Investigating the ASMR Afterglow: Post-Exposure Emotional and Physiological Responses

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Abstract

Autonomous Sensory Meridian Response (ASMR) is a sensory experience in which specific auditory or audiovisual triggers, such as whispering, tapping, or gentle, repetitive sounds, elicit a tingling sensation along the scalp and spine, often accompanied by feelings of relaxation and pleasure. ASMR has been linked to increased relaxation and reduced physiological activation during exposure. To date, limited research has investigated the short-term persistence of ASMR-related emotional and perceived physiological responses following exposure. Understanding these post-exposure effects may provide a preliminary foundation for future marketing and consumer research. This study addresses this by investigating whether ASMR produces measurable post-exposure changes in self-reported emotional and physiological responses over short time intervals. Understanding how long ASMR effects last is a necessary first step before considering whether it could meaningfully influence consumer experiences. Using a one-condition within-subject, repeated-measures experimental design, 25 participants listened to a five-minute ASMR audio clip in a controlled university classroom at Auckland University of Technology. Self-reported emotional and physiological responses were assessed at 1, 5, and 10 minutes post-exposure using an adapted version of the Pleasure-Arousal-Dominance (PAD) scale and an adapted version of the Relaxation State Questionnaire (RSQ) items. Repeated-measures ANOVA and ANCOVA were conducted to examine temporal changes in ASMR across individual responses, whilst also accounting for potential influences of stress, caffeine intake, and sleep, as these factors are known to affect emotional and physiological states. Findings indicated that pleasure peaked immediately after exposure and declined slightly over time, while arousal and all self-reported physiological measures except sleep, which showed a modest increase, remained stable. This suggests that ASMR produces a brief emotional shift rather than sustained self-reported physiological change. The study contributes to knowledge by extending ASMR research beyond in-stimulus effects and conceptually positions ASMR within the Stimulus-Organism-Response framework, highlighting its relevance to consumer affective processes. From a managerial and consumer perspective, the findings indicate that ASMR may serve as a short-term mood-regulating stimulus, suggesting

that low-arousal sensory cues like ASMR could influence how consumers feel in retail environments.

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Attestation of Authorship

I hereby declare that this dissertation is my own work and has not been previously submitted for assessment or for the award of any degree or diploma at this or any other tertiary institution. To the best of my knowledge and belief, this dissertation contains no material that has been published or written by another person, except where due acknowledgment has been made in the text. I confirm that all sources of information have been appropriately acknowledged and referenced. I also declare that any assistance received in the preparation of this dissertation has been disclosed in accordance with university guidelines.

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Chapter 1: Introduction

1.1 Background and context

Social media platforms like YouTube and TikTok increasingly feature content designed to calm and soothe viewers rather than inform or entertain. Among this content is Autonomous Sensory Meridian Response (ASMR), a sensory phenomenon characterised by tingling sensations, relaxation, and affective shifts triggered by specific auditory and audiovisual cues (Barratt et al., 2015; Roberts et al., 2019). Common triggers include whispering, tapping, soft-speaking, and repetitive sounds, which are reported to induce feelings of calmness, comfort, and reduced stress (Barratt et al., 2017; Poerio et al., 2018).

Initially popularised within online communities, ASMR has evolved beyond independent content creation and into mainstream commercial practice. Brands have begun incorporating ASMR-inspired elements like whispering and tapping on products in their advertising and have seen an overall increase in brand recall from customers (De Kerpel et al., 2023; Gotsch & Gasser, 2024). Rather than representing a new direction in marketing, this development reflects the continued use of sensory and atmospheric cues to shape consumers' states (Bitner, 1992; Kotler, 1974; Krishna, 2011). In this context, ASMR can be understood as a specific form of auditory stimulus applied within established sensory marketing principles.

Retail spaces, both physical or digital, are intentionally designed to influence consumers' emotions and affect how they shop (Bitner, 1992; Krishna, 2011). Emotional states significantly guide attention, impact how information is processed, and shape behavioural tendencies (Caruelle et al., 2023; Mehrabian & Russell, 1974). In this context, understanding how emerging sensory phenomena such as ASMR influence emotional and perceived physiological states has become increasingly important both theoretically and practically. ASMR has consistently been associated with low-arousal positive affect, relaxation, and parasympathetic activation during exposure (Barratt & Davis, 2015; Engelbregt et al., 2022; Poerio et al., 2018). Because these organism-level

responses may not dissipate immediately following stimulus removal, ASMR may produce a temporary residual affective state that persists briefly into the post-exposure period before gradually returning toward baseline. Understanding the temporal course of these post-exposure states is important in consumer-relevant contexts, where emotional states can influence how individuals process and respond to environmental cues (Krishna, 2011; Mehrabian & Russell, 1974).

1.2 Problem Identification

Empirical research demonstrates that ASMR exposure is associated with increased pleasure, reduced subjective stress, and measurable physiological changes, such as decreased heart rate and shifts in parasympathetic activation, during active listening (Barratt & Davis, 2015; Kim et al., 2024; Seifzadeh et al., 2023). These findings establish ASMR as a stimulus that can elicit measurable emotional and physiological responses.

However, most research measures responses during active listening, with a focus on in-session effects rather than on what occurs after the stimulus ends (Swart et al., 2022). This distinction is theoretically important because if ASMR-induced changes dissipate immediately upon stimulus removal, their functional relevance is confined to the listening period. In contrast, if the relaxing effects of ASMR persist beyond the listening period, the resulting positive affect may influence emotional states. This is particularly relevant in consumer settings, where emotional states are known to shape attention, evaluation, and overall experience within retail environments.

Within consumer environments, emotional states mediate the relationship between environmental stimuli and behavioural responses, as conceptualised by the stimulus-organism-response (S-O-R) framework (Mehrabian & Russell, 1974). Even short-lived exposure to affective states may influence attentional focus, comfort, and responsiveness to environmental cues (Bitner, 1992; Krishna, 2011). Therefore, examining whether ASMR effects extend beyond active listening is necessary to

determine its broader applied relevance. Examining the temporal pattern of these responses also extends the application of the S-O-R framework, which often assumes that environmental stimuli generate emotional states that influence downstream behaviour, but less frequently considers how long such states persist once the stimulus is removed. If the relaxing effects of ASMR persist beyond the listening period, the resulting positive affect may shape how consumers engage with retail environments and process commercial stimuli. The present research begins by examining the first component of this broader question, investigating whether ASMR-induced emotional and physiological responses persist across defined post-exposure time points.

1.3 Research Gap

Although ASMR has been examined extensively within psychological and neuroscientific contexts, it has primarily been studied in therapeutic, laboratory, or self-selected online contexts (Barratt & Davis, 2015; Swart et al., 2022). These settings focus on relaxation, well-being, or individual sensory experiences, rather than consumer-oriented environments. To date, limited research has examined the short-term post-exposure course of ASMR-induced emotional and perceived physiological responses within consumer-relevant contexts.

In addition to this contextual gap, there are methodological limitations within existing research. Most studies measure emotional and physiological responses during active exposure, with relatively little attention given to what occurs after the stimulus ends (Swart et al., 2022). Although some findings suggest that mood improvements may decline following exposure (Barratt & Davis, 2015), structured measurement across defined post-exposure intervals remains limited. Addressing these gaps requires investigating whether ASMR produces measurable emotional and relaxation-related responses, and whether such responses persist across defined post-listening time points.

1.4 Research Aim and Question

Drawing on the stimulus-organism-response (S-O-R) framework (Mehrabian & Russell, 1974), this study conceptualises ASMR audio as the stimulus (S), emotional and relaxation-related states as the organism level response (O), and potential behavioural outcomes as the response (R). While behavioural outcomes are not directly measured in the present study, establishing whether organism-level responses (i.e., individual responses) persist beyond exposure represents a necessary preliminary step before downstream behavioural implications can be examined. As this is an honours project and considering the limited time available to conduct research, the primary research question guiding this study is therefore:

> *To what extent do measurable self-reported emotional and physiological responses persist across post-exposure time points following ASMR exposure?*

1.5 Overview of Methodology

To address this research question, a one-condition within-subject repeated-measures experimental design was employed. Adult participants were recruited through convenience sampling and completed the study in a controlled experimental setting. Participants were exposed to a five-minute ASMR audio stimulus and completed measures at three post-listening intervals (1 minute, 5 minutes, and 10 minutes). This design allows for the examination of within-individual changes over time while reducing variability associated with baseline differences (Landers & Behrend, 2015). Emotional responses were operationalised using the Pleasure-Arousal-Dominance (PAD) framework by Mehrabian & Russell (1974), with a focus on the pleasure and arousal dimensions. Self-reported physiological perceptions were assessed using items from the relaxation-state questionnaire by Steghaus and Poth (2022), including self-reported muscle tension, breathing rate, heart rate and sleepiness. By measuring responses at structured post-exposure intervals, the study examines whether ASMR-related states decline immediately, remain stable, or change gradually over time.

1.6 Contribution

This study provides one of the first experimental examinations of the short-term persistence of ASMR-induced affective states. First, it advances ASMR research (Barratt & Davis, 2015; Engelbregt et al., 2022; Poerio et al., 2018; Swart et al., 2022; Tan et al., 2022) by systematically exploring the short-term persistence of emotional and relaxation-related responses after stimulus removal. Whereas much of the existing research on ASMR duration has focused on clinical or therapeutic outcomes, such as mood enhancement or pain relief, limited attention has been given to the persistence of ASMR-induced states. Instead of only examining in-session effects (Engelbregt et al., 2022; Poerio et al., 2018; Swart et al., 2022), it describes the temporal dynamics of post-exposure states. Second, the study contributes to consumer behaviour literature by applying the S-O-R framework by Mehrabian and Russell (1974) to ASMR within a consumer context. Conceptualising ASMR as an environmental stimulus capable of influencing internal emotional and physiological states in consumer settings. In doing so, the study explores whether ASMR primarily functions as a low-arousal mood-regulation cue rather than as a stimulus that elicits sustained activation or heightened arousal in consumer contexts. Third, the use of structured post-exposure measurement intervals provides methodological insight into how short-term affective changes can be experimentally assessed over time. Finally, by examining organism-level emotional and relaxation-related responses within a retail-relevant experimental context, the study provides preliminary evidence regarding whether ASMR-induced states persist long enough to plausibly influence subsequent engagement with consumer environments. This distinction has practical implications for retailers considering the use of low-arousal auditory cues, as the effectiveness of such stimuli may depend on whether calm engagement or heightened stimulation is desired.

1.7 Structure of The Dissertation

This dissertation is structured into five chapters. Chapter 1 sets the research context, outlines the theoretical motivation, identifies the research gap, and states the

study's aims and guiding questions. Chapter 2 reviews interdisciplinary literature on sensory marketing, the stimulus-organism-response (S-O-R) framework, and ASMR. It presents ASMR as an auditory stimulus within consumer environments and highlights the theoretical and empirical gaps that shape the study's hypotheses. Chapter 3 details the methodological approach, including research design, sampling strategy, measurement tools, and data analysis plan used to explore the experimental findings. Chapter 4 reports the results of the repeated-measures analyses, showing changes across post-listening time points and the impact of relevant covariates. Chapter 5 interprets the findings in relation to existing literature, discusses theoretical and practical implications, acknowledges limitations, and suggests avenues for future research.

