater value to the opinion of a superior than to the opinion of other project team members.	AB_1	Moosa and Ramiah (2017)
The project team attributes greater value to the opinion of experts than to the opinion of other project team members.	AB_2	Moosa and Ramiah (2017)
The project team will act on the opinion of an authority figure, even if the project team members don't share the same opinion.	AB_3	Moosa and Ramiah (2017)
In order to avoid hindering the progress of the discussion, project team members sometimes comply against their will.	GrTk_1	Kroon et al. (1992)
In order to allow to finish in time, project team members sometimes keep dissenting points of view to themselves.	GrTk_2	Kroon et al. (1992)
The project team tends to ignore negative information.	OE_1	Moosa and Ramiah (2017)
The project team prefers to not talk about the negative aspects of the project.	OE_2	Moosa and Ramiah (2017)
Negative aspects of the project are generally ignored within the project team.	OE_3	Moosa and Ramiah (2017)

Note: SQB = Status Quo Bias; ME = Mum Effect; SS = Student Syndrome; AB = Authority Bias; GrTk = Groupthink. OE = Ostrich Effect (proxy for the deaf effect)

APPENDIX 2B. ROTATED COMPONENT MATRIX (PCA WITH VARIMAX ROTATION)

Table 2-5. Rotated Component Matrix from PCA with Varimax Rotation (Loadings ≥ .50)

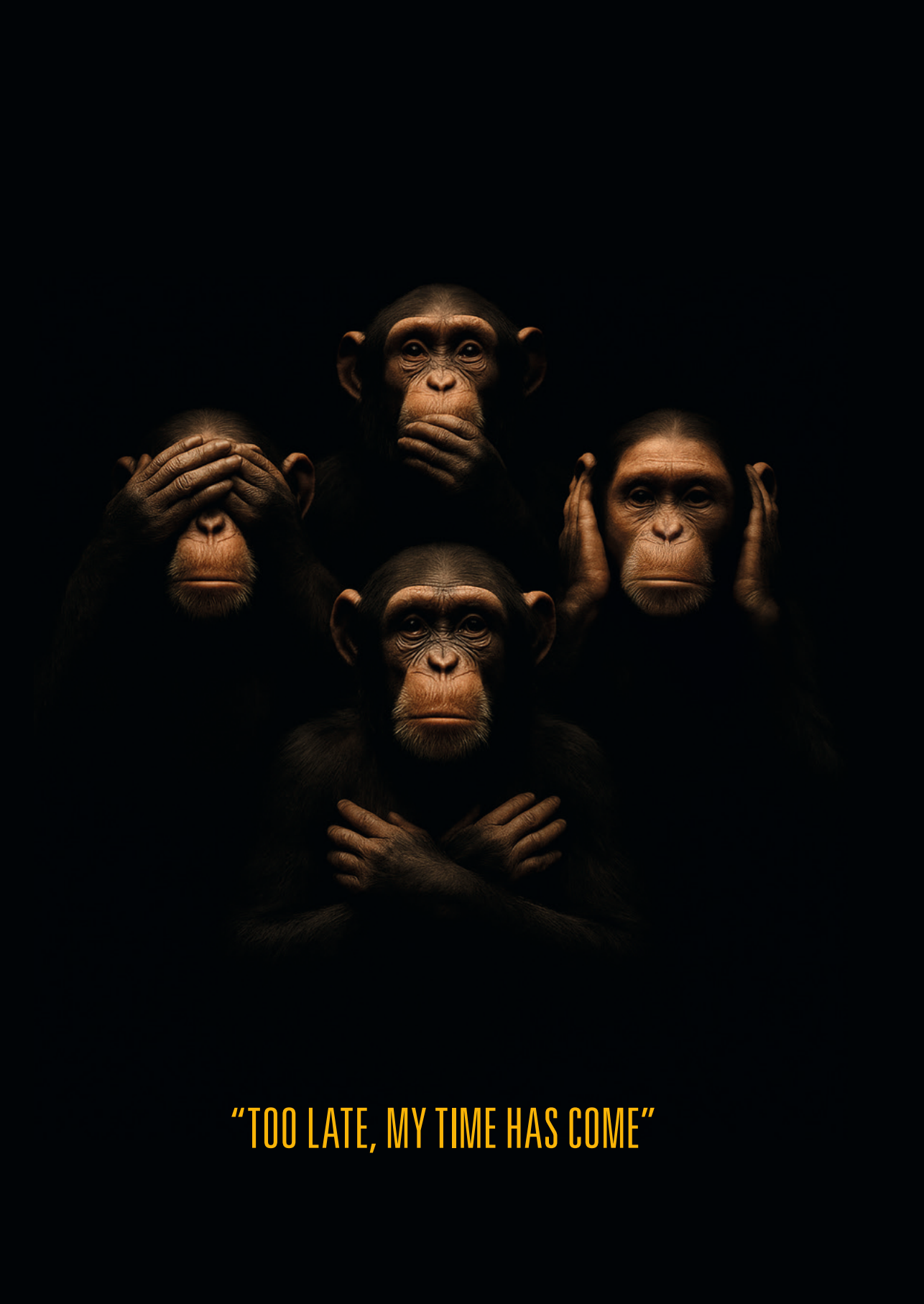
		Component				
		1	**2**	**3**	**4**	**5**
The project team prefers things to stay unchanged.	SQB_1	**0.955**	0.146	0.086	0.008	-0.021
The project team prefers the "status quo".	SQB_2	**0.926**	0.129	0.061	0.139	0.007
I feel like the project team prefers to keep things the way they are.	SQB_3	**0.904**	0.311	0.187	-0.043	0.038
Members of the project rather avoid reporting bad news to their boss, even when they feel like there is a serious problem.	ME_1	0.174	**0.880**	0.119	0.010	0.084
When reporting bad news about the project, members of the project wouldn't go into too much detail about the negatives.	ME_2	0.072	**0.872**	0.088	0.094	0.034
When reporting bad news about the project, members of the project leave out some of the negative information.	ME_3	0.335	**0.800**	0.045	0.153	-0.029
The project team needlessly delays finishing jobs, even when they are important.	SS_1	0.095	0.217	**0.868**	0.261	0.108
When the project team have a deadline, they wait till the last minute.	SS_2	0.012	0.159	**0.901**	-0.066	0.122
The project team gets stuck in neutral even though we know important it is to get started.	SS_3	0.181	-0.113	**0.852**	-0.074	-0.034
The project team attributes greater value to the opinion of a superior (e.g., project manager/owner or scrum master/product owner) than to the opinion of other project team members.	AB_1	0.247	0.203	0.464	**0.599**	0.119
The project team attributes greater value to the opinion of experts than to the opinion of other project team members.	AB_2	-0.117	0.019	-0.027	**0.854**	-0.062
The project team will act on the opinion of an authority figure, even if the project team members don't share the same opinion	AB_3	0.254	0.198	-0.042	**0.719**	0.352
In order to avoid hindering the progress of the discussion, project team members sometimes complies against their will.	GrTk_1	0.049	0.054	0.061	-0.074	**0.923**
In order to allow to finish in time, project team members sometimes keep dissenting points of view to themselves.	GrTk_2	-0.083	0.008	0.140	0.353	**0.728**

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 6 iterations.

Note: SQB = Status Quo Bias; ME = Mum Effect; SS = Student Syndrome; AB = Authority Bias; GrTk = Groupthink.


“TOO LATE, MY TIME HAS COME”

CHAPTER 3
LITERATURE REVIEW

This chapter is based on a paper presented at the 16th European Conference on Internal Audit and Corporate Governance (EIACG, Naples, Italy, 2018).

Yap, L. (2025). Enhancing Internal Audit Communication through Music: It's the Music, Stupid. Internal working paper.

The starting point for this paper is the question whether the way risk warnings are delivered vocally influences their effectiveness. This chapter lays the foundation for further research into the influence of elements of music on improving auditors' oral communication. It does so by drawing on existing literature on internal audit effectiveness, the deaf effect and the role of music in decision-making.

3.1 ABSTRACT

Music[2] has been used to communicate and capture people's attention for centuries. As risk warnings from internal auditors often go unheard, music may be an interesting means to ensure these warnings are noticed and heeded. In this study, we explore the potential benefits of integrating musical elements into auditors' communication strategies. Traditional verbal risk warnings fail to capture the attention of many decision-makers, which can lead to project failures. The importance of effective audit communication is well-documented in the existing literature. We propose that musical elements may improve communication by affecting how audit messages are perceived. This critical literature review examines the psychological effects of music, such as pitch, dynamics, rhythm, and tempo, suggesting that these elements may help auditors improve their audit communication and mitigate the deaf effect. This review outlines practical implications for the use of music in audit communication and suggests directions for future empirical research.

2 Music is the art or science of arranging sounds in a sequence, combining them, and organizing them over time to create a unified and continuous composition (Merriam-Webster, n.d.).

3.2 INTRODUCTION

Internal auditing plays an important role in organizations, particularly with regard to transparency, accountability, risk management, and corporate governance (Al Sawalqa & Qtish, 2021; Mihret & Grant, 2017). Moreover, Atu et al. (2014) emphasize the importance of internal auditing in offering assurance and insight into the effectiveness and efficiency of governance, risk management, and internal control processes. For an auditor to be effective, internal audit messages must be received and understood. Unfortunately, risk warnings issued by internal auditors are often disregarded. This phenomenon is known as the 'deaf effect' and it occurs when decision-makers fail to react to negative news (Cuellar et al., 2006; Nuijten et al., 2016; Nuijten et al., 2017; Nuijten et al., 2019). Several factors have been identified that affect internal audit effectiveness, including internal audit quality, degree of management support, auditor characteristics, and the relationship between internal auditors and auditees (Mihret & Yismaw, 2007; Nuijten et al., 2017; Tackie et al., 2016). Abdullah et al. (2018) emphasize the importance of internal auditors' communication skills, but little attention has been paid to how verbal risk warnings are conveyed.

While most studies on the deaf effect focus on understanding why people do not listen to auditors' messages, there has been relatively little research into what makes people actually listen. This opens up the opportunity to shift the perspective: instead of analyzing only psychological or organizational barriers, we can also explore how vocal delivery might break through them. Even when the content of a risk warning remains unchanged, the way it is vocally delivered can make a significant difference in how it is received. This raises the question whether musical concepts, which are known for their ability to evoke emotion and attention, can contribute to better understanding and improving audit warnings.

Schäfer et al. (2013) underscore the psychological function of music, noting that it not only captivates listeners and keeps them listening but is also capable of evoking emotions. Therefore, this insight suggests the potential relevance of applying musical concepts in professional communication settings, such as audit communication.

In the auditing domain, the importance of verbal risk warnings is often overlooked (IIA, 2024). Cohen et al. (2010) identified five musical elements – tempo, dynamics, pitch, timbre, and rhythm – that are relevant to delivering powerful messages. We propose applying these five elements to auditor communication. Just as a composer uses these elements to evoke emotional responses from listeners, auditors can use these elements to improve their communication by evoking the emotions of the decision-makers.

The purpose of this literature review is to introduce a new perspective to the field of auditing. We aim to empower auditors to convey their risk warning more effectively, so that they not only signal to the decision-maker to take action, but also significantly improve audit effectiveness. In the next section, we discuss the relationship between the deaf effect

and internal audit effectiveness. Furthermore, we explore the world of music and analyze its influence on emotions and decision-making. Finally, in this critical literature review we identify interesting intersections between the fields of internal audit effectiveness and music and make some suggestions for further research. The research question guiding this chapter is: *What conceptual foundations can be drawn from the literature on music, psychology, and decision-making to inform the use of musical elements in internal audit risk warnings?*

3.3 INTERNAL AUDIT EFFECTIVENESS

One of the key factors of audit success is the management's response to audit findings. As early as 1995, Sawyer emphasized the importance of management's willingness to respond to internal auditor warnings and recommendations. Moreover, he concluded that the auditor's work cannot be considered complete until the identified deficiencies have been corrected and remain corrected.

Subsequent academic studies have focused on what determines the effectiveness of internal audits. Research indicates that the effective follow-up of audit findings contributes to more robust corporate governance (Arena & Azzone, 2009; Mihret & Yismaw, 2007; Sarens, 2009). In 2012, Lenz and Sarens argued that an audit is only effective when the audit report leads to changes in the organization.

Another important factor contributing to the effectiveness of internal audits is top management support, as highlighted in several studies (Arena & Azzone, 2009; Cohen & Sayag, 2010; Sarens & De Beelde, 2006; Schneider & Church, 2008; Soh & Martinov-Bennie, 2011; Sterck & Bouckaert, 2006). Endaya and Hanefah (2016) confirm that management support is not only relevant, but also serves as moderating factor in relation to the other factors.

In addition, several studies emphasize the quality of the internal audit function itself. Drogalas et al. (2015) pointed to factors such as the quality of internal audits, internal audit team capabilities, and the independence of internal auditors. Coetzee and Erasmus (2017) also stressed the importance of audit function independence and the competence of the audit team, and further emphasized the role of the Chief Audit Executive. In a follow-up study, Erasmus and Coetzee (2018) determined that audit effectiveness is also a matter of aligning audit work with stakeholder expectations.

While these studies offer interesting insights into how to improve internal audit effectiveness, it remains apparent that risk warnings are not heard. This phenomenon poses a significant threat to internal audit effectiveness and is examined in detail in the next section.

3.4 DEAF EFFECT

Introduction

The phenomenon commonly known as the deaf effect poses a significant threat to internal audit effectiveness. First identified by Keil and Robey (2001), the deaf effect occurs when both project managers and stakeholders of information system (IS) projects ignore or dismiss risk warnings, resulting in project overruns.

Subsequent research, including studies by Cuellar et al. (2006) and Lee et al. (2014), expanded on this study by exploring the cognitive processes behind decision-makers' responses to bad news and the factors influencing these responses, such as the credibility of the messenger and the perception of risk. Further contributions by Nuijten et al. (2016, 2017, 2019) delved into the relationship between auditors and managers, showing the importance of this relationship and effective communication in overcoming the deaf effect.

In the following sections, we discuss the existing literature on the deaf effect and introduce two important theoretical perspectives on decision-making in the domain of risk: prospect theory, which explains how people perceive and evaluate risk, and stewardship and agency theory, which illustrates the relationship between auditors and decision-makers in organizations.

Theoretical Foundations

Prospect theory

In 1979, Kahneman and Tversky discovered that people perceive gains and losses differently, an insight known as prospect theory. This is contrary to the assumptions of traditional utility theory (Von Neumann & Morgenstern, 1944) and subjective expected utility theory (Savage, 1954). Individuals are more sensitive to losses than equivalent gains. Therefore, individuals make decisions not exclusively to maximize their utility but rather to avoid loss, which is known as loss aversion.

Moreover, Kahneman and Tversky (1979) also demonstrated the impact of framing effects on decision-making processes. When presented or framed differently, the same choice can lead to different decisions. Their research indicated that individuals are more likely to avoid risks when presented with a positive frame (e.g., saving lives), whereas risks are more accepted when presented with a negative frame (e.g., avoiding deaths). Their findings showed that risky decisions are influenced by psychological and cognitive biases rather than purely rational evaluation.

Prospect theory identifies key factors influencing decision-making under risk: the probability of outcomes, potential gains and losses, and the framing of choices. These principles are further explored below in relation to the deaf effect.

Building on this research, Kahneman studied the role of heuristics and distinguished between more intuitive thinking (System 1) and reasoning thinking (System 2). System 1 is an intuitive and automatic system that is quick and requires minimal effort. In contrast, System 2 is slower and requires more logical thinking. The language used in System 2 also encourages deeper thinking, incorporating abstract ideas and less common words. Kahneman (2003) referred to the terms System 1 and System 2, originally coined by Stanovich and West (2002). These characteristics are summarized in Figure 3-1.

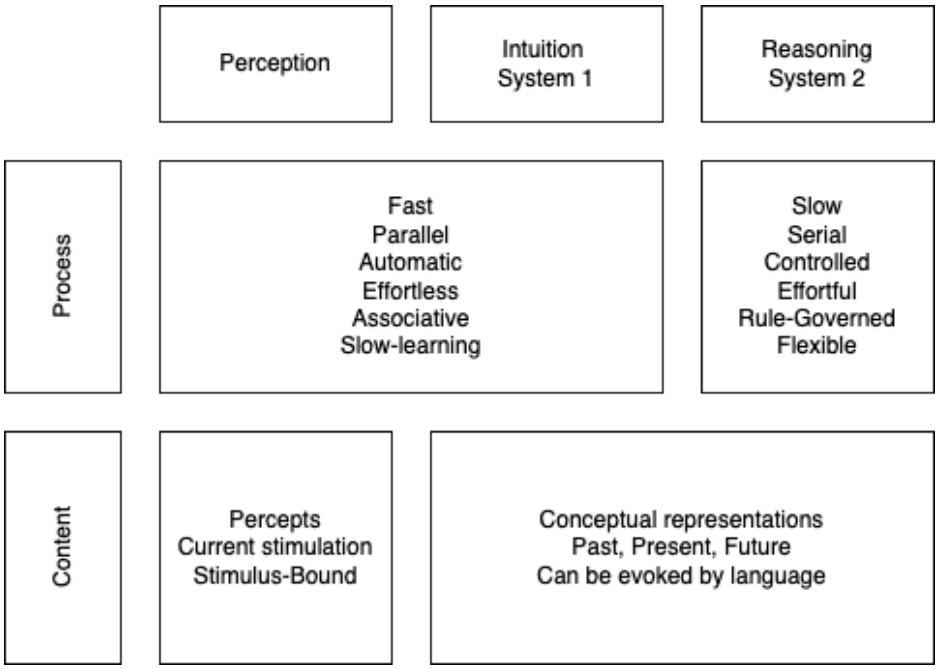


Figure 3-1. Properties of system 1 and system 2 (Kahneman, 2003)

Understanding the interaction between these two systems may help explain why some audit warnings are met with immediate resistance (System 1), while others invite more deliberate consideration (System 2).

Building on the principles outlined above, prospect theory provides a useful lens for understanding the deaf effect, particularly in the context of internal auditing and risk management. This theory helps explain why decision-makers tend to ignore internal auditors' risk warnings, which can undermine internal audit effectiveness.

- Probability of outcomes: Higher probabilities of negative outcomes may increase risk awareness, thereby reducing the deaf effect, as decision-makers are more likely to heed risk warnings.

- Potential gains and losses: High potential gains can result in an escalation of commitment, where decision-makers continue to invest in a failing project and enhance the deaf effect. Conversely, high potential losses can heighten risk awareness and increase the attention given to a risk warning by decision-makers, leading to a reduction in the deaf effect.
- Framing choices: The use of positive framing of outcomes can result in overoptimism and an increased deaf effect, as decision-makers tend to underestimate the potential risks. Conversely, the negative framing of outcomes can increase risk perception, increase potential risk, and reduce the deaf effect.

Heuristic-Analytic Theory

Evans' (1984, 1994, 2006) heuristic–analytic theory is widely used to gain insight into decision-making processes, especially in situations that are complex and stressful. Evans (1984, 1994, 2006) distinguishes two phases: heuristic and analytic. The heuristic phase is characterized by intuitive and automatic processing of information using mental shortcuts and heuristics. On the other hand, the analytical phase is characterized by conscious thought, logical reasoning, or more rational decision-making. This analytical phase serves to filter out irrelevant information when substantial amounts of information were involved.

In 2006, Cuellar et al. used the heuristic-analytic model to better understand the deaf effect in the context of IS- projects, and they identified three factors. First, their study demonstrates that messages that are considered relevant are more likely to be acted upon. Second, the credibility of the messenger is found to be important; decision-makers are more likely to listen to a messenger who they consider credible. Finally, mental models play an important role in the decision-making process. Decision-makers tend to rely on existing knowledge and experience when filtering and interpreting information. However, this leads to bias and may cause risk warnings to be ignored. These findings align with those of Near and Micelli (1995), who conclude that the effectiveness of whistleblowing depends significantly on the credibility of the whistleblower. Integrating Evans' theory into the study of the deaf effect provides a deeper understanding of why decision-makers might ignore risk warnings.

Deaf Effect in Organizational Behavior

In 1987, March and Shapira (1987) examined the influence of risk perception and engagement on managers' decision-making processes. Their study shows that managers often view negative outcomes as a result of bad luck rather than poor decision-making. This observation contradicts classical decision theory, suggesting that decisions are influenced by cognitive biases, emotional responses, and the organizational context. Furthermore, other research has demonstrated that perceptions, attitudes, and the organizational context of individuals affect openness and receptivity to information, a phenomenon known as receptivity to communication (Simon, 1997). This concept is important for forming a picture of how decisions are made, communicated, and implemented effectively

in an organizational environment. Finally, Simon (1997) indicates that enhancing receptivity could improve the decision-making process. It is important to note that Simon's (1997) findings remain relevant today and continue to inform our understanding of effective communication in organizational contexts.

Ocasio (1997) also contributes to the deaf effect theory by introducing the attention-based view of the firm, which emphasizes how organizational actions are shaped and where decision-makers direct their attention. Ocasio introduces three different perspectives: focused attention, where organizations focus on prioritized issues; structured attention, how organizational processes and hierarchies influence focus; and situated attention, contextual factors that affect the focus of the organization. This study challenged traditional decision-making models by emphasizing the role of attention.

Deaf Effect in Internal Auditing

The previous section outlined the dynamics of decision-making within the organizational context and emphasized how cognitive biases, emotional responses, and management attention shape outcomes (March & Shapira, 1987; Ocasio, 1997; Simon, 1997). To gain a better understanding of the impact of the deaf effect on internal auditing, we conducted a qualitative systematic review. Qualitative systematic reviews, as mentioned by Stern et al. (2014), provide a thorough understanding of the process of interventions and studies rather than concentrating solely on their effectiveness. To improve the methodological rigor of these reviews, it is important to follow a structured approach that ensures replicability and a thorough analysis (Sauer & Seuring, 2023).

METHODS

In June 2024, we conducted a critical literature review according to the PRISMA checklist criteria (Moher et al., 2009). For the Web of Science search, the following terms were used: "deaf effect" NOT "health". This resulted in the retrieval of only four articles. The references in these articles were screened to identify additional relevant articles. All included articles were read and examined. The selection process is summarized in Figure 3-2.

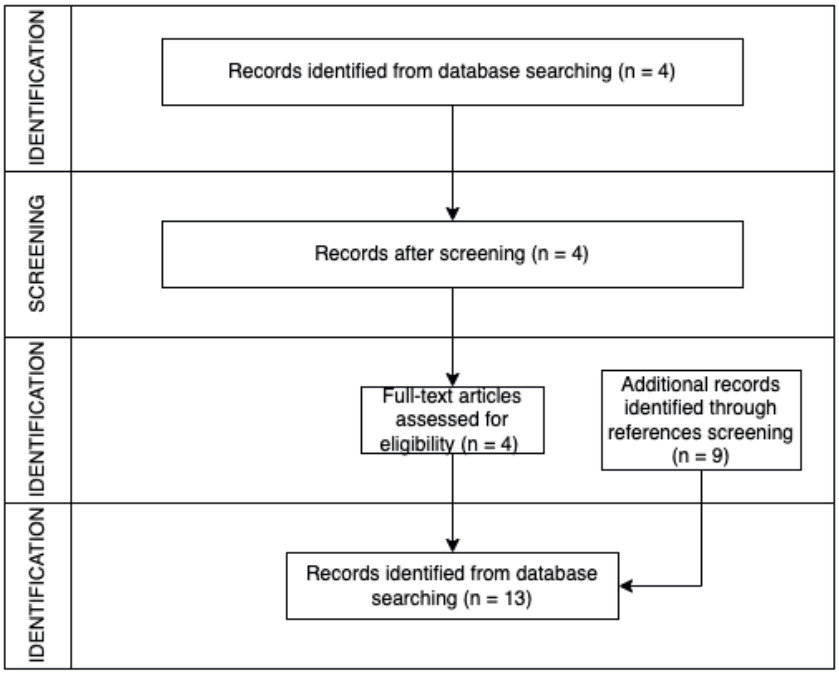


Figure 3-2. Flow of studies through the review process to identify literature on the deaf effect in internal auditing

RESULTS

In 2001, Keil and Robey first identified the 'deaf effect' in the context of managing troubled software projects. They showed a tendency among decision-makers to dismiss risk warnings from auditors, leading to project failures and financial losses. This study highlights the "escalation of commitment," which is observed in 30%–40% of all software projects. These projects experienced cost and schedule overruns of more than 150%, with less than a quarter of these projects ultimately reaching a successful conclusion. The study also showed the need for clear communication and auditor credibility to decrease the deaf effect. The authors argue that neglecting unwelcome information about a project hinders decision-making. This is caused by a combination of the mum-effect, where auditors are held back from communicating bad news, and the deaf effect, where bad news is ignored. This study also suggests that auditors' credibility should be enhanced by increasing their expertise and trustworthiness to decrease the deaf effect.

Cuellar et al. (2006) based their research on cognitive psychology and whistleblowing theory, delving into the cognitive and communicative aspects of the deaf effect and the conditions under which it is most likely to occur. This study examined the credibility of bad-news reporters, such as internal auditors, and their impact on the decision-making process.

The authors found that the perceived credibility of a bad-news reporter is significantly influenced by the reception and perceived relevance of risk warnings.

Several years later, Lee et al. (2014) built upon the work of Cuellar et al. (2006) and offered a better understanding of the factors that influence decision-makers' responses to risk warnings. While Cuellar et al. (2006) focused on the credibility of bad-news reporters to ensure that risk warnings are heeded, Lee et al. (2014) introduced additional dimensions. Role prescription was identified as an important factor in ensuring these risk warnings from individuals who are perceived as credible or role-prescribed are still acknowledged and acted upon.

Moreover, Lee et al. (2014) identified that perceived message relevance and risk perception are important mediators between bad-news reporter characteristics and decision-making regarding project continuation. This suggests that the effectiveness of risk warnings depends not only on credibility, but also on how the message is perceived. Furthermore, Lee et al. (2014) also found that gender actually influences the risk response, and that men exhibit a greater propensity for risk-taking than women, which makes them "deafer" to risk warnings.

Nuijten et al. (2017) expanded the research on the topic of the 'deaf effect' in IS-project management by examining the dynamics between the messenger of the risk warning and the decision-maker. Stewardship theory was applied to examine the messenger-recipient relationship (MRR). They found that when decision-makers view the messenger as a collaborative partner with shared objectives they are more likely to consider the messenger's risk warning.

Additionally, Nuijten et al. (2017) demonstrated that the nature of MRR can influence message relevance and perceived risk, which can either increase or decrease the deaf effect. This finding is consistent with that of Lee et al. (2014), who showed that the relational context determines the effectiveness of a risk warning.

The research conducted by Nuijten (2012) and Nuijten et al. (2019) also produced interesting results, which correspond with Kahneman and Tversky's (1979) conclusions in Prospect Theory. These studies found that the perception of risk warnings depends on the framing of the project and the control of the project's decision-makers.

Nuijten et al. (2019) extended the examination of the deaf effect in IS-projects by focusing on the post-deaf effect dynamics between internal auditors and managers. Their study delved into the actions internal auditors could take to reduce the deaf effect and positively impact the auditor-manager relationship. Nuijten et al. (2019) distinguished three categories: actions to force managers to listen, an inspector-like approach focused on compliance with formal procedures, and a consultative approach focused on collaboration.

Moreover, Nuijten et al. (2019) examined the influence of these actions on relationship dynamics and found that some actions have a negative impact on both the relationship and the deaf effect, whereas others contribute positively and reduced the deaf effect.

In 2018, Verbraak-Kolevska found that appropriate timing is significantly determined by the degree of urgency. The study demonstrated that in high-stake situations, immediate action should be taken. However, in other cases, it is particularly important to consider organizational schedules. Moreover, the study showed that when a risk was presented at the right time, the decision-maker was more likely to listen to the message, thereby increasing the probability that the risk warning would be heeded, ultimately enhancing the auditor's effectiveness.

In 2024, Nuijten et al. examined the influence of nudging, defined as a subtle behavioral intervention, on the deaf effect. The study identified three factors: descriptive norms, credibility of the messenger, and the relevance of the message. Their research showed that the credibility of the messenger and relevance of the message were important, which was also in line with the findings of Cuellar et al. (2006) and Lee et al. (2014). More interesting to note is that nudging with descriptive norms also contributes to mitigating the deaf effect. Nudging with descriptive norms makes decision-makers more aware of the behavior of their peers, encouraging them to conform to group norms.

Studies on the Deaf Effect

Table 3-1 lists studies in the research field on the deaf effect. In this table, we include the characteristics of the research method, independent and dependent variables, and methods applied for statistical analysis. Furthermore, we included the decision-making perspective represented by the participants of each study.

The Role of Music in the Deaf Effect

The 'deaf effect' within the internal audit domain has been explored by researchers such as Keil and Robey (2001) and Cuellar et al. (2006), Lee et al. (2014), and Nuijten et al. (2016, 2017, 2019, 2024), who offer valuable insights into ensuring that risk warnings are heard and acted upon.

The strategies discussed aim to mitigate the deaf effect by addressing several factors, including auditors' credibility and role prescription, the decision-maker's risk perception and risk propensity, the auditor–decision-maker relationship, the timing of risk warnings, and the use of nudging through descriptive norms. However, a closer examination reveals a critical gap, while these strategies focus on content and context, they overlook the delivery of the message. Auditors may need to capture the decision-maker's attention not only through *what* they say, but also through *how* they say it, using emotional tone to convey urgency and importance.

Table 3-1. Overview of studies on the deaf effect

Authors	Article	Research method(s)	Respondent(s)	Region	Key-variables / Theories	Independent variables	Dependent variable	Analysis	Role-perspective
Keil et al., 1994	Understanding runaway IT projects: Results from an international research program based on escalation theory	Series of 3 laboratory experiments, and a field research	graduate and undergraduate students	United States (US) and Finland	Self-Justification, Sunk Cost, Culture, subjective probability to continue	1. Prior Commitment ans Feedback (positive/ negative); 2. Sunk Cost; 3. Alternative course of action	1. Willingness to commit additional resources to a project 2. Willingenss to continue the project	ANOVA	Perspective of project managers and decision-makers dealing with runaway IT projects
Keil et al., 2000a	A Cross-Cultural study on escalation of commitment behavior in software projects	Laboratory experiments in three different cultures (single-factor, four-cell design)	536 subjects: 185 from Finland, 121 from the Netherlands, 230 from Singapore	Finland, Netherlands, Singapore	Sunk cost theory: The tendency to continue an endeavor once an investment in money, effort, or time has been made. Risk perception: Decision maker's assessment of the risk inherent in a situation. Risk propensity: Decision maker's tendency to take or avoid risks. Uncertainty avoidance: Cultural dimension that affects risk-taking behavior.	1. Level of sunk cost (15%, 40%, 65%, 90% of the total budget) 2. Risk propensity (measured by a question from MacCrimmon and Wehrung's portfolio of risk measures)	Willingness to continue a project	Partial least squares (PLS) analysis to test the structural model and measurement model. F-tests and T-tests for hypothesis testing and manipulation checks.	Perspective of decision-makers in software project management

Authors	Article	Research method(s)	Respondent(s)	Region	Key-variables / Theories	Independent variables	Dependent variable	Analysis	Role-perspective
Keil et al., 2000b	An investigation of risk perception and risk propensity on the decision to continue a software project	Laboratory experimentl, 3x3 factorial design	242 undergraduate business students enrolled in an introductory IS course at a large urban university	United States (US)	Risk perception: Decision maker's assessment of the risk inherent in a situation. Risk propensity: Decision maker's tendency to take or avoid risks. Probability of failure: Likelihood that the project will fail. Magnitude of potential loss: Impact of project failure on the company.	1. Probability of failure (manipulated as low, medium, high) 2. Magnitude of potential loss (manipulated as low, medium, high) 3. Risk propensity (measured using a scale adapted from the Choice Dilemma Questionnaire)	Decision to continue or discontinue the software development project	Two-way factorial design ANOVA Stepwise regression analysis Content analysis of written explanations	Perspective of software project managers making decisions under risk
Sabherwal et al., 2003	Escalating commitment to information system projects: findings from two simulated experiments	Experiment	86 graduate and undergraduate students (Experiment 1) and 122 students (Experiment 2)		Self-justification theory, prospect theory, expectancy theory, decision dilemma theory, self-presentation theory, modeling theory, agency theory	Level of project payoff, cost of payoff, personal responsibility, framing, competitor's success, job security, top-management support, side bets	Level of commitment to the project	ANOVA, regression analysis, manipulation checks	Perspective of decision-makers in IS project management
Keil et al., 2004	Climate, information asymmetry, and bad news in troubled projects	Controlled experiment with role-playing scenario (two-factor, four-cell design)	134 graduate business students at a large university in the southeastern U.S	US	Whistle-blowing, mum effect, perceived risk, agency theory	Perceived organizational climate, perceived information asymmetry	Reluctance to report negative information	Partial Least Squares (PLS) analysis, 2x2 Multiple Analysis of Variance (MANOVA), reliability and validity assessments	Perspective of project managers dealing with information reporting in troubled projects

Authors	Article	Research method(s)	Respondent(s)	Region	Key-variables / Theories	Independent variables	Dependent variable	Analysis	Role-perspective
Cuellar et al., 2006	Deaf effect response to bad news reporting in IS project	Laboratory experiment with role-playing scenario	60 students (average age: 20.5 years, 2.5 years of work experience, 57% female, 43% male)	US	Whistle-blowing, mum effect, perceived risk, decision-making theories	Auditor credibility, relevance of the message, demographic variables (age, gender, work experience)	Decision to delay or proceed with the project	Partial Least Squares (PLS) analysis, t-tests, confirmatory factor analysis	Perspective of project managers dealing with information reporting in troubled projects
Tiwana et al., 2006	Information systems project continuation in escalation situations: A real options model	Conjoint analysis experiment with field data	IT managers in 123 firms	US	Real options theory, escalation of commitment, decision-making theories	Real options (switch use, change scale, stage investments, abandon, grow), perceived option value, NPV	Willingness to continue a project	Hierarchical mediated regression analysis, Sobel mediation tests, multinomial logistic regression, conjoint analysis	Perspective of IT managers making continuation decisions in escalation situations
Cuellar et al., 2007	Impact of collectivism on the deaf effect in IT projects	Laboratory experiment with role-playing scenarios, 2x2 factorial design	Undergraduate students in introductory classes within business or information sciences at major universities	United States, Germany, China, South Africa, Saudi Arabia	Deaf effect, collectivism, project escalation	Institutional collectivism, in-group collectivism, role prescription, bad news reporter credibility	Relevance of the bad news reporter's message, decision to continue the project	Partial Least Squares (PLS) analysis, manipulation checks, confirmatory factor analysis	Perspective of project managers dealing with the communication of bad news in IT projects

Authors	Article	Research method(s)	Respondent(s)	Region	Key-variables / Theories	Independent variables	Dependent variable	Analysis	Role-perspective
Jani, 2008	An experimental investigation of factors influencing perceived control over a failing IT project	Laboratory experiment using a computer-simulated task 2 x 2 x 2 x 4 mixed facto rial design with between-subjects manipulations of project risk factors and the initial task-specific self-efficacy beliefs of par- ticipants before they worked on the failing project.	20 undergraduate students, 16 graduate students, 35 practicing managers	US	Escalation of commitment, self-efficacy theory, risk perception, project risk management	Project risk factors (endogenous vs. exogenous), initial task-specific self-efficacy (TSSE)	Perceived control over the project	Repeated measures ANOVA, mixed factorial design, manipulation checks	Perspective of project managers and students in decision-making scenarios involving failing IT projects
Lee et al., 2014	Deaf effect response to bad news reporting in IT project management	Mixed method approach including both quantitative and qualitative data obtained through a laboratory experiment	105 undergraduate students enrolled in information systems courses at a large urban university in the southeastern U.S.	United States	Perceived message relevance, risk perception, risk propensity, and the role of gender in IT project escalation	Role prescription, credibility, and gender	Willingness to continue a troubled project despite receiving bad news	PLS-analysis	Perspective of decision-makers in IT projects and their response to bad news reported by bad news reporters
Nuijten et al., 2016	Collaborative partner or opponent: How the messenger influences the deaf effect in IT projects	Two scenario-based laboratory experiments	Experiment 1: 199 master's students; Experiment 2: 140 executives, all enrolled in accounting and information systems courses	Netherlands, Belgium	Stewardship theory, agency theory, framing, risk	Messenger-recipient relationship (collaborative partner vs opponent), gain/ loss framing, perceived control	Willingness to continue a project despite receiving risk warnings	Partial Least Squares (PLS) analysis, two-way ANOVA, MANOVA	Perspective of project decision-makers receiving risk warnings from messengers

Authors	Article	Research method(s)	Respondent(s)	Region	Key-variables / Theories	Independent variables	Dependent variable	Analysis	Role-perspective
Nuijten et al., 2019	Partners or opponents auditor-manager relationship dynamics following the deaf effect in information system projects	Multiple case study approach, in-depth interviews	10 cases involving Dutch auditors with senior internal auditors holding leadership positions in Dutch Chapter of the IIA	Netherlands, Belgium	Internal audit effectiveness, auditor-manager relationship dynamics, deaf effect	Auditor actions (e.g., forcing managers to listen, standard reporting procedures, consulting approach)	Auditor-manager relationship, resolution of the deaf effect	Case study analysis, multi-cycle coding, NVivo 9 for data management and coding, clustering actions into meaningful categories	Perspective of internal auditors dealing with deaf effect in information system projects
Nuijten et al., 2024	Can nudging with descriptive norms help internal auditors stop runaway information systems projects?	Mixed methods approach: Two experiments and ten interviews	Experiment 1: 88 U.S. managers, Experiment 2: 170 undergraduate students, Interviews: 10 Chief Audit Executives	United States, Belgium, Netherlands	Deaf effect, nudging, descriptive norms, perceived social norms, internal audit effectiveness	Nudging with descriptive norm, auditor-manager relationship (AMR), perceived social norms	Willingness to continue a troubled project	Partial Least Squares (PLS) analysis, multiple analysis of variance (MANOVA), manipulation checks, thematic analysis of interview data	Perspective of internal auditors in corporate governance and IT project management

In 2003, Juslin and Laukka examined the impact of musical elements on listeners' emotions and behavior. Douek (2013) also stated that some musical elements such as dynamics and rhythm could indicate urgency or importance. More specifically, incorporating these elements can also help to capture and hold the attention of decision-makers when communicating risks.