Chapter 2: Literature Review

Retail environments are crafted to influence how consumers feel, think, and behave (Bitner, 1992; Krishna, 2011). While many sensory cues aim to excite and generate urgency, emerging research on autonomous sensory meridian response (ASMR) suggests that low-arousal, relaxation-inducing stimuli can also significantly affect individuals' internal states. Although ASMR has mainly been explored within psychological and therapeutic fields (Barratt & Davis, 2015; Swart et al., 2022). Its ability to produce measurable emotional and physiological changes raises important questions about whether these calming effects could influence consumers' emotional responses, attentional focus, and responsiveness to environmental cues within retail environments. Because ASMR has been associated with parasympathetic activation (Hozaki et al., 2025; Kim et al., 2024), focused attentional absorption (McErlean & Osborne-Ford, 2020; Swart et al., 2022), and low-arousal positive affect (Barratt & Davis, 2015; Engelbregt et al., 2022), the associated organism-level responses may not dissipate immediately following exposure and may instead persist briefly into the post-exposure period before gradually returning toward baseline.

The chapter begins by examining how emotional states are shaped in retail settings and introduces the stimulus-organism-response (S-O-R) framework by Mehrabian and Russell (1974) as a foundation for understanding how environmental cues trigger internal responses. It then reviews research on auditory atmospherics and positions ASMR as a distinctive auditory stimulus within this framework. The discussion that follows explores the psychological and physiological mechanisms behind ASMR and assesses evidence on the duration and persistence of its effects. By combining insights from psychology and marketing, the review identifies a gap in understanding the post-exposure course of ASMR-induced states in consumer contexts, laying the groundwork for the current study.

2.1 Sensory Marketing, Retail Environments, and S-O-R Theory

Consumers do not engage with retail environments purely rationally (Kotler, 1974); rather, their experiences are shaped by affective and physiological states that influence attention, comfort, and information processing. Retail environments can be deliberately designed to evoke affective responses through lighting, layout, scent, sound, and spatial design (Kotler, 1974). These atmospheric cues, shape consumers' evaluations, time spent in-store, and approach-avoidance behaviour (Bitner, 1992; Kotler, 1974; Krishna, 2011). Emotional states influence not only how consumers feel within the environment, but also how they process information, allocate attention, and form judgements (Mehrabian & Russell, 1974). Understanding the emotional mechanisms underlying consumer experiences is central to sensory marketing research.

Relaxation signifies a low-arousal emotional state associated with lower stress levels and enhanced emotional regulation, which has been shown to influence decision-making (McManus et al., 2024). From a consumer perspective, relaxed states may promote more comfortable and enjoyable shopping by decreasing cognitive load (Kence et al., 2022) and reducing feelings of pressure or overwhelm commonly reported in retail environments (Doucé & Adams, 2020). Previous research suggests that the emotional and physiological states consumers experience during shopping influence how they process marketing stimuli (Bitner, 1992). For example, low-arousal states may decrease cognitive effort (Kence et al., 2022) and boost receptiveness to ambient cues in retail spaces, which has been connected to behaviours like impulse buying (Rodrigues et al., 2021).

The stimulus-organism-response (S-O-R) framework (Mehrabian & Russell, 1974) provides a useful model for understanding how environmental stimuli influence internal emotional states and behavioural tendencies. Within this framework, the stimulus (S) refers to the environmental inputs, the organism (O) represents the individual's emotional and physiological responses, and the response (R) reflects behavioural outcomes, such as approach or avoidance. The S-O-R framework has been widely applied in retail and environmental psychology research to explain how

atmospheric cues can influence consumer behaviour indirectly through internal emotional states (Bitner, 1992; Donovan, 1994; Vieira, 2012). Rather than assuming that environmental stimuli directly produce behavioural outcomes, the model emphasises the mediating role of organism-level responses, particularly affective dimensions such as pleasure and arousal.

Among the various atmospheric stimuli that influence organism-level responses, auditory cues have attracted particular interest in retail research. Sound is a versatile and often adjustable element of the servicescape, making it a key starting point for understanding how sensory inputs affect emotional states.

2.2 Auditory Cues In Retail Environments

Within retail environments, sound represents one of the most frequently manipulated atmospheric cues. Research examining the role of audio cues in consumer environments shows that sound can influence emotional experiences and behavioural outcomes. However, the evidence is often context-dependent and inconsistent. Milliman (1982) provided early experimental evidence that slower-tempo music reduces shoppers' pace, thereby increasing spending. This paper established tempo as a key atmospheric variable. Nonetheless, this relationship is not universally replicable. A study by Soh et al. (2017) found that slow-tempo music increased customer stay in restaurants and supermarkets, but not in bookstores or apparel stores. Later studies (Esfidani et al., 2022) reaffirmed Milliman's (1982) findings that low tempo and volume increase both time and money spent in stores. These mixed findings suggest that the effects of auditory cues may depend heavily on contextual and methodological factors.

However, these replications have been conducted in similar retail contexts, which limits the generalisability of the results to online or hybrid shopping settings. Much of the foundational evidence was conducted decades ago (Milliman et al. 1989), raising questions about its applicability to contemporary retail environments. Tempo is generally understood to influence arousal levels and consumer impatience during decision-making, yet these findings assume a uniform emotional response to tempo,

overlooking moderating factors such as cultural background or shopping motivations. Perceptions of tempo may also vary, with faster music interpreted as either energising or stressful depending on the consumer and context.

In the study by Esfidani et al. (2022), participants were unaware of the songs used, which aligns with Yalch and Spangenberg's (2000) investigation of how music familiarity influences shoppers' perceptions in retail environments. They found that when music was unfamiliar, shoppers believed they had spent more time in the store. Additionally, arousal levels were significantly affected by the environmental music conditions. However, these studies were conducted in relatively controlled settings, which may not fully capture the complexity of real-world environments. The use of unfamiliar music raises questions about ecological validity, as consumers are often exposed to familiar commercial playlists in stores. This suggests that while tempo and familiarity are both influential, their interaction remains underexplored, particularly in contexts where brand identity and consumer mood are mediated by music choice.

An often-overlooked aspect in atmospherics research is the growing use of personal media consumption in retail environments, as consumers wear Bluetooth headphones and use personal devices while shopping (McCormick, 2010), allowing them to create their own auditory environment separate from the in-store soundscape. This shift introduces a less-examined layer of consumer-controlled auditory influence, in which individuals may actively regulate their emotional state through self-selected audio content (Schurig, 2024). In this context, ASMR is particularly relevant, as it offers a portable and intentional means of inducing relaxation. Rather than depending solely on retailer-controlled atmospheric cues, shoppers can independently access ASMR audio to regulate their arousal levels during retail encounters. This development broadens the conversation about sound in retail from ambient environmental manipulation to individual sensory regulation.

The main challenge in many empirical articles is the highly controlled environments in which the studies are conducted. Biswas et al. (2019) employed a combination of laboratory testing and field studies, whereas Esfidani et al. (2022)

primarily relied on field settings with limited controls. This makes it challenging to isolate sound effects from other environmental noise or crowd noise, a challenge highlighted by Hynes and Manson (2015), who show that ambient soundscapes are far more complex than most methodologies acknowledge. Damen et al. (2021) attempt to bridge this gap by using an online approach in their methodology, but by omitting the no-music control group, the results are difficult to compare with studies that include a baseline condition.

Across these studies, there was also a lack of consistent variables such as volume, tempo, and emotional response. Biswas et al. (2019) used objective dB levels and physiological heart-rate measures; Esfidani et al. (2022) report volume only as "higher/lower than average," and Damen et al. (2021) do not report volume levels at all. This inconsistency makes it difficult to compare effect sizes or replicate the findings. Because sensory effects are highly context-dependent, inconsistent findings may reflect the environment rather than the sensory intervention itself.

Although research on music and atmospherics shows that sound influences arousal and consumer behaviour, these studies mainly focus on ambient background effects rather than specific sound-based stimuli designed to trigger emotional or physiological responses. ASMR provides a unique perspective on how more personalised auditory stimuli may promote relaxation. Unlike ambient cues controlled by retailers, ASMR is usually self-selected and accessed through personal devices, offering a more concentrated sensory experience. Understanding whether ASMR causes sustained relaxation offers insights into how micro-sensory stimuli, defined here as small, discrete sensory cues like whispering or tapping sounds, may affect emotional states that lead to consumer decisions.

Accordingly, the present study examines the preliminary question of whether ASMR reliably induces relaxation in a retail-relevant context and whether such effects persist beyond immediate exposure. Understanding whether this state can be elicited and sustained is a necessary first step before exploring its potential downstream effects on consumer decision-making, including impulse buying. By establishing the

effectiveness of ASMR in producing relaxation, this research addresses a key gap in sensory marketing literature and lays the groundwork for future studies examining consumer behaviour outcomes.

2.3 ASMR As an Auditory Stimulus (S)

ASMR is described as a self-reported, unusual sensory experience that occurs in response to exposure to specific auditory or audiovisual stimuli (Roberts et al., 2019). Commonly, people report a tingling sensation, often called the tingles, which is usually described as a pleasurable, intense, electric-like tingling that can be felt on the top and back of the head, down the spine (Roberts et al., 2019), and through the arms. For some, it can also be experienced throughout the entire body (Barratt et al., 2017; Fredborg et al., 2018). The tingling is often accompanied by feelings of comfort, relaxation, and calmness and is generally used as a relaxation aid to help people fall asleep more easily or reduce stress and anxiety (McErlean & Banissy, 2017). While the tingling sensation is commonly described as the central feature of ASMR in online and media discussions, empirical research has increasingly examined it as a broader emotional and physiological experience.

The response to an ASMR trigger is a person-to-person case. No single trigger has a positive relaxing effect on everyone (Barratt et al., 2017; McErlean & Banissy, 2017; Roberts et al., 2019). Adverse effects include a misophonia-like irritation or even discomfort rather than relaxation (Barratt et al., 2017; McErlean & Banissy, 2018). This suggests that ASMR is a highly subjective experience, making it difficult to define as a universal trigger. While tingles are a defining feature, many people report feeling relaxed without experiencing any physical “tingles”, suggesting that ASMR’s emotional effects might extend beyond the sensory experience itself (Barratt & Davis, 2015; Engelbregt et al., 2022; Poerio et al., 2018). In empirical research, ASMR is usually measured through a combination of self-report and physiological indicators. Self-reports capture tingling sensations, relaxation, calmness, and emotional comfort (Barratt et al., 2017; Poerio et al., 2018; Roberts et al., 2019). Even without the presence of physical tingles, affective responses have been shown to be valid markers of ASMR sensitivity (Biswas et al., 2019;

Poerio et al., 2018). Given this variability, researchers have sought to operationalise ASMR using both subjective and objective measures.

Physiologically, ASMR has been linked to decreases in heart rate, increases in heart rate variability, and neural signs related to parasympathetic nervous system activation (Kim et al., 2024; Seifzadeh et al., 2023). Collectively, these findings position ASMR as a measurable affective state rather than a subjective response. It is this dual perspective that guides this study's focus on relaxation as the main outcome of ASMR exposure. Understanding the sensory and emotional characteristics of ASMR is important in marketing contexts because emotional states influence how consumers process environmental cues and evaluate experiences. If ASMR reliably induces relaxation or positive affect, it may function as a controllable sensory input capable of shaping consumer responses.

A popular trigger often seen in visual audio ASMR content is interpersonal and close-proximity triggers. These triggers are often associated with role-play situations that mimic real-life ASMR experiences (Roberts et al., 2019). Whispers and soft speaking are included in this category and are triggers for 75% of participants in a study by Barratt & Davis (2015). It is not just visual cues that stimulate ASMR. Many studies have found that audio stimuli are central to the ASMR experience (Barratt & Davis, 2015; Seifzadeh et al., 2023; Tan et al., 2022). Popular audio triggers used by ASMR artists on YouTube include crisp sounds like metallic foil or tapping on metal, repetitive sounds such as finger tapping on objects, and scratching (Barratt & Davis, 2015; Fredborg et al., 2018). The participants in the studies preferred lower-pitched, naturalistic sounds (e.g., tapping, paper crinkling, or soft brushing) over digitally modified audio or layered background music. However, background music in ASMR videos tends to suppress tingles and is often avoided in ASMR (Barratt et al., 2017). Most of these findings rely on self-reported data, which raises concerns about bias, consistency and ecological validity, since the experience is difficult to replicate under controlled conditions. However, such variability does not diminish the relevance of ASMR as a research phenomenon. Rather, it underscores the need for controlled experimental designs that isolate specific stimulus characteristics and incorporate both emotional and

physiological measures. Given the increasing use of ASMR-inspired cues in advertising and branding content (Cohen et al., 2024; De Kerpel et al., 2023; Kence et al., 2022; Suci et al., 2023), alongside emerging evidence of measurable autonomic effects, which are observable changes in involuntary physiological processes (Kim et al., 2024; Seifzadeh et al., 2023), further systematic investigation is warranted.

Efforts to systematise these triggers have led to classifying ASMR sounds based on their structural acoustic properties. The specific ASMR sounds were categorised using sonic structures in a study by Tan et al. (2022). The four main structural categories include static, characterised by constant amplitude and frequency; staccato, which involves short, high-frequency bursts interspersed with silence; repetitive, defined by symmetrical patterns that repeat; and mixed, which includes static and staccato without a clear pattern. Recognising these structural features suggests that ASMR can be seen as a structured and controllable auditory stimulus rather than an undefined relaxation experience.

Establishing both structural and physiological characteristics is important because it positions ASMR as a distinct and testable stimulus category. Unlike traditional ambient music, which modulates arousal primarily through tempo or volume (Biswas et al., 2019; M. Sullivan, 2002), ASMR relies on targeted audio cues associated with parasympathetic activation (Hozaki et al., 2025). Clarifying these properties allows the present study to examine ASMR as a defined stimulus within a controlled experimental context.

The conceptualisation of ASMR as a controllable sensory stimulus has helped it become more popular in advertising. When focusing on ASMR in advertising, it becomes more evident that this niche phenomenon has been turned into a tool for brands because of its psychological benefits, such as inducing pleasure, relaxation, and well-being (Gotsch & Gasser, 2024). ASMR marketing uses soothing audio-visual stimuli like whispering and tactile sounds, which come from online communities on platforms like YouTube and TikTok (Zheng, 2025). Companies have reported positive results from using ASMR in advertising, such as IKEA, which noted an increase in sales

while its ASMR advertising campaign was live (De Kerpel et al., 2023). Campaigns that integrated ASMR also achieved higher brand recall compared to traditional visual-only advertisements. Despite these commercial adaptations of ASMR, academic research is still trying to determine the persistence of the effects and the direct, long-term impact on consumer behaviour

While ASMR involves audiovisual components, evidence suggests that auditory cues are far more effective at causing the tingles than visual cues. De Kerpel et al. (2023) found that auditory cues such as whispering and crisp sounds were significantly more effective at evoking physical tingles, whereas personal attention cues, which are common ASMR themes, had a negative effect. This challenges the marketing practice of combining all four popular triggers simultaneously (De Kerpel et al., 2023). Many studies use very short advertisements (6-45 seconds) to elicit a response, despite ASMR videos on YouTube lasting 20-40 minutes, making it difficult to draw conclusions about whether the effect was even triggered by the ASMR cues or whether there are any long-term behavioural changes. Much of the data also relies on self-reported psychological measures (Likert scales for purchase intentions and feelings of relaxation), which reflects a lack of physiological measures commonly experienced when consuming ASMR content (Kence et al., 2022). A lack of longitudinal studies means it is unknown if the positive effects of ASMR strengthen over time or diminish due to familiarisation or annoyance (Sands et al., 2022).

These studies reveal growing commercial interest in ASMR as a sensory marketing tool, yet empirical evidence remains scattered and methodologically limited (Cohen et al., 2024). Current research confirms short-term relaxation and engagement effects; however, little is known about the persistence of organism-level responses after stimulus removal or their integration within established emotional frameworks.

2.4 Psychological and Physiological Mechanisms of ASMR (O)

ASMR induces measurable physiological changes linked to relaxation and reduced arousal. A study by Seifzadeh et al. (2023) found that a single ASMR session significantly decreased heart rate compared to baseline, indicating relaxation. Kim et al. (2024) showed that high-frequency heart rate variability reflected enhanced parasympathetic activity, supporting a rest-and-digest state. Skin conductance measurements yielded mixed results: higher conductance indicates arousal, lower indicates calm, suggesting ASMR can be both relaxing and mildly stimulating. These findings challenge the view of ASMR as purely relaxing, hinting at a complex arousal-pleasure interplay. Additionally, ASMR appears to stimulate the frontal lobe, involved in attention and relaxation (Engelbregt et al., 2022; Kim et al., 2024). However, most research relies on short clips in labs, which limits understanding of the effects in naturalistic, long-form ASMR.

These studies often utilise small, self-selected samples of ASMR-sensitive individuals, which introduce bias and limit generalisability (Roberts et al., 2019). Survey participants were usually recruited through dedicated online communities, such as Reddit ASMR subforums or ASMR Facebook groups, which led to a homogeneous perception of the phenomenon. However, participants in these studies may not be representative of the general population, potentially skewing the reliability of ASMR research (McErlean & Banissy, 2017). Age and gender bias show a skew towards young adults (mean age of 25), reflecting the demographics of users from the recruitment platform rather than the entire ASMR-capable population (Barratt et al., 2017). Female participants were also more persistent in these studies, which limits the applicability of the findings to women (Kence et al., 2022). The way the experience is measured is also a limitation, as self-reported data were relied upon to assess sensations and are vulnerable to bias, with participants potentially overreporting or misinterpreting their sensations, especially given that they are recruited from ASMR-focused social media groups (Barratt et al., 2017). Introducing physiological measures such as heart rate, skin conductance, or EEG activity is useful but is often conducted with small sample sizes, resulting in findings that lack replication (Kence et al., 2022).

These findings suggest that ASMR helps people relax by focusing attention and calming the nervous system. The gentle, repetitive triggers of ASMR keep attention engaged without overwhelming the brain, helping shift the body from a stressed state to a relaxed one. Besides general relaxation, ASMR is often used as a sleep aid (Woods & Turner-Cobb, 2023), with many users reporting engaging with it before bedtime to help reduce arousal (Barratt & Davis, 2015; McErlean & Banissy, 2017). Sleepiness has been identified as a component of ASMR-related relaxation scales (Roberts et al., 2019), suggesting that decreased alertness may occur alongside the broader relaxation response. However, whether this sleep-related aspect lasts beyond exposure remains underexplored.

Beyond explaining effects, ASMR responses can be understood through mechanisms linked to autonomic regulation and attentional focus. Many ASMR triggers, such as soft whispering and repetitive tapping, are low-intensity, predictable stimuli that may decrease sympathetic activation and promote parasympathetic dominance (Hozaki et al., 2025; Kim et al., 2024), as reflected in lower heart rate and higher heart rate variability (Engelbregt et al., 2022; Kim et al., 2024; Seifzadeh et al., 2023). The repetitive and close-proximity nature of ASMR may encourage a focused, absorbed attentional state that reduces cognitive load and supports emotional regulation (Swart et al., 2022). These mechanisms together suggest that ASMR may evoke a low-arousal affective state that extends beyond the moment of listening, potentially leading to a short-lived “afterglow” before returning to baseline.

Emotional and autonomic states do not necessarily return to baseline immediately after a stimulus ceases. Because ASMR has been associated with parasympathetic activation, focused attention, and positive affect (Engelbregt et al., 2022; Kim et al., 2024; Swart et al., 2022), these regulatory processes may persist briefly beyond active listening. Barratt and Davis (2015) observed a gradual decline in mood following ASMR exposure rather than an abrupt cessation of emotion, suggesting that the emotional effects of ASMR may decrease progressively over time. Accordingly, ASMR may produce a temporary residual low-arousal affective state that persists into the immediate post-exposure period before gradually returning towards a baseline.

Examining this short-term post-listening period provides insight into the temporal course of organism-level responses following ASMR exposure.

In the present study, ASMR functions as the stimulus (S). Unlike the broad ambient music used in traditional retail atmospherics research (Esfidani et al., 2022; Milliman, 1982), ASMR consists of targeted audio cues such as whispering, tapping, and repetitive sounds. These cues have been shown to elicit measurable organism-level responses, including reduced heart rate, increased parasympathetic activation, and subjective calmness (Kim et al., 2024; Roberts et al., 2019; Seifzadeh et al., 2023). Within the S-O-R framework, these emotional shifts and perceived physiological changes represent the organism (O) and are operationalised using the PAD dimensions of pleasure and arousal alongside relaxation-related indicators from the RSQ.

2.5 Duration and Residual Effects of ASMR

Evidence shows that the effects of ASMR persist even after the inducing stimulus has ended, but this is specific to mood enhancement and chronic pain relief (Barratt & Davis, 2015). A study by Barratt and Davis (2015) found that individuals suffering from chronic pain experienced a reduction in symptoms for up to three hours following ASMR exposure. Although no statistically significant difference was reported between chronic pain symptoms during the ASMR session and those reported immediately afterwards, Barratt and Davis (2015) also found a positive impact of ASMR on mood. Participants reported feeling at their best mood during the ASMR session (averaging 78 on a 0-100 scale), and the effect gradually decreased over several hours following the sessions. The decline in mood was more rapid for participants who showed a higher risk of depression.

The core physical sensation of ASMR (the tingles) is noted for its persistence compared to related sensory experiences. Frisson (aesthetic chills, often musically induced) lasts only up to 10 seconds, whereas individuals who experience ASMR may report the tingling sensation induced by a trigger lasting for several minutes or more

(Fredborg et al., 2018). These findings suggest that ASMR provides a functional, temporary, and regulating effect on emotional and physical discomfort that extends well beyond the active consumption of the content (Roberts et al., 2019). This lasting effect supports the idea that ASMR may hold therapeutic potential for stress reduction and emotional regulation, particularly in contexts where sustained low-arousal states are beneficial. Despite evidence that ASMR effects can persist for minutes or even hours, it remains unclear whether these lingering physiological and emotional changes lead to meaningful differences in consumer-related outcomes.

Much of the existing research on ASMR's duration focuses on clinical or therapeutic outcomes, such as mood enhancement or chronic pain relief, rather than on decision-making, attention, or behaviour within consumer environments. No empirical research has yet examined whether the short-term "afterglow" of ASMR generates measurable changes in consumer states. This gap highlights the need for this study to investigate whether the immediate post-ASMR period is characterised by short-term post-exposure emotional responses that could be relevant in applied settings such as retail environments. The present study will address this gap by examining whether relaxation persists in the minutes following ASMR exposure within a controlled, retail-relevant context.

Existing evidence suggests that ASMR effects may persist beyond active exposure however the duration and significance of this residual relaxation remain under-examined. Studies assess physiological or emotional responses during ASMR consumption (Barratt et al., 2017; Barratt & Davis, 2015; Hozaki et al., 2025; Kim et al., 2024; McErlean & Banissy, 2017), with limited attention to post-stimulus states as expressed as a limitation by Swart et al. (2022). As a result, it is unclear whether ASMR induces only momentary relaxation or a short-term affective shift that extends into subsequent activities, which establishes whether relaxation persists after ASMR exposure. It is important to understand the practical relevance, particularly in consumer environments where sensory stimuli often influence decision-making (Krishna, 2011).