Consequently, we propose a study to investigate the impact of musical elements on the deaf effect. To conduct such a study, it is important to understand the impact of music on human psychology, particularly on emotion and mood.

In the following paragraph, we explore the psychology of music and its impact on human decision-making and discuss how internal auditors can use music to improve their communication.

3.5 MUSIC

Why do people listen to music?
Listening to music is not a recent phenomenon; according to Zatorre and Peretz (2001), musical activities date back over 250,000 years. Numerous studies have reported high levels of music consumption in the past century (Fitzgerald et al., 1995; Zillmann & Gan, 1997). According to the International Federation of the Phonographic Industry (Smirke, 2024), the total revenue of the recorded music industry was USD 28.6 billion in 2024.

People listen to music for several reasons. For example, Gantz et al. (1978) discovered that pop music evokes a strong emotional response in listeners and can regulate mood. Roe (1985) showed that the music tastes and preferences of Swedish adolescents are influenced by peers, which underscores the importance of the social dimensions of music consumption.

In 1999, Hargreaves and North claimed that the way people use and interact with music has changed because of social and technological changes. Hargreaves and North believe that music has a social function and helps individuals manage their self-identity and interpersonal relationships. Their research indicated that music consumption is closely related to social context and personal identity formation.

In the following year, Tarrant et al. (2000) examined why English and American adolescents listened to music, identifying three main reasons: self-actualization, fulfilling emotional needs, and fulfilling social needs. Their study highlighted the multifaceted role of music in adolescent development; music is used not only for personal enjoyment, but also for social integration and self-expression.

Lonsdale and North (2011) expanded the research of Gantz et al. (1978) and confirmed that people listen to music primarily to regulate their mood. Additionally, they emphasized the psychological function of music, specifically its capacity to enhance moods. Further, Schäfer et al. (2013) demonstrated that music enhances self-awareness and social connections, thereby improving personal perceptions and strengthening social bonds.

Understanding why people listen to music can provide valuable insights into how to use music to mitigate the deaf effect. As it has been found that music can evoke emotions, increase self-awareness and promote social interactions, it could be used to improve the reception of risk warnings. Specifically, elements of music could be incorporated into the oral presentation of audit findings to draw and keep the interest of decision-makers.

Music, Mood and Emotion

Various stimuli trigger emotions in humans, and music is one such stimulus. Music has been proven to affect mood, feelings, and even thoughts, as Schäfer et al. (2013) pointed out. Not only does music have the ability to transform our emotional state from sad to happy, but it is also viewed as a universal means of communication. The relationship among music, mood, and emotion has been the subject of numerous studies. This section focuses on the most relevant studies for understanding the influence of music on mood and emotion.

Bruner (1990) discussed the influence of musical elements such as tempo, rhythm, and pitch on people's mood and how this can be used for marketing strategies. For example, happiness is induced by a major key, fast tempo, high pitch, flowing rhythm, consonant harmony, and medium volume, whereas sadness is produced by a minor key, slow tempo, low pitch, firm rhythm, and dissonant harmony (Bruner, 1990).

McCraty et al. (1998) examined the impact of various types of music on tension, mood, and mental clarity. Their research demonstrated that classical music can reduce anxiety and depression. Furthermore, the study revealed that the music that listeners enjoy evokes a positive emotional response in them.

In 2004, North et al. supported previous research showing that music influenced listeners. North et al. (2004) measured not only their change in mood, but also participants' willingness to engage in helping behavior. The results of the study indicate that uplifting music is associated with a positive mood and a higher likelihood of helping people, whereas annoying music has the opposite effect.

Another interesting study is that of Webster and Weir (2005), who show that different elements of music, such as mode, texture, and tempo, each affect an individual's mood differently. Their findings suggest that major modes, simple melodic textures, and faster tempos are positively correlated with happiness, while minor modes, complex melodic textures, and slower tempos are less strongly associated with happiness.

In 2012, Rea et al. conducted a study in which participants listened to various music genres. This study showed that pop or classical music has a more positive impact on individuals than heavy metal music does. More specifically, classical and pop music increased participants' feelings of calmness and relaxation, while heavy metal music increased their feelings of tension and nervousness. Heavy metal music typically has dramatic shifts between loud and soft passages, and often features thundering rhythms from electric bass guitars and drums, which could induce feelings of tension and nervousness (Cheng & Tsai, 2016; Hall, 1998). In contrast, classical music is known for its clear rhythm and tuneful melodies, which have a calming effect (Chen, 2018; Conrad et al., 2010).

Finally, a study by Van Der Zwaag et al. (2012) demonstrated the effect of music on mood and driving performance. Their results show that music significantly affects the driver's mood without negatively affecting driving.

These studies show how music can influence the emotions of individuals, specifically musical elements such as tempo, pitch, and rhythm. This raises interesting questions about incorporating these elements into risk warnings to enhance the engagement of decision-makers (listeners). In the following section, we investigate the impact of music on actions and behaviors.

Music and Behavior

It is widely known that music influences human behavior. For example, Smith and Curnow (1966) conducted an experiment in two large supermarkets, finding an association between higher music volume and shorter shopping duration. Although louder music increased sales per minute, it had no effect on the overall sales or customer satisfaction. Milliman (1982) also conducted research in a supermarket and found that slower music, characterized by fewer beats per minute, increased shopping duration, and potentially increased sales compared to faster tempo music. However, the different music conditions were not significantly related to the shoppers' awareness of the music. In 1986, Milliman expanded previous research to examine the influence of music in a restaurant setting. This study found that, compared to high-tempo music, low-tempo music was associated with more time spent at the table and higher bar tabs. Similarly, Dubé et al. (1995) examined the effects of music in social settings, using video simulations of service experiences at banks. They found that background music with high-arousal content (which often has a faster tempo) increases customer engagement.

North et al. (2000) delved deeper into the influence of music on customers' perceptions of atmosphere and their willingness to pay for products. Their findings showed that both the type of music and the volume level affected customers' perception of the atmosphere, with classical music and lower volume levels being associated with a positive atmosphere and higher purchase intentions.

Finally, subsequent research conducted by Guéguen et al. (2004, 2008) showed that loud music led to more alcohol consumption while simultaneously resulting in shorter stays in bars.

In the following section, we extend our perspective and explore how music influences decision-making.

Music and Decision-making

Music significantly impacts emotions and behavior, affecting mood, feelings, and even actions. Research has demonstrated that musical elements such as tempo, rhythm, and pitch shape emotional responses, while different genres of music evoke different moods, ranging from calmness to tension (Bruner, 1990; Rea et al., 2012). Furthermore, music has an impact on consumer behavior and social settings. Research has also shown that music alters perceptions and influences actions (Guéguen et al., 2004; North et al., 2000).

However, the connection between music and decision-making, particularly in the context of the deaf effect, requires more thorough exploration. The deaf effect refers to a situation in which information is ignored or downplayed, often due to emotional or cognitive biases. As music has the ability to affect mood and emotional states, it can play an important role in mitigating the deaf effect.

To investigate this, we conducted a qualitative systematic review to examine the effects of music on decision-making to understand its potential impact on the deaf effect. Specifically, we investigated how music influences the decision-making process. Qualitative systematic reviews offer a thorough understanding of the process of interventions and studies rather than concentrating solely on their effectiveness (Stern et al., 2014). To improve the methodological rigor of these reviews, it is important to follow a structured approach that ensures replicability and a thorough analysis (Sauer & Seuring, 2023). These reviews typically organize the data into themes and categories (Butler et al., 2016). In our analysis, we examined the articles included in the study based on the following criteria: participant demographics, research method, music type, decision-making tasks, and outcomes.

METHODS

In performing this review, we used the criteria of the PRISMA checklist (Moher et al., 2009). Initially, a preliminary search was performed on Web of Science to identify appropriate keywords. In July 2024, we used the following terms: “music” AND “decision”. The search was limited to articles that had both terms in their titles.

Studies were selected if they met the following criteria: they were empirical, published in English, and involving human participants. The researcher screened the references of each

article to identify additional relevant articles. The researcher read the full-text version of all included articles and examined them for similarities and differences.

In total, 117 records were identified in the database search. After screening the titles and abstracts, the researcher excluded irrelevant articles and articles in languages other than English.

To ensure conceptual clarity, the following definitions were used:

- *Music* is the art of arranging sounds in a sequence and organizing them over time to create a unified composition; it includes vocal, instrumental, or mechanical sounds that have rhythm, melody, or harmony (Merriam-Webster, n.d.).
- *Decision-making* is defined as the process of choosing between different options, involving the selection of one option from a set of possible alternatives (Kitajima & Toyota, 2013; Shafir, 2007).

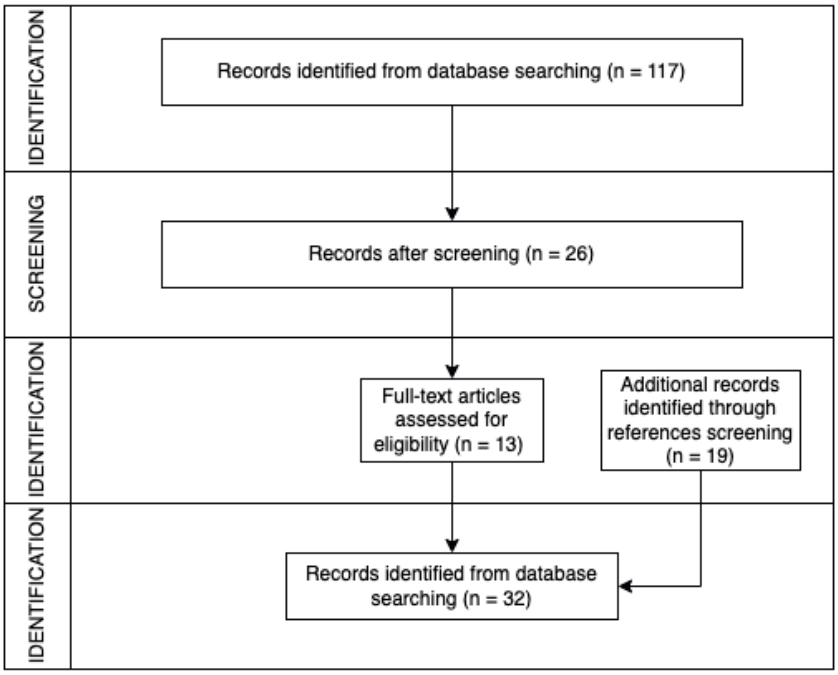


Figure 3-3. Flow of studies through the review process to identify literature on music in decision-making

Figure 3-3 shows the flow of studies included in the review on music in decision-making. Thirteen studies that met the eligibility criteria were included and analyzed based on participant demographics, research method, type of music, decision-making tasks, and outcomes. Table 3-2 presents the categories. Furthermore, 19 additional articles were identified through reference screening.

Results

Researchers have found that music can influence a listener's emotional state (Juslin, 2016; Juslin & Västfjäll, 2008; Krumhansl, 1997; Schäfer et al., 2013; Sloboda, 1991).

Researchers have also shown that music influences risk-taking and financial decisions. For example, Halko and Kaustia (2012) examined the effects of music on financial decisions. Their findings suggest that listening to music you like reduces your loss aversion. Following these results, Halko et al. extended their research in 2015 and used functional magnetic resonance imaging (fMRI) to gain more insights, confirming their previous research. Israel et al. (2019) investigated the effects of slow music on financial decisions. Their study demonstrated that slow music induced riskier decision-making, which was not the case for fast music.

However, music also appears to affect the trading performance. Au et al. (2003) showed that an unpleasant mood evoked by unpleasant music leads to better trading performance and more decision accuracy, compared to a pleasant mood. Furthermore, Brooks and Schweitzer (2011) showed that music that arouses anxiety entices negotiators to make lower first offers and exit negotiations earlier.

Furthermore, they found that people listening to happy music were more likely to choose riskier lotteries than those listening to sad music or random tones (Schulreich et al., 2014).

Moreover, music also influences decision accuracy. Research by Day et al. (2009) indicates that fast tempo music improves decision accuracy, particularly in challenging tasks. Nonetheless, they found that a higher tempo did not affect decision time, which suggests that music enhances cognitive processes without speeding up response time. This appears to contradict the findings of Santangelo et al. (2022), who showed that background music leads to inaccurate decisions. A possible explanation is that Santangelo et al. (2022) primarily investigated the general influence of music on decision-making, whereas Day et al. (2009) predominantly focused on the effect of the tempo of music on difficult tasks.

It is interesting to note that music not only influences financial decisions but also affects cooperative behavior. For example, Kirschner and Tomasello (2010) found that children engaged in joint music-making displayed more social behavior than those who were not. Moreover, this musical interaction not only led to increased empathy and social engagement, but also reduced aggression (Greitemeyer, 2011; Greitemeyer, 2009a; Greitemeyer, 2009b; Kirschner & Tomasello, 2010). A subsequent study suggested that listening to happy music leads to more cooperative behavior and helps improve team dynamics (Kniffin et al., 2017).

Furthermore, it appears that music also impacts decisions in environments that are not directly work-related. For example, Moritz et al. (2009) found that anxious music[3] improved decision-making in patients with schizophrenia. Conversely, party music leads to riskier decisions, particularly regarding increased alcohol consumption (Nikoulina et al., 2020). Additionally, music can affect people's impatience; research by Kim and Zauberman (2019) suggest that exposure to fast music causes consumers to perceive the temporal distance as longer, which increases their impatience. Finally, Zhou et al. (2022) showed that happy music[4] was associated with a preference for immediate rewards, and sad music leads to a preference for delayed rewards.

Thus, the influence of music is evident. While auditors continue to struggle to be heard and their warnings are often unheeded, music has the power to make people listen and consequently shape their perception. Music could therefore be an important link in mitigating the deaf effect and improving audit effectiveness.

Studies on Music and Decision-making

Table 3-2 lists the studies that were examined in this research regarding music and decision-making. In this table, we include the characteristics of the participant demographics, research method, type of music, decision-making tasks, and outcomes. Furthermore, we include a role perspective that was proposed to the participants in the experiments.

Table 3-2. Research on the relationship between music and decision-making

Authors	Article	Research method(s)	Decision context	Findings
Au et al., 2003	Mood in foreign exchange trading: Cognitive processes and performance	2 experiments (music & mood statements)	Risk-taking (trading)	(1) Pleasant mood decreased accuracy and performance. (2) Unpleasant mood improved accuracy but reduced investment. (3) Neutral mood yielded best results.
Brooks and Schweitzer, 2011	Can nervous nelly negotiate? How anxiety causes negotiators to make low first offers, exit early, and earn less profit	Experiment (music-induced anxiety)	Negotiation decisions	(1) Anxiety reduced offers and increased exit rate. (2) Self-efficacy mitigated negative effects.

3 "Anxious music" refers to the background use of the Halloween film theme (John Carpenter), while the "happy music" condition featured an instrumental version of Take Five (Dave Brubeck Quartet).

4 "Happy music" was operationalized as instrumental music in major/fast combinations, and "sad music" as minor/slow combinations (Zhou et al., 2022)

Table 3-2. Research on the relationship between music and decision-making (continued)

Authors	Article	Research method(s)	Decision context	Findings
Buelow et al., 2022	Contextual factors affecting risky decision making: The influence of music on task performance and perceived distraction	Experimental studies	Risky decision-making	(1) Limited evidence that music significantly affected task performance. (2) Rock music caused greater distraction than classical in passive listening. (3) Active listening showed mixed effects on risk-taking, depending on task.
Chung et al., 2016	Music-induced mood biases decision strategies during the ultimatum game	Experiment (musical excerpts)	Fairness in economic decisions	(1) Unpleasant mood increased rejections of unfair offers. (2) Negative correlation between rejection rates and fairness, and rejection rates happiness.
Colombo and Iannello, 2022	The combined effect of music-induced emotions and neuromodulation on economic decision making: a tDCS study	Experimental study using tDCS and music-induced emotions	Economic decision-making (Ultimatum Game)	(1) Cathodal tDCS led to more strategic offers depending on responder type. (2) Music-induced emotions enhanced strategic offers under sham condition. (3) Anodal tDCS led to more impulsive, higher offers after music.
Day et al., 2009	Effects of music tempo and task difficulty on multi-attribute decision-making: An eye-tracking approach	Experimental study using eye-tracking technology	Multi-attribute decision-making under varying tempo and task difficulty	(1) Faster tempo music improved decision accuracy. (2) No significant effect on decision time. (3) Tempo × difficulty interaction favored harder tasks. (4) Faster tempo increased intra-dimensional search.
Fischer & Greitemeyer, 2006	Music and aggression: The impact of sexual-aggressive song lyrics on aggression-related thoughts, emotions, and behavior toward the same and the opposite sex	Three experimental studies on misogynous vs. men-hating lyrics	Aggression-related decision-making	(1) Male participants exposed to misogynous lyrics showed more aggression toward female targets. (2) Misogynous music increased negative attributes and vengeance in men; men-hating music did the same for women. (3) Misogynous lyrics increased aggression and punishment behavior.
Greitemeyer, 2009a	Effects of songs with prosocial lyrics on prosocial thoughts, affect, and behavior	Three experimental studies on prosocial songs and behavior	Prosocial decision-making	(1) Prosocial songs increased accessibility of prosocial thoughts. (2) They fostered greater empathy. (3) Participants were more willing to donate money.

Table 3-2. Research on the relationship between music and decision-making (continued)

Authors	Article	Research method(s)	Decision context	Findings
Greitemeyer, 2009b	Effects of songs with prosocial lyrics on prosocial behavior: Further evidence and a mediating mechanism	Four experimental studies on prosocial lyrics and behavior	Prosocial decision-making	(1)Prosocial songs increased spontaneous helping. (2) Increased accessibility of prosocial thoughts and willingness to assist. (3) Increased empathy. (4) Increased empathy and cooperation in dictator game.
Greitemeyer, 2011	Exposure to music with prosocial lyrics reduces aggression: First evidence and test of the underlying mechanism	Five experimental studies on prosocial lyrics and aggression	Aggression-related decision-making	(1) Reduced aggressive word completions. (2) Reduced pro-violence attitudes, even when controlling for arousal/ mood. (3) Reduced hostility and cognition. (4) Reduced aggression in evaluations. (5) Reduced aggression in chili sauce task, mediated by lower state hostility.
Halko & Kaustia, 2012	Are risk-preferences dynamic? Within-subject variation in risk-taking as a function of background music	Lab experiment with musical conditions	Financial risk-taking (adolescents)	1) Liked music increased gamble acceptance to 54.1%. (2) Disliked music decreased it to 47.4% vs. 51.4% baseline. (3) Liked music reduced loss aversion; disliked music increased it.
Halko et al., 2015	Hedonic context modulates risky choices and reward responses in amygdala and dorsal striatum	Lab experiment using fMRI	Neural mechanisms of risk and reward processing	(1) Liked music increased risky choices and reduced loss aversion. (2) Music modulated neural activation in amygdala and striatum. (3) Music alters risk preferences and value coding.
Israel et al. 2019	Stop the music? The effect of music on risky financial decisions: An experimental study	Experimental study	Financial decision-making	(1) Slow-tempo music increased risk-taking in lottery tasks. (2) It led to less diversification in portfolios. (3) Males took more risks than females. (4) Music perception affected risk-taking.
Juslin and Västfjäll, 2008	Emotional responses to music: The need to consider underlying mechanisms	Review and theoretical framework development	Emotional processing and judgment	(1) Music induces a wide range of emotions, including complex and mixed. (2) Different mechanisms are triggered by features, context, and individual differences.
Juslin, 2016	Emotional reactions to music	Review of definitions, studies, and BRECVEMA theoretical framework	Emotional processing and judgment	(1) Music can induce a wide range of emotions, often positive but also complex and mixed. (2) Different mechanisms depend on musical features, context, and person.

Table 3-2. Research on the relationship between music and decision-making (continued)

Authors	Article	Research method(s)	Decision context	Findings
Kim & Zauberman, 2019	The effect of music tempo on consumer impatience in intertemporal decisions	Four laboratory experiments	Intertemporal consumer decision-making	(1) Fast tempo music made participants perceive time intervals as longer. (2) This increased impatience. (3) Temporal perception mediated the effect of tempo.
Kirschner & Tomasello, 2010	Joint music making promotes prosocial behavior in 4-year-old children	Experimental study (joint music vs. non-musical control)	Prosocial behavior in young children	(1) Joint music making increased helping and cooperation. (2) Children showed more empathy and social commitment, e.g., verbal excuses when unable to help.
Kniffin, et al., 2016	The sound of cooperation: Musical influences on cooperative behavior	Two 20-round public goods experiments	Cooperative behavior in group settings	(1) Study 1: Happy music increased cooperation vs. unhappy music. (2) Study 2: Effect persisted over 20 rounds. (3) Mood partially mediated the effect.
Krumhansl, 1997	An exploratory study of musical emotions and psychophysiology.	Lab experiments with psychophysiological measures	Emotional and physiological responses to music	(1) Sad music increased heart rate and blood pressure. (2) Happy music affected respiration. (3) Fearful music influenced blood transit time and amplitude. (4) Emotional self-reports aligned with physiological responses.
McDonald et al., 2022	Soundtrack to the social world: Emotional music enhances empathy, compassion, and prosocial decisions but not theory of mind.	Experimental study using EmpaToM paradigm	Social affect and prosocial decisions	(1) Emotional music enhanced empathy and compassion with negative videos. (2) No effect on Theory of Mind. (3) Prosocial decisions increased under emotional music. (4) MEMS scores correlated with compassion.
Moritz et al., 2009	Decision making under uncertainty and mood induction: further evidence for liberal acceptance in schizophrenia	Experimental study using mood induction via music	Uncertainty and decision thresholds in schizophrenia	(1) Schizophrenia patients made more decisions with lower thresholds. (2) Anxiety-evoking music increased decisions by deluded patients vs. non-deluded patients and healthy controls
Nikoulina et al., 2020	Risky drinking decisions: The influence of party music and alcohol abuse in young adult women	Experimental study with hypothetical scenarios	Risky drinking decisions in young women	(1) Party music increased risky drinking regardless of alcohol abuse history. (2) Party music raised drinking risk vs. eating decisions. (3) Abuse history raised risk generally.
Palazzi et al. 2019	Music-induced emotion effects on decision-making	Qualitative systematic review	Decision-making across emotional domains	(1) Music influences prosocial behavior, risk-taking, and aggression. (2) Effects depend on individual traits, preferences, and listening context.

Table 3-2. Research on the relationship between music and decision-making (continued)

Authors	Article	Research method(s)	Decision context	Findings
Santangelo et al. 2022	Background music changes the policy of human decision-making: Evidence from experimental and drift-diffusion model-based approaches on different decision tasks	Experimental study using drift-diffusion models	Decision speed, accuracy, and policy under music conditions	(1) Background music made decisions faster but less accurate. (2) Both slow and fast music lowered decision thresholds. (3) Effects were consistent across tasks.
Schäfer et al., 2013	The psychological functions of music listening	Literature review and PCA on data from 834 respondents	Psychological motives for music engagement	(1) Arousal/mood regulation and self-awareness were dominant. (2) Social relatedness was less important. (3) Context and personal traits shape music's function.
Schulreich et al., 2014	Music-evoked incidental happiness modulates probability weighting during risky lottery choices	Lab experiment with 4 conditions (happy, sad, random tones, no music)	Risk attitudes and probability weighting	(1) Happy music increased choice of risky lotteries. (2) Elevated probability weighting for large outcomes. (3) Effect was short-lived, fading after stimulation.
Skulmowski et al., 2014	Forced-choice decision-making in modified trolley dilemma situations: a virtual reality and eye tracking study	Experimental study using VR and eye-tracking	Moral decision-making under emotional arousal	(1) Participants consistently chose utilitarian options. (2) Faster responses in ten-to-one dilemmas. (3) Music group showed more negative affective response.
Sloboda, 1991	Music structure and emotional response: Some empirical findings	Questionnaire study	Emotional and physical reactions to musical structure	(1) Common reactions: shivers, laughter, lump in throat, tears. (2) Tears linked to sequences/appoggiaturas. (3) Shivers linked to unexpected harmonies.
Strick et al., 2015	Striking the right chord: Moving music increases psychological transportation and behavioral intentions	Three experiments in audio-visual advertising	Behavioral intentions and psychological transportation	(1) Exp 1: Moving music increased transportation and some intentions, not memory. (2) Exp 2: Reduced manipulative intent, boosted intentions (if salience was moderate). (3) Exp 3: No effect under extreme salience.
Sunaga, 2018	How the sound frequency of background music influences consumers' perceptions and decision making	Three experimental studies	Evaluative judgments influenced by sound frequency	(1) Low-frequency music increased perceived distance. (2) Frequency-message congruency improved evaluations. (3) Processing fluency mediated this effect.

Table 3-2. Research on the relationship between music and decision-making (continued)

Authors	Article	Research method(s)	Decision context	Findings
Yu et al. 2022	Decision support system for evaluating the role of music in network-based game for sustaining effectiveness	Theoretical and methodological study (DSS)	Game design and user engagement	(1) DSS evaluates musical elements in games. (2) AI/ML techniques optimize music for engagement. (3) Hierarchical model aids structured music evaluation.
Zhou et al., 2022	Music-induced emotions influence intertemporal decision making	Three experiments (music-induced emotions, tempo, mode)	Intertemporal choice and time perception	(1) Happy music led to preference for smaller-but-sooner rewards; sad music led to preference for larger-but-later rewards. (2) Fast tempo music led to preference for smaller-sooner reward (3) Mode-induced mood had no significant effect. (4) Time perception partially mediated the effects.

3.6 DISCUSSION

This critical literature review aims to investigate the complexities of the deaf effect within the context of internal auditing. The deaf effect occurs when decision-makers choose to disregard or downplay risk warnings from internal auditors. This situation poses a significant threat to risk management and project success. The deaf effect is driven by cognitive, emotional and communicative factors (March & Shapira, 1987; Ocasio, 1997; Simon, 1997). Although previous research has highlighted the importance of this issue, auditors still face difficulties in effectively communicating their findings (Cuellar et al., 2006; Keil & Robey, 2001; Nuijten et al., 2017; Nuijten et al., 2019; Nuijten et al., 2024).

To understand the deaf effect, it is important to consider the impact of cognitive biases and emotional responses on the decision-makers' perception of risk and thereby on their actions. Theoretical frameworks such as prospect theory (Kahneman & Tversky, 1979) and March and Shapira's (1987) view of risk as the chance of falling below target provide valuable insights because decision-makers may ignore risk warnings. These researchers have shown the importance of loss aversion, framing effects, and intuitive versus analytical thinking in the decision-making process. According to Kahneman and Tversky (1979), decision-makers often seem more motivated to avoid losses than to pursue gains, leading to an escalation of commitment to failing projects. Moreover, Keil and Robey (2001) argue that auditors also hesitate to communicate negative information about a project, which is referred as the mum-effect. Both the mum-effect and the deaf effect hinder project decision-making. It can be speculated that emotions such as fear, anxiety, and overconfidence can further increase the disregard for risk warnings. Additionally, Cuellar et al. (2006) suggest that factors such as the credibility of the auditor and the relevance of

the message also affect whether a risk warning is heeded. In addition to these elements, decision-makers' emotional and cognitive states should not be overlooked.

To strengthen the integration between the two theoretical streams discussed, the mechanisms and mediators underlying the deaf effect, and the psychological effects of music on decision-making, the following table presents a synthesized overview. For each deaf effect category, Table 3.3 identifies relevant music studies and explains how their findings conceptually align with specific cognitive or social processes. Additionally, it proposes corresponding vocal delivery strategies that could potentially be applied in practice.

Research on music and decision-making may offer a novel approach for mitigating the deaf effect in internal auditing. Music has been shown to significantly influence emotions, moods, and even actions (Bruner, 1990; North et al., 2004; Rea et al., 2012). Musical elements such as tempo, rhythm, pitch, and volume can shape emotional responses in people, and different genres of music evoke different moods, from calmness to tension (Bruner, 1990; Chen, 2018; Hall, 1998; Rea et al., 2012; Webster & Weir, 2005).

Studies have shown that music has the ability to alter perceptions and influence actions (Dubé et al., 1995; Guéguen et al., 2004; Guéguen et al., 2008; Milliman, 1982; Milliman, 1986; North et al., 2000; Smith & Curnow, 1966), suggesting that it could be used to enhance the effectiveness of audit communications.

The traditional verbal communication of auditors has proven to be insufficient in overcoming the deaf effect, as indicated by Cuellar et al. (2006), Nuijten et al. (2019) and Lee et al. (2014). The effectiveness of the risk warning depends not only on the content but also on the credibility of the auditor, the relevance of the message, and the relationship between the auditor and the decision-maker. However, even when the auditor is credible, the message is relevant, and the relationship is strong, decision-makers' biases and emotional state can still lead them to disregard risk warnings.

In this context, the influence of music-induced emotions on risk-taking behavior and financial decisions becomes relevant. Israel et al. (2019) examined the effects of music tempo on financial decisions and showed that slow-tempo music led to more risk-taking behavior. Similarly, Halko and Kaustia (2012) discovered that listening to music one likes reduces one's loss aversion. Expanding on these findings, Halko et al. (2015) discovered that listening to music you like influences your neural responses in areas associated with risk and reward. Therefore, these studies indicate that music can alter risk preferences, which is important for understanding the deaf effect.

Furthermore, music affects trading performance and decision accuracy. Au et al. (2003) demonstrated that unpleasant music induces an unpleasant mood and is associated

Table 3-3. Linking Deaf Effect Mechanisms to Music Concepts

Deaf Effect Category	Underlying Mechanisms / Theories	Nature of the Problem	Authors	Relevance to the Deaf Effect Category	Musical Intervention Vocal Delivery
Self-justification and escalation of commitment	Self-justification, sunk cost, escalation of commitment	The project continues despite negative signals, escalating failing behavior.	Keil et al. (1995), Keil et al. (2000a); Sabherwal et al. (2003); Tiwana et al. (2006)	Schulreich et al. (2014) and Israel et al. (2019) show that happy or slow paced music can reduce the perceived threat of risks, potentially reinforcing the cognitive tendency to continue a chosen course despite negative signals. Au et al. (2003), in contrast, shows that a neutral affect enhances decision accuracy, supporting the idea that breaking through automatic self-justification requires reflection and cognitive alertness.	Use a calm, neutral tone at a steady pace to interrupt automatic justification. Avoid rushed or emotional speech, which may reinforce sunk cost thinking.
Resistance to bad news	Mum effect, whistle-blowing, perceived risk, collectivism, reluctance to hear bad news	Risks or negative messages are not (clearly) communicated or are ignored.	Keil et al. (2004), Cuellar et al. (2006, 2007)	Brooks and Schweitzer (2011) demonstrate that a neutral mood reduces avoidance in difficult conversations, directly connecting to the mum effect and reluctance to communicate bad news. Kniffin et al. (2017) show that happy, rhythmic music fosters social connectedness and cooperative behavior, which can help overcome relational barriers to sharing negative or bad messages.	Use an open and neutral tone to reduce avoidance. A light, positive delivery can promote receptiveness and trust.

Table 3-3. Linking Deaf Effect Mechanisms to Music Concepts (continued)

Deaf Effect Category	Underlying Mechanisms / Theories	Nature of the Problem	Authors	Relevance to the Deaf Effect Category	Musical Intervention Vocal Delivery
Risk perception and sense of urgency	Risk perception, risk propensity, message relevance	Warnings are not taken seriously or are not perceived as urgent.	Keil et al. (2000b), Lee et al. (2014)	Schulreich et al. (2014) show that happy music increases optimism, lowering risk perception and potentially reducing the seriousness attributed to warnings. Israel et al. (2019) show that slow-paced music increases risk-taking, suggesting that slow speech might downplay risks. Au et al. (2003) reports that an overly pleasant affect reduces decision accuracy. Day et al. (2009) shows that faster music increases attention and accuracy, suggesting that elevated speech tempo can boost urgency and alertness.	Use a slightly faster pace and firm tone to strengthen urgency. Avoid happy or slow delivery, which may downplay risk.
Relational and social dynamics	Auditor-manager dynamics, stewardship theory, social norms, collectivism	The relationship determines whether the message is accepted or rejected, depending on the social context.	Nuijten et al. (2016, 2019, 2024), Cuellar et al. (2007)	Kniffin et al. (2017) show that happy music increases cooperation and social connectedness. In situations where message acceptance depends on the relational dynamic between auditor and auditee, such effects can help reduce resistance.	Use a happy, positive tone to invite divergent opinions and reduce pressure to conform.

Table 3-3. Linking Deaf Effect Mechanisms to Music Concepts (continued)

Deaf Effect Category	Underlying Mechanisms / Theories	Nature of the Problem	Authors	Relevance to the Deaf Effect Category	Musical Intervention Vocal Delivery
Decision context and power dynamics	Agency theory, information asymmetry, governance structures	Warnings are ignored or downplayed due to asymmetrical information flows or power dynamics.	Sabherwal et al. (2003), Keil et al. (2004), Nuijten et al. (2016)	None of the reviewed music studies explicitly examine the influence of music or vocal delivery on situations where warnings are ignored due to power asymmetries or informational inequality. As such, no direct theoretical linkage is currently available for this category.	No vocal intervention could be identified based on the available literature.

with better trading performance and higher decision accuracy, suggesting that mood states affect cognitive processing. Additionally, Schulreich et al. (2014) found that participants listening to happy music chose riskier lotteries than those listening to sad music, suggesting that mood induced by music alters risk perception and decision-making strategies. Moreover, Santangelo et al. (2022) found that fast tempo music led to faster and less accurate decisions.

Given these findings, we propose that the relationship between music and decision-making is relevant when considering the deaf effect. The deaf effect is partly driven by cognitive biases and emotional responses, and since music is capable of influencing emotions, it could be helpful in overcoming these difficulties. By strategically incorporating musical elements into spoken audit communications, such as risk warnings, auditors may increase the emotional relevance of their risk warnings, making them harder to ignore and more likely to be heeded.

Musical elements, such as tempo, rhythm, dynamics, and pitch, can be strategically used to emphasize the importance or urgency of a message, making it difficult to ignore. For instance, dramatic shifts between loud and soft passages and paced cadence can create a sense of tension or nervousness (Cheng & Tsai, 2016; Hall, 1998). Conversely, a slow tempo, less variability in the soft and loud passages, and a low pitch can evoke a sense of calmness (Bruner, 1990).

Using elements of music in audit communications, such as integrating elements of music into a spoken risk warning, could be a novel approach to mitigate the deaf effect and improve internal audit effectiveness. However, the use of musical elements in a spoken risk warning should be carefully considered to ensure that it improves the delivery of the message without distracting from the intended purpose. Moreover, the use of elements of music also has the potential to manipulate decision-makers' emotions, which should be taken into account.

To implement elements of music in an auditor's risk warning, a good understanding of both the decision-making context and the preferences of the decision-makers (audience) is required. The success of this approach depends on tailoring the use of musical elements to fit the specific organization's culture and circumstances. Furthermore, empirical research is needed to explore how to use these strategies in different contexts and identify the best practices for their implementation.

As discussed above, studies in psychology and behavioral science suggest that both musical elements and emotional responses can significantly influence how people perceive and act on risk information. These insights form the basis for the empirical chapters that follow, which examine how such elements may improve the effectiveness of audit warnings.

Therefore, we suggest that future research explore the impact of various musical elements (e.g., pitch, dynamics, rhythm, and tempo) on auditors' reception of risk warnings. Experimental studies should focus on how variations in these musical elements affect decision-makers' perceptions of urgency and relevance and whether these musical elements indeed mitigate the deaf effect. This will be explored in Chapter 4, which investigates how specific musical elements in vocal delivery may influence how risk warnings are perceived.

Furthermore, future research should explore how individual emotional differences may impact the vocal delivery shaped by elements of music in audit communication. This is further explored in Chapter 5, which examines how emotional tone in vocal delivery affects the reception of risk warnings.

Additionally, future research could explore the long-term effects of incorporating musical elements into audit communication on organizational outcomes such as project success rates and audit effectiveness. For example, research should investigate whether the initial effectiveness of integrating musical elements diminishes over time as decision-makers become accustomed to these cues.

In response to the research question of this chapter, the literature reviewed provides a conceptual basis for applying elements of music to strengthen internal audit risk warnings and address the deaf effect.

In conclusion, this review outlines the challenges caused by the deaf effect in the context of internal auditing and proposes a novel approach that incorporates elements of music in audit communications. By using the emotional and cognitive impact of music, auditors may increase the effectiveness of their communications and reduce the likelihood of a risk warning being disregarded. However, this approach presents its own challenges, including both practical and ethical considerations, and future research is necessary to understand the potential benefits and limitations of such an approach.

3.7 SUMMARY

This critical literature review shows that the deaf effect is a barrier to internal audit effectiveness. The existing literature pays little attention to the way in which risk warnings are delivered vocally.

Although previous studies have focused on cognitive, organizational, and relational factors that influence whether decision-makers listen to auditors, the emphasis has remained primarily on the content of the message and the context in which it is presented. As a result, the role of the auditor's voice, the vocal delivery, has remained underexplored.

Insights from music psychology demonstrate that elements of music, such as rhythm, tempo, dynamics, and pitch, can influence attention, emotion, the sense of urgency, and decision-making. While these insights have been widely applied in other domains, such as politics and marketing, they are rarely considered within auditing and IS projects.