Understanding whether ASMR induces a brief sensory effect or a short-term affective shift is therefore critical. Emotional states do not necessarily dissipate immediately upon stimulus cessation, and temporary mood changes may influence subsequent evaluations or experiences. Although the present study does not assess consumer behaviour directly, examining emotional responses across post-listening intervals is a necessary step in determining whether ASMR produces a measurable residual effect that could benefit understanding of consumer responses.

These findings indicate that ASMR-related emotional and relaxation benefits might last beyond active exposure, rather than fading immediately after the stimulus stops. Although current research shows residual mood improvements, relaxation, and physiological regulation, the short-term dynamics of these responses are still not well understood. Specifically, there is limited research on how these post-exposure states change in the immediate aftermath of ASMR, particularly in consumer-relevant contexts.

2.6 Research Gap

ASMR has been consistently associated with deep relaxation and calmness, elicited through specific audio and visual cues (Barratt & Davis, 2015). Unlike many retail stimuli that aim to increase excitement and urgency such as high-tempo and volume background music (Milliman, 1982). ASMR is characterised by its capacity to induce a sustained, low-arousal state (Poerio et al., 2018). This makes ASMR particularly relevant for consumer research, as it offers a means of examining how relaxation, rather than stimulation shapes the consumers experience within a retail context.

Establishing whether ASMR can reliably induce relaxation in a consumer setting is therefore an important preliminary step. Understanding this relationship provides insight into how sensory stimuli may support emotional regulation during shopping (Krishna, 2011). The behavioural outcomes (R) are not directly measured in this study. However, sustained relaxation may have implications for consumer contexts. Prior research suggests that emotional states influence information processing, attention

and responsiveness to environmental cues (Bitner, 1992; Rodrigues et al., 2021). If ASMR produces a residual low-arousal state, this may shape how individuals engage with subsequent retail stimuli. Establishing whether such a sustained affective state exists is therefore a necessary preliminary step before examining downstream behavioural effects.

Although ASMR reliably induces emotional and physiological changes during exposure, it remains unclear whether these individual (organism)-level responses persist beyond stimulus removal. Existing research has mostly focused on in-session effects, leaving the post-exposure course of affective states underexplored, particularly in consumer-relevant settings.

> ***RQ:*** *To what extent do measurable self-reported emotional and physiological responses persist across post-exposure time points following ASMR exposure?*

While this study does not measure purchasing behaviour directly, establishing whether ASMR can reliably induce relaxation in a consumer context is the first step. By examining whether ASMR elicits a measurable short-term residual relaxation state within a consumer-relevant context, the present research provides preliminary insight into how low-arousal sensory stimuli may influence emotional states relevant to consumer experiences.

2.7 Hypothesis Development

ASMR has been associated with increased pleasure and reduced physiological arousal during exposure (Barratt & Davis, 2015; Kim et al., 2024; Seifzadeh et al., 2023) within the stimulus-organism-response (S-O-R) framework (Mehrabian & Russell, 1974). These emotional and physiological changes represent organism-level responses. The pleasure-arousal-dominance (PAD) model (Mehrabian & Russell, 1974) is used to operationalise these affective states.

While the immediate effects are well documented, fewer studies have investigated whether these organism-level responses last beyond stimulus removal

(Swart et al., 2022). Prior research suggests that ASMR is associated with parasympathetic activation (Hozaki et al., 2025; Kim et al., 2024), focused attentional absorption (McErlean & Osborne-Ford, 2020; Swart et al., 2022), and low-arousal positive affect (Engelbregt et al., 2022). Because emotional and autonomic regulation processes may decrease gradually rather than terminate immediately upon stimulus cessation, the associated organism-level responses may briefly persist into the post-listening period. Barratt and Davis (2015) observed a gradual positive mood decline following ASMR exposure rather than an immediate return to baseline, supporting the possibility of a short-term residual effect.

> ***H1:*** *Pleasure will be highest immediately following ASMR exposure and is expected to remain elevated across the post-listening time points.*

Similarly, if ASMR induces a sustained low-arousal state, arousal levels may remain relatively stable rather than showing significant change across the post-listening period.

> ***H2:*** *Arousal is expected to remain relatively stable across post-listening time points.*

Accordingly, relaxation-related indicators would also be expected to remain relatively stable, rather than abruptly returning to baseline, if a sustained low-arousal state is present.

> **H3:** *Self-reported relaxation-related indicators are expected to remain relatively stable across post-listening time points.*

2.8 Conclusion

Collectively, the literature demonstrates that ASMR induces measurable emotional and physiological, including increased pleasure, reduced heart rate, and enhanced parasympathetic activation during exposure (Barratt & Davis, 2015; Fredborg

et al., 2020; Kim et al., 2024; Poerio et al., 2018; Seifzadeh et al., 2023). These findings support the classification of ASMR as a stimulus that can produce a calm, low-arousal state (Barratt & Davis, 2015; Engelbregt et al., 2022). However, existing research has largely examined these effects during active consumption and within therapeutic or laboratory contexts. Limited attention has been paid to whether these organism-level responses persist after stimulus removal, particularly in consumer-relevant settings (Krishna, 2011). Consequently, the short-term residual impact of ASMR on emotional regulation remains insufficiently understood.

The present study addresses this gap by examining self-reported emotional and physiological responses following exposure across specific time intervals in a retail-focused context. The S-O-R model suggests that if ASMR causes a low-arousal emotional state, parts of this organismic response may last beyond the immediate exposure. Specifically, pleasure is likely to stay high, arousal should remain steady, and relaxation-related signs are expected to stay consistent across post-listening points.

Chapter 3: Methodology

This chapter outlines the methodology used to examine the effects of ASMR audio on consumer emotions and self-reported physiological relaxation. The study aims to investigate within-participant changes in emotional and relaxation responses over time in a one-condition repeated-measures design, addressing whether ASMR results in measurable post-listening effects and how long these effects last. Given the exploratory nature of this research and the need to capture temporal variations in emotional states, a quantitative experimental approach was deemed most suitable. The chapter is organised as follows: first, the research paradigm and philosophical stance are outlined, then the research approach and design are discussed. Next, the recruitment and sampling strategies are described, followed by the instruments, stimuli, and procedures used for data collection. Finally, the data analysis strategy is presented.

3.1 Research Paradigm and Philosophical Position

This study is based on a post-positivist research paradigm (Brown et al., 1991), which assumes that psychological and emotional responses can be objectively observed, measured, and analysed. Ontologically, this study adopts a realist position (Brown et al., 1991; Easton, 2002), suggesting that the effects of ASMR are real phenomena independent of individual interpretation and can therefore be captured through structured measurement. Epistemologically (Crotty, 1998), the study relies on empirical, quantifiable data to generate knowledge, using a repeated measures design to test whether ASMR produces measurable changes over time. Specifically, affective and relaxation-related responses were measured with structured self-report scales and analysed with inferential statistics to test hypotheses and examine whether ASMR produced measurable changes over time. This study deliberately moves away from an interpretivist or constructionist approach, instead focusing on identifying patterns in responses across individuals. This philosophical stance aligns with the study's aim to determine whether ASMR elicits reliable post-listening effects and how long these effects last, using statistical analysis to infer causal patterns (Creswell, 1994; Crotty, 1998).

3.2 Research Approach

Consistent with a post-positivist paradigm, the present study employed a quantitative experimental design (Crotty, 1998). A one-condition within-subjects, repeated-measures design was utilised to examine whether exposure to ASMR audio results in measurable changes in relaxation and affect over time in a consumer context. This exploratory approach enables the identification of patterns and the empirical testing of hypotheses, providing initial insights into this emerging research area.

3.3 Experimental Design

This study employed a one-condition within-subject repeated-measures design where all participants experienced the same ASMR audio stimulus (linked in Appendix F) without a comparison or control condition and completed measures at multiple intervals (1 minute, 5 minutes, and 10 minutes). The intervals were selected to capture both immediate and short-term persistence of ASMR-related emotional and perceived physiological states, aligning with previous ASMR research Barratt & Davis, 2015; Swart et al., 2022). The 1-, 5-, and 10-minute intervals also enabled observation of whether these organism-level responses stabilised or gradually declined over the post-listening period. Prior studies have demonstrated that ASMR can produce temporal changes in mood and affect, with some effects persisting beyond the listening period, including improvements in mood and reductions in chronic pain at 1- and 3-hour follow-ups (Barratt & Davis, 2015). Drawing on this evidence of lingering post-exposure effects, the present study focused on shorter, staggered intervals (1-, 5-, and 10-minutes) to examine whether early persistence of affective and self-reported relaxation responses could be detected immediately following stimulus removal.

The one-condition within-subject design is ideal for examining within-individual changes in relaxation and affect over time, reducing the influence of individual differences in baseline stress, caffeine intake, or sleep. Based on prior research, this may affect the outcome measure (affective, emotional, and self-reported physiological responses) (Goldstein & Walker, 2014; Hachenberger et al., 2025; Inagaki & Ohta, 2022;

Mikalsen et al., 2001). ASMR studies employing this research design include Hozaki et al. (2025), who also used a repeated-measures ANOVA to compare participants' responses to ASMR and nature sounds. The repeated-measures ANOVA in their study was used to examine how audio and audiovisual ASMR affected ASMR ratings over 600 seconds.

3.4 Sampling Strategy

A non-probability convenience sampling method was used to recruit participants from the university community and the researchers' professional and personal networks. Recruitment occurred via social media platforms such as LinkedIn and Instagram. Interested individuals signed up for the study using an online link or QR code on the recruitment poster (Appendix D). They used this link to select the date and time that suited their availability between 12th and 16th January 2026. Participants received a confirmation email closer to their selected date that outlined the study location, session time, and logistical details such as directions, parking areas, and arrival instructions.

Convenience sampling targets participants who are readily accessible and able to follow the study protocol, enabling quick and efficient data collection (Bornstein et al., 2013). This approach was appropriate given the study's preliminary aim to examine changes in affect and relaxation across three post-exposure time points. The primary aim was to determine whether an effect persisted after ASMR. This also allowed each participant to serve as their own control, reducing individual variability and increasing experimental control (Landers & Behrend, 2015). Similar sampling strategies have been used in prior ASMR research (Kence et al., 2022; Roberts et al., 2019). The method also supported procedural consistency and participant compliance, which were important given the repeated-measures design and controlled listening conditions (Barratt & Davis, 2015; Poerio et al., 2018; Stratton, 2021). Ethical approval was obtained from the AUT Ethics Committee (approval reference: 25/350, Appendix A).

3.5 Eligibility Criteria

Inclusion criteria required participants to be 18 years or older, fluent in English, and able to listen to audio through headphones. Participants who had any significant hearing difficulties or conditions that could interfere with engagement with auditory stimuli were excluded from data analysis.

3.6 Sample Size and Justification

An a priori power analysis was conducted using G*Power 3.1 to determine the minimum required sample size (Faul et al., 2009). A repeated-measures ANOVA (within-subjects, three time points) was selected as the planned primary analysis. Parameters were set to: effect size f = 0.30 (medium), $\alpha = .05$, and desired power $(1–\beta) = .80$, with the correlation among repeated measures assumed to be $r = .50$. The analysis indicated that a minimum sample of 21 participants was required. The final sample (N = 25) exceeded this requirement.

3.7 Data Collection Procedures

All study sessions were held in a quiet classroom, booked for the study participants only. This room was equipped with computers in case participants did not bring their own device. The environment was neutral, with standard lighting and no visually distracting materials (Photos of the classroom are in Appendix H & I). Upon arrival, participants were welcomed by the researcher and given a participation information sheet (Appendix B) and a consent form (Appendix C). They had 3-5 minutes to review these documents, after which the consent form was read aloud to ensure understanding. Participants were given the chance to ask any questions before the study began to ensure they were informed of the procedure. Written informed consent was obtained prior to the study's commencement.