This chapter therefore develops a theoretical framework, inspired by principles from music theory, in which the auditor's voice is positioned as a possible strategy to mitigate the deaf effect.

This framework draws on insights from music psychology and proposes that auditors, by consciously using vocal elements such as rhythm, tempo, dynamics, and pitch, can enhance the emotional relevance, urgency, and credibility of their message. This approach offers an innovative addition to existing modes of audit communication, which so far have focused mainly on rational and content-driven aspects, overlooking the performative and affective dimensions of spoken risk warnings. It serves as the foundation for the three empirical chapters that follow, which explore how vocal delivery and musical elements influence the effectiveness of risk warnings.

"THUNDERBOLTS AND LIGHTNING,
VERY, VERY FRIGHTENING ME!"

CHAPTER 4
EXPERIMENT ON RHYTHM AND DYNAMICS

This chapter is based on a paper presented at the 17th European Conference on Internal Audit and Corporate Governance (EIACG, Paris, France, 2019).

Yap, L., Benschop, N., Nuijten, A., Keil, M., & Commandeur, H. (2025a). Reducing the Deaf Effect for Risk Warnings on Failing Information Systems Projects: A Music Theory Perspective. Under review.

Chapter 3 provided the theoretical foundation for conducting the empirical studies. It suggested that elements of music in vocal delivery, such as rhythm and dynamics, might influence how risk warnings are perceived. Although this idea was only briefly explored, it offered a starting point for further empirical investigation.

This chapter presents the first empirical investigation into the influence of vocal delivery on the effectiveness of risk warnings. Specifically, it examines how rhythm and dynamics affect how a risk warning is received.

In a scenario-based experiment, participants listened to the exact same risk warning, with the rhythm and dynamics manipulated. The goal was to test to what extent these vocal manipulations affect emotions, the perceived relevance of the message and the willingness to continue with a failing project.

4.1 ABSTRACT

Managers of Information System (IS) projects are not always receptive to risk warnings, a phenomenon known as the deaf effect. Based on concepts from music theory, this exploratory study investigates whether the dynamics and rhythm of a spoken risk warning can evoke emotions and influence the perceived relevance of warnings, thereby potentially decreasing the deaf effect. Findings from our 2 x 2 factorial design experiment suggest that increasing rhythm or dynamics influences emotions, evoking more interest and hope and less boredom, as well as impacting the perceived relevance of the warning. Furthermore, while dynamics appeared to reduce the deaf effect, the influence of rhythm was less clear and requires further investigation.

Keywords: internal audit effectiveness; deaf effect; information system projects; risk warnings; music; rhythm; dynamics

Article Classification: Research Paper

Ethical Compliance: All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

4.2 INTRODUCTION

Many information systems (IS) projects still encounter difficulties and fail to be completed within budget, on schedule, or with the desired functionality (Bloch et al., 2012; Cao, 2008; Cecez-Kecmanovic et al., 2014). However, in many cases, decision-makers are aware that the project is experiencing difficulties. Yet, despite receiving warnings about these issues from internal auditors or other parties involved in the project, decision-makers do not always act on these warnings, and this is known as the 'deaf effect' (Cuellar et al., 2006; Keil & Robey, 2001). Prior research has shown that this can result in a variety of issues such as budget and schedule overruns, project escalation (Nuijten et al., 2016), or even project failure.

A recent example of a large IS project experiencing the deaf effect is the DSO project in the Netherlands. This project aims to provide a digital portal that can be used to provide insights into what building activities are allowed in specific areas in the Netherlands. The system has been under development for a long time, and involved parties have warned that crucial parts of the system do not function, that the system is too complex, and that there is reason to doubt whether the system will work properly (van Dinther, 2022). Even though serious warnings concerning the project were received, the Minister of Health did not seem to have heed them and continued to pour resources into the failing project (van Dinther, 2022), which is the definition of escalating commitment to a failing course of action. As a result of these issues, the intended implementation date has already been delayed four times.

Some elements that may contribute to the deaf effect, such as the role of the risk messenger (Cuellar et al., 2006), the characteristics of the decision-maker who receives the warning (Lee et al., 2014), the manner in which the risk warning is framed (Benschop et al., 2022; Nuijten et al., 2016), and the relationship between the messenger and decision-maker (Nuijten et al., 2016), have already been identified in prior research. However, there has been no prior research on whether differences in how the warning is delivered influences the deaf effect.

In this study, we investigate whether the deaf effect might be influenced by the use of musical elements to support the delivery of risk warnings. Specifically, we aim to explore whether adding rhythm and dynamics to the delivery of spoken risk warnings could reduce the deaf effect. Our study was inspired by the contrast between risk warnings, which people may not want to hear, and music, which most people love to hear. Specifically, we explored the possibility that musical elements that make people inclined to listen could be applied in the context of IS projects to increase the receptivity to risk warnings. In this study, we leverage two elements from music theory (i.e., rhythm and dynamics) and apply them to spoken risk warnings to determine whether they can be used to reduce the deaf effect in IS projects.

While our study draws upon music theory to explain how dynamics and rhythm capture attention, these principles align with findings from speech-processing studies, where

prosodic features such as speech rate, tempo, and loudness enhance attentional focus and emotional engagement (Coutinho & Dibben, 2013). These shared views between music and speech provide a strong foundation for exploring whether musical elements can be used effectively in spoken risk warnings to potentially reduce the deaf effect.

Music is often used to influence listeners (Juslin & Laukka, 2003; Saarikallio et al., 2013; Sloboda & O'Neill, 2001). Therefore, in this study, we investigate how elements of music can influence the decision-makers' receptivity toward the risk warnings that they receive. Specifically, we investigate whether adding more dynamics and rhythm could potentially evoke emotional reactions toward the spoken risk warning, thereby increasing receptivity to such risk warnings and potentially reducing the deaf effect. In this exploratory study, we aim to address the following research question:
How does the use of dynamics and rhythm in spoken risk warning affect the willingness to continue as failing IS projects?

To address this question, we conducted a scenario-based experiment designed to test the effects of dynamics and rhythm in a spoken risk warning. The remainder of this paper is organized as follows. First, we provide a brief overview of relevant literature and outline our propositions and model. We then introduce our experimental design, discuss the patterns observed in the results, and conclude by discussing the theoretical and practical implications of our work.

4.3 THEORETICAL BACKGROUND AND EXPLORATORY RESEARCH MODEL

This section provides a brief description of the context of the deaf effect and how the application of music theory may provide a way to increase decision-makers makers' willingness to listen, thus reducing the deaf effect.

Deaf Effect
The deaf effect phenomenon is defined by Keil and Robey (2001) as occurring when auditors execute their responsibility to warn about a troubled IS project, but the responsible decision-makers refuse to listen to the risk warnings given by the auditor (Cuellar et al., 2006; Keil & Robey, 2001; Nuijten et al., 2016). In the context of IS project escalation, the deaf effect has been shown to increase the likelihood that managers will continue troubled projects despite warnings from auditors (Keil & Robey, 2001).

Prior research has identified several aspects that can cause the deaf effect. Perceived message relevance (i.e., the degree to which the receiver perceives the message to be pertinent to their situation) has been shown to be influenced by the credibility of the messenger (Cuellar et al., 2006). Furthermore, Lee et al. (2014) have shown that decision-

makers are more likely to pay attention to risk warnings issued by role-prescribed individuals (i.e., those whose role in the organization includes the issuing of such warnings).

The most important driver of message relevance is, of course, the content of the message itself, and thus, the content of the risk warning. If these are incorrect, unclear, or of poor quality then a receiver is likely to perceive the relevance as low and is unlikely to act. However, several studies have shown that factors other than the content of the message can influence perceived message effectiveness.

Nuijten et al. (2016), for example, has shown that managers are more likely to listen to the same message when the auditor delivering the message is perceived as a partner rather than an opponent. Another finding of their study was that managers were more likely to listen to the warning when it was described using positive rather than negative framing. Finally, studies have shown that factors such as gender, work experience, and risk propensity of the message recipient impact the deaf effect (Cuellar et al., 2006; Lee et al., 2014).

Internal Audit Warning Effectiveness

The deaf effect is not just a problem for the receiver of the message or other IS project stakeholders but also for the messenger. Specifically, the deaf effect has been shown to hamper the effectiveness of internal auditors as risk messengers. Research has long emphasized that the success of an audit is determined by the management's response to the auditors' warnings and recommendations. Sawyer (1995) highlighted that the auditor's job is complete when the identified issues are corrected and remain corrected, which shows the importance of management's willingness to act.

In recent years, researchers have continued to explore internal audit effectiveness and have determined that it depends on factors such as senior management support, internal audit competence, and the independence of internal auditors (Arena & Azzone, 2009; Drogalas et al., 2015; Mihret & Yismaw, 2007; Sarens, 2009). Moreover, Endaya and Hanefah (2016) have demonstrated that top management plays a moderating role in improving the audit effectiveness. Lenz and Sarens (2012a) emphasized that audit effectiveness is measured by the changes it initiates within the organization, rather that the audit report itself.

A crucial precondition for all these aspects of IA effectiveness is that auditees are willing to listen to the recommendations or warnings of internal auditors. After all, if they are unwilling to listen to what the IA function is saying, they are unlikely to follow or implement their recommendations. Similarly, if nothing changes as a result of an audit report that calls for change, the audit report is unlikely to have a positive impact on the quality of corporate governance or risk management. As such, the deaf effect, in which receivers of these risk warnings do not listen to them, poses a serious obstacle to IA's effectiveness (Lenz & Hahn, 2015; Lenz & Sarens, 2012a). In the next subsection, we propose a solution for the deaf effect based on the music theory, which has not yet been explored in prior research.

In summary, while some factors that can influence the deaf effect have been identified in prior literature, there are others that remain unexplored. In this study, we focus on some unexplored factors by drawing upon music theory. In the following subsection we introduce aspects of music theory that have to do with which elements influence how music is received. We then propose that some of the elements that influence receptivity to music may also influence the receptivity to risk warnings by internal auditors in IS projects.

Music

Music has always been an effective way to communicate with people (Schäfer et al., 2013), and has a strong influence on people's emotions. Music is known to be an effective tool for positively or negatively influencing mood (Ransom, 2015). To understand how music can affect mood, it is important to know the elements of music and how they affect emotions. Based on this understanding, we can determine whether these elements of music can be applied to internal audits.

Music literature shows that there is no clear consensus on the number of elements that are important for music. For example, Sarrazin (2016) defined music by distinguishing six elements: melody, harmony, rhythm, dynamics, timbre, and texture. In contrast, Burton (2015) introduces the seven elements: pitch, duration, loudness, timbre, sonic texture, and spatial location. However, for the purpose of this paper, we draw upon Cohen et al. (2010), who identified five elements of music: tempo, dynamics, pitch, timbre, and rhythm. We selected Cohen et al. (2010) as it provides a clear and practical framework for understanding musical elements, making them accessible and applicable to internal audits. Table 4-1 provides definitions and descriptions of these five key elements.

Table 4-1. Elements of music (Cohen et al., 2010)

Element	Definition	Characterization
Tempo	The speed level of the sound	• Sounds the music relatively fast or slow? • Is there a sudden change in pulse? • Are there lots of fluctuations in speed?
Dynamics	The volume level of the sound	• Is the volume relatively loud or quiet? • Is there a sudden volume change? • How gradual is the volume change?
Pitch	The location of the sound in the musical scale	• Are the sounds high or low in pitch? • Are there fluctuations in pitch?
Timbre	The "character" or "personality" of the sound	• Are the sounds sharp or rather dull? • Are there accentuated notes? • Do the sounds seem warm, sweet, or rough?
Rhythm	The structural spacing of the sound	• Is there variation and unpredictability, or is there regularity and consistency? • What is the duration of the pauses? • Are the pauses sudden or expected?

Cohen et al. (2010) suggest that these elements can be used to induce emotional reactions. *Tempo* for example can be used to build, sustain tension or to excite. If the tempo of a song increases slowly, listeners will experience hastiness. Similar to tempo, d*ynamics* can also be used to surprise or excite, as well as to soothe and calm. This can be achieved by changing the volume of a piece of music from loud to soft or vice versa.

Pitch is another element of music and can be defined as the location on a musical scale (Cohen et al., 2010). Pitch can vary from high to low. Studies have shown that a high pitch can be related to joy or fear and that a low pitch can be related to sad emotions (Rodero, 2011; Waaramaa et al., 2008).

Timbre can be described as the character or personality of a sound (Cohen et al., 2010). The character of a sound can be changed from a sharp and thin sound to a more dull and warmer sound. Cohen et al. (2010) suggest that a sharp and thin sound evokes a sense of magic and mystery, while big warmer sounds can evoke a sense of sadness.

Rhythm is the structural spacing of the sound in a regular and repeated pattern (Cohen et al., 2010). Rhythms differ from tempo. Tempo is the number of beats per minute, and indicates how fast or slow a musical piece is performed. Rhythm is a pattern of music in time. This difference can be explained by the human heartbeat. The heart can beat fast or slow, also known as its tempo. But the heart also has a repeated pattern of sounds "dub-dub, dub-dub", and this is known as its rhythm. Rhythm can be used to create excitement; using an unpredictable rhythm keeps listeners alert and on edge (Cohen et al., 2010).

These musical elements can often function together, rather than in isolation. For example, if a musical piece has a slow tempo, a low pitch, and dull timbre, the composer may evoke a sad image. By increasing the tempo and pitch and using sharp sounds, the composer can change the emotion from sadness to excitement or fear. Cohen et al. (2010) suggest that if composers use the elements of tempo, rhythm, pitch, and timbre to create an image, a mood, or a story, that speakers can potentially also use these elements to intensify their message. In this research, we propose that the same elements that a composer uses to move the listener can also be used by an auditor to reach the decision-maker.

Douek (2013) suggested that rhythm and dynamics, in other words, spacing and loudness, can be used to communicate urgency and importance. A risk warning is often urgent and important. Thus, we posit that auditors could use dynamics and rhythm in order to communicate their message more effectively. We also think that it is more feasible for auditors to alter dynamics and rhythm in a controlled and conscious way than it would be to effectively control the other elements. Specifically, learning to change the timbre or pitch of one's voice is difficult, since it requires practice in altering the larynx height or learning how to modify vowels, which can require years of study. Therefore, this study

examines how internal auditors can use the elements of dynamics and rhythm to convey risk warnings more successfully in an IS project.

From Music to IA Warning Effectiveness

While it may come as no surprise that these elements influence how listeners respond to a piece of music, it may be less evident that the same elements could also play a role in how a spoken warning by an internal auditor is received. After all, a song and a spoken message are two different things. One obvious difference is that it is rare for the latter to involve musical instruments. However, music theory suggests that musical instruments are not the only aspect of songs that can incorporate the five elements of tempo, dynamics, pitch, timbre, and rhythm. The human voice can similarly convey these five elements, for example via lyrics in songs or via poems.

In addition to lyrics in songs, people can also apply the five elements of music theory to their voices in other contexts, such as when reading a poem or in speech. This notion is in line with Cohen et al.'s (2010) suggestion that speech can be a powerful way to deliver a message, given that music and speech are both performance arts. Cohen and Wei (2010, p. 1) similarly suggest that music and speech evoke emotions in the listener and conclude that "the lyrical message is inherently musical and that there is a music of speech." Professional speakers do not separate words and music when they talk. According to Cohen et al. (2010), they use words to convey their thoughts and musical elements to support their words in conveying the right emotions. By combining words and music, speakers attempt to influence how listeners receive and interpret their messages.

Professional speakers use this 'coating' process to increase the persuasiveness of their messages. We explore how internal auditors can use these same techniques to increase the persuasiveness of their warnings regarding IS projects, which might help reduce the deaf effect.

The Role of Dynamics and Rhythm in Spoken Warnings

Drawing on music theory, we explore whether the dynamics and rhythm of spoken risk warnings by the IA might influence the receiver's willingness to listen to such risk warnings. Specifically, we aim to investigate whether these aspects of the risk warnings can influence the listener emotionally, which can subsequently increase their willingness to listen. In this way, we aim to extend traditional deaf effect studies which have focused on how people's thoughts on the relevance of a risk warning can be influenced (e.g., Nuijten et al., 2016). However, these prior studies did not focus on how the emotions of the receiver might be influenced by such a message and how this is related to the deaf effect.

First, we explore whether adding dynamics and rhythm to IA messages might influence the perceived relevance of a spoken risk warning. Second, we investigate whether adding

dynamics and rhythm to IA risk warnings can evoke specific emotions in the listener, which can increase the willingness to listen.

The Effects of IA Risk Warning Dynamics and Rhythm on Perceived Message Relevance

Prior research has shown that the deaf effect is driven by the relevance that the recipient assigns to the message as well as their risk perception, and that such factors can be influenced by the characteristics of the messenger and the way in which the message is presented (Nuijten et al., 2016). In our study, we suggest that message relevance will mediate the relationship between the musical elements and the deaf effect. The logic for this assertion is that decision-makers will assign greater relevance to a risk warning when certain elements of music are used in its delivery rather than when such elements are missing. To illustrate the importance of these musical aspects, we describe how former U.S. presidents (e.g., Clinton and Obama) applied these same elements in their speech.

Former U.S. President Bill Clinton's remarks at the 1995 Oklahoma bombing memorial prayer service illustrate how dynamics can be used to great effect. Clinton used dynamics in his speech to comfort and reassure. He started each sentence with a strong and loud voice, and concluded each sentence rather quietly. By doing so, he likely helped change the thoughts of the people from anger to acceptance. Former U.S. President Barack Obama used a rhythmic pattern in his 2013 inauguration speech. By constantly changing the rhythm, he emphasized the importance of what he was saying, keeping listeners engaged.

Dynamics in music are used to grab the attention of the listener and we explore whether the same is true with respect to human speech. Without dynamics, music would be flat and boring. The same is true with respect to human speech. When a spoken risk warning is delivered without dynamics, listeners are less apt to be engaged and are less likely to regard the risk warning as being relevant. Spoken risk warnings that are dynamic, however, can really grab the listener's attention, which will cause them to ascribe greater relevance to the risk warning. Our first proposition is as follows:

Proposition 1*). Adding dynamics to a spoken risk warning could increase the perceived message relevance.*

Another musical element is rhythm, which is used to make certain notes stand out in a sequence by making them longer, higher, or louder. However, in speech, syllables are used to replace notes or beats. Stressing certain words determines the rhythm. Roach (2001, p. 37) states that: "rhythm is useful to us in communicating: it helps us to find our way through the confusing stream of continuous speech, enabling us to divide speech into words or other units, to signal changes between topic or speaker, and to spot which items in the message are the most important."

Rhythm is a musical element that is also used to create excitement. By using an unexpected rhythm, the music will evoke alertness by the listeners (Cohen et al., 2010). Further, when the rhythm of the music suddenly changes, this grabs the attention of the listener. Research supports this notion. For example, Miller et al. (2013) found that rhythmic sounds can help individuals to focus more effectively. Similarly, Jones and Boltz (1989) found that both regular and irregular rhythms can capture individuals' attention, particularly when something unexpected occurs. Based on these findings, we posit that changes in rhythm within a spoken risk warning can grab listeners' attention and make the warning seem more relevant.

We explore whether using unexpected rhythms in speech can help to hold listeners' attention and keep them alert. In line with this, we propose that rhythm in spoken risk warnings will have a similar effect as dynamics by not only grabbing listeners' attention, but also by causing them to ascribe greater relevance to risk warnings. Therefore, this leads to the following proposition:

Proposition 2). *Adding rhythm to a spoken risk warning could increase the perceived message relevance.*

In line with the findings of prior studies, we expect that when decision-makers assign greater message relevance to a risk warning, they will be less willing to continue a failing course of action. Conveying risk warnings in such a way that their relevance to the receiver is clear is an important step in reducing the deaf effect. Prior research indicates that when a risk warning is perceived to be more relevant, decision-makers are more willing to listen to it (Cuellar et al., 2006; Nuijten et al., 2016). Since this has been established in prior research, we probe this relationship purely for the value of replication but do not formally state it as a proposition.

The Effects of IA Risk Warning Dynamics and Rhythm on Emotion

The word emotion is often used in our everyday language. However, it is difficult to reach a consensus on the definition of emotion. Words such as mood or feelings are often used to define the concept of emotion. According to Fisher and Ashkanasy (2000), emotions are primarily reactions to a person or an event. Emotions differ from moods in that they last for a shorter duration and are more intense (Gohm & Clore, 2002).

Research has shown that music can influence emotions (Juslin & Västfjäll, 2008; Sloboda et al., 2001). Furthermore, some studies have shown that music influences the formation of thoughts or creates or changes feelings (Ahmad et al., 2015; Bharucha et al., 2006; Ganser & Huda, 2010). Classical music has even been shown to reduce anxiety and depression. McCraty et al. (1998), conclude that the emotional and physical status of people can also be influenced by using non-harmonized, simple melodies or by increasing the tempo of a song, both of which can increase ratings of happiness. Gerardi and Gerken (1995) suggest

that a falling melody often induces sadness, while a rising melody induces happiness. Finally, Ahmad et al. (2015) concluded that music affects the listener in many ways, that sad music makes the listener sad, and that happy music makes them feel happy. Thus, it is clear from prior research that music influences emotions.

Speakers can use elements of music theory to change their tone of voice and convey emotions (Juslin & Laukka, 2003). Specifically, we investigate whether a spoken IA risk warning that contains clear dynamics and rhythm will evoke emotion on the part of the recipient. Similarly, we expect that a lack of dynamics and rhythm will not evoke emotion. Thus, we introduce the following propositions:

Proposition 3). *Adding dynamics to a spoken risk warning could evoke more emotion.*

Proposition 4). *Adding rhythm to a spoken risk warning could evoke more emotion.*

Richmond et al. (2001) argued that people often do not listen to speakers' messages because of their poor communication skills. Cohen et al. (2010) suggest that professional speakers attempt to influence their listeners, in order to get their message heard. Professional speakers accomplish this by using various elements of music to enhance the delivery of their speech (Juslin & Laukka, 2003). In the context of an auditor's warning about a project, we explore whether a message delivered with a high degree of dynamics and rhythm will be more effective in evoking of emotive responses. If such a message is communicated convincingly, it is expected, for example, to increase the listener's interest in the message. Given the negative content of the message, such a message could also evoke a higher degree of fear when communicated effectively. In turn, reactions such as a higher degree of interest in the message and an increased sense of fear regarding the project's future could reduce the willingness to continue with that project. As such, we argue that emotive reactions, such as these, are related to a lower willingness to continue.

This leads to the following proposition:

Proposition 5). *The level of emotion experienced after receiving a spoken risk warning could influence the willingness to continue a failing IS project.*

Based on our literature review and theorizing, we developed an exploratory research model shown in Figure 4-1. In our analysis, risk propensity, age, and work experience were included as control variables. We included these variables based on the conclusions of Cuellar et al. (2006) and Lee et al. (2014) that the deaf effect is influenced by risk propensity, age, and work experience.

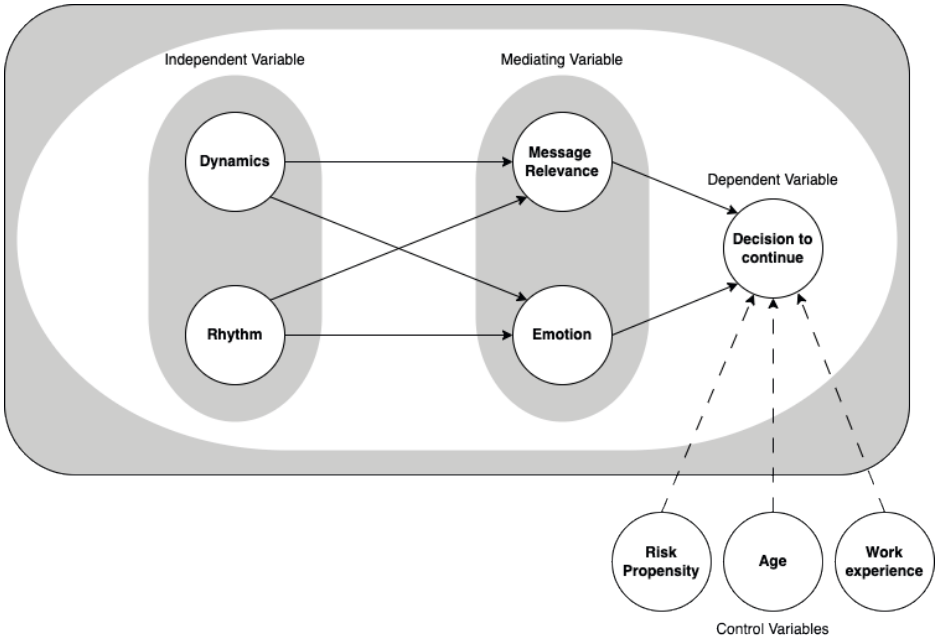


Figure 4-1. Exploratory Research Model

Since the proposed effects via both emotions and perceived message relevance are theorized to ultimately lead to a greater willingness to listen, and lead to the following propositions regarding the overall effects of dynamics and rhythm on decision-makers' willingness to continue:

Proposition 6). *Adding dynamics to a spoken risk warning could decrease the willingness to continue a failing IS project.*

Proposition7). *Adding rhythm to a spoken risk warning could decrease the willingness to continue a failing IS project.*

4.4 METHOD

To explore potential patterns, we conducted an experiment with a 2×2 factorial design in which we independently manipulated the rhythm and dynamics of an auditor's spoken risk warning.[5] Although the content of the risk warning was identical in all treatment conditions, the levels of rhythm and dynamics differed across the four treatment conditions.

5 Data were gathered as part of the author's dissertation research following approved university procedures. Authorization was obtained to conduct the experiment.

Overview of Manipulations

Four versions of the risk warning were recorded by a professional voice actor, allowing us to manipulate different combinations of dynamics and rhythm in order to probe how they might affect participants' responses. These combinations included: one with variability in both dynamics and rhythm, where emphasis was placed on key elements of the message through changes in volume and brief pauses; a monotone version with no variability in dynamics or rhythm, maintaining consistent volume and pace; one with variability in dynamics only, where volume changes emphasized certain words while rhythm remained steady; and one with variability in rhythm only, where brief pauses emphasized key words while volume remained consistent.

Scenario and Treatment

In the experiment, all participants were presented with a scenario in which they were asked to take on the role of the project owner of an IS project. This scenario was adapted from that of Nuijten et al. (2016). This scenario reveals that the internal audit department of the organization has assessed the quality of the testing activities just before the planned implementation of a new information system. The internal auditor who conducted the assessment reports serious weaknesses in the testing activities on the basis of this assessment. The auditor reports that the IS project should be redirected. This risk warning by the auditor is communicated verbally, in our case, via a short audio file to which participants had to listen to.

While the content of the auditor's risk warning was identical in all treatment conditions, the levels of dynamics and rhythm in this spoken risk warning (i.e., how it was conveyed) differed, yielding four treatment conditions (High Dynamics and High Rhythm; Low Dynamics and Low Rhythm; High Dynamics and Low Rhythm; Low Dynamics and High Rhythm). In order to manipulate the effects of dynamics and rhythm independently, a professional voice actor recorded a risk warning in a studio. Subjects were subsequently asked about their willingness to continue with the troubled IS project or, in other words, their lack of willingness to listen to the auditor's recommendation to redirect the project. A full description of the scenario can be found in Appendix 4A.

Experimental Setting and Procedure

The experiment was conducted via an online survey, which was distributed digitally to the participants. As such, participants completed the survey in their own environments, which were not under the control of the experimenter.

Participants

Using the first author's professional contacts from LinkedIn, we contacted a diverse group of practitioners including internal auditors, consultants, risk managers, and directors to encourage them to participate in our study. Our participant pool included both men (65%) and women (35%) and consisted of 165 practitioners with an average age of 46 years and

an average work experience of 21 years. The participants were told that the study was about decision-making in IS projects. Participants were randomly assigned to one of the four treatment conditions. Of the 165 responses, 122 were useable; 43 responses were not useable because they were incomplete. Thirty-two respondents listened to the risk warning containing High Dynamics and High Rhythm, 31 respondents listened to the risk warning containing Low Dynamics and Low Rhythm, 32 respondents listened to the risk warning containing High Dynamics and Low Rhythm, and 27 respondents listened to the risk warning containing Low Dynamics and High Rhythm.

Construct and Measures

Two dummy variables were created to indicate whether the risk warning that the subjects heard was delivered with a high (1) or low (0) level of rhythm and whether the risk warning was delivered with a high (1) or low (0) level of dynamics. This allowed us to observe how these manipulations might influence the participants' perceptions and decisions.

The dependent variable of our study, willingness to continue the IS project, was assessed using two questions based on items from Cuellar et al. (2006) and measured on a 7-point scale. Perceived message relevance, which was one of the mediating variables in our model, was assessed using three questions that were also based on items from Cuellar et al. (2006) and measured on a 7-point scale. The other mediating variable, level of emotion, was assessed using the Geneva Emotions Wheel (Scherer, 2005), in which subjects were assigned a score of 1-7 to indicate the degree to which they experienced 16 different emotions. The average score for these 16 emotions was used to measure the level of emotion.

The control variable, risk propensity, was assessed using four items based on the items from Sitkin and Weingart (1995) and measured on a 7-point scale. Appendix 4B (see Table 4-7) contains the items used to measure the constructs in our study.

4.5 RESULTS

Manipulation Checks

Before investigating our propositions, we first assessed whether our manipulations were successful. Using one-way ANOVA analyses, we tested whether subjects who had listened to a risk warning containing a high level of rhythm (dynamics) indeed perceived the level of rhythm (dynamics) in the risk warning to be higher than those subjects who had been exposed to a risk warning containing a low level of rhythm (dynamics). Both our manipulations had effects on their intended variables in the expected direction. Specifically, subjects in high-dynamics conditions experienced a higher level of perceived dynamics (mean = 3.58) than subjects in low-dynamics conditions (mean = 2.17). Similarly, subjects in high-rhythm conditions experienced a higher level of perceived rhythm

(mean = 4.07) than subjects in low-rhythm conditions (mean = 2.70). These effects were statistically significant as reported in Table 4-2.

Table 4-2. Effects of experimental manipulations on their intended variables.

	Degrees of freedom	F	p-value
Dynamics (Manipulation) -> Perceived Dynamics Between Groups	1	25.414	< 0.001
Within Groups	120		
Total	121		
Rhythm (Manipulation) -> Perceived Rhythm Between Groups	1	32.804	< 0.001
Within Groups	120		
Total	121		

Convergent Validity

Our next step involved testing the reliability of our measurement items. For convergent validity, two different assessments were made: individual item reliability and construct reliability. The individual item reliability was assessed by examining the item-to-construct loadings for each construct, which was measured using multiple indicators. For the shared variance between each item and its associated construct to exceed the error variance, the standard loadings should be greater than 0.70 (Bearden et al., 2011). The third risk propensity item had a loading below 0.70; therefore, it was eliminated. Eliminating other risk propensity items did not show any improvement in our test values and so were not eliminated from further testing. The final results are shown in Table 4-3.

Table 4-3. Item to Construct Loadings.

Construct Item	Continue	Message Relevance	Risk Propensity
Continue1	0.927		
Continue2	0.877		
Message Relevance 1		0.861	
Message Relevance 2		0.851	
Message Relevance 3		0.835	
Risk Propensity 1			0.809
Risk Propensity 2			0.622
Risk Propensity 4			0.759

Table 4-4 provides an overview of the reliability of our constructs. Composite reliability scores and Cronbach's alpha scores both measure the internal consistency among a given construct's items. Hair et al. (1998) noted a Cronbach's alpha score higher than 0.7 is acceptable for exploratory research. The Cronbach's alpha scores of our study are

presented in Table 4-4. We conclude that the reliability of our measurements met these thresholds.

Table 4-4. Construct Reliability for multi-item constructs.

Constructs	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Continue	0.775	0.898	0.814
Message Relevance	0.807	0.886	0.721
Risk Propensity	0.591	0.776	0.539

Discriminant Validity

We conducted two tests to examine the discriminant validity. First, we calculated each indicator's loading on its own construct and its cross-loadings on all other constructs. In Table 4-5, we see that each indicator exhibits a higher loading on its own construct than it does on any other construct. We also notice that the indicators for a given construct have a higher loading with their own constructs than do the indicators associated with any other construct, which provides good evidence of discriminant validity (Chin, 1998).

Table 4-5. Item to Own Construct Loading

Construct Item	Item	Item-to-Construct Loading
Continue	Continue 1	0.927
	Continue 2	0.877
Message Relevance	Message Relevance 1	0.866
	Message Relevance 2	0.856
	Message Relevance 3	0.825
Risk Propensity	Risk Propensity 1	0.809
	Risk Propensity 2	0.622
	Risk Propensity 4	0.759

PLS Structural Model Assessment

We examined our structural model using SmartPLS software. Our exploratory analysis indicates that our model is adequate, with an R-squared of .446 for the dependent variable Continue, suggesting that a large portion of the variability in the dependent variable continue can be explained by the model. After calculating the path estimates for the structural model, bootstrapping was applied to generate the corresponding t-values and p-values. The path coefficients and t-values of the model are shown in Figure 4-2.

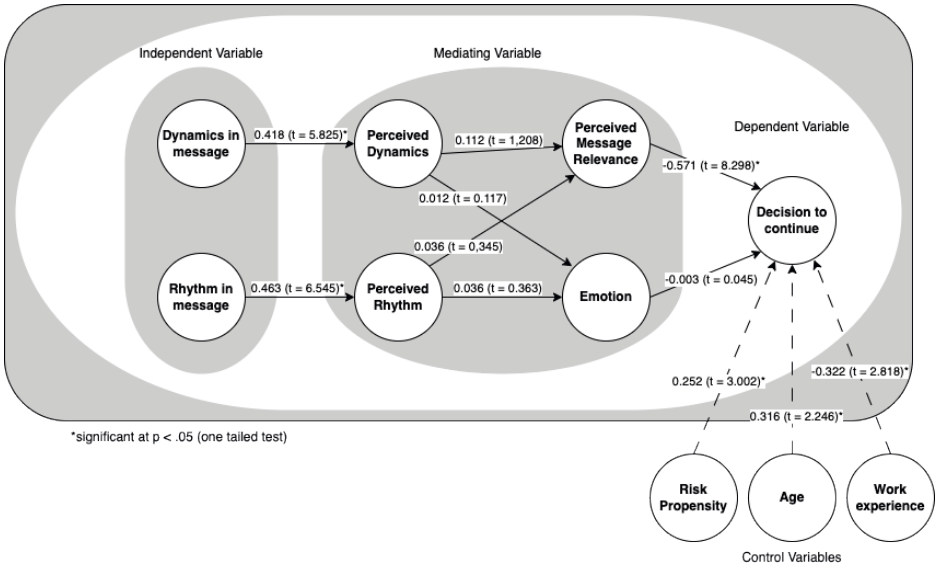


Figure 4-2. Structural Exploratory Model[6]

Our exploratory findings suggest that adding dynamics (rhythm) to a risk warning may influence perceived dynamics (rhythm) in the expected direction. As shown in Figure 4-2, the paths from perceived dynamics and perceived rhythm to message relevance were not significant, indicating that there may not be strong evidence supporting the idea that more perceived dynamics or rhythm directly increases message relevance. These findings indicate that dynamics and rhythm may not strongly influence message relevance, thus addressing Propositions 1 and 2.

The path from message relevance to decision to continue was significant in the expected direction, suggesting that a relevant message may be associated with a lower willingness to continue, thus replicating the results reported by Nuijten et al. (2016).

Figure 4-2 also shows that the paths from perceived dynamics and perceived rhythm to level of emotion were not significant, suggesting that a risk warning with more dynamics or more rhythm may not strongly evoke a strong emotional response. This result offers limited insight in terms of addressing Propositions 3 and 4, indicating that further research is needed to better understand the potential role of these elements in emotional activation. Furthermore, Figure 4-2 shows that there is no significant relationship between the level of emotion and the willingness to continue, suggesting that emotional responses may

6 As a robustness check, the model was also run again with all risk propensity items included. The results were identical to the model with the third item removed with regard to the significance of all paths in the model.

not strongly influence decision-makers' willingness to continue a failing project. These findings provide limited support for Proposition 5.

In order to gain a better understanding of our results, we conducted a drill-down analysis. While combining the scores of all the emotions on the Geneva Emotion Wheel (Scherer, 2005) showed no overall effect, we examined whether there were any effects on specific individual emotions. Specifically, we analyzed the extent to which rhythm and dynamics influenced each of the emotions separately rather than focusing on the combined level of all emotions. In addition, we tested the degree to which each of these emotions influenced decision-makers' willingness to continue the IS project.

Drill-down Analysis and Refined Model

We explored the effects of rhythm and dynamics on sixteen different emotions. Of these, three emotions were observed to be influenced by the effects of rhythm and dynamics. These include hope, interest, and boredom. According to the test results, rhythm and dynamics seem to have an effect on interest and boredom. Furthermore, these emotions have a significant effect on the willingness to continue. However, rhythm only had a marginally significant effect on hope. These findings are described in the following paragraphs.

First, we tested our model and linked the three emotions to the dependent variable continue. Our analysis suggests that perceived message relevance mediates the effects of one of these emotions, boredom, on willingness to continue. Specifically, a higher degree of boredom appears to be associated with a lower level of perceived message relevance, which in turn makes the decision-maker more willing to continue the IS project despite the auditor's warning. This result makes sense because a monotonous risk warning can be perceived as boring and therefore considered less relevant.

Based on our drill-down analysis, we present a refined model in Figure 4-3 that addresses the relationships between variables. Our exploratory findings suggest that dynamics have a significant effect on willingness to continue. This effect is mediated by the emotions interest and boredom as well as by message relevance. The path coefficients and indirect effects are presented in Table 4-6.

Table 4-6. Path Coefficients and Indirect Effects for our refined model

	Path Coefficient	t-value	p value*
Direct Effects			
Age -> Continue	0.328	2.759	0.003
Dynamics (Manipulation) -> Perceived Dynamics	0.418	5.673	<0.001
Rhythm (Manipulation) -> Perceived Rhythm	0.463	6.456	<0.001
Emotion Hope -> Continue	0.116	1.443	0.075
Emotion Interest -> Continue	-0.150	2.215	0.013
Emotion Boredom -> Message Relevance	-0.255	2.411	0.008
Message Relevance -> Continue	-0.549	7.854	<0.001
Perceived Dynamics -> Emotion Interest	0.285	3.558	<0.001
Perceived Dynamics -> Emotion Boredom	-0.125	1.853	0.032
Perceived Rhythm-> Emotion Hope	0.300	3.353	<0.001
Perceived Rhythm -> Emotion Boredom	-0.230	2.567	0.005
Risk propensity -> Continue	0.217	3.050	0.001
Work Experience -> Continue	-0.323	3.168	0.001
Specific Indirect Effects			
Dynamics (Manipulation) -> Perceived Dynamics-> Emotion Interest -> Continue	-0.018	1.800	0.036
Dynamics (Manipulation) -> Perceived Dynamics -> Emotion Boredom -> Message Relevance -> Continue	-0.007	1.225	0.110
Rhythm (Manipulation) -> Perceived Rhythm -> Emotion Boredom -> Message Relevance-> Continue	-0.015	1.330	0.092
Rhythm (Manipulation) -> Perceived Rhythm -> Emotion Hope -> Continue	0.016	1.262	0.103
Total Effects			
Dynamics (Manipulation) -> Continue	-0.060	2.143	0.016
Rhythm (Manipulation) -> Continue	0.003	0.070	0.472

* One-tailed

A higher perceived level of rhythm in a risk warning is associated with both a lower level of boredom (path coefficient = -0.230, t = 2.567, one-tailed p = 0.005) and a higher level of hope (path coefficient = 0.300, t = 3.353, one-tailed p < 0.001). A higher perceived level of dynamics in a risk warning is associated with a lower level of boredom (path coefficient = -0.125, t = 1.853, one-tailed p = 0.032) and a higher level of interest (path coefficient = 0.285, t = 3.558, one-tailed p <0.001) but did not appear to influence hope.

A higher level of boredom is associated with a lower perceived message relevance[7] (path coefficient = -0.255, t = 2.411, one-tailed p = 0.008), which in turn increases the willingness

7 Perceived message relevance was not found to mediate the effects of either interest or hope on willingness to continue.

to continue (path coefficient = -0.549, t = 7.854, one-tailed p <0.001). This makes sense because, if a risk warning is boring to a recipient, it is less likely that the recipient will take action based on the risk warning.

Hope was found to have a marginally significant effect (path coefficient = -0.116, t = 1.443, one-tailed p = 0.075), increasing the willingness to continue. While this latter effect was not significant at the p < 0.05 level, it was strong enough to suppress the positive effect via boredom. Overall, the total effect of dynamics on willingness to continue was observed to align with the expected direction and was significant (path coefficient = -0.060, t = 2.143, one-tailed p = 0.016). However, the total effect of rhythm on willingness to continue was in the anticipated direction but was not statistically significant (path coefficient = 0.003, t = 0.070, one-tailed p = 0.472). In conclusion, our exploratory findings suggest that dynamics, but not rhythm, used in a spoken risk warning may reduce the deaf effect by reducing the willingness to continue.

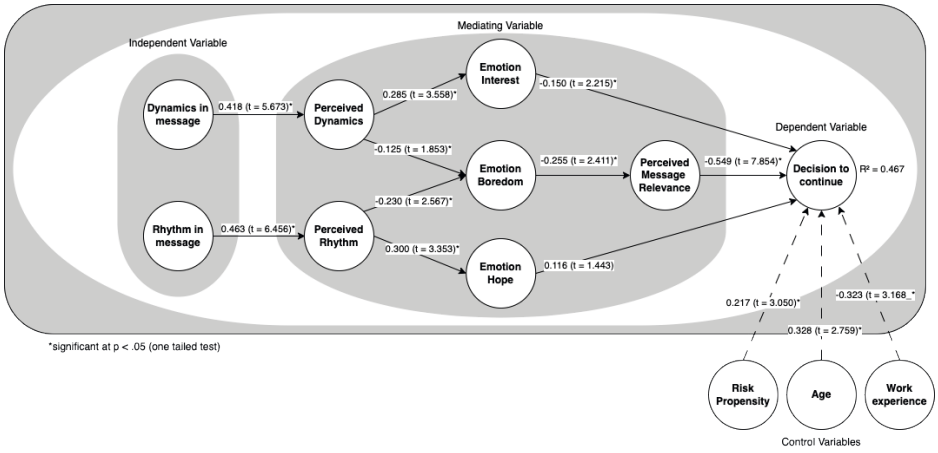


Figure 4-3. Structural Refined Model

4.6 DISCUSSION AND IMPLICATIONS

Main findings

Our research contributes to the discourse on IS project escalation resulting from the deaf effect, in which decision-makers ignore risk warnings. Prior research has paid little attention to the delivery of spoken risk warnings and their influence on the deaf effect. In our study we conducted an experiment to explore whether insights from music theory can be used to increase managers' receptivity to risk warnings on IS projects, potentially reducing the deaf effect. We approached this investigation by examining how decision-makers respond to a spoken risk warning within the context of an information system project that has gone awry. Using a digital audio recording to deliver a risk warning in a spoken form, we were able to independently manipulate the musical elements of dynamics and rhythm that were

used to deliver the message. We explored a simple model that included two mediation paths in parallel: (1) the relevance that the decision-maker assigns to the message and (2) the emotional state that the decision-maker might have. Although our original model did not reveal any statistically significant effects associated with the overall level of emotion, our drill-down analysis focused on individual emotions and revealed interesting patterns in the data. Specifically, our findings suggest that the musical elements of dynamics and rhythm can affect the emotions of interest, boredom, and hope. Furthermore, we found potential evidence that these specific emotions, in turn, can influence the deaf effect.

In particular, our results suggest that adding dynamics to a spoken warning may reduce the emotions of boredom and increased interest. We further observed that adding rhythm could reduce boredom and increased hope. These three emotions—boredom, interest, and hope—had different effects on willingness to continue a troubled IS project. Specifically, participants experiencing less boredom or more interest appeared less willing to continue the troubled IS project, whereas participants with increased hope may have been more willing to continue the troubled IS project. The effect of boredom on willingness to continue was mediated by perceived message relevance. Our exploratory findings have implications for both research and practice, as discussed below.

Our findings align with the Dynamic Attending Theory (Jones & Boltz, 1989), which posits that listeners synchronize their attention with rhythmic auditory stimuli. Rhythmic patterns create attentional peaks that assist listeners in anticipating upcoming events, thereby enhancing their focus and engagement. Similarly, Miller et al. (2013) highlighted that rhythmic entrainment plays a critical role in how individuals synchronize their attention with external rhythmic cues, thereby improving their focus and temporal processing.

Our exploratory study also revealed a nuanced relationship between rhythm and decision-making. Specifically, while rhythm has the potential to reduce boredom and enhance message relevance, it also increases the emotion of hope, which might counteract the overall deaf effect. Consequently, the net effect of rhythm on willingness to continue a troubled IS project was not significant in our study. This aligns with Jones and Boltz's (1989) Dynamic Attending Theory, which suggests that rhythmic elements enhance attentional focus, and potentially improve message relevance and cognitive processing.

For practitioners, this would suggest that dynamics may play an important role in reducing the deaf effect. However, caution should be exercised with the use of rhythm, which may unintentionally evoke the emotion of hope, potentially leading to the continuation of failing projects. More research is needed to confirm these relationships and to further explore the role of rhythm. In conclusion, auditors should focus more on the dynamics of their vocal delivery to improve the effectiveness of risk warnings.

Implications for Research

The deaf effect is a problem that affects IS projects and has been identified as a cause of IS project escalation (Keil & Robey, 2001; Keil et al., 2000a, 2000b; Nuijten et al., 2016). Increasing our understanding of how the deaf effect can be prevented is an important step toward reducing IS project escalation. Some elements that can influence the likelihood of the deaf effect occurring have been identified in prior studies, such as the role of the risk messenger (Cuellar et al., 2006), the characteristics of the decision-maker who receives the warning (Lee et al., 2014), the manner in which the risk warning is framed (Benschop et al., 2022; Nuijten et al., 2016), and the relationship between the messenger and the decision-maker (Nuijten et al., 2016). However, the effects of how a message is delivered have not been previously studied.

Our exploratory study addresses this gap in the literature by studying how the "tone" of a spoken risk warning can influence managers' receptivity to this warning, thereby preventing the deaf effect from occurring. Based on insights from music theory, our findings suggest that dynamics and rhythm may play an important role in how IS project managers react to such warnings. Specifically, our refined model indicates that when spoken risk warnings are delivered using more dynamics, decision-makers are more willing to listen to these warnings, thus potentially reducing the deaf effect. The influence of rhythm on the deaf effect is more nuanced, such that more rhythm can simultaneously increase and reduce the deaf effect. This is because rhythm appears to influence two emotional responses that have countervailing effects. First, rhythm appears to reduce boredom, which may reduce the deaf effect. However, rhythm can also increase hope, which could potentially increase the deaf effect. In our study, a higher level of hope might give decision-makers more faith that they could overcome IS project challenges, making them more willing to continue the IS project despite risk warnings. These observations suggest that the total effect of rhythm is more complex, with opposing effects potentially canceling each other.

In addition to testing the main effects of dynamics and rhythm, our study identified several mediators that provide insight into how these musical elements can influence decision-makers' perceptions. In addition to factors commonly related to the deaf effect, such as perceived message relevance, our study also included specific emotions that a decision-maker may experience at the time of hearing the warning. To the best of our knowledge, the role of specific emotions of decision-makers has not been studied in the context of the deaf effect. Our refined model indicates that specific emotions, such as interest and boredom, can be influenced by the degree of dynamics in a spoken risk warning, whereas the emotions of boredom and hope can be affected by incorporating rhythm in a spoken risk warning. Furthermore, our findings indicate that interest and boredom can, either directly or indirectly, influence decision-makers' willingness to listen to these warnings via perceptions of message relevance. These initial insights contribute to existing knowledge on how the deaf effect works and how it can be prevented in the context of IS projects.

Similarly, our study makes an initial contribution to the literature on internal audit effectiveness. If warnings provided by internal auditors are not listened to, this hampers the effectiveness of the internal auditor. Our findings suggest that the method of delivering spoken risk warnings is a relevant factor for determining the effectiveness of these messages. The effects of rhythm and dynamics on the delivery of audit messages have been previously unexplored in the internal audit literature.

Finally, this study contributes to the Music Theory literature. While the effects of Music Theory elements have been theorized and studied in several contexts, to the best of our knowledge, the effects of music theory elements in spoken risk warnings have not been previously studied. Our findings suggest that music theory elements can indeed be successfully injected not only in songs or lyrics, but also in spoken risk warnings. Specifically, it shows that doing so is capable of evoking specific emotions within listeners and subsequently influences their receptiveness to these risk warnings.

Implications for Practice

Prior studies have illustrated that the deaf effect is a serious problem that can lead to IS project escalation (Cuellar et al., 2006; Keil & Robey, 2001; Nuijten et al., 2016). Our exploratory findings provide practitioners with insights into when the deaf effect can occur in relation to spoken risk warnings, and what can be done to prevent this. This leads to several recommendations for practitioners involved in IS projects. First, our results suggest that by altering the dynamics or rhythm of a spoken risk warning, a risk messenger could heighten the recipient's receptivity to the message. Second, our findings suggest that risk messengers who want their messages to be heeded should consider adding both dynamics and rhythm to their vocal delivery of warning messages. Therefore, we presume that training risk messengers, such as internal auditors, in how to convey their risk warnings could contribute to the effectiveness of their warnings in failing IS projects. However, messengers should be careful not to add too much rhythm when delivering a warning message about a troubled IS project, as this could have the unintended consequence of inducing hope, thus making the recipient less likely to abandon a project that should be terminated.

An overarching implication of our work for auditors is that they should pay attention not only to the content of their warning messages, but also to how they are delivered. Our exploratory findings suggest that the manner in which a spoken message is delivered can influence receivers' receptivity to that message. We believe that this insight can help to reduce the deaf effect in IS projects.

Finally, our findings underscore that risk warnings are not processed in a purely rational manner and are devoid of any emotions. Whether we like it or not, the way people deliver their messages appears to evoke emotional responses on the part of message recipients, and these emotional responses can play a role in managers' receptivity to risk warnings.

Limitations and Directions Further Research

As in any study, our experiment is not without limitations. First, we focused only on the characteristics of spoken risk warnings. We are fully aware that warnings in the context of IS projects come not only in spoken form, but also in written form. Nevertheless, we believe that written messages are often expressed and described by messengers in spoken form. Further research is needed to explore whether these musical elements could also be effective when warnings take the form of written text. Just as poetry can have rhythmic elements, it may also be possible to embed rhythm in written messages.

Second, our study was limited to two musical elements: dynamics and rhythm. We selected these elements because prior literature suggests that if one has a message that is important and urgent, delivering it with dynamics and rhythm could make the message more effective. However, there are other musical elements (e.g., pitch, timbre, and tempo) that we did not explore. The effects of these other elements on the deaf effect should be explored in future research.

Third, it is important to consider that different voice presentation manipulations might influence the perceptions of professionalism, competence, or trustworthiness among participants. For instance, slower speech or less excited tones, which may correspond to slower rhythm/speed or lower dynamics, could be perceived as less confident or competent. These and other factors could potentially mediate the effect of rhythm or dynamics on people's willingness to continue. Although we were not able to test a large number of potential mediators due to design limitations, future research could explore these aspects more directly to increase the understanding of the mechanisms through which rhythm or dynamics could reduce the deaf effect in IS projects.

Fourth, our study involved a hypothetical IS project scenario that was performed outside an actual organizational setting. Therefore, we cannot be certain that the observed effects would be the same in an organizational setting involving an actual IS project. Calder et al. (1981) argue that two distinctive types of external validity should be considered. One regards "effects application" research, which aims to obtain findings that can be applied directly to real-world situations of interest. The other regards "theory application," which focuses on scientific theory that provides a general understanding of the real world. In this context, external validity is seen as a function of theory rather than the method. Thus, experimental designs should be evaluated to determine whether they are likely to increase our understanding of work behavior, not whether they mimic organizational settings (Dobbins et al., 1988). Nonetheless, further research is warranted to explore whether the observed effects can be replicated in actual IS projects in organizational settings.

Fifth, as music can have emotional impacts on people, it has been shown to affect people's moods (Liebman et al., 2016). Further research is needed to explore the effects of musical elements on mood contagion in the context of the deaf effect. Knowledge gained from

such studies could offer additional insights into how musical elements could influence the deaf effect in IS projects.

Sixth, future research could explore how individual differences such as age, experience, gender, and skills could act as potential moderators in the relationship between emotional responses and the willingness to continue a project. This would provide deeper insights into the generalizability of the findings and could help identify whether these characteristics influence how people respond to risk warnings in IS projects.

Seventh, prior to our data analysis, we did not specifically predict which specific emotions would or would not be influenced by changes in rhythm and dynamics. Rather, we took an exploratory approach in which we tested the effects of our manipulations on a variety of different emotions. Our drill-down analysis revealed that boredom, interest, and hope were specifically affected. Further research could investigate and provide further theoretical and/or empirical support for why these emotions, specifically but not others, serve as mediators for the effect of rhythm and dynamics on the willingness to continue. In general, further research into the role of experienced emotions on the deaf effect in the context of project decision making would be valuable because our findings indicate a relationship between these constructs.

Finally, our findings suggest that rhythm and dynamics evoke different emotional responses that counteract one another. More specifically, rhythm appears to reduce boredom while simultaneously increasing the emotion of hope, potentially leading to the effect to disregard for risk warnings. Future research should explore this complexity of emotions in more detail to understand these counteracting effects.

4.7 SUMMARY

This experiment was conducted among 122 professionals with experience in project management and decision-making. Participants were presented with a scenario about a failing IS-project and heard a risk warning, which was randomly delivered in one of several spoken versions.

The experiment shows that variations in vocal dynamics increased listeners' interest and reduced feelings of boredom. These emotional responses made the risk warning feel more relevant, which, in turn, reduced participants' willingness to continue with the failing project.

Rhythm also enhanced the perceived relevance of the risk warning but, although not significant, evoked feelings of hope. This emotion appeared to increase the tendency to continue with the project, despite its negative outlook.

These findings demonstrate that decision-making is influenced not only by the content of the risk warning but also by the way in which it is vocally delivered. Vocal delivery does not simply transmit information but also evokes emotions that can strengthen or weaken the impact of the message. While dynamics reinforced the message's effectiveness, rhythm, by evoking hope, introduced a potentially counterproductive effect. This potential counterproductive effect of hope forms the basis for the follow-up study in Chapter 5, in which hope is contrasted with the opposite emotion: fear.

APPENDIX 4A. SCENARIO AND MEASUREMENTS

Scenario

Imagine that you are the Senior Vice President of the Pensions Operations department within a large insurance company. You inherited a prestigious IS-project called PENSION-VIEW. As Project Owner, you became responsible for the successful implementation of PENSION-VIEW and for realizing the benefits for your organization with this in-house developed system.

With this IS-project you could be the first insurance company in the market that grants all citizens (customers and potential customers) access to the complete set of their personal pension information. If your insurance company is the first in the market to provide this service at a reliable level, the expected revenue to your company would be 60 million euros, as documented in a detailed business case for the project.

Your main competitors have all decided to wait for the supplier of a standard software-package to provide a module to the insurance-market that integrates and presents their pension data. If your implementation is too late or does not prove reliable during the first month of operations, you will miss your competitive advantage and your organization will gain nothing.

The main challenge and risk of the PENSION-VIEW project are the large number of interfaces to retrieve reliable information from other information systems that contain pension data.

Your PENSION-VIEW project is close to implementation and under time-pressure to continue implementation as planned.

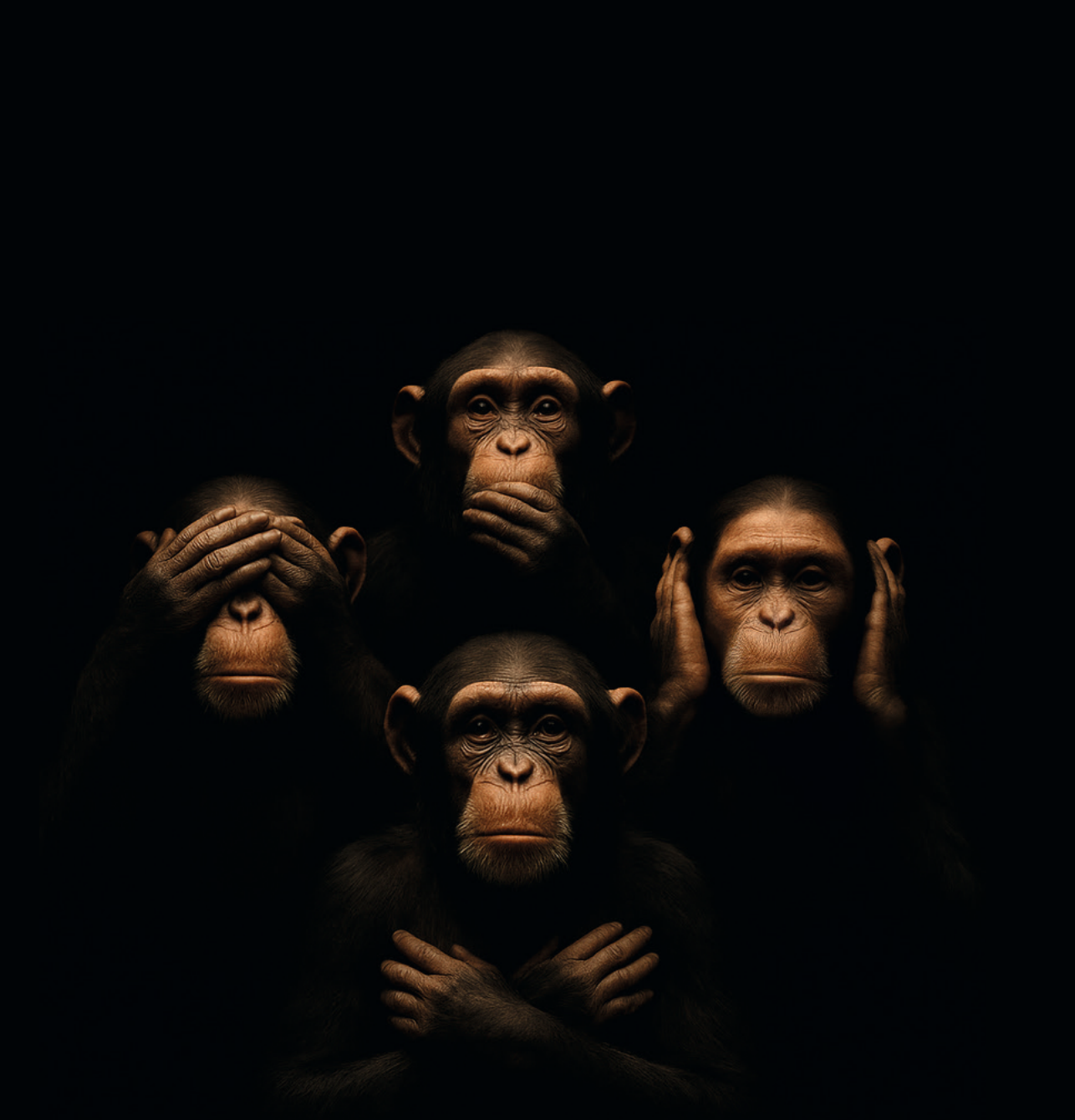
According to standard procedures, Mrs. Smith of the Internal Audit department has recently reviewed the testing-procedures of your project.

Mrs. Smith reports the following:
Now follows an audio text:
"I found serious weaknesses in the design and execution of testing activities on the data exchange with other IS.
There is a two-thirds probability that the exchange of data would show reliability problems in the first month of operations.
As a consequence, the project should be redirected and should not be continued as planned."

APPENDIX 4B. MEASUREMENT OF CONSTRUCTS

Table 4-7. Measurement of constructs

Item		Scale	Source (adapted from)
Continue1	Indicate whether you would decide to continue the project as planned or redirect, and how strong your leaning would be.	7-point	Cuellar (2009)
Continue2	I will certainly continue the PENSION-VIEW project as planned (i.e., without redirection).	7-point	
MsgRelev1	The assessment of Mrs. Smith was highly relevant in forming my decision to continue the PENSION-VIEW project.	7-point	Cuellar et al. (2006)
MsgRelev2	The assessment of Mrs. Smith was very important in forming my decision to continue the PENSION-VIEW project.	7-point	
MsgRelev3	My decision was most influenced by the assessment of Mrs. Smith.	7-point	
Affect1	Please write down the first thoughts or images that come to mind when hearing the message.	Each item: -1 to +2 Total -10 to +10	Slovic et al. (1991)
Affect2	Give each a score between -2 (very negative) to +2 (very positive).		
Risk1	In general, how risky do you consider the project to be?	7-point	Finucane et al. (2000)
Risk2	According to you, how dangerous is it to continue with the project?	7-point	
Emotion1	Please write down the five emotions you feel most.		GEW; Scherer (2005)
RiskProp1	Your tendency to choose risky alternatives relying on an assessment that's high in technical complexity.	7-point	Sitkin and Pablo (1992)
RiskProp2	Your tendency to choose risky alternatives which could have major impact on the strategic direction of your unit and organization.	7-point	
RiskProp3	Your tendency to choose risky alternatives based on the assessment of other people on whom you must rely.	7-point	
RiskProp4	Your tendency to choose risky alternatives despite considerable failures in risky choices you made in the past.	7-point	



“SO YOU THINK YOU CAN STONE ME
AND SPIT IN MY EYE?”

CHAPTER 5
EXPERIMENT INVOLVING HOPE AND FEAR

This chapter is based on a paper presented at the 20th European Conference on Internal Audit and Corporate Governance (EIACG, Athens, Greece, 2024).

Yap, L., Benschop, N., Nuijten, A., Keil, M., & Commandeur, H. (2025b). Auditors' Resonance: Tuning into Hope or Fear in Risk Warnings. Manuscript in preparation.

This chapter builds on the findings of Chapters 3 and 4. Chapter 3 suggested that elements of music influence emotional responses, and that emotion may in turn affect how risk messages are processed and whether they are acted upon. Chapter 4 provided initial evidence that vocal delivery, through the use of musical elements such as rhythm and dynamics, may evoke such emotional responses, which appeared to influence perceived message relevance and willingness to listen. These insights provide a foundation for exploring the role of emotion more directly in audit communication.

Therefore, this chapter examines the emotions of hope and fear, and their potential impact on how such warnings are received.

In an experiment, participants listened to one of two identical risk warnings, delivered in either a hopeful or fearful tone. The study investigated to what extent the risk warning was perceived as relevant, how these emotions influence risk perception, and whether they affected the decision to terminate the project.

5.1 ABSTRACT

This article explores the use of musical elements in risk warnings, specifically focusing on evoking the emotions of hope and fear within the context of Information Systems (IS) projects, to enhance the effectiveness of internal audits. This study uses a scenario-based laboratory experiment with a basic randomized design (Shadish et al., 2002) to examine how hopeful and fearful risk warnings affect the perceived relevance of the warning and decision-makers' willingness to discontinue a failing project. The study demonstrates that specific messages intensifying hope or fear among decision-makers significantly increase the relevance of risk warnings. Consequently, decision-makers who experienced elevated levels of hope or fear were more likely to opt for discontinuing the failing project than those who experienced neither emotion. Furthermore, the study highlights the complex interplay between emotions and risk perceptions and suggests that auditors can draw inspiration from musical theory to incorporate these techniques to improve their effectiveness in conveying risk information.

Keywords: risk warning; internal audit effectiveness; deaf effect; emotional cues; hope; fear; music; information system projects; decision-making

Article Classification: Research Paper

5.2 INTRODUCTION

In the auditing domain, auditors often issue risk warnings that are not always heeded, a phenomenon referred to as the Deaf Effect. This occurs when a decision maker ignores bad news (Cuellar et al., 2006; Nuijten, 2012). Studies show that various factors influence the Deaf Effect, such as the content of a risk warning, the characteristics of the auditor, and the relationship between the auditor and the auditee. Surprisingly, little attention has been given to the impact of verbal risk warnings and how they are conveyed.

Drawing parallels with other arenas, political leaders demonstrate the power of effective verbal communication. Both Barack Obama and Donald Trump left permanent marks in the American political landscape, each using their own distinct communication style to get their message across. Barack Obama is widely known for his message of hope (Millward, 2017). Conversely, Donald Trump focused on conveying emotions, such as fear, which resonated with voters who were afraid (Rowland, 2021).

Interestingly, both leaders attempted to influence their audiences by evoking these emotions. Although they evoked different emotions, they successfully communicated with their audiences. This raises an interesting question: Could the use of the emotions of hope and fear be relevant to auditing in an organizational context? How can auditors use these emotions to influence decision-making processes and redirect a failing course of action in a project?

To explore these ideas, this study aims to address the following research question:
How do the emotions hope and fear, evoked through musical elements, affect the effectiveness of spoken risk warnings in IS projects?

Our study delves into these emotions, exploring their impact on decision-making, and explains how auditors can draw inspiration from music theory to incorporate these techniques in their audit toolkit. By doing so, auditors may improve their effectiveness, motivating decision-makers to heed warnings, and alter the course of a failing project. The remainder of this paper is structured as follows. First, we offer a brief overview of relevant literature, justify our hypotheses, and present our research model. Subsequently, we introduce our experimental design, present the results obtained, and conclude with a discussion of the theoretical and practical implications of our research.

5.3 THEORETICAL BACKGROUND AND HYPOTHESES

This section briefly discusses Internal Audit Effectiveness, the Deaf Effect, and the use of musical elements in a spoken risk warning by an internal auditor to evoke certain emotions and reduce the Deaf Effect.

Internal Audit Effectiveness

It has been shown that the deaf effect reduces the effectiveness of internal auditors in conveying risk information. To be effective as an internal auditor, studies have shown that auditors are effective when they accomplish their objectives, which positively impacts the quality of Corporate Governance (Mihret & Yismaw, 2007; Sarens, 2009).

The willingness to heed the advice and warnings provided by internal auditors is fundamental to the effectiveness of an internal audit (IA). Ultimately, if decision makers are unwilling to listen to the insights offered by the IA function, they are unlikely to act upon the recommended courses of action. This phenomenon, often called the "deaf effect" in the context of decision-makers failing to acknowledge risk warnings, undermines the effectiveness of internal audits (Lenz & Hahn, 2015; Lenz & Sarens, 2012a).

Deaf Effect

According to Keil and Robey (2001), the deaf effect occurs when auditors carry out their duty to alert decisionmakers to a troubled IS project but management chooses not to heed their risk warnings (Cuellar et al., 2006).

To gain auditor attention, the content of the message and the research conducted are still very important. However, previous research has shown that various factors cause deafness. For example, Lee et al. (2014) showed that the credibility of a messenger influences its relevance of the message. Further research, such as the study conducted by Nuijten et al. (2016) has shown that the perception of the auditor as partner, rather than an opponent, significantly influence the effectiveness of the message. Nuijten et al. (2016) also found that managers were more likely to pay attention to the warning if the warnings were described positively than if they were described negatively. Finally, studies have shown that the deaf effect is influenced by the recipient's gender, work history, and risk propensity (Cuellar et al., 2006; Lee et al., 2014; Nuijten et al., 2016).

However, we introduce a new perspective on the concepts of hope and fear, and how they may be crucial in reducing the "deaf effect" and increasing audit effectiveness.

Conceptualization of hope and fear

Research shows that there is some controversy regarding whether hope is an emotion. Some authors have claimed that hope is not an emotion (Plutchik, 1982; Russell, 1980; Watson & Tellegen, 1985). MacInnis and Mello (2005) concluded that hope is a positive emotion. Based on their literature review, hope can be considered as an emotion.

According to Snyder (2000), hope is future-oriented and important when facing a challenging environment. Creamer et al. (2009) also concluded that hope is related to positive expectations for accomplishing a goal. According to previous research (Park et

al., 2004; Snyder, 2000; Snyder et al., 1991), hopeful people are more successful and have a more optimistic outlook on both the future and their ability to achieve their goals.

However, the construct of hope is closely related to that of fear. We sometimes fear that something will happen, but we hope it will not. Both constructs have a strong link. Snyder (2003) suggested that hope and fear are motivators. Nevertheless, hope serves as a motivator towards a particular outcome, while fear functions as a motivator to avoid or steer clear of a certain situation or outcome.

According to the American Psychiatric Association (2013), fear arises when there is threat or danger. Jarymowicz and Bar-Tal (2006) suggest that these threats and dangers can be related to experiences in the past or present. In addition, LeDoux (2015) suggests that fear is activated automatically to deal with danger in a routine manner. When fear arises spontaneously and automatically, it overcomes cognitive control, rational thinking, and logic and prepares individuals to deal with threatening situations. Other researchers have shown that fear limits cognitive processing, which can cause cognitive freezing, less open-mindedness, and an inability to change (Clore & Schwarz, 1994; Isen, 1990; LeDoux, 2015).

Averill et al. (1990) stated that both hope and fear can have a meaningful impact on an individual. Both can cause anticipatory psychological responses (e.g., excitement and sweaty palms), but one is more desirable than the other (LeDoux, 2013).

The emotion fear in the domain of IS projects has been previously studied. In 2010, Johnston and Warkentin investigated the effectiveness of fear appeals in information security, demonstrating that strategically designed messages that evoke fear can lead to increased compliance with security protocol.

Furthermore, it is important to clarify that our research explicitly investigated hope and fear as states. This means that we are interested in how hopeful/fearful individuals feel at the moment of hearing a risk warning about the project. We do not focus on the traits of hope and fear, which refer to how individuals are naturally hopeful or fearful. Nevertheless, we recognize that these traits influence how respondents react to such risk warnings. For this reason, we also measured hope and fear traits, and statistically controlled for these effects in our analyses.

Evoking emotions of Hope and Fear through Musical Elements

The auditor's risk warning has the potential to evoke specific emotions in the recipient, much like the way words in music resonate. Studies have shown that music often influences listeners' emotions and mood (Juslin & Laukka, 2003; Juslin & Sloboda, 2001; Ransom, 2015; Saarikallio et al., 2012). In this study, we investigate how auditors can use these elements of music to evoke feelings of hope or fear to reduce the deaf effect. Music literature shows

many elements of music, such as melody, harmony, dynamics, timbre, texture, pitch, structure, tempo, rhythm, structure, and instrumentation (Sarrazin, 2016).

Cohen et al. (2010) distinguished five elements of music: tempo, dynamics, pitch, timbre, and rhythm. In contrast, tempo is a sound's playback rate, dynamics relate to volume, pitch is its position on a musical scale, timbre is the character of its sound, and rhythm is how the sound is structurally spaced out. For this paper, we rely on Juslin and Laukka (2003) to explore the ways in which voice can convey hope or fear. Research has shown that fear is communicated and expressed by a fast tempo, soft voice (except in panic fear), much sound level variability (dynamics), and rising pitch. These factors correspond to what is expected when fear is in voice, a faster tempo of speaking, and a rising and higher pitch (Juslin & Laukka, 2003; Scherer, 1995). According to previous research, using a relatively slow speech rate, low voice intensity or sound level, slow voice onset or tone attacks[8], little change in the sound level, relatively low pitch, and little variation in the tone, with falling pitches, leads to the evocation of emotional tenderness (Juslin & Laukka, 2003; Scherer, 1995). To evoke the feeling of hope, we suggest that the auditor coats the words with tenderness so that the decision maker will be comforted and feel hope for better days to come. We think that the felt emotions can relate to how a person feels on that specific day; a very depressed person may not react to the evoked emotion of fear.

Our study focuses on how the auditor delivers an audit message to an auditee. We theorize that by altering the elements of music, such as dynamics, tempo, rhythm, and pitch, auditors evoke respondents' emotions. Our review of the literature suggests that fear is communicated and expressed by altering the speech tempo, loudness of the voice, and more dynamic and rising pitch (Juslin & Laukka, 2003; Scherer, 1995). The difference between these musical elements in conveying hope and fear is shown in Figure 5-1 and results in the following hypothesis:

Hypothesis 1). *A spoken risk warning message containing a fast tempo, a soft voice (except in panic fear), much sound level variability (dynamics), and a rising pitch induces the emotion of fear.*

To communicate a calmer and more hopeful message, an auditor should communicate a message that includes tenderness. According to our research, tenderness is communicated by a relatively slow speech rate, low voice intensity or sound level, slow voice onset or tone attacks, little change in the sound level, relatively low pitch, and little variation in the tone with falling pitches (Juslin & Laukka, 2003; Scherer, 1995). This results in the following hypothesis:

8 The term 'attack' in speech refers to the rise time or the rate at which amplitude increases for voiced speech segments, typically assessed through the amplitude acoustic waveform (Scherer, 1989).

Hypothesis 2). *A spoken risk warning message containing a relatively slow speech rate, low voice intensity or sound level, slow voice onset or tone attacks, little change in the sound level, relatively low pitch, and little variation in the tones, with falling pitches, induces the emotion of hope.*

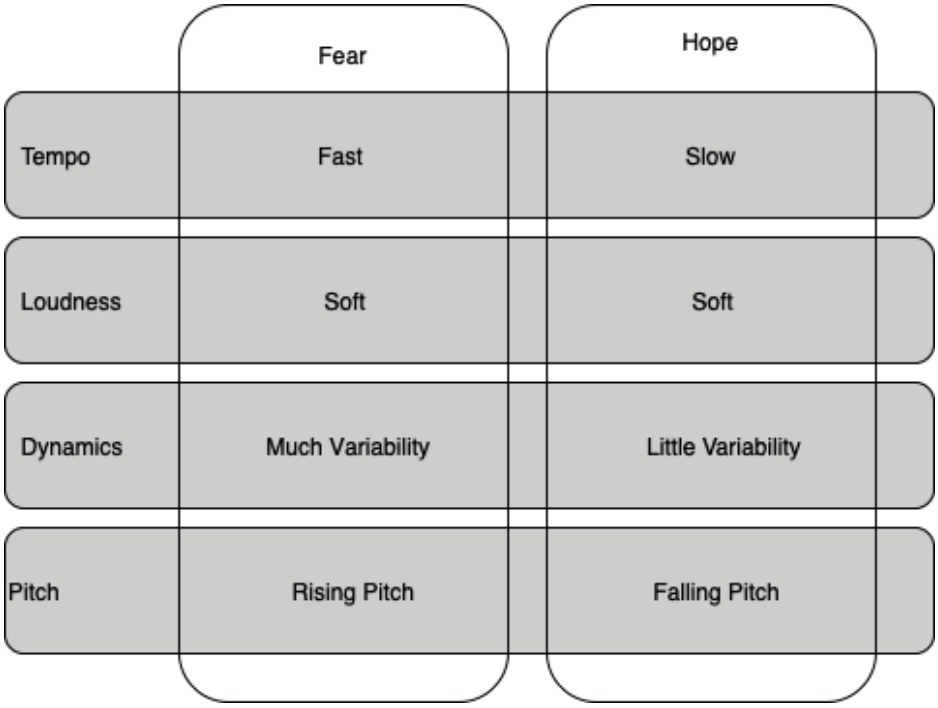


Figure 5-1. Music elements for hope and fear

The Impact of Hope and Fear on Message Relevance

Now that we understand how spoken messages by the auditor can evoke hope and fear in the receiver of those messages, it is interesting to understand how these emotions can help auditors effectively communicate risk warnings, building upon Kahneman's dual-process theory. Kahneman (2003) suggests that people use two systems to process information. The primary system, known as System 1, is associated with intuition, whereas the secondary system, System 2, is associated with reasoning. According to Dane and Pratt (2007), the primary system is quick, nonconscious, and effortless. The secondary system is slow, conscious and value-neutral (Bargh & Chartrand, 1999; Kahneman, 2003).