After this, participants were asked to ensure they had access to a personal device (laptop, phone or tablet) and headphones. Spare headphones and computers were available for those who did not have the required equipment.

Following consent, participants were instructed to access the online survey via a QR code or a web link sent to their email. All materials were administered through Qualtrics, an online survey platform suitable for this research. Participants completed an initial audio check using a brief beep test to verify appropriate volume levels. The volume level is important because ASMR audio contains low frequencies; therefore a volume check ensures that the auditory threshold is met and that users are comfortable (Kim et al., 2024; Tan et al., 2022). Biswas et al. (2019) also mention that volume significantly influences relaxation. The researcher stayed prepared to assist with any technical issues. All participants completed the audio check before proceeding.

Participants then started the ASMR listening task. The ASMR stimulus was a five-minute audio clip played through their personal headphones. The survey instructions asked participants to stay quiet, minimise movement, and stop the task at any point if they felt uncomfortable. All participants listened to the same five-minute ASMR audio clip and followed the same sequence and intervals between measurement points to ensure internal validity.

After the ASMR audio finished, participants watched a one-minute silent video showing an online grocery store on the classroom projector. The video acted as a structured filler task between measurement intervals, helping to keep participants engaged and preventing long periods of passive silence (linked in Appendix G). No extra sounds were added, ensuring that the main manipulation remained limited to the ASMR audio. The grocery video also followed how consumers shop through an online website (Benn et al., 2015). Participants were also told to stay silent and avoid multitasking to keep testing conditions consistent.

The inclusion of a consumer-relevant visual context enhanced experimental realism by situating participants within a plausible everyday environment rather than an artificial waiting period, thereby supporting external validity (Morales et al., 2017). Designing the preliminary study in a manner consistent with its intended future application also supports feasibility for larger-scale testing (Leon et al., 2010).

Following the one-minute waiting period, the participants completed the self-report questions. The study used a set of validated self-report measures (Appendix E) to assess participants' emotional states before and after listening to the ASMR audio. To measure participants' affective states, the pleasure-arousal-dominance (PAD) scale (adapted from Mehrabian & Russell, 1974) was used. This was chosen because it is a widely used and validated measure of pleasure, arousal, and dominance, aligning with the theoretical framework underpinning this study (SOR) (Mehrabian & Russell, 1974). The relaxation state questionnaire (RSQ) (adapted from Steghaus and Poth, 2022) was included as a measure of subjective relaxation. It has been utilised in research examining short-term changes in relaxation levels at different time points (Steghaus & Poth, 2022), also incorporating self-reported physiological measures not covered by the PAD scale.

These self-reported physiological measures are important because ASMR is as much a physiological experience as it is a psychological one (Poerio et al., 2018). Both the PAD and RSQ scales have demonstrated strong internal consistency and validity in assessing affective states across the dimensions of pleasure, arousal, and relaxation. The RSQ was specifically designed for use in a within-subject repeated-measures design and is responsive to short-term changes (Steghaus & Poth, 2025). The PAD scale has been used specifically to measure emotions in consumer-related contexts, which aligns with the conceptual design of the present study (Donovan, 1994; Mehrabian & Russell, 1974).

Participants then viewed a five-minute continuation of the same silent grocery environment before completing the same self-report measures again. This procedure was repeated with a ten-minute silent interval.

All visual content was presented on the classroom projector to ensure uniform exposure across participants and to minimise variability in screen size, brightness, and playback timing. Progression through each stage was synchronised, with the researcher prompting participants to proceed only once all individuals had completed the prior section, therefore maintaining temporal consistency across the sample. During the

study there were attention check questions included to ensure participants were reading questions. Attention checks are commonly used in experimental surveys to identify participants who respond carelessly to the questions (Mathur, 2025)

After completing the final self-reported questionnaire, participants answered additional questions about sleep, caffeine intake, and perceived stress. After completing the PAD and RSQ, the survey concludes with questions about how much sleep participants had before the study, their caffeine intake beforehand, and their current stress levels, which are unrelated to the study itself. These questions were not posed before the study, so caution should be exercised when interpreting the findings related to these covariates. This order was chosen to minimise demand characteristics and to prevent priming participants' awareness of factors related to arousal or fatigue that could influence their affective self-reports during the task. Recent research by Hachenberger et al. (2025) also suggests that the relationship between caffeine levels and affective states varies across individuals and is influenced by factors like sleep quality. Demographic information, including age and ethnicity, was also collected to describe the sample and clarify the scope and generalisability of the findings.

After completing the survey, participants were verbally debriefed and informed of the study's true purpose, as deception was used to conceal the ASMR aspect. Participants then had the opportunity to ask questions and received a $10 grocery voucher as compensation for their participation. All participants were thanked for their time before leaving.

During the sessions, the researcher wore neutral clothing in black, and the environment was kept consistent across all sessions to minimise potential confounds. Colour has been shown to influence emotional states, including pleasure and arousal (Valdez & Mehrabian, 1994). Since the current study examined changes in emotional responses over time, variations in environmental or researcher-related colour cues could have unintentionally affected participants' emotional states. Keeping neutral and consistent visual conditions therefore helped ensure that any observed changes were due to the auditory stimuli rather than external sensory factors.

Table 1 presents all measures used, their sources, whether they were adapted or adopted, the items used, and the scale.

Table 1. *Overview of Constructs, Measures, Sources, and Scale Characteristics*

Construct	Measure	Source	Adopted / Adapted	Items used	Scale
Pleasure	PAD - Pleasure	Mehrabian & Russell (1974)	Adapted (sub-scale only)	3 items (e.g., Happy–Unhappy; Pleased–Displeased; Satisfied–Dissatisfied)	7- point bipolar Likert scale (1= Very Happy, 7 – Very Unhappy)
Arousal	PAD - Arousal	Mehrabian & Russell (1974)	Adapted (sub-scale only)	3 items (e.g., Relaxed–Stimulated; Calm–Excited; Tense–Relaxed)	7- point Bipolar Likert scale (1= Very Relaxed, 7 = Very Stimulated
Relaxation	RSQ	Steghaus & Poth (2022)	Adapted (selected items from scale, analysed individually)	4 selected items assessing muscle tension, sleepiness, breathing rate, and heart rate.	7-point likert scale. (1 = Strongly Disagree, 7 = Strongly Agree)
Sleep	Single-item	Self-developed	Developed for this study	1 question. How many hours of sleep did you get prior to this study?	Categorical (<4 hours, 4–6 hours, 7–8 hours, 9+ hours)
Caffeine	Single-item	Self-developed	Developed for this study	1 Question. How much caffeine have you consumed today? (Select the closest option) coffee/tea/energy drink/soft drink	Categorical (0, 1, 2, 3, 4+ drinks)
Stress	Single-item	Self-developed	Developed for this study	1 Question. What are your current stress levels	7-point Likert-type scale (1 = Not stressed at all, 7 = Extremely stressed)

3.9 Data Analysis Plan

All statistical analyses were conducted using IBM SPSS (Version 30). Prior to hypothesis testing, data were screened for attention check failures and missing values (Abbey & Meloy, 2017). Descriptive statistics (means and standard deviations) were calculated for all outcome variables.

Because pleasure and arousal were measured using multiple items intended to capture unified affective constructs, internal consistency was assessed using Cronbach's alpha (Cronbach, 1951). Reliability was acceptable for both pleasure (α = .898) and arousal (α = .812), exceeding the recommended threshold of .70. Given this internal consistency, items within each subscale were aggregated by calculating their mean to form composite scores (Mehrabian, 1996).

In contrast, items from the Relaxation State Questionnaire (RSQ) (Steghaus & Poth, 2022) were analysed individually, as they reflect distinct physiological sensations rather than a single latent construct.

To examine changes in emotional and relaxation responses across time, one-way repeated-measures analyses of variation (ANOVA) were conducted. The within-subjects factor was Time, with three levels: 1 minute, 5 minutes, and 10 minutes post-ASMR exposure. Repeated-measures ANOVA was selected due to the within-participant design (L. M. Sullivan, 2008), allowing comparison of mean differences across multiple time points while accounting for correlated observations.

The assumption of sphericity was assessed using Mauchly's Test of Sphericity, which tests whether the variances of the differences between all repeated-measures conditions are equal (Mauchly, 1940). If this assumption was violated ($p<.05$), the Greenhouse-Geisser correction was applied to adjust the degrees of freedom, providing a more conservative estimate of statistical significance (Bathke et al., 2009). Where significant main effects were observed, Bonferroni-adjusted pairwise comparisons were conducted to control for Type I error across multiple comparisons (Armstrong, 2014).

To account for potential confounding influences, repeated-measures analyses of covariance (ANCOVA) were conducted, including relevant covariates (e.g., caffeine intake, sleep, perceived stress). Effect sizes were reported using partial eta squared (ηp^2), representing the proportion of variance explained by the independent variable. Statistical significance was set at $p < .05$.

3.10 Ethical Considerations

Ethics approval for this study was granted by the AUT Ethics Committee on the 10th of December 2025, (Ethics number 25/350). All procedures were conducted in accordance with the approved ethics application. The ethics approval letter (Appendix A), participant information sheet (Appendix B), and consent form (Appendix C) are included in the appendices.

3.11 Conclusion

This chapter describes the methodological framework used to examine how ASMR audio influences relaxation and emotions over time. A post-positivist perspective has guided the study. The study employed a quantitative, experimental approach with a within-subject, repeated-measures design to track changes in emotional responses across time points. It details the research design, sampling method, data collection steps, materials and measures, variables, data analysis plan, and ethical considerations. These methodological choices provide a solid, appropriate basis for achieving the research objectives and ensure that the results can be interpreted with confidence. The next chapter displays the study's findings.

Chapter 4: Results

This chapter presents the results of repeated measures analyses examining self-reported changes in emotional and physiological responses following ASMR exposure across three post-listening time points (1 minute, 5 minutes, 10 minutes). The purpose of this chapter is to evaluate whether the observed patterns of change over time support or do not support the study's hypotheses regarding the persistence of post-exposure effects.

H1: Pleasure will be highest immediately following ASMR exposure and is expected to remain elevated across the post-listening time points.

H2: Arousal is expected to remain relatively stable across post-listening time points.

H3: Self-reported relaxation-related indicators (muscle tension, breathing rate, heart rate, and sleepiness) are expected to remain relatively stable across post-listening time points.

Descriptive statistics are reported first, followed by the analysis of how time affects each outcome variable, and lastly the covariates. The hypotheses are as follows

4.1 Sample Size

A total of 27 participants took part in this study. After screening the data, 2 participants were excluded for failing both attention checks, whereas those who failed only one were retained, resulting in a final sample of N=25.

4.2 Participant Demographics

Participants ranged in age from 18 to 51 years (M = 28.76, SD = 9.02). The sample consisted of 9 males (36%) and 16 females (64%). Participants identified as Indian

(52%, 13), Māori/Pasifika (20%, 5), Asian (20%, 5), European (4%, 1), and African (4%, 1).

4.3 Summary of findings

To provide a clear overview of the study findings, Table 2 summarises the mean scores across post-listening intervals, the results of the repeated-measures analyses, and whether each hypothesis was supported. This table displays the primary effects of time for each outcome variable, along with any significant interactions involving control variables. The "Hypothesis Supported" column indicates whether the observed pattern matched the directional predictions outlined in Chapter 2.