Research has shown that people engage in intuitive decision making when experiencing a good mood, whereas people experiencing a bad mood are more rational (Bolte et al., 2003; Elsbach & Barr, 1999; Isen, 2001; Staw & Barsade, 1993). Other studies claim that it is not mood, but an emotion that influence decision-making. In contrast to mood, emotions

focus more on a target or cause, whereas moods have no clear target or cause, and are less intense (Barsade & Gibson, 2007; Ekman, 1994).

As posited by Johnston and Warkentin (2010), the application of fear appeals in information security has proven effective in enhancing the perceived relevance of warnings and the seriousness of possible threats. Drawing on these principles, we expect that the fear induced through a risk warning will positively correlate with perceived message relevance. This aligns with the finding that emotions can impact decision-making processes by altering the cognitive assessment of risk and urgency.

To understand how hope and fear can help auditors communicate their risk warnings, we must first understand whether hope and fear are positive or negative emotions. According to Cohn et al. (2009), positive emotions are pleasant or desirable responses to situations that determine happiness and enhance future growth and success. Additionally, hope is a positive cognitive state centered on goal realization, according to Snyder et al. (1991). While hope is categorized as a positive emotion, Pekrun and Stephens (2010) claim that fear, in contrast, is recognized as a negative emotion (Pekrun & Stephens, 2010).

According to Tiedens and Linton (2001), emotions can be divided into two categories: certainty emotions (such as anger and happiness) and uncertainty emotions (such as fear and hope). According to Bachkirov (2015) and Tiedens and Linton (2001), anger and happiness promote heuristic processing (System 1), while fear and hope promote systemic processing (System 2). Therefor certainty emotion, such as anger and happiness, makes the decision-makers feel certain and, therefore, creates an internal feeling that tells them they made a correct choice and that there is no need for further consideration. In summary, these emotions influence cognitive decision making and decision-makers' systemic processing. Therefore, decision-makers who are experiencing feelings of hope or fear are likely to be receptive to risk warnings. Thus, we propose the following hypotheses:

Hypothesis 3a*). Perceived hope is positively correlated with perceived message relevance.*

Hypothesis 3b*). Perceived fear is positively correlated with perceived message relevance.*

The Impact of Hope and Fear on Risk Perception

The previous section explained that hope and fear lead to a more systematic processing. In this section, we explore how hope and fear influence the perception of risk.

Prior research has concluded that affective states, impact risk perception and behavior (Benschop, 2016). In the previous section, we suggested that hope is positive, and fear is a negative emotion. Research has shown that people with a positive state of mind tend to perceive risk as less significant and make riskier decisions than do those with a negative state (Isen & Patrick, 1983; Johnson & Tversky, 1983).

As mentioned before, Johnston and Warkentin (2010) showed that fear appeals significantly increase the seriousness of threats. This finding supports the notion that fear, as a negative emotional state, heightens the perception of risk.

Therefore, it is relevant to introduce the concept of risk perception, which refers to how individuals assess potential hazards by perceiving their probability and impact (Sitkin & Pablo, 1992; Sitkin & Weingart, 1995). Based on various studies, risk perception could be a mediating factor in understanding how decision makers respond to risk warnings. Thus, we propose the following hypotheses:

Hypothesis 4a). *Hope is negatively correlated with perceived risk.*

Hypothesis 4b). *Fear is positively correlated with perceived risk.*

The Mediating roles of Message Relevance and Perceived Risk

Prior research shows that when a risk warning is perceived as relevant, decision-makers are more willing to listen to it (Cuellar et al., 2006; Nuijten et al., 2016). In line with these findings, we also expect that when decision-makers experience the emotion of hope or fear, the receiver perceives the risk warning as relevant, assigns more relevance to it, and is more willing to listen to it. As this has been established in prior research, we consider Hypothesis 5 as a replication hypothesis:

Hypothesis 5). *A higher level of perceived relevance is associated with lower willingness to continue a failing IS project.*

Moreover, previous studies have indicated that decision makers who perceive higher levels of risk are less likely to continue the failing course of a project (Benschop, 2016; Keil et al., 2000c; Nuijten et al., 2016; Sitkin & Weingart, 1995). Keil et al. (2000c) examined how risk assessment information influences managers' decision-making. Their study showed that two relationships exist: risk assessment affects decision-making, and a change in risk perception affects decision-making. As this has also been established in prior research, we consider Hypothesis 6 as a replication hypothesis:

Hypothesis 6). *A higher level of perceived risk is associated with lower willingness to continue a failing IS project.*

We developed our research model, illustrated in Figure 5-2, based on our analysis of the literature and theorizing, which we tested in this study. Our analysis used age, work experience, and risk propensity as control variables. We included these variables based on the conclusions of Cuellar et al. (2006) and Lee et al. (2014) that the deaf effect is influenced by risk propensity, age, and work experience.

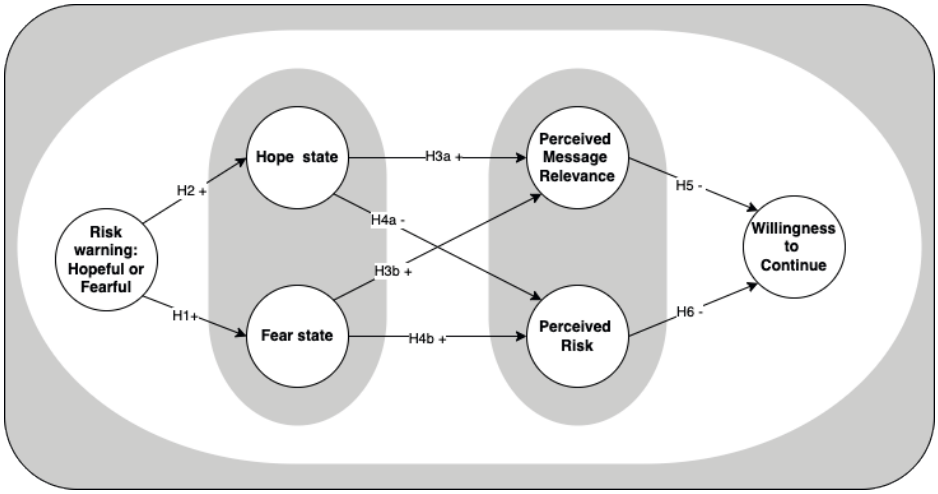


Figure 5-2. Research Model (Hope and Fear in Risk warning)

5.4 METHOD

In a scenario-based laboratory experiment, we employed a basic randomized design (Shadish et al., 2002) to compare two treatments, manipulating the auditor's spoken risk warning to test our hypotheses[9]. The content of the risk warning was identical for both treatment conditions. Prior to conducting a full-scale study, we conducted a pilot test to ensure the feasibility of the research design.

Scenario and treatment

In the experiment, all participants were presented with a scenario in which they were asked to take on the role of the project owner of an IS project. This scenario was adapted from that of Nuijten et al. (2016). Just before the anticipated implementation of the new information system, the organization's internal audit department evaluated the effectiveness of the testing activities. The internal auditor who conducted the assessment reported severe weaknesses in the testing activities based on this assessment. The auditor reported that the project should be redirected. In our case, this message was communicated orally via a short audio file that participants had to listen to. The content of the risk warning was identical for both treatment conditions. To evoke the emotion of hope and fear, music elements such as tempo, loudness, dynamics, and pitch must be changed to evoke hope and fear in our treatment conditions. The emotion of fear, for example, is evoked by a high tempo, soft voice (except in the case of panic fear), many variations in sound level (dynamics), and rising pitch. In contrast, the emotion of hope is evoked using a slow speech tempo, soft

9 Data were gathered following approved university procedures. Authorization was obtained to conduct the experiment.

voice, little voice intensity or sound level variability, low pitch level and variability, and falling pitch, as illustrated in Figure 5-1 and previously discussed.

Subjects were subsequently asked about their willingness to continue with the troubled IS project, or, in other words, their lack of willingness to listen to the auditors' recommendation to redirect the project. To manipulate the risk warning, it was recorded in a studio by a professional voice actor. The development of the experimental setup required considerable investment of time and effort dedicated to the production of the risk warning audio files. The recording process was undertaken in a professional studio environment in order to produce high-quality audio output. The first author's background as a musician was instrumental in this phase, as it provided me with a nuanced understanding of sound quality and auditory perception. In collaboration with a skilled voice actor and an experienced producer, we aimed to create a recording that was not only clear and professional, but also evocative of the intended emotional impacts. This collective effort was crucial in refining the nuances of the recording, including aspects such as tone, pacing, and overall delivery, to ensure that it accurately conveyed the intended risk warning.

Subjects were subsequently asked about their willingness to continue with the troubled IS project or, in other words, their lack of willingness to listen to the auditor's recommendation to redirect the project. A full description of the scenario can be found in Appendix 5A.

The audio files can be found in Appendix 5C, where it is evident from Figure 5-4 that the fearful message is delivered at a faster pace (tempo) than the hopeful risk warning. Furthermore, as depicted in Figure 5-5 in, Appendix 5C, the dynamics between the two messages also exhibit a difference. Specifically, the fearful risk warning shows greater variability in dynamics than the hopeful risk warning, with the former displaying more pronounced differences between loud and soft parts. Figure 5-6, in Appendix 5C, illustrates the pitch of both risk warnings, with the hopeful risk warning displaying a clear falling pitch, while the fearful risk warning exhibits a rising pitch, although maintaining a rising pitch with an instrument other than a voice is easier than with a voice. It is worth noting that both risk warnings are relatively soft, without any screaming or whispering. The printed audio files confirm that the intended delivery, as proposed by Juslin and Laukka (2003) and Scherer (1995), was achieved.

Participants

We selected a diverse group of practitioners using Prolific- and Clickworker-platform who spoke Dutch and who had management experience. Our participant pool consisted of 305 practitioners with an average age of 32 and an average work experience of 12 years. Both men and women were included in our sample, with a gender split of 57% for men, 41% for women, and 2% for "I'd rather not indicate." Participants were told that the study was focused on decision making in IS projects. Participants were randomly assigned to one of the two treatment conditions.

Construct and Measures

The dependent variable of our study, willingness to continue the IS project, was assessed using two questions based on items from Cuellar et al. (2006) and measured on a 7-point scale. Perceived message relevance, one of the mediating variables in our model, was assessed using three questions based on items from Cuellar et al. (2006) and was measured on a 7-point scale.

The other mediating variable, perceived risk, was assessed using two items from Finucane et al. (2000) and was measured on a 7-point Likert scale. The control variable, risk propensity, was assessed using four items adapted from Sitkin and Weingart (1995) and measured on a 7-point scale. To assess the impact of the spoken risk warning on the participants, we evaluated their emotional states. We used a set of six questions derived from the State Hope Scale (Snyder et al., 1996) to measure hope state, and a set of six questions adapted from the SQ-48 (Carlier et al., 2012) to measure fear state. Both states were measured on a 7-point scale.[10]

5.5 RESULTS

Manipulation Checks

Before testing our research hypotheses, we performed a preliminary step to assess the effectiveness of our intended manipulations. We conducted a manipulation check to ensure that the risk warnings triggered the intended emotions. Specifically, we used a seven-point scale to ask respondents to indicate how much they perceived the risk warning as hopeful or fearful. On this scale, a score of 1 represented 'Completely disagree' and 7 represented 'Completely agree.' Accordingly, respondents who did not perceive a hopeful risk warning (i.e., scoring three or below) were excluded from further analyses. A similar approach was used for fearful risk warnings. This evaluation was essential to ensure that the manipulations were effective.

Consequently, of the 305 responses, 94 were excluded as they failed the manipulation check aimed to evoke the emotions hope or fear, approximately equal number from both the fear and hope treatment group. Additionaly, 43 responses were omitted due to incompleteness. Thus, 168 responses were usable for the analysis. Of the 168 usable responses, 88 respondents listened to a fearful message and 80 respondents listened to a hopeful risk warning. The failure of the manipulation check can be primarily explained by the nature of the fictive setting of our experiment. Similar to real-life situations, individuals respond differently to emotional stimuli in the real world, participants reacted differently to the simulated scenarios, highlighting the challenge of achieving consistent emotional engagement.

10 Appendix B contains the items used to measure the constructs in our study.

Convergent Validity

To test the robustness of our measurement items, we conducted two assessments: one focusing on individual item reliability, and the other on construct reliability. Individual item reliability was evaluated by examining the item-to-construct loadings for each construct measured with multiple indicators. According to Bearden et al. (2011), standard loadings should be greater than 0.7, to surpass the error variance.

The sixth hope item, the second perceived risk item, and the third risk propensity item had loadings below 0.7 and were therefore eliminated. A reassessment showed that the fifth item of hope had a loading below 0.7 and it was thus also eliminated. The third risk propensity item had a loading below 0.7; therefore, we eliminated it. Eliminating other risk propensity items did not improve our test values. Additionally, the first and second items of work experience were also eliminated due to a loading below 0.7. For a detailed list of the excluded items, see Table 5-5 in Appendix 5B. Table 5-1 presents the item to construct loadings for the retained items.

Table 5-1. Item to Construct Loadings.

Construct Item	Willingness to Continue	Fear State	Hope State	Message Relevance	Perceived Risk	Riskprop
Willingness to Continue1	0.938					
Willingness to Continue2	0.923					
Fear 1		0.817				
Fear 2		0.812				
Fear 3		0.878				
Fear 4		0.864				
Fear 5		0.841				
Fear 6		0.711				
Hope 1			0.709			
Hope 2			0.891			
Hope 3			0.882			
Hope 4			0.824			
Perceived Message Relevance 1				0.913		
Perceived Message Relevance 2				0.920		
Perceived Message Relevance 3				0.820		
Perceived Risk 1					0.851	
Perceived Risk 3					0.835	
Perceived Risk 4					0.794	
Risk Propensity 1						0.825
Risk Propensity 2						0.863
Risk Propensity 4						0.784

Table 5-2 provides an overview of the constructs' reliability. Composite reliability and Cronbach's alpha scores were used to measure how consistently each item measured the given construct. Hair et al. (2013) stated that Cronbach's alpha scores must be higher than 0.7 for exploratory research. The score results are presented in Table 5-2 and show that the threshold were met.

Table 5-2. Reliability of multi-item constructs.

Constructs	Cronbach's alpha	Composite Reliability	Average Variance Extracted (AVE)
Continue	0.845	0.928	0.866
Fear State	0.903	0.926	0.676
Hope State	0.850	0.898	0.688
Perceived Message Relevance	0.861	0.916	0.784
Perceived Risk	0.776	0.866	0.684
Risk Propensity	0.764	0.864	0.680

Discriminant Validity

We calculated each indicator's loadings on its own construct, which is shown in Table 5-3, to check that each indicator has a higher loading with its construct than it does with any other construct. We conclude that the given items have a higher loading with their own constructs, and thus provide strong support for discriminant validity (Hair et al., 2013).

PLS Structural Model Assessment

We tested our hypotheses using SmartPLS to analyze the structural model. With an R-squared for the dependent variable of .462, our model is adequate. The corresponding p-values were produced using bootstrapping after calculating the path estimates for the structural model. Figure 5-3 shows the path coefficients and t-values for the model, which are detailed in Table 5-4.

Additionally, our results showed that the influence of hope or fear was positively correlated with higher perceived message relevance (path coefficient = 0.350, $t = 4.595$, $p < 0.05$; path coefficient = 0.276, $t = 4{,}228$, $p < 0.05$). This means that Hypotheses 3a and 3b are accepted. Another interesting observation based on our results is that hope and fear influence perceived risk differently. Initially, we hypothesized that hope would be associated with reduced perceived risk and fear would be associated with increased perceived risk. Our model revealed that hope did not show any statistically significant relationship with perceived risk (path coefficient = -0.051, $t = 0.602$, $p > 0.05$). By contrast, fear displayed a significant relationship in the expected direction, influencing decision-makers' risk attitudes (path coefficient = 0.264, $t = 3.669$, $p < 0.05$). Therefore, hypothesis 4a must be rejected and hypothesis 4b is accepted.

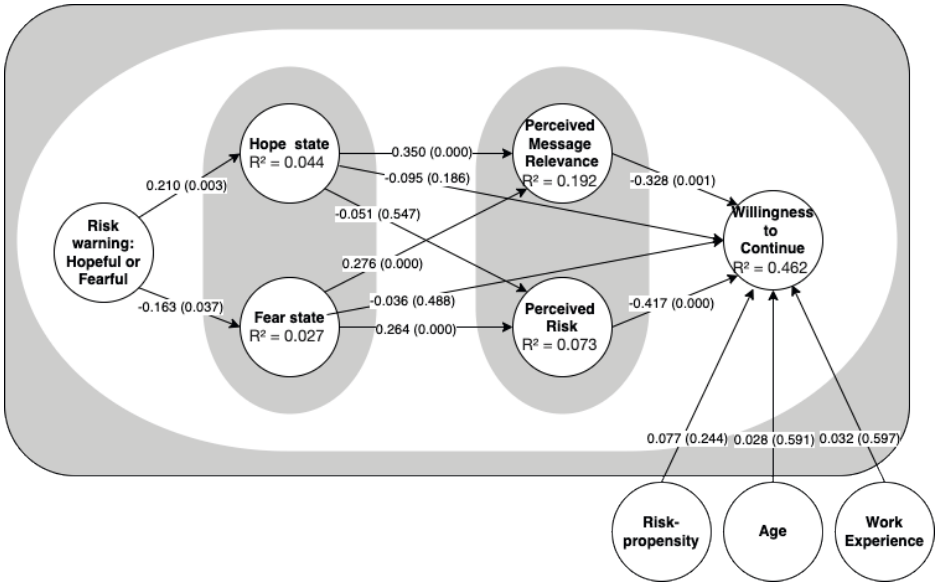


Figure 5-3. Structural model (Path Coefficients with P-values)

5

Furthermore, the path from perceived message relevance to willingness to continue is also significant in the expected direction (path coefficient = -0.328, t = 3.448, $p < 0.05$), supporting Hypothesis 5 and confirming the results of Nuijten et al. (2016).

Finally, our results indicate that the greater the perceived risk, the less willing the decision maker is to continue the project's failing course (path coefficient = -0.417, t = 5.482, $p < 0.05$). Therefore, Hypothesis 6 was accepted. This result is also consistent with the findings of Nuijten et al. (2016), who demonstrated that perceived risk negatively impacts willingness to continue.

Our results show that the delivery of the message can evoke emotions of hope or fear. Furthermore, we found a significant effect of fear on the willingness to continue, mediated by perceived risk and message relevance. Further analysis also shows that hope, mediated by message relevance, significantly affects the willingness to continue.

Table 5-3. Item-to-own construct correlation vs. correlations with other constructs

Construct Item	Willingness to Continue	Fear State	Hope State	Perceived Message Relevance	Perceived Risk	Risk Propensity	Age	Work experience
Willingness to Continue1	0.938	-0.235	-0.136	-0.521	-0.577	0.301	-0.109	-0.070
Willingness to Continue2	0.923	-0.214	-0.194	-0.505	-0.478	0.244	-0.049	-0.026
Fear 1	-0.185	0.817	0.001	0.206	0.209	-0.242	0.007	0.105
Fear 2	-0.186	0.812	-0.114	0.178	0.242	-0.150	-0.027	0.088
Fear 3	-0.201	0.878	-0.014	0.280	0.218	-0.111	-0.029	0.046
Fear 4	-0.265	0.864	-0.001	0.226	0.206	-0.152	0.086	0.063
Fear 5	-0.220	0.841	-0.030	0.215	0.194	-0.113	0.076	0.008
Fear 6	-0.122	0.711	-0.028	0.184	0.249	-0.230	0.061	-0.003
Hope 1	-0.093	-0.037	0.709	0.159	-0.111	0.190	0.035	-0.246
Hope 2	-0.196	-0.006	0.891	0.346	-0.032	0.061	0.065	-0.118
Hope 3	-0.161	-0.005	0.882	0.285	-0.059	0.091	-0.022	-0.153
Hope 4	-0.107	-0.089	0.824	0.293	-0.028	0.105	0.080	-0.148
Perceived Message Relevance 1	-0.502	0.220	0.355	0.913	0.343	-0.264	0.068	0.049
Perceived Message Relevance 2	-0.461	0.175	0.336	0.920	0.308	-0.248	0.122	0.042
Perceived Message Relevance 3	-0.499	0.304	0.209	0.820	0.412	-0.188	0.114	0.079
Perceived Risk 1	-0.448	0.150	-0.071	0.273	0.835	-0.224	0.049	0.026
Perceived Risk 3	-0.577	0.287	0.051	0.450	0.851	-0.351	0.120	0.150
Perceived Risk 4	-0.337	0.198	-0.186	0.217	0.794	-0.269	0.209	0.218
Risk Propensity 1	0.232	-0.152	0.155	-0.168	-0.291	0.825	-0.126	-0.169
Risk Propensity 2	0.256	-0.154	0.055	-0.203	-0.291	0.863	-0.148	-0.153
Risk Propensity 4	0.239	-0.184	0.089	-0.282	-0.280	0.784	-0.097	-0.118
Age	-0.086	0.034	0.048	0.113	0.146	-0.150	1.000	0.008
Work Experience 3	-0.052	0.063	-0.184	0.064	0.156	-0.177	0.008	1.000

Table 5-4. Path Coefficients and Indirect Effects

	Path Coefficient	t-value	p-value
Direct effects			
Risk warning (H/F)-> Fear State	-0.163	2.090	0.037
Risk warning (H/F)-> Hope State	0.210	2.953	0.003
Fear State -> Willingness to Continue	-0.036	0.693	0.488
Fear State -> Perceived Message Relevance	0.276	4.228	0.000
Fear State -> Perceived Risk	0.264	3.669	0.000
Hope State -> Willingness to Continue	-0.095	1.324	0.186
Hope State -> Perceived Message Relevance	0.350	4.595	0.000
Hope State -> Perceived Risk	-0.051	0.602	0.547
Perceived Message Relevance -> Willingness to Continue	-0.328	3.448	0.001
Perceived Risk -> Willingness to Continue	-0.417	5.482	0.000
Riskpropensity -> Willingness to Continue	0.077	1.166	0.244
Age -> Continue	0.029	0.537	0.591
Work experience -> Continue	0.032	0.529	0.597
Specific Indirect Effects			
Hope State -> Perceived Risk -> Willingness to Continue	0.021	0.593	0.553
Hope State -> Perceived Message Relevance -> Willingness to Continue	-0.115	2.797	0.005
Fear State -> Perceived Risk -> Willingness to Continue	-0.110	2.908	0.004
Fear State -> Perceived Message Relevance -> Willingness to Continue	-0.091	2.446	0.014
Total Effects			
Fear State -> Willingness to Continue	-0.237	3.486	0.000
Hope State -> Willingness to Continue	-0.189	2.201	0.028

Our results showed that manipulating musical elements such as tempo, loudness, dynamics, and pitch of a risk warning evoked the listener's intended emotions. As shown in Table 5-4, the paths from risk warning to hope and fear states were significant (path coefficient = 0.210, $t = 2.953$, $p < 0.05$; path coefficient = -0.163, $t = 2.090$, $p < 0.05$). Consequently, Hypotheses 1 and 2 are accepted.[1]

1 Additionally, we measured hope and fear as personality traits (trait) and conducted statistical checks, confirming their significant effects on corresponding emotional states. However, these findings did not alter the relationships reported in Figure 5-3.

5.6 DISCUSSION AND IMPLICATIONS

Main findings

Research on Internal Audit has neglected to consider the manner in which risk warnings are communicated and the consequences of such communication on the effectiveness of internal auditing. To address this gap, we conducted an experiment to understand how risk warnings, designed to evoke hope or fear, influence decision-makers' responses within the context of failing information system projects.

In this experiment, risk warnings were delivered through audio recording, in which we manipulated various musical elements, such as speech rate, loudness, intensity, and pitch. This resulted in two different risk warnings: one conveyed hope and the other conveyed fear.

We tested the model, which included two mediation paths: (1) the relevance assigned to the risk warning, and (2) the perceived level of risk by the listener. Our research has revealed that the emotional state of decision-makers, particularly in response to hopeful or fearful risk warnings, has a notably positive impact on the perceived relevance of risk warnings. Consequently, decision makers show a greater willingness to discontinue failing projects.

Furthermore, we observed that only a fearful risk warning affects the perceived risk level, unlike hope, which does not significantly affect the perceived risk. An auditor can shape risk perception and the relevance of a risk warning by issuing a fearful risk warning. Conversely, with a hopeful risk warning, the auditor tends to primarily impact the relevance of the warning and not risk perception.

Implications for Research

Our study aims to enhance internal audit effectiveness, with a particular emphasis on the consequence of unattended warnings by auditors. Our investigation reveals that using musical elements, in order to evoke emotions, such as hope or fear, in verbal risk warnings can impact their efficacy, an area that has been relatively neglected in prior research. This finding is also pertinent in the context of the "deaf effect" phenomenon in information systems projects, where auditors' warnings are frequently disregarded.

A known problem that occurs in IS projects and causes project escalation is referred to as the deaf effect (Keil & Robey, 2001; Keil et al., 2000a, 2000b; Nuijten et al., 2016). Prior studies have shown that certain factors can influence the deaf effect, such as the role of the risk messenger (Cuellar et al., 2006), the characteristics of the decision maker receiving warnings (Lee et al., 2014), the framing of risk warnings (Benschop et al., 2022; Nuijten et al., 2016), and how the messenger and decision-maker interact (Nuijten et al., 2016). These studies did not explore how messages are conveyed, which emotions are evoked, or how they impact decision-making processes. Our research addresses this knowledge gap by demonstrating how the emotional tone of a spoken risk warning impacts decision-making

and reduces the deaf effect. We found that a fearful risk warning increased risk perception, whereas a hopeful risk warning did not affect risk perception. Our research contributes to the existing knowledge on the deaf effect.

Finally, our study applies music theory to a new domain by manipulating musical elements in spoken risk warnings for IS projects to evoke feelings of hope or fear. This approach demonstrates how existing musical theory can be used to alter the emotional responses of decision-makers in an organizational context.

Implications for Practice

Our research particularly emphasizes that it is not only the content of the auditors' risk warning that is important, but also how it is conveyed. Therefore, we provide valuable insights for practitioners, particularly auditors in the context of IS projects, on using musical elements within their risk warnings to evoke the emotion of hope or fear to be heard and enhance their audit effectiveness. Based on our findings, we offer several recommendations to practitioners.

First, the auditor can tailor risk warnings by modifying musical elements such as speech rate, loudness, intensity, and pitch to evoke the desired emotional response. Moreover, a risk warning that emotionally engages decision makers may increase the sense of urgency and lead to better decisions. Second, evoking emotions is a powerful tool for communicating risk warnings. Over- or inappropriate use of evoking these emotions risks could be perceived as unprofessional and raise questions of ethical integrity.

Limitations and Directions Further Research

Like all studies, our study has some limitations. First, it was conducted using a laboratory experiment rather than a field experiment based on audit warnings that were given in relation to actual IS projects. Consequently, we cannot assume that our observed effects would translate directly into actual IS projects. According to Calder et al. (1981), two distinct types of external validity should be considered. The "effects application" aims to apply the findings directly to real-world situations of interest. "Theory application" is more concerned with advancing scientific theory and providing a broader understanding of the real world. In our context, external validity is considered a function of theory. Therefore, our experimental design should focus more on how it enhances our understanding of decision making rather than its application to organizations (Dobbins et al., 1988). Further research is needed to confirm whether the observed effects can be replicated with actual IS projects in an organizational context.

Second, we acknowledge that warnings in the context of IS projects are delivered both in spoken and written forms. We argue that setting the appropriate tone for the message, whether written or spoken, influences the decision maker and their decision making.

However, further research is needed to understand how musical elements in written risk warnings may evoke certain emotions and influence the deaf effect.

Third, our research focused primarily on the emotions of hope and fear. Future research should broaden this scope to include other emotions, examining their impact on the deaf effect.

Finally, our research did not consider potential cultural variations in emotional responses to risk warnings. As the impact of evoked emotions can vary across cultures, future research should examine these differences.

5.7 SUMMARY

The results show that both vocal variants, hopeful and fearful, successfully evoked the intended emotion in listeners. Both emotions increased the perceived relevance of the message. Fear also led to a higher perception of risk, which increased the willingness to terminate the project. Hope, on the other hand, influenced the perceived relevance of the message but had no effect on risk perception. As a result, participants were more likely to continue the project rather than to terminate it.

These findings are based on a scenario-based experiment involving 168 professionals with management experience, who were randomly assigned to either the hopeful or fearful vocal delivery condition. The message content remained identical in both conditions, ensuring that any observed effects were solely attributable to the vocal delivery. Manipulation checks confirmed that the intended emotions were effectively evoked in the majority of participants.

Interestingly, these effects were observed without changing any content of the message. The only difference was the vocal delivery. This finding indicates that vocal expression can influence decision-making: negative emotions may heighten alertness in the decision-maker, whereas hope appears to provide support for the status quo.

This chapter thus demonstrates that vocal expression of emotion may play a significant role in audit communication, particularly in communicating risks. It also forms a bridge to Chapter 6, in which the focus shifts to how auditors and chief audit executives (CAEs) themselves view the deliberate use of the elements of music in their spoken risk warnings.

APPENDIX 5A. SCENARIO AND MEASUREMENTS

Experiment IS (Information System)-Project (version R1 - f0s0)
Thank you for your willingness to participate in our study. The purpose of this experiment is to study business decision making and priority-setting in the field of IS projects. Please carefully read the scenario below and respond to the questions. Please do NOT skip ahead through the pages of this experiment. Please do not discuss during the experiment.

Scenario
Imagine that you are the Senior Vice President of the Pensions Operations department within a large insurance company. You inherited a prestigious IS-project called PENSION-VIEW. As Project Owner, you became responsible for the successful implementation of PENSION-VIEW and for realizing the benefits for your organization with this in-house developed system.

With this IS-project you could be the first insurance company in the market that grants all citizens (customers and potential customers) access to the complete set of their personal pension information. If your insurance company is the first in the market to provide this service at a reliable level, the expected revenue to your company would be 60 million euros, as documented in a detailed business case for the project.

Your main competitors have all decided to wait for the supplier of a standard software package to provide a module to the insurance market that integrates and presents their pension data. If your implementation is too late or does not prove reliable during the first month of operations, you will miss your competitive advantage and your organization will gain nothing.

The main challenge and risk of the PENSION-VIEW project are the large number of interfaces to retrieve reliable information from other information systems that contain pension data.

Your PENSION-VIEW project is close to implementation and under time-pressure to continue implementation as planned.

According to standard procedures, Mrs. Smith of the Internal Audit department has recently reviewed the testing procedures of your project.

APPENDIX 5B. MEASUREMENT OF CONSTRUCTS

Table 5-5. Measurement of Constructs

Item		Scale	Source (adapted from):
Continue 1	Indicate whether you would decide to continue the project as planned or redirect, and how strong your leaning would be.	7-point	Cuellar (2009)
Continue 2	I will certainly continue the PENSION-VIEW project as planned (i.e., without redirection).	7-point	Cuellar (2009)
MsgRelev1	The assessment of Mrs. Smith was highly relevant in forming my decision to continue or redirect the PENSION-VIEW project.	7-point	Cuellar et al. (2006)
MsgRelev2	The assessment of Mrs. Smith was very important in forming my decision to continue or redirect the PENSION-VIEW project.	7-point	
MsgRelev3	My decision was most influenced by the assessment of Mrs. Smith.	7-point	
Fear1	I was afraid or anxious after hearing the risk warning	5-point	SQ-48 (Carlier et al., 2012)
Fear2	I was scared after hearing the risk warning	5-point	
Fear3	I was nervous after hearing the risk warning	5-point	
Fear4	I felt restless after hearing the risk warning	5-point	
Fear5	I felt tense after hearing the risk warning	5-point	
Fear6	I was worrying after hearing the risk warning	5-point	
Hope1	After hearing the risk warning, I always know a way out	7-point	State hope Scale (Snyder et al., 1996)
Hope2	After hearing the risk warning, I will continue to follow the project goal with great energy	7-point	
Hope3	After hearing the risk warning, I know there are countless possibilities on solving problems with the project	7-point	
Hope4	After hearing the risk warning, I can think of many ways to achieve the current project goals	7-point	
Hope5	After hearing the risk warning, I am very confident everything will be fine	7-point	
Hope6	After hearing the risk warning, I am quite positive	7-point	
Risk1	In general, how risky do you consider the project to be?	7-point	Finucane et al. (2000)
Risk2	According to you how dangerous is it to continue with the project?	7-point	
Emotion1	Please write down the five emotions you feel most		GEW; Scherer, 2005

Table 5-5. Measurement of Constructs (continued)

Item		Scale	Source (adapted from):
RiskProp1	Your tendency to choose risky alternatives relying on an assessment that is high in technical complexity.	7-point	Sitkin and Pablo (1992)
RiskProp2	Your tendency to choose risky alternatives which could have major impact on the strategic direction of your organization.	7-point	
RiskProp3*	Your tendency to choose risky alternatives based on the assessment of other people on whom you must rely.	7-point	
RiskProp4*	Your tendency to choose risky alternatives despite considerable failures in risky choices you made in the past.	7-point	
TimeUrgency1	I believe that this matter is of considerable time urgency given the schedule under which the PENSION-VIEW project is to be installed.	7-point	Park et al., 2008
TimeUrgency2	I believe that the problems must be solved quickly because of the PENSION-VIEW project installation schedule.	7-point	
Credibility1	I am confident that Mrs. Smith is a credible auditor (Sandy is the most credible person in the scenario)	7-point	Adopted from Cuellar et al. (2006) & Pornpitakpan (2004)
Credibility2	I am confident that Mrs. Smith is very trustworthy (Sandy is very trustworthy)	7-point	
Credibility3	I am confident that Mrs. Smith has a lot of expertise in this area (Sandy has a lot of expertise in this area)	7-point	

APPENDIX 5C. PRINTED AUDIO FILES

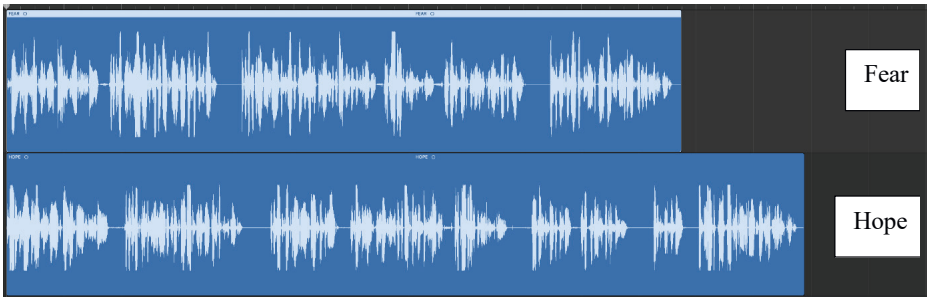


Figure 5-4. Tempo

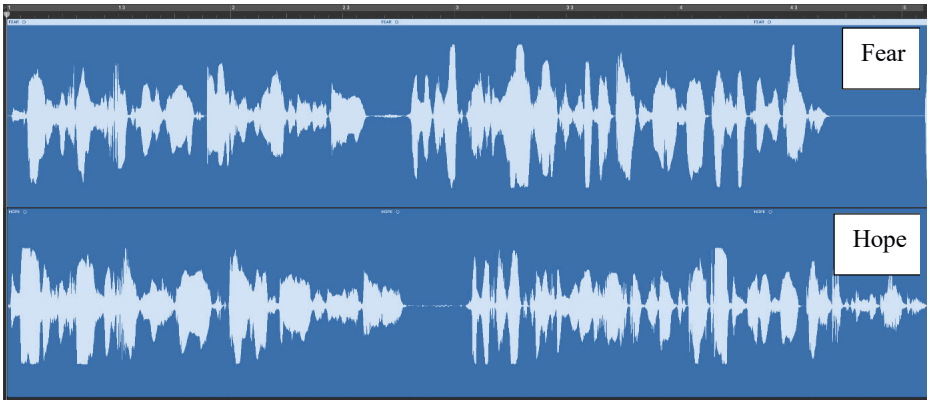


Figure 5-5. Dynamics

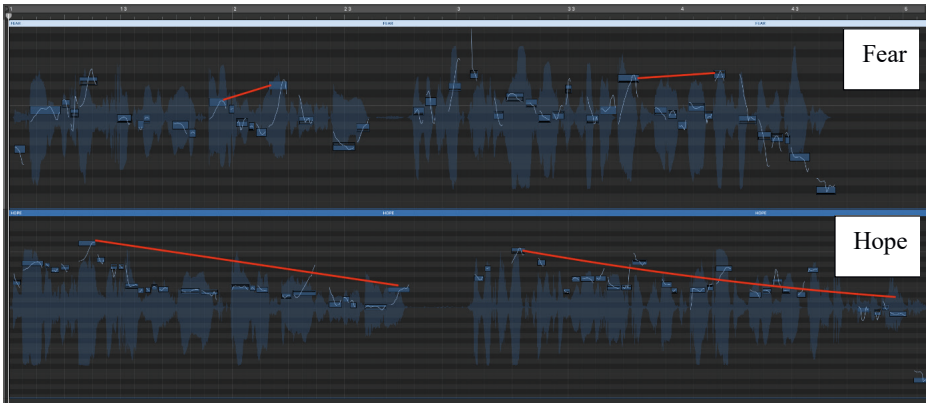


Figure 5-6. Pitch

“NOTHING REALLY MATTERS TO ME”

CHAPTER 6
Q-SORT ANALYSIS

This chapter is based on an article presented at the 21st European Conference on Internal Audit and Corporate Governance (EIACG, Catania, Italy, 2025), where it was awarded the Best Paper Award.

Yap, L., Benschop, N., & Nuijten, A. (2025). Nothing Really Matters to Me: Exploring the Role of Vocal Delivery in Risk Warnings. Manuscript in preparation.

The previous chapters explored how vocal delivery can influence the impact of a risk warning. This chapter demonstrates how auditors and chief audit executives (CAEs) themselves view the deliberate use of elements of music, such as rhythm, tempo, dynamics and pitch, when communicating a risk warning.

Using a Q-sort study with experienced auditors and chief audit executives (CAEs), we investigated which vocal characteristics they consider appropriate or inappropriate when delivering risk warnings. This study provides insight into the preferences and tensions that auditors and chief audit executives (CAEs) experience regarding credible and effective vocal delivery in audit practice.

6.1 ABSTRACT

Two previous experimental studies have demonstrated that rhythm, dynamics, tempo, pitch and emotion significantly influence the perceived urgency and effectiveness of a risk warning (Yap et al., 2025a; Yap et al., 2025b). These findings suggest that internal auditors may be able to reduce the deaf effect and enhance the impact of their warnings by consciously using elements of music in their vocal delivery. However, little is known about how auditors actually use their voice in practice, or how they perceive the desirability and feasibility of deliberately applying such elements (tempo, rhythm, dynamics, pitch) in vocal delivery of a risk warning. This study explores how internal auditors and chief audit executives (CAEs) perceive the role of musical elements in vocal delivery, and which vocal characteristics they consider desirable or undesirable. Using Q-methodology and qualitative interviews with 27 professionals (senior auditors and CAEs), two dominant viewpoints were identified. One viewpoint emphasized calmness and credibility, whereas the other emphasized urgency. The findings provide insight into the preferences, considerations and limitations auditors face when communicating risk warnings.

Keywords: risk warning; internal audit effectiveness; deaf effect; emotional cues; hope; fear; music; information system projects; decision-making

Article Classification: Research Paper

6.2 INTRODUCTION

"Nothing really matters, anyone can see…"
(Queen)

Risk warnings from internal auditors are often ignored. Regardless of the apparent clarity of auditors' warnings, and even when decision-makers recognize the risks, it often appears that such warnings simply go unheeded. As the lyrics of *Bohemian Rhapsody* (Queen) suggest, anyone can see it, yet no action is taken. This study explores whether delivering spoken risk warnings in a certain way, specifically employing elements of music, such as rhythm, tempo, and dynamics, can improve the effectiveness of auditors' warnings.

Even when the risks are recognized, decision-makers regularly refuse to take risk warnings seriously or act on them, which is also known as the deaf effect (Cuellar et al., 2006; Keil & Robey, 2001). When such a message is ignored or toned down, it can lead to an escalation of commitment to failing projects, resulting in budget overruns, missed deadlines, and failing systems (Keil et al., 2000a, 2000b; Nuijten et al., 2016).

Previous research focused primarily on *what* is said or *who* delivers the risk warning, for example the credibility of the messenger, the relationship between auditor and auditee, and the organizational context in which the risk warning is issued (Arena & Azzone, 2009; Drogalas et al., 2015; Lee et al., 2014; Mihret & Yismaw, 2007; Pornpitakpan, 2004; Sarens, 2009). Yet while these factors explain why a risk warning is ignored, less attention has been paid to the way in which messages are delivered verbally.

Drawing from studies at the intersection of music and decision-making, this study builds on the theoretical idea that elements of music may influence how a risk warning is received. Two earlier experimental studies, conducted by the author, support this idea within the context of internal audit effectiveness and the deaf effect. Both these studies show that the perceived urgency and the impact of the risk warning are significantly influenced by musical elements.

Despite these findings, it is unclear how auditors and chief audit executives (CAEs) themselves perceive the use of musical elements in spoken risk warnings. Therefore, this study focuses on the following research question: "*How do internal auditors and chief audit executives perceive the use of musical elements in spoken risk warnings?"*

By using Q-methodology, this study shifts the focus to practical applications by examining internal auditors' and CAEs' viewpoints on the potential impact of elements of music in risk warnings.

This paper is structured as follows. First, a brief overview of the relevant literature is presented. Subsequently, the research methodology is described, followed by the presentation and analysis of the results. Finally, we conclude with the main findings and the theoretical and practical implications of our study.

6.3 THEORETICAL BACKGROUND

This section provides a brief overview of internal audit effectiveness, the deaf effect, and the musical factors that influence decision-making.

Deaf Effect and Internal Audit Effectiveness

Even when the risks are recognized, decision-makers regularly refuse to take risk warnings seriously or act on them, which is also known as the deaf effect (Cuellar et al., 2006; Keil & Robey, 2001). When such risk warnings are ignored or toned down, it can lead to an escalation of commitment to failing projects, resulting in budget overruns, missed deadlines, and failing systems (Keil et al., 2000a, 2000b; Nuijten et al., 2016).

Prior research has identified several factors that influence the likelihood of a decision-maker heeding an auditor's risk warning. One such factor is the credibility of the messenger. Decision-makers are more inclined to listen to risk warnings when the messenger is perceived as credible, which involves a combination of expertise, reliability, and good reputation (Lee et al., 2014; Pornpitakpan, 2004). In addition, the characteristics of the decision-maker also play a role. Two such factors are risk perception (the degree to which a situation is perceived as risky) and risk propensity (the general tendency to take risks). Both factors strongly determine whether a risk warning is accepted or ignored (Keil & Robey, 2001).

However, the deaf effect is not solely the result of the recipient's resistance to risk warnings. Internal auditors, as messengers, may also influence the likelihood that their risk warnings are heeded. Previous research has shown that the effectiveness of internal audits depends on factors such as senior management support, competencies, and auditors' independence (Arena & Azzone, 2009; Drogalas et al., 2015; Mihret & Yismaw, 2007; Sarens, 2009). Furthermore, the relationship between the auditor and auditee is also frequently mentioned as a factor for effective communication. Auditors who are seen as partners are more effective at conveying their message than when they are seen as opponents (Nuijten et al., 2016; Sarens & De Beelde, 2006). Finally, the timing of a risk warning is another important element that affects whether an auditor will be heeded. Research conducted by Verbraak-Kolevska (2018) found that the willingness to listen to and to act on a risk warning is influenced by when the risk warning is communicated.

Vocal Expression: Insights from Music Theory

In the field of internal auditing and information systems (IS) projects, extensive research has been conducted into why risk warnings are ignored or downplayed. However, considerably less attention has been paid to how these warnings are delivered vocally. This section discusses existing studies on the influence of music on decision-making and attention. It also discusses previous experimental research by the author, which explored how elements of music in spoken risk warnings affect internal audit effectiveness and the deaf effect.

Research in the field of speech-processing and music psychology suggests that vocal characteristics such as speech rate, tempo, rhythm, volume, dynamics and pitch improve attentional focus and emotional engagement (Cohen et al., 2010; Coutinho & Dibben, 2013; Juslin & Laukka, 2003).

To determine the extent to which music may play a role in the context of auditing and information systems, it is useful to first consider how music influences emotion and decision-making. Cohen et al. (2010), for example, describe how the elements of music, such as tempo, rhythm, dynamics and pitch, can evoke different emotional responses in listeners. An increase in the musical tempo evokes a feeling of haste or urgency, whereas a change in dynamics creates more excitement or calmness. Variations in pitch also have a distinct effect; higher notes are often associated with fear, while lower notes are commonly linked to sadness (Rodero, 2011; Waaramaa et al., 2008). Rhythm, the temporal pattern of the music, serves yet another function. Unpredictable rhythmic patterns help to maintain attention, whereas regular and predictable rhythmic patterns have a calming effect (Chen, 2018; Conrad et al., 2010; Jones & Boltz, 1989; Miller et al., 2013).

Several studies have also demonstrated that elements of music influence decision-making. Day et al. (2009) showed that fast-paced music can lead to more accurate decisions, while Israel et al. (2019) found that slow-tempo music actually increased participants' willingness to take risks.

However, the strength of music lies in the combination of the elements. Douek (2013) argues that variation in rhythm and dynamics can be used to communicate urgency and importance. In a first experimental study, the author explored whether variations in rhythm and dynamics in a spoken risk warning, delivered by an internal auditor about a failing IS-project, could enhance its effectiveness. The results showed that such variation led to increased perceived urgency, making respondents more likely to halt a failing project (Yap et al., 2025a).

The interplay between elements of music in vocal delivery has also been previously examined. Juslin and Laukka (2003) find that emotions such as hope and fear can be conveyed vocally by adjusting speech tempo, loudness, pitch and pace. These insights formed the foundation for a second experiment by Yap et al. (2025b), in which an identical

risk warning, again concerning a failing IS-project, was delivered in a hopeful tone and a fearful tone. The results showed that the fearful message led to an increased perception of risk and a greater willingness to stop the project, whereas the hopeful message appeared to have no impact on the perception of risk and instead reinforced the status quo. These findings are consistent with previous research by Johnston and Warkentin (2010), who find that fear appeals increase compliance in the context of information security.

Recent research further demonstrates that vocal delivery plays an important role in how the speaker is perceived, particularly in terms of competence, stress level and emotional control. Wang et al. (2021) indicate that a vocal style characterized by focus, calmness, and a steady tone is associated with greater persuasiveness. These characteristics enable listeners to draw conclusions about the speaker's expertise and trustworthiness, thereby influencing the impact of the message itself.

This aligns with previous findings on the role of perceived credibility of the messenger in risk communication. When the messenger is perceived as credible, decision-makers are likely to take risk warnings seriously (Lee et al., 2014; Pornpitakpan, 2004). The way someone speaks may thus reinforce the perception of credibility.

In summary, these studies show that elements of music, applied through vocal delivery or a part of a musical fragment, not only evoke emotional responses, but also influence attention, persuasiveness and decision-making. These findings raise the question of how internal auditors and CAEs perceive the use these elements of music in their vocal delivery in practice. The following section outlines the research methodology.

6.4 METHODS

Q-methodology

Q-methodology (De Graaf & Van Exel, 2008; Watts & Stenner, 2012) is a mixed-method approach that combines qualitative and quantitative techniques to investigate 'subjectivity', such as opinions, values, or beliefs. This methodology ensures that shared viewpoints on a particular subject are identified through a structured sorting process and statistical analysis. The method consists of two stages: sorting cards to generate data, and factor analysis to identify patterns of similarity.

The first stage of a Q-study involves creating a set of statements that reflect different viewpoints on the subject (Baker et al., 2006). Respondents are then guided through a card-sorting process, known as the Q-sort, in which they arrange the various statements on a grid according to specific instructions, such as arranging them from 'mostly agree' to 'mostly disagree'.

In the next phase, the collected Q-sorts undergo a personal factor analysis, to identify the underlying dimensions (viewpoints) that connect similar Q-sorts. These viewpoints are represented as a composite Q-sort, which is an underlying ranking of the original set of statements for each viewpoint, demonstrating how a respondent with a perfect correlation (coefficient 1) with a particular viewpoint would have ranked the statements. This composite Q-sort serves as a basis for interpretation with the objective of developing rich descriptions of each shared perspective (viewpoint) on the subject. A detailed explanation of the Q-methodology is available elsewhere (Brown, 1980; De Graaf & Van Exel, 2008; McKeown & Thomas, 1988; Watts & Stenner, 2012).

Approach

Our study followed a four-step approach, capturing the key phases commonly described in Q-methodological research. While different studies vary in how many distinct steps they identify (e.g., Brown, 1980; Watts & Stenner, 2012), the core components typically include item selection, participant sorting, factor analysis, and interpretation. The first step was to develop a 'Q-set' of items based on previous studies of music and its impact on decision-making and the use of these elements of music in spoken risk warnings. The second step was to identify respondents, which was then followed by the third step, conducting the Q-sort and interviews. Finally, the last step was to analyze and interpret the collected data and identify the different viewpoints regarding the effectiveness and potential impact of elements of music in spoken risk warnings. The four steps of this Q-methodology used in this study are shown in Figure 6-1.

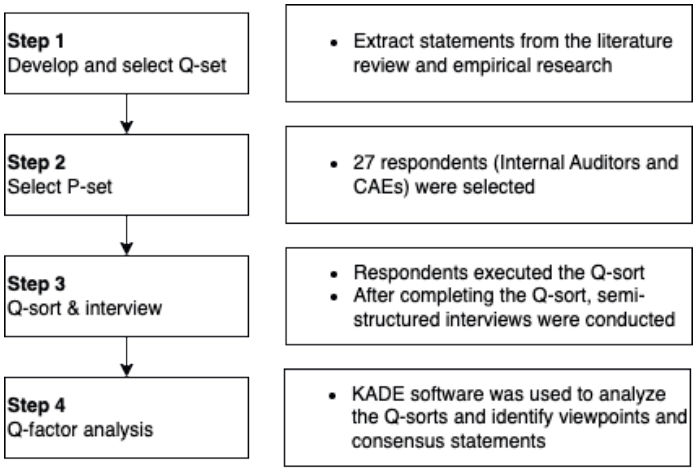


Figure 6-1. The Q-methodology process used in this study

Statement Set

The development of the Q-set is based on the theoretical and empirical insights presented in section 6.1, which describe how musical elements in vocal delivery, such as speaking pace (tempo), volume, dynamics, rhythm, and pitch, may influence the effectiveness of risk warnings. The series of statements was iteratively refined to assess both its usability and formulation in line with the research question, with a specific emphasis on ensuring clarity and avoiding redundancy.

A pilot test was conducted with two CEAs and one senior internal auditor to validate and refine the set of statements. This resulted in one important modification: the focus shifted from the auditor, generally conveying a message orally, to specifically conveying a risk warning orally. This refinement allowed the respondents to better understand the relevant audit context. Although the revision led to minor textual changes, the number of statements remained unchanged, at 23 (see Table 6-5 in Appendix 6A). These statements form a valuable basis for gaining insight into how senior auditors and CAEs assess the role of musical elements in conveying risk warnings as well as their potential influence on the effectiveness of these warnings.

Selection of Respondents

In Q-methodology, the objective is to identify patterns in subjective views, rather than generalize findings to a larger population (Brown, 1980; Watts & Stenner, 2012). Consequently, the selection of respondents was conducted in a targeted manner to ensure that they had sufficient relevant expertise and experience with regard to the research subject. Twenty-seven respondents, consisting of nine CAEs and 18 senior internal auditors, were selected for this study.

The primary selection criterion was that the respondents needed to have experience in conducting audits and reporting audit findings and/or risk warnings to auditees. Demographic factors, such as age, years of work experience, and level of education, were also considered in the selection process. Junior- and mid-level auditors were excluded to ensure that the respondents had sufficient experience in issuing risk warnings.

The final sample size of 27 respondents corresponds with the guidelines of the Q-methodology. Since Q-studies typically identify between two and five factors, a sample size of at least four to six respondents per factor is recommended (Webler et al., 2009). Most Q-studies include between 20 to 40 respondents (Brown, 1980), although reliable results have been produced with as few as twelve respondents (Barry & Proops, 1999). With 27 respondents, this study meets the methodological requirements for a valid Q-sort study.

Respondents were recruited via professional audit networks and associations and through direct invitations to selected CAEs and auditors. Participation was voluntary and anonymous to encourage candid answers. As only highly experienced professionals were

selected, this study can contribute practically relevant and theoretically substantiated insight into how elements of music influence the effectiveness of spoken risk warnings. An overview of the participants' demographics is presented in Table 6-1.

Table 6-1. Participant Characteristics (n = 27)

Characteristics	Value
Age (mean, range)	48 years; 30–64
Gender (%)	Female: 25.9%
	Male: 74.1%
Years of work experience (mean, range)	16.9 years; 3-48
Education (%)	Bachelor's degree: 3.7%
	University degree: 44.4%
	Post-university degree: 51.9%
Job title (%)	Chief Audit Executive: 33.3%
	Audit Manager: 33.3%
	Senior Auditor: 25.9%
	Other: 7.4%

Data Collection

Q-method software was used for this study to collect the Q-sort data. This software enabled respondents to perform the Q-sort independently, on their computer, in a controlled and structured environment. After completing the consent form, respondents were given an introduction explaining the purpose and focus of the study. They were then shown 23 statements in random order to limit possible bias as a result of the order in which the statements were placed. Respondents began the Q-sort by first dividing the 23 statements into three categories: important, somewhat important, and not important. Following this pre-sort, the respondents engaged in Q-grid ranking, placing statements on a scale ranging from -3 (least important) to +3 (most important). Respondents were instructed to place two statements in the +3 category, three statements in the +2 category, and four statements in the +1 category. The same process was repeated for the least important statements, with the respondents placing two statements in the -3 category, three statements in -2, and four statements in -1. Finally, the respondents filled in the remaining boxes until all 23 statements were positioned. The Q-sort distribution is shown in Figure 6-2.

Upon completion of the Q-sort, an audio-recorded interview was conducted. During this interview, the respondents were asked to explain their views with a particular focus on the +3/-3 and +2/-2 categories. This was important for our analysis, as we expected that the statements in the +3 category would predominantly contain familiar elements from audit practice, such as independence, credibility, and acting as a collaborative partner, which are often associated with the effectiveness of the internal audit.

Additionally, respondents were asked to reflect on their use of voice in private situations, for example when warning their children about potential dangers or reading bedtime stories. This comparison allowed us to examine the extent to which respondents were aware of how they use their voice in private environments and the potential differences when they use their voice within the professional audit context.

All interviews were transcribed verbatim to accurately document the respondents' responses for further analysis.

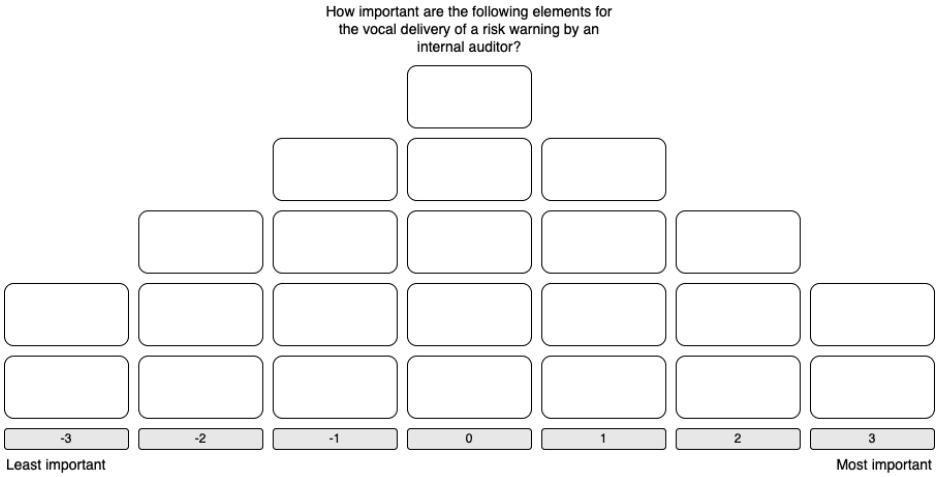


Figure 6-2. Q-sort distribution used in this study (n = 27). Participants ranked 23 statements from -3 (least important) to +3 (most important) in response to the question: "How important are the following elements for the vocal delivery of a risk warning by an internal auditor?"

Data Analysis

The purpose of Q-factor analysis is to identify the underlying similarities between the Q-sorts that represent shared viewpoints. The Q-sort data were entered into a specially developed software application called KADE (Banasick, 2019). To identify the different viewpoints, centroid factor analysis was performed, followed by varimax rotation. Factor analysis generates a number of statistically possible factor solutions. We determined the preferred factor structure (number of factors) by examining both the statistical output and the coherence between different factors (Watts & Stenner, 2012).

The interpretation of the factors is based on the composite Q-sorts that represent each viewpoint, supported by the rank-order of statements in Table 6-2 and their relative position within and between the factors. Since this study involved 23 statements, the factor analysis focused on salient statements within the Q-grid, in particular, the statements at the extremes: -3, -2, +2, and +3. These positions reflect the most outspoken opinions of the respondents and are, therefore, important for interpretation. Additionally, we examined

the distinguishing statements, which were those with a significantly different position in one viewpoint compared to the other viewpoint ($p < 0.01$) (see Table 6-4).

Qualitative interviews provided valuable insights into which musical elements were considered important or unimportant for the effectiveness of spoken risk warnings. Combined with the Q-sort results, the interviews allowed us to form a nuanced understanding of how auditors and CAEs perceive the role of musical elements in improving spoken risk warnings and internal audit effectiveness.

Research Ethics

This study was conducted in accordance with the principles of the Declaration of Helsinki (WMA, 2013). The researchers provided the respondents with an explanatory text that outlined the purpose of the study, confidentiality measures, data storage, ethical approval, and project funding. The respondents were given the opportunity to ask questions and seek clarification about the study before deciding whether they would take part. Respondents were assured that their identities would remain confidential in any project publications or other outputs. Moreover, they were informed that they could withdraw from the study at any time and that there were no right or wrong answers to the questions they would be posed. All respondents provided an online informed consent prior to the data collection.

6.5 RESULTS

To identify the respondents' shared perceptions, we conducted a Q-factor analysis with a principal component analysis and a varimax rotation in Ken-Q Analysis (KADE), Version 3.0 (Banasick, 2019; McKeown & Thomas, 1988). By correlating the 27 Q-sorts, we identified significant differences and common insights.

During the exploratory factor analysis (EFA), a Heywood case caused by respondent EX020 was initially identified. A Heywood case occurs when factor analysis yields a negative variance or a correlation estimate greater than 1 (Kolenikov & Bollen, 2012). Based on the recommendations of Bollen (1987) and Fabrigar et al. (1999), the number of factors was reduced to five to prevent over-factorization. Fabrigar et al. (1999) note that over-factorization can result in factors lacking theoretical value and unnecessarily complex models. In addition, over-factoring can reinforce previous incorrect choices in the factor analysis, which can undermine the reliability and interpretation of the results.

Once the number of factors was reduced, we observed that respondent EX013 was the only one with significant loading on a separate factor. According to Osborne (2014), such a factor is considered a single-item factor, which is characteristic of an outlier. In line with Osborne's (2014) recommendation, EX013 was therefore excluded from the analysis because it did not meaningfully contribute to the factor structure. Despite the removal of EX013, the

Heywood case involving EX020 persisted. As a result, we further reduced the number of factors to three. Two of these factors exhibited an eigenvalue greater than 1 (15.5071 and 1.3267, respectively) and collectively explained 65% of the total variance (see Table 6-3). This cumulative explained variance exceeds the commonly accepted threshold of 35–40% in common factor analysis, as suggested by Kline (2014), and indicates a robust solution. The third factor had an eigenvalue of 0.1349, which was considered insignificant. This aligns with the guidelines of Watts and Stenner (2012), who stated that factors with an eigenvalue of less than 1 generally have insufficient explanatory value.

Based on the final two-factor solution, Table 6-2 shows the ranking positions of all 23 Q-statements across the two viewpoints. These scores served as the input for the thematic interpretation discussed further below.

Table 6-2. Factor Scores with Corresponding Ranks

#	Statement	Factors	
		F1	F2
1	A fast speaking pace that evokes urgency	13	10
2	A fast speaking pace that reduces the willingness to take risk	18	17
3	A fast speaking pace that helps assess risks more accurately	16	11
4	A slow speaking pace that inspires confidence	7	6
5	A slow speaking pace that increases the willingness to take risks	15	14
6	A loud voice that increases alertness	11	8
7	A soft voice that calms	8	13
8	A high-pitched voice that evokes fear	21	23
9	A low voice that evokes gloominess	20	21
10	An unexpected speaking rhythm that evokes alertness	14	7
11	A constant speaking rhythm that evokes inattention	17	20
12	A clear and easy-to-follow rhythm that calms	4	4
13	Variation in dynamics and rhythm that evokes urgency	6	3
14	A fearful voice	23	22
15	A hopeful voice	9	12
16	A cheerful voice	10	15
17	Credibility of the auditor	1	5
18	Acting as a collaborative partner	2	1
19	Correct timing of the risk warning	5	2
20	Independence of the auditor	3	9
21	An emotionless voice	12	18
22	A voice with a lot of emotion	22	16
23	A monotonous voice	19	19

Note: This table presents the raw rank scores of each Q-statement in both factors, sorted by item number (1–23)

Table 6-3 provides an overview of the demographic characteristics of the 27 respondents and their specific factor loadings. Based on the auto-flagging procedure in Ken-Q Analysis (KADE), Version 3.0 (Banasick, 2019; McKeown & Thomas, 1988), 11 respondents loaded significantly on Viewpoint 1 (F1) and 14 respondents on Viewpoint 2 (F2). One respondent (EX020) did not load significantly on either factor and was therefore excluded from further interpretation.

Table 6-3. Respondents' characteristics and factor association

Q-sort	Gender	Yrs Work Exp	Education	Role	F 1	F2
EX015	female	48	Bachelor degree	Senior Auditor	0.81*	0.32
EX019	female	14	Post-university degree	Audit Manager	0.79*	0.52
EX016	female	5	University degree	Senior Auditor	0.79*	0.28
EX018	male	3	Post-university degree	Audit Manager	0.74*	0.46
EX021	male	9	University degree	Audit Manager	0.73*	0.44
EX023	male	5.5	University degree	Audit Manager	0.72*	0.44
EX008	male	16	Post-university degree	Senior Auditor	0.69*	0.52
EX010	male	10	University degree	Audit Manager	0.67*	0.21
EX002	male	17	University degree	Senior Auditor	0.64*	0.10
EX026	male	16	Post-university degree	Senior Auditor	0.64*	0.22
EX003	male	30	University degree	CAE	0.59*	0.51
EX025	male	9	University degree	Other, namely	0.32	0.26
EX020	female	8	University degree	Senior Auditor	0.34	0.91*
EX001	female	15	Post-university degree	CAE	0.55	0.74*
EX022	female	30	Post-university degree	Audit Manager	0.58	0.68*
EX017	male	43	University degree	CAE	0.63	0.67*
EX024	male	25	Post-university degree	CAE	0.04	0.66*
EX009	male	10	Post-university degree	Audit Manager	0.65	0.65*
EX006	male	5	Post-university degree	Senior Auditor	0.24	0.65*
EX027	male	10	University degree	CAE	0.30	0.65*
EX012	male	10	Post-university degree	Audit Manager	0.60	0.64*
EX005	male	25	Post-university degree	CAE	0.59	0.61*
EX011	male	29	Post-university degree	CAE	0.48	0.60*
EX014	female	20	Post-university degree	CAE	0.55	0.59*
EX004	male	10	University degree	Other, namely	0.51	0.56*
EX007	male	15	Post-university degree	CAE	0.22	0.53*

% Explained Variance

The automatic flagging procedure in Ken-Q Analysis (KADE) Version 3.0 was used to identify defining sorts, indicated by an asterisk (*). This procedure is based on two criteria: (1) the factor loading must be statistically significant at p<.05 (i.e., > 1.96 × SE, which equals 0.41 for N = 23 statements), and (2) the factor must account for more than half of the respondent's common variance ($a^2 > h^2/2$).

While some Q-sorts show loadings above the significance threshold, only those meeting both criteria were flagged and included in the interpretation of the corresponding factor.

The table also shows considerable variation in years of professional experience (ranging from 3 to 48 years), educational background, and role within the audit domain. Viewpoint 1 presents a balanced distribution of senior auditors and audit managers, while Viewpoint 2 is more strongly represented by CAEs and respondents with postgraduate degrees. Although some differences are visible in function and educational background, both viewpoints display a wide range of demographic characteristics. Therefore, it can be concluded that the factor structure cannot be easily attributed to demographic characteristics alone but, consistent with the nature of Q-methodology, is more likely driven by shared preferences and beliefs about how risks should be effectively communicated verbally. The two extracted factors are therefore better understood as distinct viewpoints, rather than reflections on position, seniority or educational level.

Table 6-4. Distinguishing Statements per Factor (Sorted by Ranking Variance)

ID#	Statement	Factor 1: Calm Conviction	Factor 2: Urgent Appeal	Ranking var.
10	An unexpected speaking rhythm that evokes alertness	0*	1*	0.291
17	Credibility of the auditor	3*	2*	0.239
20	Independence of the auditor	2*	1*	0.219
22	A voice with a lot of emotion	-3*	-1*	0.213
6	A loud voice that increases alertness	0*	1*	0.16
21	An emotionless voice	0*	-1*	0.118
3	A fast speaking pace that helps assess risks more accurately	-1*	0*	0.109
19	Correct timing of the risk warning	2*	3*	0.105
7	A soft voice that calms	1*	0*	0.089
1	A fast speaking pace that evokes urgency	0*	0*	0.075
11	A constant speaking rhythm that evokes inattention	-1*	-2*	0.068
8	**A high-pitched voice that evokes fear**	**-2**	**-3**	**0.067**
13	**Variation in dynamics and rhythm that evokes urgency**	**1**	**2**	**0.042**
15	**A hopeful voice**	**1**	**0**	**0.04**
5	**A slow speaking pace that increases the willingness to take risks**	**-1**	**0**	**0.029**
16	**A cheerful voice**	**0**	**-1**	**0.025**
9	**A low voice that evokes gloominess**	**-2**	**-2**	**0.011**
23	**A monotonous voice**	**-2**	**-2**	**0.01**
12	**A clear and easy-to-follow rhythm that calms**	**2**	**2**	**0.007**
2	**A fast speaking pace that reduces the willingness to take risk**	**-1**	**-1**	**0**
4	**A slow speaking pace that inspires confidence**	**1**	**1**	**0**
14	**A fearful voice**	**-3**	**-3**	**0**
18	**Acting as a collaborative partner**	**3**	**3**	**0**

Note: All statements are significant at p < .05. Asterisks (*) indicate p < .01. Bold indicates consensus statements (no significant difference between factors). Statements are sorted by ranking variance.

The two remaining viewpoints provide a clear, distinct, and coherent explanation of the respondents' perceptions of the important elements in the verbal communication of a risk warning. The correlation between the viewpoints was 0.83, which indicates a strong degree of consensus between the viewpoints.

Given this broad consensus, the interpretation was not solely based on statistical significance. Following McKeown and Thomas's (1988) recommendations, some non-significant statements were also included, as they enriched the thematic picture and provided additional context to the viewpoints. Table 6-4 shows the statements that most clearly differentiate between the two factors, along with those that reflect consensus across viewpoints. The interpretation of the viewpoints is therefore primarily based on these distinguishing statements, as they represent the clearest contrasts between the viewpoints. Statements ranked at the extremes of the Q-sort distribution (e.g., +3 and -3) are used to illustrate the tone and emphasis of the viewpoints but they were not the exclusive focus of the interpretation. Based on this thematic analysis, the two viewpoints were labeled as follows: (1) 'Calm Conviction' and (2) 'Urgent Appeal'. These views are summarized below.

Viewpoint 1 – Calm Conviction

Viewpoint 1 was labeled 'Calm Conviction' because of its association with a strong emphasis on elements such as calmness and credibility, as identified by 11 respondents. This interpretation is mainly based on the statements that significantly distinguish this viewpoint from Viewpoint 2 ($p < 0.01$), as shown in Table 6-4.

The statements that define this viewpoint refer to the credibility (#17) and independence (#20) of the auditor, and a calm (#7) and hopeful (#15) voice. This combination indicates that the respondents prefer a communication style that is both calm and convincing, wherein the auditor is perceived as reliable and credible.

The significance of trust and credibility was further underscored by respondents' responses. EX017 puts it this way: "*You have to be a trusted partner. And I mean, if there is any doubt at all... well, that's just not good.*"

This view is confirmed by EX019: "*I think it makes a big difference if you consider me to be an expert and trustworthy person from whom to accept something. [...] Whereas if they see me as some sort of know-it-all, they are also less inclined to accept something from me.*"

In addition to credibility, respondents highlighted reliability as an important aspect of an auditor. EX008 states, "*You are an auditor precisely because of your independence, you weigh all aspects. So, the moment you are not independent... they may think, 'yes, that's nice, you are friends with him' or 'You're just going along with what he says.' So, independence is essential.*" This view is confirmed by EX027: "*You want to be taken seriously and as soon as there is any*

doubt about the quality of the person sitting across from you, you can no longer have a proper conversation. As far as I'm concerned, independence is a prerequisite."

The respondents also believed that risk warnings should be communicated in a manner that is both hopeful and calm. EX010 states, "*I think that when you issue a risk warning, it is more useful to the recipient if you not only emphasize the seriousness but also indicate how things can be improved. That it is not the end of the road, but that there are still possibilities to solve it.*" Furthermore, respondents stressed the importance of avoiding unnecessary panic. A risk warning should not incite fear (#8) or be delivered with excessive emotion (#22) because too much emotion could undermine credibility. EX019 remarks, "*Well, it might help a little with the sense of urgency, but I think if it's too much... it will backfire and then I don't think people will find you credible either.*"

Conversely, fear was counterproductive according to respondents. EX026 notes, "*I wouldn't feel comfortable if the person in front of me had conveyed a message designed to scare me. I would want to see hope.*" EX014 agrees, emphasizing the importance of calm and conviction, "*I think fear sends the wrong signal. You must radiate calm and confidence to get your message across.*"

Respondents associated with Viewpoint 1 perceived trust, calmness, and confidence as the best ingredients for effectively communicating a risk warning and being heard by the auditee.

Viewpoint 2 – Urgent Appeal

Viewpoint 2 is labeled as 'Urgent Appeal', due to its association with elements that emphasize urgency and alertness. Fourteen respondents identifying with this viewpoint prioritized signals that drew the attention of the auditee and evoked a sense of urgency. This interpretation focuses on the statements that significantly distinguish this viewpoint from Viewpoint 1 ($p < 0.01$), as presented in Table 6-4.

The key statements that characterize this viewpoint refer to the right timing (#19), variation in rhythm and dynamics to enhance urgency (#13), an unexpected speaking rhythm (#10), and a loud voice to increase alertness (#6). Concurrently, maintaining the auditor's credibility (#17) remains important.

Respondents underscored the significance of timing in communicating risk warnings effectively. EX007 states, "*I think that's about the most important thing there is. Everything has to do with timing. You achieve the most effect with your research or with everything at the moment you communicate it in the right tone and the right form and at the right moment.*"

This is confirmed by respondent EX005, who explains that the moment the message is conveyed determines its impact: "*You have to sense when the momentum is right to do that.*

If you are too early, and you cannot substantiate your claim, it will have no effect. If you are too late, they will ask, 'Why didn't you come sooner?' "

According to the respondents, when an auditor chooses the right moment to issue a risk warning, it ensures that the auditee not only hears the warning, but also perceives its urgency. Variations in rhythm and dynamics can enhance this effect. EX001 explains, "*If there is urgency, then it is important to incorporate this into the way you talk. With variations in how you talk, the registers open up. So, that is not focused on fear but is focused on: Listen to me. Hear what I have to say. Don't filter.*" EX007 further notes that variation in rhythm and dynamics can amplify the sense of urgency: "*The sense of urgency increases if you can play with it, and that is actually what you want to achieve: raising the sense of urgency as high as possible*."

In addition to urgency, the respondents emphasized the importance of the auditee's remaining alert during the conversation. To facilitate this, they suggested using an unexpected speaking rhythm and a loud voice. EX006 notes that an unexpected speaking rhythm can help maintain the attention of the auditee, stating, "*If you suddenly vary it (rhythm), then he knows: this is no longer small talk, but this is serious. When he uses his voice like that, I suspect that there really is something going on, so I think that's a good thing.*" Respondents also indicated that a loud voice could be effective in emphasizing urgency. EX006 articulates this as follows: "*So a clear voice, a loud voice, I thought was good. And I do think that makes a difference compared to varying the pace. So, sometimes I think you have to say slowly and loudly: okay, this is going to happen, but after that you might go a bit faster again.*" EX027 qualifies this by stating that it is not necessarily about speaking loudly but rather clearly. "*By loud I don't mean talking loudly but being clearly audible. I also know people I have to turn my ears to hear them properly. This is not good, because it is distracting. The moment someone has to say, 'What did you say?' every time, they have already lost the thread of their story.*"

Interestingly, the respondents also identified elements that could undermine the effectiveness of risk warnings. For instance, they noted that a constant speaking rhythm (#11) can lead to inattention. Noting that a monotonous rhythm can result in disinterest, EX023 explains, "*I think that the other person will no longer listen to me. Even though you. You want to get your message across, and your risk.*"

According to the respondents, emotion also plays an important role in the effectiveness of risk warnings. They noted that a voice without any emotion (#21) fails to convey the messenger's risk warning effectively. EX022 comments, "*In my experience, if you have an emotionless voice, you actually show no compassion or empathy, nor do you show that you are participating and want to help.*" EX005 adds that an emotionless voice does not adequately convey the urgency: "*An emotionless voice? Yes. Yes, if you speak monotonously, people do not act. Where is the urgency?*"

While emotion can help communicate urgency, respondents warn against the potential drawbacks of a voice filled with emotion (#22). EX019 articulates this concern, stating, "*It can help a little with the sense of urgency, but I think if it's too much, it will backfire and then I don't think people will think you're credible either.*" Excessive emotional expressions by an auditor when delivering a risk warning may prove counterproductive. EX007 provides an example: "*I have someone on my team who talks very emotionally. I notice that this can even have the opposite effect of: it won't be as bad as they're making it out to be.*"

Respondents with this viewpoint emphasize the importance of an active and attention-grabbing style of communication, in which timing, dynamics, and rhythm are important for effectively conveying risk warnings.

Comparison Between Viewpoints

Several statements showed significant differences between the two viewpoints, providing a clear picture of how preferences in voice delivery diverge. These differences do not only relate to the individual statements, but also reflect how respondents prioritize aspects such as tone, rhythm and vocal expression when delivering oral risk warnings.