Table 2. *Summary of Findings*

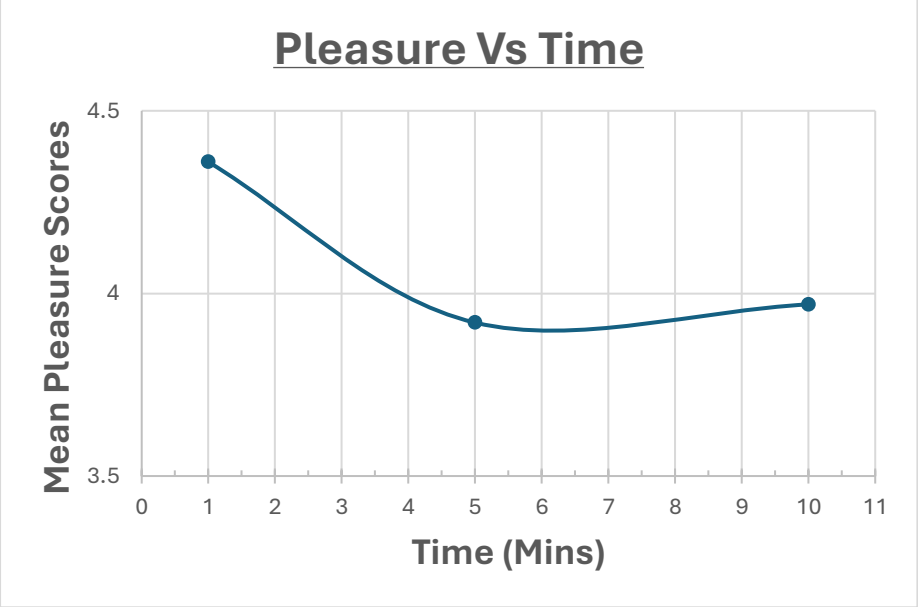
Outcome Variable	1 Minute Mean	5 minutes Mean	10 minutes Mean	Hypothesis supported	Statistical finding	Significant control interaction
Pleasure (H1)	4.36	3.92	3.97	Yes, Partially	$F(2, 48) = 3.48$, $p = .039$	Stress x Time: $F(2, 42) = 6.69$, $p = .003$
Arousal (H2)	4.52	4.68	4.85	Yes	$F(1.47, 35.29) = 1.31$, $p = .275$	Caffeine × Time: $F(2, 42) = 6.13$, $p = .005$; Stress × Time: $F(2, 42) = 9.05$, $p < .001$
Muscle Tenseness (H3)	3.32	2.96	2.96	Yes	$F(2, 48) = 1.00$, $p = .375$	Caffeine × Time: $F(2, 42) = 3.47$, $p = .040$
Sleepiness (H3)	3.44	3.96	4.76	No	$F(1.58, 37.99) = 10.93$, $p < .001$	None
Perceived Breathing rate (H3)	3	2.72	2.8	Yes	$F(2, 48) = 0.41$, $p = .663$	None
Perceived Heart rate (H3)	3.24	2.88	2.88	Yes	$F(2, 48) = 1.28$, $p = .287$	None

4.4 Pleasure Results

To evaluate H1, which predicted that pleasure would be highest immediately following ASMR exposure and remain elevated over time, a one-way repeated-measures ANOVA was conducted to examine the effect of time (1 min, 5 min, and 10 mins) on pleasure. As shown in Figure 1, pleasure was highest at 1 minute, declined at 5 minutes, and stabilised slightly at 10 minutes.

Figure 1

Mean Pleasure Scores Across Post-listening Time Points



As shown in Table 3, mean pleasure was highest at 1 minute (M = 4.36, SD = 0.90), declined at 5 minutes (M = 3.92, SD = 0.63), and remained relatively stable at 10 minutes (M = 3.97, SD = 1.05). This pattern reflects an initial post-exposure peak followed by a slight decline and stabilisation.

Table 3.

Means and Standard Deviations of Pleasure Across Time

Time Point	Mean	Standard Deviation
1 Minute	4.36	0.90
5 Minutes	3.92	0.63
10 Minutes	3.97	1.05

Mauchly's test indicated that the assumption of sphericity was met, $\chi^2(2) = 1.93$, $p = .381$; therefore, sphericity-assumed degrees of freedom were used. The effect of time on pleasure was significant, $F(2, 48) = 3.48$, $p = .039$, $\eta p^2 = .127$.

Bonferroni-adjusted pairwise comparisons revealed that pleasure was significantly higher at 1 minute ($M = 4.36$) compared to 5 minutes ($M = 3.92$), $p = .044$. No significant differences were observed between pleasure at 1 and 10 minutes ($p = .219$), or between 5 and 10 minutes ($p = 1.00$).

Pleasure Over Time Controlling for Covariates

A one-way repeated-measures ANCOVA was conducted to examine changes in pleasure across time (P1, P2, P3), while controlling for caffeine intake, hours of sleep, and stress levels.

Mauchly's test indicated that the assumption of sphericity was not violated, $\chi^2(2) = 0.48$, $p = .787$; therefore, sphericity-assumed degrees of freedom were used. After controlling for the covariates, the main effect of time on pleasure was not significant, $F(2, 42) = 1.76$, $p = .184$, $\eta p^2 = .08$.

However, a significant interaction between time and stress levels was observed, $F(2, 42) = 6.69$, $p = .003$, $\eta p^2 = .24$, indicating that changes in pleasure over time differed depending on participants' reported stress levels. This interaction was driven by a significant linear trend, $F(1, 21) = 11.86$, $p = .002$, $\eta p^2 = .36$. The inspection of the parameter estimates indicated that the association between stress and pleasure

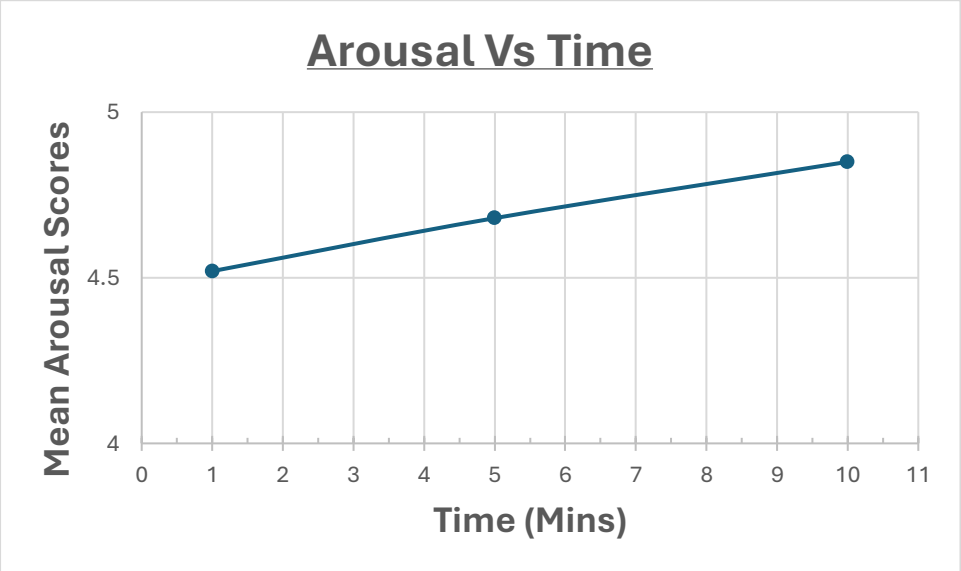
became increasingly negative across the time points, suggesting that higher stress levels were associated with a steeper decline in pleasure over time. No significant interactions were found between time and hours of sleep, $F(2, 42) = 0.36$, $p = .703$, $\eta p^2 = .02$, or between time and caffeine intake, $F(2, 42) = 1.41$, $p = .255$, $\eta p^2 = .06$.

Bonferroni-adjusted pairwise comparisons of estimated marginal means indicated that pleasure was significantly higher at 1 minute than at 5 minutes ($p = .028$), while no other time-point comparisons were significant (all $ps \geq .12$).

4.5 Arousal Results

To evaluate H2, which predicted that arousal would remain relatively stable across post-listening time points, a one-way repeated-measures ANOVA was conducted to examine the effect of time (1 min, 5 min, and 10 min) on arousal. As illustrated in Figure 2, mean arousal scores increased gradually across the post-listening period.

Figure 2
Mean Arousal Scores Across Post-Listening Time Points



The means and standard deviations for arousal across time are presented in Table 4. As shown, arousal increased from 1 minute (M = 4.52, SD = 1.17) to 5 minutes

(M = 4.68, SD = 1.06) and 10 minutes (M = 4.85, SD = 1.23), reflecting a steady upward pattern over time.

Table 4 .
Means and Standard Deviations of Arousal Across Time

Time Point	M	SD
1 Minutes	4.52	1.17
5 minutes	4.68	1.06
10 minutes	4.85	1.23

Mauchly's test indicated that the assumption of sphericity was violated, $\chi^2(2) = 10.27$, $p = .006$; therefore, degrees of freedom were corrected using Greenhouse–Geisser estimates of sphericity ($\varepsilon = .74$). The effect of time on arousal was not significant, $F(1.47, 35.29) = 1.31$, $p = .275$, $\eta p^2 = .052$.

Arousal Over Time Controlling for Covariates

A one-way repeated-measures ANCOVA was conducted to examine the effect of time (P1, P2, and P3) on arousal, while controlling for caffeine intake, hours of sleep, and stress levels. Mauchly's test indicated that the assumption of sphericity had not been violated, $\chi^2(2) = 5.10$, $p = .078$; therefore, sphericity-assumed degrees of freedom were used.

After controlling for the covariates, the main effect of time on arousal was significant, $F(2, 42) = 9.24$, $p < .001$, $\eta p^2 = .31$, indicating that arousal changed significantly across the three time points. Polynomial contrasts revealed a significant linear trend, $F(1, 21) = 12.88$, $p = .002$, $\eta p^2 = .38$, suggesting a steady increase in arousal over time, whereas the quadratic trend was not significant ($p = .82$).

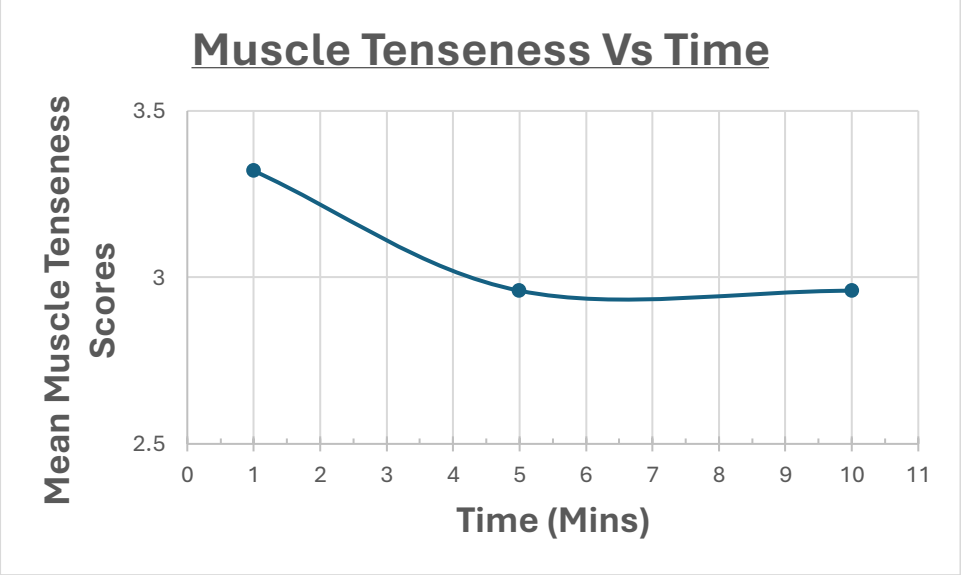
Significant interactions were observed between time and caffeine intake, $F(2, 42) = 6.13$, $p = .005$, $\eta p^2 = .23$, and between time and stress levels, $F(2, 42) = 9.05$, $p < .001$, $\eta p^2 = .30$. Inspection of parameter estimates indicated that higher stress levels and

higher caffeine intake were associated with a flatter increase in arousal across time. The interaction between time and hours of sleep was not significant, $F(2, 42) = 2.29$, $p = .114$, $\eta p^2 = .10$. Bonferroni-adjusted pairwise comparisons revealed no significant differences between individual time points (all *ps* > .39), indicating that the effect reflected an overall linear change rather than discrete differences between specific time points.

4.6 Muscles Tenseness

To evaluate the self-reported muscle tension component of H3, which predicted that self-reported relaxation indicators are expected to remain stable across post-listening time points, a one-way repeated-measures ANOVA was conducted to examine the effect of time (1 min, 5 min, and 10 min) on muscle tension. As illustrated in Figure 3, mean muscle tenseness decreased from 1 minute to 5 minutes and remained stable at 10 minutes.

Figure 3
Mean Muscle Tenseness Scores Across Post-Listening Time Points



As shown in Table 5, mean muscle tenseness decreased from 1 minute (M = 3.32, SD = 1.91) to 5 minutes (M = 2.96, SD = 1.72) and remained stable at 10 minutes (M = 2.96, SD = 1.79). Although a slight reduction was observed between 1 and 5

minutes, muscle tenseness did not change significantly across the post-listening intervals.

Table 5.
Means and Standard Deviations of Muscle Tenseness Across Time

Time points	Mean	Standard Deviation
1 minute	3.32	1.91
5 minutes	2.96	1.72
10 minutes	2.96	1.79

Mauchly's test indicated that the assumption of sphericity was not violated, $W = .79$, $\chi^2(2) = 5.57$, $p = .062$; therefore, sphericity-assumed degrees of freedom were used. The main effect of time on muscle tenseness was not significant, $F(2, 48) = 1.00$, $p = .375$, $\eta p^2 = .04$.

Muscle Tenseness Over Time Controlling for Covariates

A one-way repeated-measures ANCOVA was conducted to examine the effect of time (P1, P2, P3) on muscle tenseness while controlling for caffeine intake, hours of sleep, and stress levels.

Mauchly's test indicated that the assumption of sphericity was not violated, $W = .84$, $\chi^2(2) = 3.57$, $p = .167$; therefore, sphericity-assumed degrees of freedom were used. After controlling for the covariates, the main effect of time on muscle tenseness was not significant, $F(2, 42) = 2.20$, $p = .124$, $\eta p^2 = .10$.

A significant interaction between time and caffeine intake was observed, $F(2, 42) = 3.47$, $p = .040$, $\eta p^2 = .14$. Inspection of the parameter estimates indicated that higher caffeine intake was associated with a steeper increase in muscle tenseness across the time points. This interaction was driven by a significant linear trend, $F(1, 21) = 4.83$, $p = .039$, $\eta p^2 = .19$. No significant interactions were found between time and hours of

sleep, $F(2, 42) = 0.30$, $p = .744$, $\eta p^2 = .01$, or between time and stress levels, $F(2, 42) = 1.06$, $p = .356$, $\eta p^2 = .05$.

4.7 Sleepiness

To evaluate the sleepiness component of H3, a one-way repeated-measures ANOVA was conducted to examine the effect of time (1 min, 5 min, and 10 mins) on self-reported sleepiness. As illustrated in Figure 4, mean sleepiness scores increased steadily across the post-listening period.

Figure 4
Mean Sleepiness Scores Across Post-Listening Time Points

As shown in Table 6, mean sleepiness increased steadily across the post-listening period, rising from 1 minute (M = 3.44, SD = 1.66) to 5 minutes (M = 3.96, SD = 1.86) and further increasing at 10 minutes (M = 4.76, SD = 1.88). This pattern reflects a consistent upward trend in reported sleepiness over time.

Table 6.
Means and Standard Deviations of Sleepiness Across Time

Time points	Mean	Standard Deviation
1 Minute	3.44	1.66
5 Minutes	3.96	1.86
10 Minutes	4.76	1.88

Mauchly's test indicated that the assumption of sphericity was violated, $W = .74$, $\chi^2(2) = 7.03$, $p = .030$; therefore, degrees of freedom were corrected using Greenhouse–Geisser estimates of sphericity. The main effect of time on sleepiness was significant, $F(1.58, 37.99) = 10.93$, $p < .001$, $\eta p^2 = .31$, indicating that sleepiness increased significantly over time.

Planned polynomial contrasts revealed a significant linear trend, $F(1, 24) = 15.98$, $p < .001$, $\eta p^2 = .40$, suggesting a steady increase in sleepiness across time.

Bonferroni-adjusted pairwise comparisons showed that sleepiness was significantly higher at 5 minutes compared to 1 minute ($p = .049$), higher at 10 minutes compared to 5 minutes ($p = .045$), and highest at 10 minutes compared to 1 minute ($p = .002$).

Sleepiness Over Time Controlling for Covariates

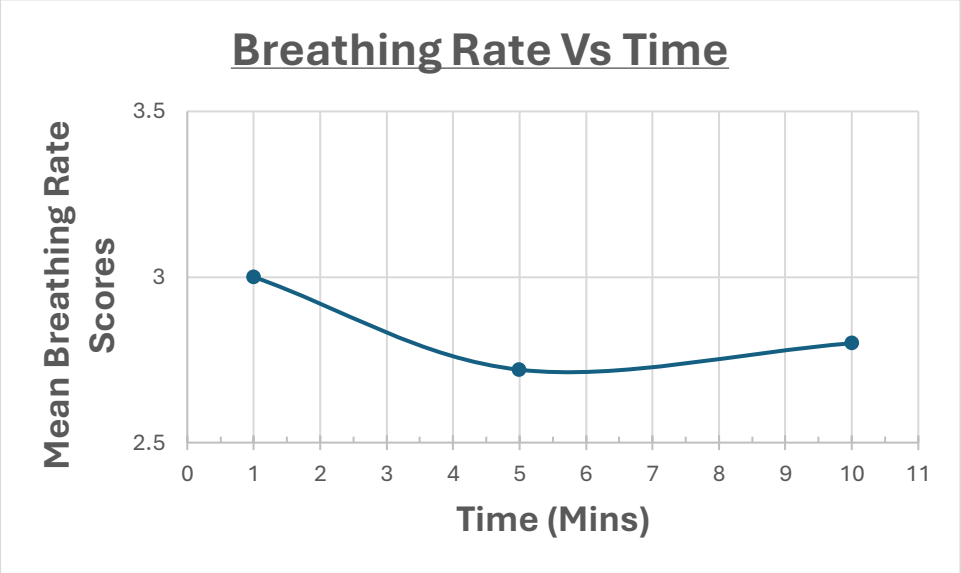
A repeated-measures ANCOVA was conducted to examine changes in sleepiness across time while controlling for caffeine intake, hours of sleep, and stress levels. Mauchly's test indicated that the assumption of sphericity was met, $\chi^2(2) = 5.52$, $p = .063$. After controlling for the covariates, the main effect of time on sleepiness was not statistically significant, $F(2, 42) = 2.90$, $p = .066$, $\eta p^2 = .12$.

No significant interactions were observed between time and caffeine intake, $F(2, 42) = 2.22$, $p = .121$, $\eta p^2 = .10$, time and hours of sleep, $F(2, 42) = 0.20$, $p = .819$, $\eta p^2 = .01$, or time and stress levels, $F(2, 42) = 2.14$, $p = .131$, $\eta p^2 = .09$. These results indicate that changes in sleepiness over time were not significantly influenced by individual differences in caffeine consumption, sleep duration, or stress levels.

4.8 Breathing Rate

To evaluate the perceived breathing rate component of H3, which predicted that self-reported relaxation indicators are expected to remain stable across post-listening time points, a one-way repeated-measures ANOVA was conducted to examine the effect of time (1 minute, 5 minutes, and 10 minutes) on self-reported breathing rate. Figure 5 illustrates a slight decrease in perceived breathing rate from 1 to 5 minutes, followed by a small increase at 10 minutes.

Figure 5
Mean Breathing Rate Scores Across Post-Listening Time Points



The means and standard deviations for perceived breathing rate across time are presented in Table 7. As shown, mean breathing rate decreased from 1 minute (M = 3.00, SD = 1.76) to 5 minutes (M = 2.72, SD = 1.67) and increased slightly at 10 minutes (M = 2.80, SD = 1.83), indicating a small initial decline followed by minor stabilisation.

Table 7.
Means and Standard Deviations of Breathing Rate Across Time

Time point	Mean	Standard Deviation
1 minute	3.00	1.76
5 minutes	2.72	1.67
10 Minutes	2.80	1.83

Mauchly's test indicated that the assumption of sphericity was met, $\chi^2(2) = 1.15$, $p = .563$; therefore, sphericity-assumed degrees of freedom were used. The main effect of time on breathing rate was not significant, $F(2, 48) = 0.41$, $p = .663$, $\eta p^2 = .017$, indicating that breathing rate did not change significantly across the three time points.

Perceived Breathing Rate Over Time Controlling for Covariates

A one-way repeated-measures ANCOVA was conducted to examine changes in perceived breathing rate across three time points (P1, P2, and P3), while controlling for hours of sleep, caffeine intake, and stress levels.

Mauchly's test indicated that the assumption of sphericity was met, $\chi^2(2) = 1.31$, $p = .519$; therefore, sphericity-assumed degrees of freedom are reported. After controlling for the covariates, there was no significant main effect of time on breathing, $F(2, 42) = 0.19$, $p = .831$, $\eta p^2 = .009$.

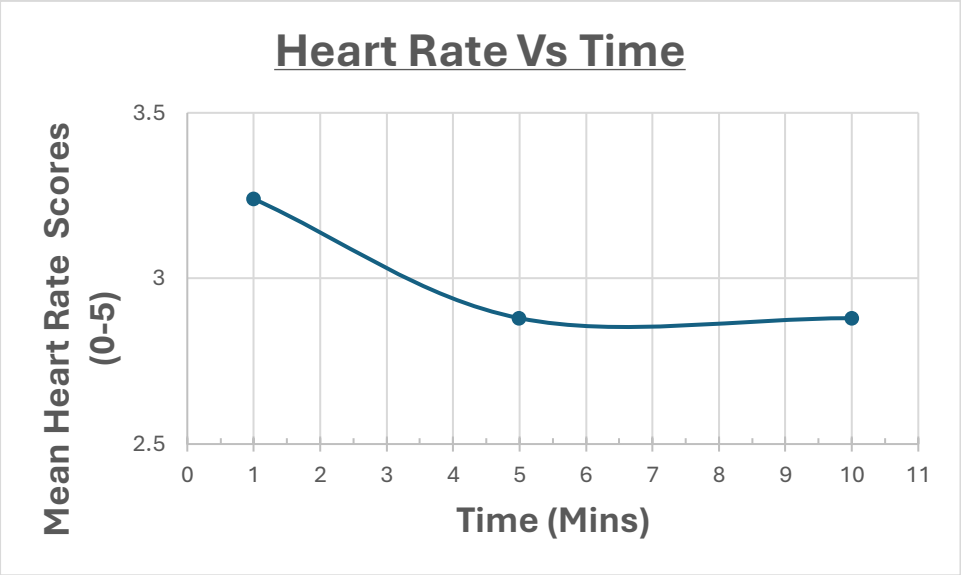
No significant interactions were observed between time and hours of sleep, $F(2, 42) = 0.20$, $p = .822$, $\eta p^2 = .009$; time and caffeine intake, $F(2, 42) = 1.42$, $p = .252$, $\eta p^2 = .064$; or time and stress levels, $F(2, 42) = 0.19$, $p = .826$, $\eta p^2 = .009$.