Viewpoint 1 emphasizes calmness, confidence and emotional restraint. Statements such as "a soft voice that calms" (#7), "a hopeful voice" (#15), and "credibility of the auditor" (#17) received high scores. Statements #7 and #17 significantly differed from Viewpoint 2 ($p < 0.1$), while statement #22 ("a voice with a lot of emotion") was clearly rejected and also showed a significant difference ($p < 0.1$).

Viewpoint 2, on the other hand, prioritized urgency. This was evident from the high scores on statements such as "variation in rhythm and dynamics" (#13), "an unexpected speaking rhythm that evokes alertness" (#10), and "a loud voice that increases alertness" (#6), with statements #6 and #10 significantly differing from Viewpoint 1 ($p < 0.1$).

Consensus Statements

Table 6-4 shows the ranking of all statements, organized according by the degree of agreement between the two identified viewpoints. The consensus statements include items that showed no significant differences between the viewpoints at $p < .01$.

The consensus statements include both positive and negative elements relevant to the verbal communication of a risk warning. The positive elements highlight aspects such as calmness, trust, and hope, whereas the negative elements refer to the use of voice, which, according to the respondents, undermines the credibility and impact of the risk warning.

Respondents underscored the importance of calmness in communicating risk warnings. Statements such as "a clear and easy-to-follow rhythm that is calming" (#12), and "a slow speaking pace that inspires confidence" (#4) were rated positively for both viewpoints.

This underlines the importance of a clear, structured and calm way of speaking. Notably, a hopeful voice (#15) can be supportive, as it encourages individuals to think in terms of solutions, rather than unnecessarily spreading panic. Respondents also identified variations in rhythm and dynamics (#13) as a means of reinforcing the urgency of the message.

In addition to the statements about vocal delivery, respondents emphasized that auditors should ideally act as cooperative partners (#18). Respondents deemed it important for auditors not only to identify issues but also to collaborate with the auditee in seeking solutions. They believed that this promotes a positive relationship, thereby enhancing the acceptance of risk warnings. EX016 reinforces this by stating, "*We are going to help them with this. We are going to monitor them. So, I think that will come across better and be better accepted than: 'Here is the plan.'* " EX022 agrees and highlights the importance of support for risk warnings: "*I don't always want to just report, drop it and just say, 'This is the problem'. Instead, I'll lend a hand to help.*"

Respondents also indicated that certain vocal characteristics have a negative effect on the effective communication of risk warnings. Statements such as "a fearful voice" (#14) and "a monotonous voice" (#23) received low ratings for both viewpoints. This suggests that such vocal delivery reduces engagement and detracts from the auditors' credibility. A low voice that evokes gloominess (#9) was also perceived unfavorably. EX022 described the effect of this as follows, "*Risk warnings are not positive, but you still need to put them in perspective. You don't have to be gloomy — nor overly cheerful — but you should convey a sense of positive energy. That's my view.*"

The consensus statements indicate that the respondents exhibit a clear preference for calm, clear, and easy-to-follow vocal delivery, while cautioning against the negative effects of an anxious, monotonous, or gloomy way of speaking.

The consensus statements clearly show where both viewpoints, despite their different emphases, exhibit strong agreement. This suggests that these findings can be considered relatively universal and robust, regardless of differences in role, work experience, or industry. As such, the consensus statements provide a reliable and widely shared perspective on how the professional community views the application and effectiveness of musical elements in the verbal communication of risk warnings.

Comparing Elements of Music to Previously Identified Contributors to the Deaf Effect and Internal Audit Effectiveness

The analysis shows that respondents primarily value factors that are already known to influence the effectiveness of internal audits and the deaf effect. Elements such as credibility (#17), timing (#19), independence (#20) and acting as a collaborative partner (#18) received higher rankings in both viewpoints than the elements of music. However, the respondents did indicate that vocal delivery does affect how both the auditor and the

risk warning are perceived. In practice, though, it is generally regarded as a supporting rather than a determining factor.

It is also evident that collaboration is considered important in both viewpoints, but the preferred tone of voice differs. Viewpoint 1 emphasizes a calm and hopeful tone to support collaboration, whereas Viewpoint 2 emphasizes an urgent tone.

6.6 DISCUSSION AND IMPLICATIONS

Main Findings

The findings show that respondents hold somewhat divergent views on the use of musical elements in the verbal communication of risk warnings. Two viewpoints were identified, each with its own approach to how elements of music can enhance risk warnings.

Viewpoint 1, 'Calm Conviction', emphasizes that a risk warning is more likely to be heeded when delivered in a calm and credible manner. Respondents in this group indicated that it is important for the auditor to come across as credible, independent, and reliable. These findings align with research showing that vocal tone can shape perceptions of competence, emotional control, and trustworthiness (Wang et al., 2021).

Respondents of Viewpoint 1 also indicated that they consider a voice that evokes fear or is highly emotionally charged to be ineffective at conveying a risk warning and motivating the auditee to act. This contradicts the existing research by Johnston and Warkentin (2010), who conclude that fear can improve compliance with security protocols. The respondents seem to reject this notion; within the audit context, a fearful voice is not only considered ineffective but also potentially harmful to the credibility of the auditor.

Viewpoint 2, 'Urgent Appeal', differs somewhat from Viewpoint 1 as it emphasizes urgency and holding attention. Variations in rhythm and dynamics, an unexpected speaking pace, and a loud voice were identified as important elements for enhancing alertness and underscoring the sense of urgency. This observation corresponds with the research of Cohen et al. (2010) and Douek (2013), who have found that changes in rhythm and dynamics evoke a sense of urgency and alertness. Respondents also identified the timing of the risk warning as an important factor in ensuring their risk warning is heard and acted upon, which aligns with the findings of Verbraak-Kolevska (2018).

At the same time, respondents cautioned that an emotionless message is perceived as inappropriate in urgent situations, whereas excessive use of emotion can undermine the auditors' credibility.

Despite the differences between these two viewpoints, there is consensus on several important elements that can enhance the effectiveness of risk warnings. First, respondents

noted that a calm, clear, and easy-to-follow rhythm makes the auditee more inclined to listen to the auditor. They also indicated that a slow speaking tempo helps build trust, while variations in rhythm and dynamics can communicate urgency. Furthermore, respondents indicated that a hopeful tone could encourage the auditee to adopt a solution-oriented mindset.

Importantly, respondents particularly emphasized factors traditionally associated with internal audit effectiveness and the mitigation of the deaf effect. Well-known factors from the audit and IS domain, such as credibility (#17), timing (#19), independence (#20) and acting as a collaborative partner (#18), were consistently rated higher than the elements of music in both viewpoints. While vocal delivery is recognized as a factor influencing how both the auditor and the risk warning are perceived, it is generally considered a supporting rather than a determining factor. At the same time, the findings suggest that elements of music in spoken risk warnings, when applied appropriately, can serve as a helpful tool to enhance the impact of the risk warnings. However, poor vocal delivery, especially one that is fearful, monotonous or gloomy, may undermine factors such as credibility and the perception of the auditor as a reliable partner.

Implications for Research

This study provides insight into how internal auditors and CAEs perceive the use of musical elements, such as rhythm, tempo, pitch, and dynamics, in vocal delivery during the verbal communication of risk warnings. The findings show that vocal delivery is not regarded as a determining factor, but rather as a supporting tool that can strengthen or undermine core principles such as credibility, independence, and acting as a partner. By identifying two distinct professional perspectives, Calm Conviction and Urgent Appeal, this study contributes to a better understanding of how vocal strategies are evaluated within the profession, and which tensions and preferences influence their use.

This study complements earlier experimental research showing that variations in rhythm, dynamics, and emotion (specifically hope and fear) can increase the perceived urgency and impact of risk warnings (Yap et al., 2025a, 2025b). However, the professional viewpoints identified in this study present a more nuanced picture. Some auditors prefer a calm, clear, and credible vocal delivery, while others place greater value on emphasizing urgency and capturing attention, as long as it is done in a controlled and professional manner. This reveals a tension between what appears effective in experimental settings and what is considered credible, appropriate, and desirable in audit practice.

When used appropriately, vocal delivery may enhance the auditor's reliability and persuasiveness. Conversely, poor vocal delivery, such as a fearful, monotonous or emotionless tone, may undermine the auditor's reliability and increase the likelihood of the deaf effect.

In addition, this study further contributes to the theoretical insights into the deaf effect. The findings suggest that even a well-substantiated risk warning may be ignored if the form of delivery, the vocal expression, does not align with the situation. This emphasizes the importance of form as well as content in communicating risk warnings.

Finally, in line with Johnston and Warkentin (2010), who have shown that fear can increase the perceived message relevance in a security context, this study finds that fear (in the messenger's voice) can undermine the credibility of the messenger and increase the likelihood that they are ignored.

Taken together, these findings suggest that existing literature on internal audit effectiveness and the deaf effect could be expanded by incorporating vocal delivery as a contextual dimension. Whereas previous studies have primarily focused on message content, the credibility of the auditor, and the organizational context, relatively little attention has been paid to how risk warnings are communicated verbally by auditors. The viewpoints identified among internal auditors and CAEs indicate that the way something is said is not merely viewed as a stylistic choice, but also influences perceptions of credibility, urgency, and trust. These findings highlight the need for further theoretical development regarding the role of vocal delivery in audit and risk communication.

Implications for Practice

The results of this study offer concrete tools for auditors and CAEs to improve their communication with auditees. While the content of the message remains important, the results of this study indicate that the manner in which the risk warning is conveyed can also affect its reception.

Auditors and CAEs can strategically adjust their vocal delivery based on the context. In situations in which trust and cooperation are key, a calm and controlled voice is important. This type of vocal delivery radiates calmness and trust; it seems particularly effective when issuing a risk warning at an early stage, when the auditee is receptive to collaboration. Conversely, using a dynamic and more powerful voice with variations in pitch, rhythm, dynamics, and volume can effectively convey urgency and emphasize the need for action. These insights could also be beneficial for CAEs, particularly during board meetings and consultations with audit committees. In such contexts, a calm and controlled voice can help strengthen authority and credibility, whereas a more dynamic speaking style can effectively draw attention to urgent risks or issues within an organization. To implement these techniques effectively, it is important for both auditors and CAEs to receive specific training to become more aware of how to use their voice appropriately.

The theoretical and practical implications also highlight certain limitations and directions for future research. The following section provides an overview of these topics.

Limitations and Directions for Future Research

Although this study provides valuable insights, it is important to acknowledge certain methodological limitations. This study was conducted with a relatively small sample of respondents, all of whom are experienced internal auditors and CAEs, which may limit the generalizability of the findings.

This study identified two dominant viewpoints; however, it is possible that other, less prominent views were not captured. This is a known limitation of Q-methodology, which aims to reveal shared perspectives within a specific group. Nonetheless, the findings offer valuable insights, as the respondents are experienced professionals with sufficient expertise in communicating risk warnings.

In addition to these methodological limitations, several findings from this study point toward new research opportunities. In particular, four directions for further research appear relevant. First, it would be interesting to explore the extent to which the rate of speech can evoke psychological effects comparable to those of music tempo. Studies by Day et al. (2009) and Israel et al. (2019) demonstrate that music tempo influences cognitive processes and risk perception. This raises the question of whether the rate of speech, like the tempo of music, could similarly influence the accuracy of risk assessment and the willingness to take risks. Future research could involve an experiment in which the rate of speech is manipulated to measure the effect on risk perception, perceived relevance of the message and the decision to continue or discontinue a project.

Secondly, this study did not investigate the influence of the context in which the spoken risk warning is delivered. Factors such as the relationship with the auditee, the nature of the message and the degree of urgency or stress may affect how the spoken risk warning is received. Future research could examine how these contextual factors influence the effectiveness of the spoken risk warning by manipulating them in an experimental setting.

Third, this study also raises the question of whether the rate of speech can serve as a strategic tool for conveying risk warnings. Future research could investigate whether variations in rate of speech influence the perceived urgency of the message.

Fourth, it may be relevant for future research to explore which and how many viewpoints arise when the Q-sort includes only musical elements, excluding the traditional factors such as credibility, timing, independence and being considered a partner. This study included these factors to provide a realistic context, but their presence may have influenced the way the musical elements were prioritized or interpreted. A Q-sort study without these traditional factors may yield different insights into how auditors assess the role of vocal delivery in risk communication.

Finally, future research could examine the role of cultural context in the perception of vocal delivery. This study was conducted in the Netherlands and Belgium, two countries with relatively similar professional communication norms within a Western European context. What is perceived as calm, controlled, and credible in this context may not carry the same meaning in other countries or cultures. In some situations, a more expressive or emotionally charged delivery might be expected, while in others it could be viewed as unprofessional. The viewpoints identified in this study may therefore reflect region-specific communication norms. Cross-cultural research could explore whether auditors and auditees in other parts of the world share similar preferences, or whether perceptions of effective vocal delivery differ across cultures.

Lessons from the Living Room

During the final part of the interviews, respondents were asked how they use their voice in private situations, particularly when communicating with their children. The majority indicated that they adjust their vocal delivery, either consciously or unconsciously, depending on the situation. Examples included slowing down their speech to enhance clarity, raising their voice to convey urgency, or speaking more softly to calm or reassure. These adjustments occurred when reading aloud, issuing warnings or trying to influence a child's behavior.

Some respondents reported that they deliberately adopt a fearful tone to make children more alert to potential danger. Others, by contrast, said they avoid conveying fear as they believe it can have a counterproductive effect.

When reflecting on their professional role, most respondents indicated that expressing emotions, especially fear, is considered inappropriate in audit conversations. Instead, there is a clear preference for a calm or clear tone of voice. These findings suggest that auditors do in fact possess intuitive and flexible vocal skills, which they routinely apply in private contexts. In professional settings, however, the vocal delivery is largely shaped by expectations associated with the auditors' role: to be neutral, credible and to communicate in an objective, fact-based manner.

6.7 SUMMARY

The Q-sort analysis revealed two viewpoints. The first group, labeled as 'Calm Conviction', values calmness, credibility and independence. The second group, 'Urgent Appeal', places greater emphasis on urgency and alertness.

Both groups clearly expressed a preference against monotone, emotionless voices. They also indicated that a voice that is overloaded with emotion is not considered appropriate for their professional role. Notably, 'classic' factors such as credibility, timing and partnership

with the auditee were rated more highly than elements of music. Vocal delivery is thus seen as important, but more as a supporting factor than a leading one.

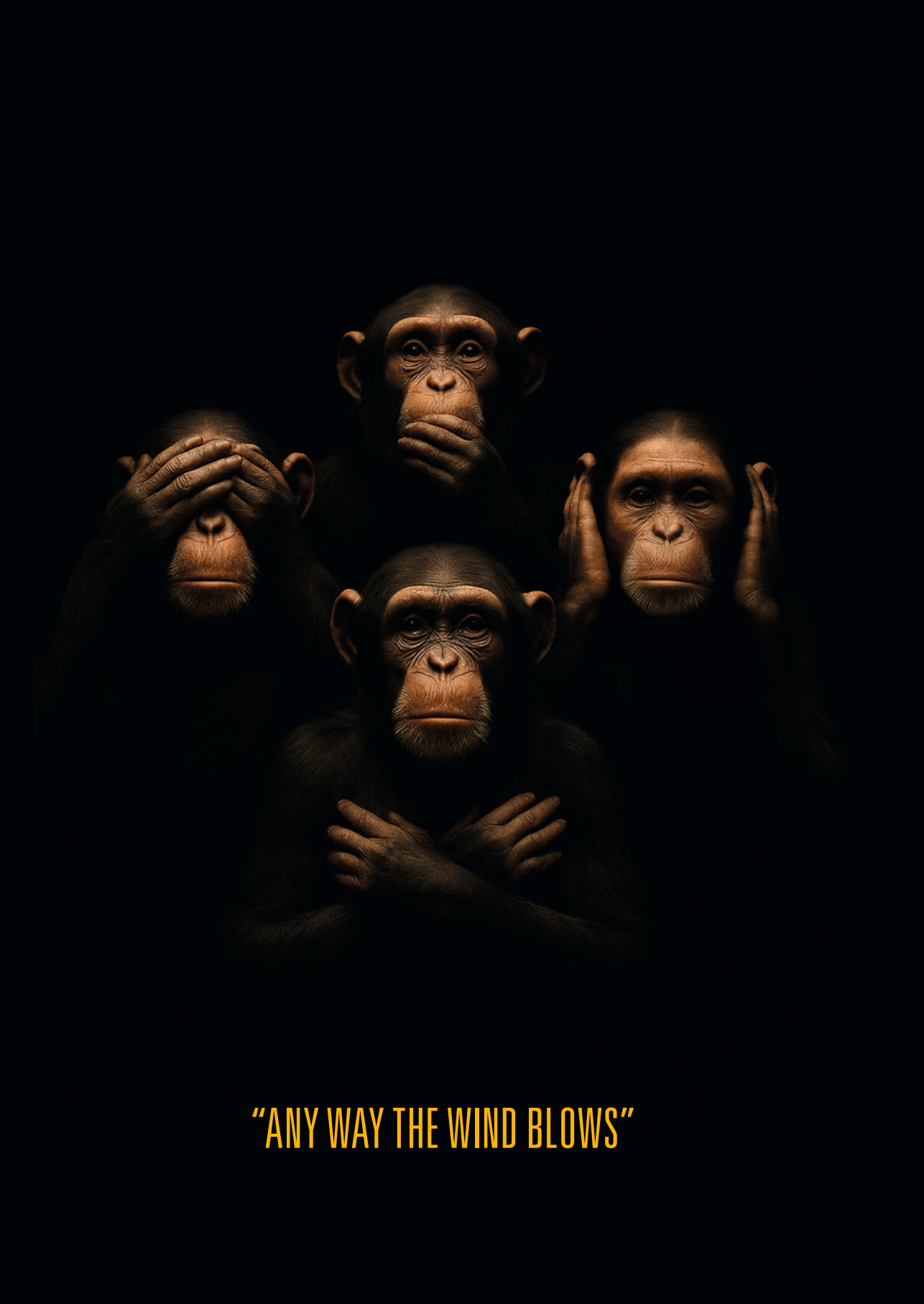
This analysis was based on Q-sorts and follow-up interviews with 27 experienced internal auditors and chief audit executives (CAEs). The sample included respondents with diverse backgrounds and professional roles, ensuring a rich exploration of perspectives. By combining quantitative and qualitative data, the study uncovered not only shared preferences but also nuances in how auditors perceive the appropriateness of vocal delivery styles.

This chapter demonstrates that the perceived effectiveness of vocal delivery is closely related to the professional perspectives of the respondents. At the same time, the auditors and chief audit executives (CAEs) appear to be somewhat cautious about using too much emotion in their voice. In Chapter 7, the findings from the previous chapters are integrated to form a comprehensive view of the role of elements of music in audit communication.

APPENDIX 6A. THEORETICAL FOUNDATION FOR SELECTION OF STATEMENTS

Table 6-5. Theoretical foundation for selection of statements

NR	Statements	References
1	A fast speaking pace that evokes urgency	Cohen et al. (2010)
2	A fast speaking pace that reduces the willingness to take risk	Israel et al. (2019)
3	A fast speaking pace that helps assess risks more accurately	Day et al. (2009)
4	A slow speaking pace that inspires confidence	Cohen et al. (2010); Juslin and Laukka (2003); Scherer (1995)
5	A slow speaking pace that increases the willingness to take risks	Israel et al. (2019)
6	A loud voice that increases alertness	Cohen et al. (2010)
7	A soft voice that calms	Cohen et al. (2010);
8	A high-pitched voice that evokes fear	Cohen et al. (2010); Rodero, 2011; Waaramaa et al., 2008)
9	A low voice that evokes gloominess	Cohen et al. (2010); Rodero, 2011; Waaramaa et al., 2008)
10	An unexpected speaking rhythm that evokes alertness	Cohen et al. (2010); Douek (2013); Jones and Boltz (1989); Miller et al. (2012
11	A constant speaking rhythm that evokes inattention	Cohen et al. (2010); Douek (2013); Jones & Boltz, 1989; Miller et al. (2012
12	A clear and easy-to-follow rhythm that calms	Chen (2018); Cheng and Tsai (2016); Conrad et al. (2010)
13	Variation in dynamics and rhythm that evokes urgency	Douek (2013);
14	A fearful voice	Yap et al. (unpublished manuscript)
15	A hopeful voice	Yap et al. (unpublished manuscript)
16	A cheerful voice	Schulreich et al. (2014)
17	Credibility of the auditor	Cuellar et al. (2006)
18	Acting as a collaborative partner	Nuijten et al. (2017)
19	Correct timing of the risk warning	Verbraak-Kolevska, (2018)
20	Independence of the auditor	Drogalas et al. (2015)
21	An emotionless voice	Yap et al. (2025a, 2025b)
22	A voice with a lot of emotion	Yap et al. (2025a, 2025b)
23	A monotonous voice	Yap et al. (2025a, 2025b)


“ANY WAY THE WIND BLOWS“

CHAPTER 7

CONCLUSIONS

This final chapter brings together the key findings of this research and discusses their theoretical and practical implications. It highlights the lessons auditors can draw from insights into the use of musical elements and emotions in the communication of audit messages and risk warnings. This chapter also reflects on the study's limitations and outlines directions for future research. It concludes with a personal reflection on the dissertation.

7.1 DISCUSSION OF THE MAIN FINDINGS

The motivation for this dissertation stems from a persistent and deeply rooted problem faced by internal auditors in their daily work: the *deaf effect*. Auditors frequently experience decision-makers ignoring or downplaying the risk warnings they issue, even when these warnings are clearly and factually substantiated. This dissertation builds on the findings from Chapter 2, which explores how various cognitive biases amplify the deaf effect, thereby undermining the effectiveness of both the warning and the auditor (Van Twist et al., 2024). These findings raise a guiding concern: *How can internal auditors ensure that their risk warnings are heard?*

Unlike risk warnings, music draws people in. People want to listen. This observation led to the following central research question:
How can internal auditors enhance the effectiveness of spoken risk warnings in IS projects by incorporating musical elements to reduce the deaf effect?

To address this question, the dissertation is structured around five interrelated research questions, each explored in a separate chapter:

1. *How do cognitive biases contribute to the deaf effect in internal audit risk warnings? (Chapter 2: "Mama, Just Killed a Man")*
2. *What conceptual foundations can be drawn from the literature on music, psychology, and decision-making for applying elements of music in internal audit risk warnings? (Chapter 3: "Too Late, My Time Has Come")*
3. *How does the use of vocal rhythm and dynamics in spoken risk warnings influence willingness to continue failing IS projects? (Chapter 4: "Thunderbolts and Lightning, Very, Very Frightening Me!")*
4. *How do emotions, such as hope and fear, evoked through musical elements affect the effectiveness of spoken risk warnings in IS projects? (Chapter 5: "So You Think You Can Stone Me and Spit in My Eye?")*
5. *How do internal auditors and chief audit executives (CAEs) perceive the use of musical elements in spoken risk warnings? (Chapter 6: "Nothing Really Matters to Me")*

The starting point for this research was Chapter 2, which explored the ostrich effect, which served as a proxy for the deaf effect, and its potential relation with other cognitive biases. Based on survey data, it identified biases that may cause risk warnings to be ignored. These findings highlight the need to consider not just *what* is communicated, but *how* it is delivered.

Chapter 3, a critical literature review titled *"Too Late, My Time Has Come"*, examines how musical elements may help improve the impact of risk warnings in the context of internal audit communication. It aimed to connect existing insights into the deaf effect and audit

effectiveness with findings from music and decision-making research. The literature review focused on the psychological mechanisms underlying musical elements and their influence on cognitive processing and decision-making. It also explored how pitch, dynamics, rhythm, and tempo shaped perceptions of urgency and relevance. These insights form the conceptual foundation for the empirical studies that follow.

Chapter 4 presented a 2x2 factorial design experiment that investigated how rhythm and dynamics influence the perceived relevance of a spoken message. Chapter 5 used a scenario-based experiment to examine how hope and fear, elicited through musical cues, affect the perceived effectiveness of a risk warning. Finally, Chapter 6 presented a Q-sort study exploring how internal auditors and CAEs perceive the influence of musical elements on spoken risk communication effectiveness.

Most previous studies on internal audit effectiveness and the deaf effect have focused on *what* auditors communicate and *who* delivers the message. Little attention has been paid to *how* messages are delivered. This dissertation contributes to academic literature by addressing this gap and by investigating how musical elements can enhance the delivery of spoken risk warnings. Based on the findings of these studies, the following conclusions were drawn:

Conclusion 1: The deaf effect begins in the mind
(*answers research question 1 – Chapter 2)*

Chapter 2 examined how other cognitive biases are associated with risk warnings being ignored. Based on survey data from 44 professionals working in internal auditing and project management, five biases were identified as relevant in the context of IS projects: *status quo bias, the mum effect, student syndrome, authority bias, and groupthink*. These biases may reinforce the deaf effect by confirming existing decisions, softening or avoiding critical messages, encouraging delay, prioritizing authority over content, or suppressing dissenting viewpoints.

This conclusion illustrates how cognitive biases may help explain why risk warnings from internal auditors are sometimes ignored or not acted upon.

The findings suggest that even well-substantiated and timely warnings may be overlooked, not because of their content, but because of the psychological filters through which they are processed. As such, the deaf effect should not only be seen as a communication problem, but also as a cognitive mechanism.

A clear understanding of these biases helps explain why auditors are sometimes not heard. Chapter 2 therefore serves as the empirical starting point of this dissertation. It

provides the foundation for the idea that internal auditors must attend not only to *what* they communicate, but also *how* they deliver their message.

Conclusion 2: A voice that doesn't resonate won't be heard
(*answers research question 2 – Chapter 3; conceptual foundation for research questions 3, 4 and 5 – Chapters 4, 5, 6*)

The literature review in Chapter 3 clarifies that the deaf effect and the resulting ineffectiveness of internal auditors cannot be understood in isolation from cognitive biases, emotional reactions, and a poor alignment between the message and recipient. Although auditors often deliver well-substantiated and factually accurate risk warnings, the literature shows that these warnings are frequently ignored because they fail to resonate with decision-makers' cognitive and emotional states.

The findings suggest that existing theories, such as prospect theory and framing, help explain why decision-makers interpret risks differently than intended. These effects are further reinforced by behavioral tendencies, such as procrastination (the student syndrome) and reluctance to deliver bad news (the mum effect), as discussed in Chapter 2. Consequently, even credible and relevant warnings may not be effective.

Against this backdrop, music is presented as a compelling alternative lens. Musical elements such as rhythm, dynamics, tempo, and pitch have been shown to influence mood, risk perception, and behavioral intention. In fields such as media, politics, and marketing, it has long been established that music can shape decision-making and evoke emotions that drive action or passivity. For example, urgency can be conveyed through variations in rhythm and dynamics.

This offers a powerful bridge to risk communication: If music can steer behavior, why should auditors not apply similar principles? Of course, it is not the intention that auditors should deliver their messages accompanied by an orchestra or while playing an instrument. Rather, the idea is that they begin to treat their *voice* as an instrument, one capable of making their warnings resonate with their audience, whether that is a decision-maker or an auditee.

This perspective also raises important questions about the ethical boundaries of vocal delivery. While vocal delivery may enhance clarity and relevance, it may also influence perceptions in unintended ways. The findings from the literature review laid the conceptual foundation for the experiments and the Q-sort study that followed.

Conclusion 3: Variation in dynamics enhances attention and perceived relevance
(*answers sub-question 3 – Chapter 4*)

By their very nature, risk warnings are tied to a sense of urgency. Chapter 4 investigated whether vocal rhythm and dynamics could help mitigate the deaf effect in the context of risk communication about failing projects. In a 2 × 2 factorial experiment, rhythm (placement of pauses) and dynamics (variations in volume) were manipulated using a spoken risk warning. The results showed that these musical elements significantly influenced both the perceived relevance of the message and the listener's emotional response.

Dynamics proved especially effective at reducing boredom and increasing the emotion of interest, both of which – in line with Scherer's (2005) model of emotion – positively influenced the respondents' willingness to terminate a failing project. Rhythm showed a more complex pattern; like dynamics, it enhanced perceived relevance and reduced boredom, but it also unexpectedly evoked the emotion of hope. While this effect was not statistically significant, hope is associated with a greater likelihood of continuing the failing project, which is an undesirable outcome when delivering a risk warning. This finding challenges the assumption that rhythm is always helpful in overcoming the deaf effect.

The study also provides empirical support for the *dynamic attending theory*, which posits that rhythm helps direct attention and fosters engagement. At the same time, the findings suggest that the effects of rhythm and dynamics are not uniform but depend on the specific emotions they elicit. Additionally, boredom was found to be mediated by perceived message relevance; when the message was seen as less relevant, boredom increased. This indicates that rhythm and dynamics influence not only the emotional response but also the cognitive interpretation and behavior of decision-makers by shaping how relevant the message is perceived to be.

This study demonstrates that rhythm and dynamics are important musical elements that enhance the impact of spoken risk warnings. However, rhythm requires more careful consideration, as it has the potential to trigger hope, an emotion that may undermine the desired effect of the warning.

Conclusion 4: Fear triggers action, but not without risks
(*answers sub-question 4 – Chapter 5*)

Chapter 4 showed that, in some cases, the emotion of hope was evoked unexpectedly. This was a surprising finding, as hope does not seem appropriate in the context of an urgent risk warning, but seems more suited to messages intended to provide reassurance. Although this effect was not statistically significant, it prompted a follow-up study in Chapter 5 that focused specifically on the emotional contrast between hope and fear. The expectation

was that a fearful message would be more likely to persuade decision-makers to adjust the course of a failing project, whereas a hopeful message was not expected to prompt action.

This study examined how musical elements such as pitch, tempo, dynamics, and loudness could be used to evoke emotions of hope and fear, and how these emotions influenced the reception of a spoken risk warning. Music theory was consulted to determine how these vocal elements could be adjusted to evoke the correct emotion.

In the experiment, two versions of the exact same risk warning were recorded: one delivered in a hopeful tone and the other in a fearful tone. The results showed that both the hopeful and fearful risk warning increased the perceived message relevance. However, only the fearful risk warning significantly increased risk perception.

This study demonstrated that emotion in audit communication is not a matter of stylistic preference; it is a fundamental part of effective communication. Fear conveyed a sense of urgency and increased the willingness to intervene, whereas hope did not create a sense of urgency and therefore failed to elicit the desired behavioral response.

The findings also suggest that the effectiveness of a message depends not only on traditional factors, such as credibility, independence, being perceived as a partner, and timing, but also on the emotional tone in which the message is delivered. Integrating emotions into risk warnings can help mitigate the deaf effect and improve audit effectiveness.

In summary, this study showed that fear, when employed carefully, may play a meaningful role in mitigating the deaf effect and may enhance internal audit effectiveness. Hope, by contrast, increased message relevance, but failed to trigger the same urgency or behavioral response.

Conclusion 5: Auditors balance credibility and impact
(*answers sub-question 5 – Chapter 6*)

Chapters 4 and 5 explored how musical elements can help auditors make their spoken risk warnings resonate with their listeners. By incorporating rhythm and dynamics into their voices, auditors can more effectively convey the urgency of a message. In addition, studies have shown that emotion plays an important role in whether or not a risk warning is heeded and acted upon.

This was examined in Chapter 6 through a Q-sort study where internal auditors and chief audit executives (CAEs) reflected on which musical elements they considered useful in ensuring that their risk warnings were heard. The survey revealed two distinct perspectives on risk communication: Calm Conviction and Urgent Appeal.

The first viewpoint emphasizes the importance of a calm and hopeful voice, a voice that reinforces the credibility, independence, and reliability of the auditor. For this group, these characteristics are considered essential for issuing risk warnings.

The second viewpoint focuses more on conveying urgency and maintaining the listener's attention. Key elements included variation in rhythm and dynamics, unexpected tempo, and a loud, though not aggressive, voice.

Despite these differences, there is broad consensus on a number of points. A monotonous or anxious voice was seen as ineffective or even harmful because it could undermine the credibility of the auditor. Respondents also repeatedly emphasized the importance of cooperation; auditors who communicate in a way that indicates that they are on the same page as the auditee are more likely to be taken seriously. This study shows that auditors and CAEs are aware of how their vocal delivery shapes their message reception. Musical elements can enhance the impact of risk warnings, provided that auditors use their voice in a way that aligns with the context and preserves their credibility.

Conclusion 6: Effectiveness sometimes clashes with credibility
(*synthesizes sub-questions 4 and 5 – Chapters 5 & 6*)

One of the most striking findings of this dissertation lies in the contrast between the results of the experiment in Chapter 5 (on hope and fear) and the results of the Q-sort study in Chapter 6. In Chapter 5, a fearful vocal tone was shown to increase risk perception and the willingness to intervene in a failing project. In contrast, the hopeful tone did not raise risk perception and therefore did not prompt action.

This is particularly notable because the viewpoints of internal auditors and CAEs in Chapter 6 paint a different picture. According to them, a fearful voice was seen as damaging to the auditor's credibility. A hopeful tone, on the other hand, was thought to increase the likelihood that a risk warning would be heard and taken seriously.

This contradiction highlights a key insight of the dissertation: effectiveness and credibility are not always aligned. What works in a controlled experimental setting may be perceived in practice as illogical or even inappropriate. While emotional expression can be a valuable tool, it also raises important questions about the auditors' perceived professionalism and trustworthiness.

This tension between perceived credibility and actual effectiveness is also reflected in what Van Buiten and Keren (2009) describe as a speaker and listener incompatibility. Their research shows that speakers tend to prefer positively framed messages, believing these to be more persuasive. Listeners, on the other hand, tend to respond more strongly to negatively framed messages. The contrast between the Q-sort findings in Chapter 6 and

the experimental results in Chapter 5 seems to confirm this. Auditors prefer a hopeful tone, as it is perceived as more positive and supportive of their credibility. However, the experiment in Chapter 5 shows that a fearful tone, although perceived as more negative, is more effective in increasing risk perception and encouraging action.

The conclusion is that emotions such as hope and fear can enhance the effectiveness of a risk warning; however, they also introduce tension between the *impact* of the message and the *perception* of the messenger. This underscores the need for deliberate choices in vocal delivery. The use of emotion must align with the content and context of the message to maintain both effectiveness and credibility.

Conclusion 7: Music theory offers insight but calls for nuanced application
(*reflects on sub-questions 3–5 – Chapters 3 & 6*)

This dissertation demonstrates that insights from music and psychology offer valuable new perspectives on how auditors communicate. In Chapter 3, the literature review showed that musical elements such as tempo, rhythm, pitch, and dynamics can influence emotions and decision-making. For example, fast-paced music has been linked to quicker but less accurate decisions, whereas slower music is often associated with increased risk tolerance. These findings may be highly relevant to the perception of spoken risk warnings.

However, the combination of insights from the literature and the Q-sort study in Chapter 6 revealed interesting tensions. While theory suggests that a fast musical tempo might enhance attention and convey urgency, auditors have indicated that a fast speaking tempo can hinder comprehension. Likewise, they found it implausible that a slower tempo would increase risk-taking as the relationship between speaking pace and risk perception was counterintuitive.

This finding points to a fundamental distinction between *musical tempo* and *spoken tempo*. While musical concepts provide a useful framework for rethinking communication strategies, this dissertation shows that they cannot be directly transposed into risk communication without careful consideration.

Together, these conclusions provide a nuanced answer to the central research question, showing that the auditor's voice may become an instrument to overcome the deaf effect.

7.2 IMPLICATIONS FOR THEORY

Contribution to the Literature on the Deaf Effect in Escalating IS Projects

In Chapter 3, we presented a critical literature review on the theoretical foundations for this dissertation. This section explains how Chapters 4 to 6, which explore the use of musical elements in spoken audit warnings, contribute to the literature on the deaf effect.

As shown in Table 3-1, prior research has identified an expanding range of explanatory factors that contribute to the deaf effect. Notably, most studies emphasize the psychological, organizational, social, cultural, and relational aspects. While these perspectives offer valuable insights into mitigating the deaf effect, relatively little attention has been paid to how risk warning messages are vocally delivered. Moreover, recognition of the recipient's emotional response as a potential explanatory factor is limited.

Prior studies largely ignored how risk warnings are vocally delivered. Therefore, we turned to a field in which listening plays a central role: music. Unlike earlier deaf effect studies, we used spoken—rather than written—risk warnings to examine how vocal delivery influences perception. In this study, risk messages were recorded and played to the respondents. This allowed us to manipulate musical elements such as tempo, rhythm, pitch, and dynamics to analyze their impact. This method aligns more closely with real-world audit communication, which is often oral and enables the exploration of vocal delivery as a contributing factor to the deaf effect.

Moreover, this dissertation introduces a new substantive perspective. The first experiment (Chapter 4) examined how rhythm and dynamics influence the perceived relevance of risk warnings and also considered emotions such as boredom, interest, and hope, which may play a role in this process.

The second experiment (Chapter 5) explicitly investigated how specific emotions (i.e., hope and fear) are related to message relevance, risk perception, and willingness to act on the warning.

The third study (Chapter 6) showed that vocal delivery influences how risk warnings are perceived, but is generally seen as a supporting rather than a determining factor, unlike credibility, timing, or independence. Poor delivery may nonetheless weaken the message's impact.

The findings also raise questions about how vocal delivery may affect cognitive processing. Emotions such as hope and fear not only color the listener's response, but also shape how a risk warning is initially interpreted. As discussed in Chapter 3, it is plausible that if a risk warning does not immediately engage the recipient, it will be processed more intuitively (System 1), rather than through reflective reasoning (System 2). Vocal cues, such

as dynamics, rhythm, tempo, and pitch, may trigger such heuristics and unintentionally influence the perceived risk or credibility of the auditor, even before the actual message content has been fully processed. This implies that the way a message *sounds* can either close or open the door to a more reflective, rational evaluation. While such cognitive mechanisms have not been central in current deaf effect studies, they may help explain why some risk warnings are instantly dismissed while others do resonate.

By focusing on both the musical form and emotional impact of spoken risk messages, this dissertation makes a unique contribution to deaf effect literature. It demonstrates that not only the content of the message or the auditor, auditee relationship, but also the form in which the message is delivered and the emotional response it evokes significantly influences the effectiveness of risk communication and, thereby, the emergence or mitigation of the deaf effect. These contributions are summarized in Table 7-1, which categorizes them across theory, methodology, and application in terms of replication, extension, and innovation.

Contribution to the Literature on Internal Auditing

This study contributes not only to the theoretical understanding of the deaf effect but also to the broader literature on internal audit effectiveness. When an auditor's risk warning goes unheard, this directly undermines its effectiveness. Yet, the literature on internal auditing rarely considers how spoken risk warnings shape message reception and credibility. Spoken audit messages differ from written reports in important ways. They unfold in real time, are shaped by vocal delivery, and often involve interpersonal dynamics that written communication lacks. Therefore, it is reasonable to approach spoken communication as a distinct focus of research.

Chapters 4 and 5 used scenario-based experiments to test how variations in vocal delivery affect perception and action, a method not typically used in audit effectiveness research. Drawing on empirical evidence, four distinct theoretical contributions are proposed, which relate to the following: (1) the structural conditions for audit effectiveness, (2) the auditor–auditee relationship, and (3) the emotional response of the auditee.

First, existing literature on internal audit effectiveness often highlights factors such as independence, positioning of the internal audit function (IAF), auditor expertise, and top management support as key enablers of effectiveness (Arena & Azzone, 2009; Drogalas et al., 2015; Mihret & Yismaw, 2007; Sarens, 2009). Others stress the extent to which audit findings lead to actual change (Lenz & Sarens, 2012a). While audit reports are widely studied, vocal delivery of audit findings remains largely overlooked. This indicates a structural blind spot in the current theoretical landscape of auditing.

Second, the internal audit literature increasingly acknowledges the importance of the auditor–auditee relationship. Auditors tend to be more effective when they are seen as

partners rather than as opponents (Nuijten et al., 2016; Sarens & De Beelde, 2006). Yet, existing theory offers little insight into how this perception is formed. The Q-sort study in Chapter 6 demonstrates that auditors and CAEs are indeed aware of how their voices are perceived. Respondents noted that vocal attributes such as tempo, rhythm, and volume influence how they are seen, whether credible and trustworthy, or conversely unpleasant or forceful. These findings underscore the interpersonal dimension in audit communication, which is often absent in studies on internal auditing.

Third, another notable gap in internal audit theory is the lack of attention paid to the auditee's emotional response. Most studies focus on the auditor, their competence, organizational position, or working context. The experiments presented in Chapters 4 and 5 reveal that emotions such as hope, fear, boredom, and interest shape how the relevance of a risk warning is perceived. These findings demonstrate that vocal qualities may play a mediating role in how risk communication is received and whether it prompts corrective action. Table 7-1 provides an overview of how these findings contribute to theory, methodology, and application in internal audit effectiveness.

Table 7-1. Contribution of this study

Contribution	Replication	Extension	Innovation
Theory	Deaf Effect (Ch4, Ch5, Ch6) IA Effectiveness (Ch4, Ch5, Ch6)	Introduces vocal delivery as a contributing factor to Deaf Effect and auditor–auditee relationship (Ch4, Ch5, Ch6)	Positions emotional response as a previously overlooked mechanism in Deaf Effect and Internal Audit literature (Ch4, Ch5)
Methodology	Deaf Effect (Ch4, Ch5, Ch6) IA Effectiveness (Ch4, Ch5, Ch6)	Uses musical elements in experimental audit research (Ch4, Ch5)	
Application	Deaf Effect (Ch4, Ch5, Ch6) IA Effectiveness (Ch4, Ch5, Ch6)	Application of musical elements (rhythm, dynamics) to audit warnings (Ch4); Emotional framing (hope/fear) to audit warnings (Ch5)	Rhythm, dynamics, hope and fear influence message relevance, risk perception, and willingness to continue on audit warnings (Ch4, Ch5)

7.3 IMPLICATIONS FOR PRACTICE

In addition to its theoretical contribution, this dissertation also holds practical relevance for the internal audit profession. The findings demonstrate that vocal delivery is a significant factor that can enhance audit effectiveness. The following practical implications are intended for internal auditors, chief audit executives (CAEs), and the professional body, the Institute of Internal Auditors (IIA). They aim to offer guidance in raising awareness, fostering development, and strategically applying vocal techniques in the communication of audit messages.

From Style to Skill

Traditionally, internal auditors have been strongly focused on being accurate, independent, and objective. Within these three pillars, however, little attention has been paid to the use of voice as a skill that can enhance auditor effectiveness. However, this dissertation shows that adjusting vocal characteristics such as tone, rhythm, tempo, and dynamics has a tangible impact on how risk warnings are received, interpreted, and acted upon.

Our empirical findings indicate that variations in vocal rhythm and dynamics increase receptiveness to the message, making people more likely to listen and respond appropriately. These insights underline that auditing skills extend beyond analytical thinking or writing clear reports. The ability to express oneself vocally is not merely a matter of personal style; it should be seen as a professional tool that requires careful and intentional use.

For CAEs, these findings suggest that vocal delivery deserves consideration in both recruitment and performance evaluation as part of an auditor's broader communication competencies. Simultaneously, auditors themselves must remain critically aware of their vocal style. Exaggeration or deliberate evoking of fear or hope can be easily perceived as manipulative.

Therefore, we argue that targeted training in vocal delivery is essential not only to increase impact but also to safeguard the integrity of the auditor. For professional body IIA, this presents an opportunity to formally recognize this dimension of professionalism by embedding it within the competency framework outlined in the Professional Practices Framework.

Speaking is Acting

A spoken risk warning should not be seen as a neutral transfer of information, but rather as a performative act[12], one that is intended to have an immediate effect at the very moment it is delivered. The way in which auditors phrase their warnings through tempo, rhythm, pitch, and volume determines how a message is received. This means that tone of voice plays an important role in the effectiveness of the warning itself.

A voice that conveys urgency can prompt immediate action, whereas a flat, emotionless tone can give the impression that the risk is manageable or even negligible. Auditors are not merely messengers, as their vocal delivery may shape how risk warnings are perceived and acted upon.

12 The term *"performative act"* refers to the use of language that does not merely describe something, but actively brings something into being (Austin, 1962).

In contexts where trust is of utmost importance and the goal is early warning, a calm and reassuring tone can be the most convincing. Conversely, in urgent situations, a more forceful tone may be required to convey the seriousness of the problem.

The Right Tone in the Right Context

Auditors often operate in environments characterized by political sensitivity, hierarchical dynamics, and conflicting interests. In such environments, it is not only the content of the message that is important, but also the auditor's ability to tailor that message to the context without provoking resistance.

Vocal delivery, whether forceful or calm, fast or deliberate, urgent or reflective, is not only a matter of expression; it is also part of the auditor's professional judgment. The auditor must be able to "read the room" and adapt his or her communication style to the purpose and dynamics of the moment to remain heard and effective. For the professional body IIA, this means that vocal delivery must not only be developed as a skill but must also be recognized as an integral part of the auditor's professional judgment.

Vocal Delivery in Training and Development

The previously mentioned implications highlight the importance of vocal delivery in internal audit effectiveness. This raises the following key question: How can auditors develop and maintain these vocal skills? Current internal audit training programs place considerable emphasis on written reporting, presentations, and conversational techniques. However, the vocal expression of the auditor through elements such as tempo, pitch, dynamics, rhythm, and emotion has received little to no attention. As a result, an important skill remains underdeveloped despite the fact that vocal delivery significantly shapes how an audit message is received.

For training programs, this calls for a broader curriculum that explicitly focuses on vocal communication. The goal is not to turn auditors into professional speakers but rather to make them understand how their voice affects the auditees' perception of the message in different contexts. Practical methods may include role-play, simulations, playback of audit conversations, and focused coaching on voice use.

Chief audit executives (CAEs) can further support this development by making vocal delivery a regular topic of feedback and discussion during evaluations. However, establishing a clear ethical framework is essential. The purpose of conscious vocal delivery should never be manipulation, but rather effective, transparent, and professional communication. If the IIA provides clear guidelines and includes this dimension in its competency profiles, the use of the auditor's voice can take its rightful place as a core element in the auditor's professional development.

Listening Beyond Words

To conduct audits, internal auditors frequently rely on documents and data analysis as well as interviews. Interviews are often used to obtain clarification or confirmation of findings, or to gather perceptions and contextual information. In our view, this presents an important opportunity for auditors to expand their investigative skills further.

It is important that auditors also develop the ability to *hear* how something is said. Vocal cues such as a rapid speech tempo, sudden changes in pitch, or an unusually calm tone may offer valuable insights that remain invisible in written documentation. Thus, the auditee's voice can serve as an important source of information. The ability to detect subtle vocal signals functions as an additional 'antenna' in the auditor's investigative process.

This perspective also connects to the concept of information leakage (Benschop, 2016; Karevold & Teigen, 2010; Sher & McKenzie, 2006; Van Buiten & Keren, 2009), whereby subtle choices regarding how something is phrased can unintentionally reveal a speaker's attitude or intent.

Listening, then, is no longer only about *what* is being said but also *how* it is being said. Sensitivity to tempo, rhythm, dynamics, pitch, and the emotions they convey should, therefore, be recognized as an essential part of the internal auditor's professional toolbox.

For the p IIA, this presents an opportunity to reposition listening skills not merely as a soft skill but as an analytical instrument, one that supports sound judgment and sharpens the auditor's insight.

7.4 LIMITATIONS AND FUTURE RESEARCH

Naturally, this study has certain limitations that affect the generalizability and applicability of its conclusions. At the same time, these limitations also open valuable avenues for future research. This section discusses the main methodological, theoretical, and contextual limitations with the aim of identifying promising directions for further research.

First, this research focused exclusively on spoken risk warnings. Across the three studies, only the effects of vocal communication were investigated; in practice, auditors also communicate in writing. While voice clearly plays no role in written reports, it is worthwhile to explore how elements of music might be translated into written audit communication, for example, through sentence length, punctuation, or structure. Just as lyrics or poetry can evoke emotion, a written risk warning can be crafted consciously to convey a certain urgency or effect. Future studies should examine the applicability of musical elements to written messages and assess their effects on risk perception.

Secondly, the experimental studies in this dissertation combined multiple elements of music to simulate real-world communication. For example, Chapter 4, combined rhythm and dynamics, while Chapter 5 manipulated several elements of music to evoke either hope or fear. Future research could focus on identifying which specific elements contribute most strongly to the cognitive and emotional response of the auditee. Additionally, Chapter 6 revealed that auditors' preferences for certain vocal traits, such as speaking tempo or tone, deviate from what earlier studies on music and risk perception suggest. These studies found, for instance, that fast music increases risk-taking behavior, whereas auditors tend to find this implausible. Future research could examine the extent to which tempo influences risk judgment and appetite in the context of audits or IS projects.

Third, the studies were conducted in controlled hypothetical environments. Real-world audit settings are often more complex, with multiple interacting variables that influence decision-making. This raises questions regarding the generalizability of the findings to audit situations in practice. As Calder et al. (1981) argue, it is important to distinguish between 'effect application', which focuses on immediate practical implementation, and 'theory application', which focuses on deepening conceptual understanding. This dissertation leans more toward 'theory application', as it is aimed at gaining insights into decision-making processes with regard to risk warnings, than toward direct application in organizations (Dobbins et al., 1988). Future research could explore the effects of vocal expressions in more naturalistic settings, for example, through observations of real-life audit conversations.

Fourth, several factors that might influence willingness to listen were not included in these studies. These include the relationship between the auditor and the auditee, the nature and seriousness of the situation, and organizational culture. Chapter 6 identified two different viewpoints regarding vocal delivery, a preference for a calm tone and a preference for a more urgent voice. Future research could examine to what extent these preferences reflect a personal communication style or whether they are applied in a more context-dependent manner. It would be interesting to explore whether auditors tend to stick to their own preferred style or whether they adapt their vocal delivery to the situation. In addition, future research could examine the extent to which the auditee's emotional state, such as stress, resistance or uncertainty, may influence the effectiveness of the risk warning.

Fifth, this dissertation primarily focused on musical elements in vocal delivery, the emotions they evoke, and the subsequent choices made regarding the adjustment of an IS project. Future research could examine how the emotional tone of voice influences cognitive processing and the perceived impact of a risk warning. Chapter 4 described how different emotions are processed in different ways, showing that emotions such as hope and fear can trigger more rational processing of the message (System 2). Future research could explore whether and how vocal delivery deepens or limits the cognitive processing of a

spoken risk warning. This could be investigated, for example, in a study where participants hear a spoken warning with a specific emotional tone. The depth of processing could then be assessed through perceived mental effort, or how well participants remember key parts of the message. Such research would help to better understand how vocal emotion shapes the substantive impact of audit communication.

Sixth, this dissertation has primarily focused on one-directional risk warnings. In practice, however, such warnings are often delivered in interactive settings. Research by Nuijten et al. (2020b) describes how the relationship between auditor and manager evolves after a risk warning is ignored. Their study identifies various behavioural patterns, depending on the actions taken by the auditor and the way management responds. Future research could build on these findings by examining how vocal delivery dynamically evolves during audit conversations. How do auditors adjust their tone, rhythm, dynamics, or tempo in response to the reaction of the auditee or manager? And how does this influence the reinforcement or mitigation of the deaf effect? Using methods such as conversation analysis or simulated role-play could provide deeper insight into how auditors adapt their vocal strategy throughout the interaction.

Seventh, this dissertation focused on Dutch-speaking professionals in the fields of auditing and IT. The musical elements of vocal delivery may not be interpreted in the same way across different languages. What is perceived as credible or urgent in one language or culture may be understood quite differently in another. Future research could explore how risk warnings with varying vocal characteristics and corresponding emotional expressions are received in other countries. Comparative studies could provide valuable insight into which aspects of vocal delivery are broadly applicable and which are more dependent on the language or culture in which they are used. This may be particularly relevant for auditors working in international or culturally diverse environments.

Beyond the research opportunities that arise from the limitations of this dissertation, several additional areas for future research can be identified. These emerge from the theoretical foundations and empirical findings of this research. Relevant directions include the interaction between musical elements and message content, the role of emotional nuance, and the effects of repeated use of specific vocal patterns. The following research directions are briefly outlined below.

One promising direction concerns the question of which form of vocal delivery best fits different types of risk warnings. In this dissertation, all warnings were framed within the context of an IS project requiring immediate corrective action. In other situations, such as strategic or ethical risks, direct action may be neither necessary nor appropriate. In such cases, an overly urgent tone could create the wrong impression or even trigger resistance. Future research could explore how musical elements, such as tempo, rhythm, dynamics, or pitch, might be tailored to specific types of risk in order to increase willingness to listen.

The Q-sort study showed that auditors are cautious about overly emotional vocal delivery. Highly expressive delivery styles were rejected, as auditors considered them unprofessional. At the same time, monotone or emotionless delivery was also dismissed for sounding flat and disinterested. This points to a tension: emotion needs to be present, but not excessive. A relevant question for future research is when vocal delivery is perceived as credible, and how auditors navigate the balance between self-expression and self-restraint.

A dimension not addressed in this dissertation is the long-term effectiveness of vocal delivery patterns. What is initially impactful may lose its power over time or even undermine the auditor's credibility. It is plausible that decision-makers become less responsive as vocal delivery becomes more predictable. Longitudinal field studies could provide insight into how sustained use of vocal patterns shapes the effectiveness of risk communication.

Finally, Chapter 6 showed that auditors are aware of the power of their vocal delivery in private situations, such as when communicating with their children, yet they appear to be more reserved in professional contexts. Future research could explore why a more emotional vocal delivery is often perceived as inappropriate or unprofessional within the audit profession. Qualitative interviews or focus groups could provide insight into the underlying beliefs or norms that shape this reluctance, helping to clarify why emotional expression is often avoided in professional audit settings.

7.5 EPILOGUE "ANY WAY THE WIND BLOWS"

With the closing words *"Any way the wind blows…"* and the final F major chord, *Bohemian Rhapsody* comes to an end, a moment of resolution and acceptance, free of lingering questions or unresolved tensions.

The insights from this dissertation offer practical tools to make risk warnings more effective. By consciously using elements of music in their risk warnings and deliberately evoking certain emotions, auditors can ensure that their message is not only *heard*, but also *felt*. This dissertation demonstrates that using musical elements in spoken audit communication is not merely a creative idea but a promising and evidence-based strategy to mitigate the deaf effect and enhance internal audit effectiveness.

At the heart of this work is also a call to rediscover *Shizaru*, the lesser-known fourth monkey. Shizaru represents *action,* a reminder that issuing a risk warning is not enough; it must lead to action. This proactive stance contrasts with the more familiar trio: *Mizaru, Kikazaru,* and *Iwazaru*, who choose not to see, not to hear, and not to speak. Auditors may find this deeply familiar: despite their best efforts to raise concerns, decision-makers in organizations may choose to look away, turn a deaf ear, or avoid discussion. Shizaru reminds us that it is the auditor's task to find new ways to be heard and to move others to act.

Like *Bohemian Rhapsody*, which is known for its unconventional structure and absence of a chorus, this dissertation breaks with tradition by drawing on music as a means to be heard. As the final chord fades, one thing remains clear: the foundation has been laid, the insights have emerged, and music has proven its value as a communication tool for auditors.

The final line of *Bohemian Rhapsody* reminds us that the direction of the wind cannot be controlled. For that reason, it is up to the auditor to make the message resonate as powerfully as possible, regardless of the way the wind blows.

Reflective Closing

Yet, unlike the final chord in *Bohemian Rhapsody*, the end of this dissertation does not bring complete resolution. If anything, more questions remain than answers. But perhaps that is precisely what makes this moment meaningful, not because everything is resolved, but because something new has been offered: a tool that allows auditors to shape not just what they say, but how they are heard. It is an invitation to move beyond simply presenting a message and hoping it lands, toward taking responsibility for the conversation that follows.

On a personal level, this journey allowed me to return to music, not as a performer on stage, but as a researcher finding new harmony between voice and professional dialogue. In 2011, I won the Best Male R&B Underground Music Award in New York, the first non-American to receive that recognition. At the time, I thought I had to close the book on music—not because I wanted to, but because I no longer believed it would take me further. Through this work, however, I was able to open it again and discover that you can move someone not only through melody, but also through meaningful communication. To touch someone not to correct them, but to reach them, that, I believe, is what both singers and auditors strive for.

Looking back on my PhD journey, I realize how special it is to combine the perspective of a performing artist with that of an auditor. As an artist, I was always searching for the right tone, emotion, and sound, whereas in my role as an auditor, I felt more inclined to rely on logic and evidence. At first glance, these worlds seem to have little in common, but I found that at their core, they share the same goal: to be heard. In this dissertation, I have therefore drawn from my experience as a musician to explore how auditors, too, can make themselves heard.

Bringing together music and auditing was not always easy. It meant translating something that I had always done instinctively, like singing or songwriting, into language and structure that would resonate in a rational, analytical world. There was uncertainty at times, especially around the recordings and their impact—it turns out speaking is sometimes more vulnerable than singing—but the process worked. And through it, I became more

aware of my own voice, and what it can evoke in others, not just as a tool to alert, but as a way to bring calm, restore trust, or start a conversation.

At a time when everything seems to move toward individualization and data-driven logic, toward n = 1[13], I found it meaningful to bring something back that points to n = 2, or more. Because ultimately, we change things together —not alone.

Thus, if there is one message that I will take with me, it is this:

Let yourself be heard.
Let people know you're there, not to speak at them, but to speak with them, to open the space for a shared conversation about what can, and cannot, be done better.

As for me, the setting may change, but the intent remains the same: to make the risk warning land. Whether in education, leadership, or audit practice, I hope to use what I've learned to help others speak up and be heard.

13 n = 1 refers to a world in which communication and decision-making are increasingly focused on the individual — one person, one perspective, one dataset.

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NEDERLANDSE SAMENVATTING

Dit proefschrift behandelt een veelvoorkomend probleem op het gebied van internal auditing: het deaf effect. Dit is het fenomeen waarbij besluitvormers de risicowaarschuwingen van auditors negeren of bagatelliseren. Hoewel deze waarschuwingen feitelijk juist zijn, vinden ze vaak geen weerklank. Dit komt niet alleen door de inhoud van de boodschap, maar ook door de manier waarop deze wordt overgebracht.

Dit proefschrift onderzoekt hoe elementen uit de muziek, zoals ritme, dynamiek, tempo en toonhoogte, strategisch kunnen worden toegepast om de impact van gesproken risicowaarschuwingen te vergroten. We hebben in dit proefschrift dus de focus verlegd van *wat* er wordt gezegd (de inhoud van de boodschap) naar *hoe* het wordt gezegd (stemvoering).

De centrale onderzoeksvraag luidt: *Kunnen internal auditors de effectiviteit van gesproken risicowaarschuwingen in IS-projecten verbeteren door elementen van muziek te gebruiken als communicatiestrategie om het deaf effect te verminderen?*

Biases die bijdragen aan het doveneffect
Hoofdstuk 2 vormt het empirische startpunt van dit proefschrift en onderzoekt welke cognitieve biases bijdragen aan het deaf effect. Op basis van een enquête onder 44 professionals die werkzaam zijn in internal auditing of projectmanagement, worden vijf dominante biases geïdentificeerd: status quo bias, het mum effect, autoriteitsbias, groupthink en het studentensyndroom. Deze biases vertonen een significante correlatie met de neiging om risicowaarschuwingen te negeren (d.w.z. het deaf effect).

Ze weerspiegelen de praktische obstakels die auditors vaak tegenkomen in hun professionele context: weerstand tegen verandering, vermijden van slecht nieuws, hiërarchische druk, groepsconformiteit en overmoed in het halen van deadlines. Het hoofdstuk concludeert dat dergelijke biases fungeren als een psychologisch filter die de ontvangst van risicowaarschuwingen blokkeert of vervormt. Daarmee zet dit hoofdstuk de toon voor de rest van het proefschrift: als cognitieve biases de ontvangst van een risicowaarschuwing verstoren, kan vocale expressie dan helpen om dat patroon te doorbreken?

Elementen van muziek in stemvoering
Hoofdstuk 3 onderzoekt de elementen van muziek in het stemgebruik aan de hand van een critical literature review die drie onderzoeksdomeinen samenbrengt: interne auditing, escalatie van IS-projecten en muziekpsychologie. In dit hoofdstuk wordt specifiek beargumenteerd dat muziek—waarvan bekend is dat het emotie, cognitie en gedrag

beïnvloedt—een waardevol theoretisch kader biedt om te onderzoeken hoe gesproken auditcommunicatie kan worden verbeterd.

Dit hoofdstuk introduceert tevens elementen van muziek, zoals ritme (temporele afstand), dynamiek (variatie in volume), tempo (snelheid) en toonhoogte (frequentie). Ook wordt in dit hoofdstuk de analyse van deze elementen besproken. Deze analyse geeft inzicht in hoe de elementen van muziek emoties en gedachten van luisteraars beïnvloeden. Deze inzichten vormen de conceptuele basis voor de experimentele hoofdstukken die volgen.

De rol van ritme en dynamiek in auditieve communicatie
Hoofdstuk 4 gaat dieper in op een 2x2 factorial experiment. Dit experiment is uitgevoerd onder 122 professionals om te onderzoeken hoe variaties in ritme en dynamiek de ontvangst van een gesproken risicowaarschuwing beïnvloeden. Respondenten luisterden naar één van de vier opgenomen versies van dezelfde risicowaarschuwing, waarbij het ritme en de dynamiek werden gemanipuleerd.

De resultaten tonen aan dat dynamiek (variatie in volume) de aandacht voor de risicowaarschuwing significant verhoogt, verveling vermindert en de waargenomen relevantie doet stijgen. Ritme heeft ook een positief effect op de aandacht, maar roept daarnaast (hoewel niet significant) een gevoel van hoop op. Deze hoop blijkt echter de waargenomen urgentie van de waarschuwing te verminderen, en daarmee ook de bereidheid van de respondenten om de koers van het project te wijzigen. Deze bevindingen suggereren dat niet alleen de inhoud, maar ook de manier waarop een risicowaarschuwing wordt gegeven, van invloed is op hoe de boodschap cognitief en emotioneel wordt verwerkt.

De invloed van de emotionele toon op risicoperceptie en actiebereidheid
Hoofdstuk 5 bouwt voort op de bevindingen uit hoofdstuk 4 door expliciet de emotionele toon van de stem te onderzoeken in de context van gesproken risicowaarschuwingen. In een experiment zijn 168 professionals blootgesteld aan één van twee versies van dezelfde risicowaarschuwing: één op een hoopvolle toon, de andere op een angstige toon.

Het blijkt dat de angstige versie wordt geassocieerd met een hoger waargenomen risico en een sterker gevoel van urgentie, terwijl de hoopvolle versie als relevant wordt ervaren maar het risico lager wordt ingeschat.

Deze bevindingen suggereren dat angst het risicobewustzijn kan verhogen en besluitvormers kan aanzetten tot actie. Dit hoofdstuk versterkt daarom het centrale argument van het proefschrift: de strategische toepassing van toon in de stem kan bijdragen aan effectievere communicatie van gesproken risicowaarschuwingen.

Auditors over stemvoering in risicocommunicatie
In de voorgaande hoofdstukken is onderzocht hoe ontvangers van risicowaarschuwingen reageren op het gebruik van muziekelementen in de gesproken communicatie. Hoofdstuk 6 gebruikt Q-methodologie om te onderzoeken hoe ervaren internal auditors en chief audit executives zelf het gebruik van muziekelementen in hun eigen vocale expressie beoordelen.

Uit de Q-studie komen twee verschillende standpunten naar voren. De eerste groep, aangeduid als *Calm Conviction*, hecht waarde aan kalmte, geloofwaardigheid en onafhankelijkheid. De tweede groep, *Urgent Appeal*, legt meer nadruk op urgentie en alertheid. Ondanks hun verschillende voorkeuren zijn beide groepen het erover eens dat een monotone of angstige stem contraproductief is bij het communiceren van auditboodschappen.

Conclusie
In het afsluitende hoofdstuk worden de bevindingen uit de enquête, de experimenten en de Q-studie samengebracht om een nieuw perspectief op auditcommunicatie te formuleren. In plaats van een risicowaarschuwing te zien als een neutrale overdracht van feitelijke informatie, stellen we dat het gezien moet worden als een vorm van actie. Door middel van toonhoogte, ritme, tempo en dynamiek bepaalt de stem de manier waarop risicowaarschuwingen worden geïnterpreteerd en ontvangen.

Het belangrijkste inzicht is dat de effectiviteit van de auditor niet alleen afhangt van *wat* er wordt gezegd (de inhoud van de boodschap), maar ook van *hoe het* wordt gezegd (stemvoering). In een context waarin risicowaarschuwingen gemakkelijk van tafel worden geveegd, wordt de stem van de auditor een instrument, niet alleen in metaforische zin, maar ook in praktische zin.

"To be truly heard, auditors must combine both science and art – because otherwise, nothing really matters."

Om écht gehoord te worden, moeten auditors wetenschap en kunst weten te verenigen – want anders doet niets er écht toe.

ENGLISH SUMMARY

This dissertation addresses a common issue in the field of internal auditing: the deaf effect, the phenomenon in which decision-makers ignore or downplay risk warnings from auditors. Although these warnings are factually accurate, they often fail to resonate. The core of the problem may not lie solely in the content of the message, but rather in the way it is delivered.

This dissertation explores how elements from music, such as rhythm, dynamics, tempo and pitch, can be strategically applied to enhance the impact of spoken risk warnings. Thus, we have shifted the focus from *what* is said (the content of the message) to *how* it is said (vocal delivery).

The central research question is:
How can internal auditors improve the effectiveness of spoken risk warnings in IS projects by using elements of music as a communication strategy to mitigate the deaf effect?

Biases contributing to the deaf effect
Chapter 2 forms the empirical starting point of this dissertation and examines which cognitive biases relate to risk warnings being ignored. Based on a survey of 44 professionals working in internal auditing or project management, five dominant biases are identified: status quo bias, the mum effect, authority bias, groupthink, and the student syndrome. These biases show a significant correlation with the tendency to ignore risk warnings (i.e., the deaf effect).

They reflect the practical obstacles auditors often encounter in their professional context: resistance to change, avoidance of bad news, hierarchical pressure, group conformity, and overconfidence in meeting deadlines. The chapter concludes that such biases act as a psychological filter that blocks or distorts the reception of risk warnings. In doing so, this chapter sets the tone for the rest of the dissertation: if cognitive biases interfere with the reception of a risk warning, can vocal delivery help break through that pattern?

Elements of music in vocal delivery
Chapter 3 explores this question through a critical literature review that brings together three research domains: internal auditing, IS project escalation, and music psychology. It specifically argues that music—long known to influence emotion, cognition and behavior—provides a valuable theoretical framework for examining how spoken audit communication can be improved.

This chapter introduces elements of music, such as rhythm (temporal spacing), dynamics (variation in volume), tempo (speed) and pitch (frequency), and analyzes how these

elements may influence the listener's perception. These insights provide the conceptual foundation for the experimental chapters that follow.

The role of rhythm and dynamics in audit communication
In Chapter 4, a 2x2 factorial experiment was conducted among 122 professionals to examine how variations in rhythm and dynamics affect the reception of a spoken risk warning. Respondents listened to one of four recorded versions of the same risk warning, in which the rhythm and dynamics were manipulated.

The results demonstrated that dynamics (variation in volume) significantly increased attention to the risk warning, reduced boredom, and increased perceived relevance. Rhythm also had a positive effect on attention, but additionally (though not significantly) evoked a sense of hope. However, this hope appeared to reduce the perceived urgency of the warning, and with it, the respondents' willingness to change the course of the project. These findings suggest that not only the content, but also the manner in which a risk warning is delivered, influences how the message is cognitively and emotionally processed.

The influence of emotional tone on risk perception and willingness to act
Chapter 5 builds on the findings from Chapter 4 by explicitly investigating the emotional tone of vocal delivery in the context of spoken risk warnings. In an experiment, 168 professionals were exposed to one of two versions of the same risk warning: one in a hopeful tone, the other in a fearful tone.

The fearful version was associated with a higher perceived risk and a stronger sense of urgency, whereas the hopeful version was perceived as relevant but had a lower perceived risk.

These findings suggest that fear can heighten risk awareness and prompt decision-makers to take action. This chapter therefore reinforces the central argument of the dissertation: the strategic application of tone in the vocal delivery may contribute to more effective communication of spoken risk warnings.

Audit professionals on vocal delivery in risk communication
The previous chapters examined how recipients of risk warnings respond to the use of elements of music in vocal delivery. Chapter 6 uses Q-methodology to explore how experienced internal auditors and chief audit executives themselves evaluate the use of elements of music in their own vocal expression.

The Q-study reveals two distinct viewpoints. The first group, referred to as *Calm Conviction*, values calmness, credibility and independence. The second group, *Urgent Appeal*, places more emphasis on urgency and alertness. Despite their differing preferences, both groups agree that a monotone or fearful vocal delivery is counterproductive when communicating audit messages.

Conclusion

In the concluding chapter, the findings from the survey, the experiments, and the Q-study are brought together to formulate a new perspective on audit communication. Rather than viewing a risk warning as a neutral transmission of factual information, we argue that it should be seen as a form of action. Vocal delivery, through pitch, rhythm, tempo, and dynamics, shapes the way risk warnings are interpreted and received.

The most important insight is that the auditor's effectiveness depends not only on *what* is said (the content of the message), but also on *how it* is said (vocal delivery). In a context where risk warnings are easily dismissed, the auditor's voice becomes an instrument, not only in a metaphorical sense, but also in a practical one.

"To be truly heard, auditors must combine both science and art – because otherwise, nothing really matters."

ABOUT THE AUTHOR

Leon Yap was born on August 22, 1978 in Dordrecht. He obtained his bachelor's degree in industrial engineering and management at the Hogeschool Rotterdam (HR&O) in 1999. He continued his academic journey at Erasmus University Rotterdam, where he earned a master's degree in business administration, specializing in Accounting & Controlling, in 2007. In 2019, he completed the post-master Executive Master of Internal Auditing & Advisory at the Erasmus School of Economics, with a thesis on auditing the creative climate within organizations. In 2020, he officially started his PhD research at Open Universiteit Heerlen, after participating in an academic incubator program.

Leon gained broad professional experience in both the public and private sector, working for various large organizations in the Netherlands. He held positions in internal auditing, risk management, consultancy, and project leadership, including roles as risk manager and project manager. He is currently serving as managing director of E-bridges, an independent research institute affiliated with Erasmus University Rotterdam.

In parallel with his professional and academic career, Leon ran his own vocal coaching studio ("Vocology"), where he trained singers in vocal technique and performance. He also pursued additional music education, including courses in songwriting, electronic music production, vocal production, and mixing at Berklee College of Music. He completed the Complete Vocal Technique (CVT) teacher training in Copenhagen and remains musically active.

Leon officially started his PhD research in 2020 under the supervision of Prof. Dr. A. Nuijten (promotor), Dr. N. Benschop (co-supervisor), and Prof. Dr. H. Commandeur (promotor). His dissertation focuses on the role of vocal delivery and musical elements in internal audit communication, with particular attention to the deaf effect and audit effectiveness. Since 2018, he has presented his research at several academic conferences across Europe, including the European Internal Audit and Corporate Governance Conference (EIACG).

He lives in Rotterdam with his partner and child. In his free time, he enjoys playing the piano and remains closely connected to the world of music and performance.

PORTFOLIO

Education
PhD in Internal Auditing *(expected November 2025)*
Open Universiteit, Faculteit Bètawetenschappen (Heerlen)
Promotor: Prof. Dr. A.L.P. Nuijten, Prof. Dr. H.R. Commandeur,
Co-promotors: Dr. N. Benschop

Executive Master of Internal Auditing (EMIA) (*2019*)
Erasmus University Rotterdam

MSc in Business Administration (*2007*)
Erasmus University Rotterdam

BASc in Industrial Engineering & Management (*1999*)
Rotterdam University of Applied Sciences (formerly Hogeschool Rotterdam)

PhD. Studies, Workshops and Courses
Research Incubator eBridges (2018 – 2020)

PhD writing (April – May 2020)

Presenting with impact (January – February 2021)

Q Methodology Workshop Glasgow Caledonian University (May 2024)

Music and Voice Education
Berklee College of Music: Art of Mixing, Composing and Producing Electronic Music, Songwriting, Vocal Production (2015 – 2016)

Complete Vocal Technique Teacher Training – 3-year program, CVI Copenhagen (2010 – 2012)

Complete Vocal Technique (CVT) – 1-year singer course, Utrecht (2009)

Publications

Articles under review:

Yap, L., Benschop, N., Nuijten, A., Keil, M., & Commandeur, H. (2025). *Reducing the Deaf Effect for Risk Warnings on Failing Information Systems Projects: A Music Theory Perspective*. Under review.

Articles in progress:

Yap, L., Benschop, N., Nuijten, A., & Commandeur, H. (2025). *"Nothing Really Matters to Me": Exploring the Role of Vocal Delivery in Risk Warnings.*
Recipient of the Best Paper Award, 21st European Academic Conference on Internal Audit and Corporate Governance (University of Catania), 2025.

Yap, L., Benschop, N., Nuijten, A., Keil, M., & Commandeur, H. (2025). *Auditors' Resonance: Tuning into Hope or Fear in Risk Warnings*.

Conference paper presented at:

"Nothing Really Matters to Me": Exploring the Role of Vocal Delivery in Risk Warnings
21st European Academic Conference on Internal Audit and Corporate Governance in Sicily (University of Catania), 2025.
Recipient of the Best Paper Award.

Auditors' Resonance: Tuning into Hope or Fear in Risk Warnings
20th European Academic Conference on Internal Audit and Corporate Governance in Athens (University of Thessaly), 2024.

Biased Harmonies: When Cognitive Biases Amplify the Deaf Effect in Internal Audit
18th European Academic Conference on Internal Audit and Corporate Governance in Athens (by Cass Business School), April 10, 2024 – April 12, 2024. Also presented at the RO Masterclass – IIA Netherlands, June 2024.

Reducing the Deaf Effect for Risk Warnings: A Music Theory Perspective
17th European Academic Conference on Internal Audit and Corporate Governance in Paris (University of Sorbonne), 2019.

Critical Literature Review: Enhancing Internal Audit Communication Through Music
16th European Academic Conference on Internal Audit and Corporate Governance in Naples (Parthenope University), 2018.

Related Research and Academic Activities

Program Manager, eBridges Research Incubator – Erasmus University Rotterdam (2018–2020)
Responsible for guiding research initiatives in the domain of internal auditing and risk communication.

Executive Director, eBridges – Erasmus University Rotterdam (since 2020)
Developing and managing the interdisciplinary research portfolio focused on audit communication, behavioral risk, and innovation in assurance.

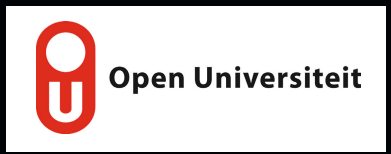
Member, Review Board ISACA Netherlands Chapter
Reviewer for the ISACA Journal and contributor to the academic–professional knowledge bridge.

Organizing Committee Member, European Academic Conference on Internal Audit and Corporate Governance (EIACG)
Responsible for program design, peer selection, and academic–professional integration.

Thesis Supervisor
Executive Master of Internal Auditing, Erasmus School of Economics
Supervising graduate theses focused on behavioral auditing and audit effectiveness.

Interviewee, Audit Magazine (IIA Netherlands)

Speaker, ISACA Netherlands
Online session on cognitive bias, risk communication, and voice in audit.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