4.9 Heart Rate

To evaluate the heart rate component of H3, a one-way repeated-measures ANOVA was conducted to examine the effect of time (1 min, 5 min, and 10 min) on self-reported heart rate. As illustrated in Figure 6, mean heart rate scores decreased from 1 minute to 5 minutes and remained stable at 10 minutes.

Figure 6

Mean Heart Rate Scores Across Post-Listening Time Points



The means and standard deviations for heart rate across time are presented in Table 8. As shown, mean heart rate decreased from 1 minute (M = 3.24, SD = 1.86) to 5 minutes (M = 2.88, SD = 1.74) and remained unchanged at 10 minutes (M = 2.88, SD = 1.83), reflecting a slight reduction followed by stability.

Table 8.

Means and Standard Deviations of Heart Rate Across Time

Time point	Mean	Standard Deviation
1 minute	3.24	1.86
5 minutes	2.88	1.74
10 minutes	2.88	1.83

Mauchly's test indicated that the assumption of sphericity was met, $\chi^2(2) = 0.33$, $p = .847$; therefore, sphericity-assumed degrees of freedom are reported. The main effect of time on heart rate was not significant, $F(2, 48) = 1.28$, $p = .287$, $\eta p^2 = .051$, indicating that heart rate did not significantly change across the three time points.

Perceived Heart Rate Over Time Controlling for Covariates

A one-way repeated-measures ANCOVA was performed to investigate changes in perceived heart rate over time (1, 5, and 10 minutes), while controlling for hours of sleep, caffeine intake, and stress levels. Mauchly's test showed that the sphericity assumption was met, $\chi^2(2) = 0.27$, $p = .873$; therefore, degrees of freedom assuming sphericity were used.

After adjusting for the covariates, the main effect of time on heart rate was not significant, $F(2, 42) = 0.11$, $p = .899$, $\eta p^2 = .005$. No significant interactions were found between time and hours of sleep, $F(2, 42) = 0.15$, $p = .863$, $\eta p^2 = .007$, caffeine intake, $F(2, 42) = 0.39$, $p = .682$, $\eta p^2 = .018$, or stress levels, $F(2, 42) = 0.09$, $p = .919$, $\eta p^2 = .004$.

Conclusion

In summary, H1 was partially supported because pleasure was highest immediately following exposure and declined slightly across the time points. H2 was supported, as arousal remained relatively stable across the post-listening time points. H3 was partially supported: muscle tension, breathing rate, and heart rate remained relatively stable as predicted, whereas sleepiness increased significantly over time.

Chapter 5: Discussion & Conclusion

5.1 Overview and Interpretation of Results

This chapter investigates whether emotional and relaxation-related responses to ASMR linger briefly after the stimulus ends and how these responses evolve over time (10 minutes). Overall, the results show varied patterns across self-reported emotional and physiological responses. Pleasure exhibited some fluctuations across post-listening time points, while arousal remained mainly stable during the post-listening period. Relaxation-related indicators, including self-reported physiological measures, displayed mixed or minimal changes over time. Additionally, individual differences, such as stress levels and caffeine intake, moderated some responses, underscoring variability in how participants experienced ASMR following exposure. The following sections review each hypothesis individually, then synthesise the findings across the existing ASMR literature and discuss their theoretical implications, practical significance, limitations, and future research directions.

5.2 Pleasure Across the Post-Listening Period

H1 was partially supported, as pleasure peaked immediately after ASMR exposure, then declined slightly and stabilised between 5 and 10 minutes.

The increase in pleasure immediately after ASMR is consistent with previous research showing that ASMR reliably produces positive effects, comfort, and emotional enjoyment during and immediately after stimulus presentation (Barratt & Davis, 2015; Roberts et al., 2019; Swart et al., 2022). ASMR is often described as a pleasurable sensory experience that evokes calmness and emotional warmth. The findings suggest that this positive emotional response lasts briefly beyond the listening period supporting that ASMR elicits an immediate positive emotional change rather than a delayed or cumulative effect.

The decrease in pleasure at later time points is consistent with evidence that mood improvements from ASMR are transient, meaning they are short-lived and most pronounced during or immediately following exposure. Barratt and Davis (2015) similarly reported that participants experienced the greatest positive affect during active engagement with ASMR content. These mood boosts lasted immediately after exposure but declined over the next three hours. Similarly, Roberts et al. (2019) argue that ASMR acts as a short-term mood booster rather than creating lasting changes. In my study, the decline in pleasure over time indicates that the effect is time-dependent rather than absent.

Interestingly, pleasure levels between 5 and 10 minutes stabilised, suggesting that although initial pleasure diminishes, a residual positive feeling may persist briefly after exposure. This pattern resembles the brief residual effect, where ASMR induces an immediate, enjoyable state that gradually fades rather than disappearing suddenly. It supports the view that ASMR subtly influences emotional state, with effects strongest immediately after the stimulus and gradually diminishing (Barratt & Davis, 2015; Roberts et al., 2019; Swart et al., 2022)

Furthermore, findings showed that changes in pleasure over time varied depending on participants' reported stress levels, suggesting that individual differences may influence emotional responses to ASMR across the post-listening period. Previous research has similarly highlighted variability in ASMR sensitivity and emotional outcomes across individuals (Barratt & Davis, 2015; Roberts et al., 2019; Swart et al., 2022). For example, Barratt and Davis (2015) found that participants with depression experienced a faster decline in mood following ASMR exposure despite also reporting stronger immediate benefits. This may reflect broader evidence suggesting that stress can influence emotional regulation and responsiveness to positive or rewarding affective experiences by modulating reward-related processing systems (Baik, 2020). Overall, these findings suggest that while ASMR may reliably elicit immediate pleasure, the duration and progression of this effect may vary with individual psychological characteristics, such as stress. However, because the present study was not designed to directly examine stress as a moderating mechanism, these findings should be

interpreted cautiously. Future research could investigate stress as a potential moderator of the duration or intensity of ASMR-related emotional responses over time.

However, the observed decline in pleasure may not solely reflect a decay of ASMR-induced affect. The post-listening intervals were embedded within a retail-relevant context (a shopping video), which may have redirected attention away from the sensory experience and attenuated the pleasurable response. This suggests that ASMR-related pleasure may be context-sensitive, with persistence dependent not only on the stimulus itself but also on competing environmental demands. Pleasure may not be the most sensitive marker of sustained ASMR effects, as prior research indicates that longer-lasting responses may emerge more clearly in low-arousal or physiological states rather than in hedonic enjoyment (Swart et al., 2022). Further research is needed to test this out.

In summary, pleasure responses to ASMR are strongest immediately after exposure and decrease over time. This supports the view of Barratt and Davis (2015) that ASMR is a short-term emotional regulator rather than a source of sustained pleasure, particularly when individual differences and post-exposure contexts are considered.

5.3 Arousal Across the Post-Listening Period

H2 was supported, as arousal levels remained relatively stable across the post-listening period. Only minor fluctuations were observed between the 1-, 5-, and 10-minute intervals, suggesting that ASMR did not produce delayed increases or decreases in arousal following exposure.

The observed stability in arousal aligns with previous research that views ASMR as a low-arousal sensory experience rather than a stimulating or activating one (Kim et al., 2024; Swart et al., 2022). ASMR is often linked with calmness, relaxation, and reduced physiological activation, rather than increases in alertness or excitement (Barratt & Davis, 2015; Hozaki et al., 2025; Kence et al., 2022). From this perspective,

the lack of significant change in arousal is noteworthy, as it suggests that ASMR does not cause heightened arousal after exposure or produce delayed arousal effects once the stimulus ends.

The absence of significant changes in arousal should not be seen as a lack of impact from the ASMR stimulus. The stability may indicate that a low-arousal emotional state is maintained following exposure. This aligns with findings showing ASMR can promote relaxation while leaving arousal relatively unchanged (Kim et al., 2024; Seifzadeh et al., 2023). This highlights the dissociation between pleasure, relaxation, and arousal within the ASMR experience.

When accounting for caffeine intake, stress levels, and hours of sleep, patterns of arousal over time appeared to vary. Individual differences may influence how arousal evolves following ASMR exposure. These variations were subtle and should be interpreted cautiously.

Although some variations in arousal were observed when accounting for these factors, there were no clear or consistent differences between the post-listening intervals. This suggests that shifts in arousal were subtle rather than reflecting meaningful increases or decreases over time. These interactions suggest that external factors such as caffeine consumption and stress levels may modulate how individuals respond to ASMR over time, consistent with the findings of the first hypothesis. Swart et al. (2022) also state that the administration of caffeine, tobacco, and alcohol is associated with a decrease in reward-related delta power (a low-frequency brain activity pattern associated with deep sleep and relaxation), implying that caffeine can mask the physiological indicators of the ASMR state.

My findings support a nuanced interpretation of arousal within the context of ASMR. As outlined in the literature review, ASMR was positioned as a low-arousal sensory experience associated with calmness rather than heightened arousal. Consistent with this framing, arousal remained relatively stable throughout the post-listening period. Within the S-O-R framework, this indicates that ASMR may operate by

enhancing pleasant feelings rather than by producing substantial fluctuations in arousal (Barratt & Davis, 2015; Poerio et al., 2018)

5.4 Relaxation-Related Indicators Across the Post-Listening Period

H3 was partially supported, with most relaxation indicators remaining stable across the post-listening time points. However, sleepiness increased across the post-listening period, diverging from the otherwise consistent pattern.

The overall stability observed in self-reported muscle tension, breathing, and heart rate aligns with existing ASMR literature, which reports mixed and inconsistent findings regarding relaxation-related physiological responses, especially when measured via self-report methods (Roberts et al., 2019; Tan et al., 2022). Although some studies have documented physiological changes such as decreased heart rate or shifts in autonomic activity during ASMR exposure, these effects were more consistently detected using objective measures, including heart rate variability, EEG, and skin conductance (Kim et al., 2024; Seifzadeh et al., 2023).

Prior research shows that self-reported bodily sensations are limited by awareness and may lack the sensitivity needed to detect subtle physiological changes associated with low-arousal relaxation states (Poerio et al., 2018; Tan et al., 2022). The lack of consistent changes across these self-reported indicators does not necessarily indicate the absence of physiological relaxation. It may highlight methodological limitations previously noted in the ASMR literature. It advises caution in relying solely on subjective physiological measures to assess regulatory effects (Swart et al., 2022).

In contrast to the stability observed across other relaxation indicators such as muscle tension, perceived breathing and heart rate, sleepiness steadily increased throughout the post-listening period. Although sleepiness is often linked to relaxation, it should not be viewed as a direct or exclusive sign of relaxation in this context. Previous research has similarly found that ASMR can produce low-arousal states that coincide with decreased alertness, without necessarily indicating physiological relaxation. ASMR

has been associated with increases in delta-wave activity, which is neurologically linked to deep sleep and neural recovery (Fredborg et al., 2020; Kim et al., 2024).

In this study, increased sleepiness may reflect several overlapping processes, including attentional disengagement (Smallwood et al., 2004) or time-on-task effects (Matthews & Desmond, 2011). Given the extended seated period after listening and the low cognitive demand of the intervening grocery video task, the rise in sleepiness might also indicate boredom or cognitive fatigue rather than sustained ASMR-induced relaxation. Furthermore, factors such as stress, hours of sleep, and caffeine intake did not influence the effect of time on sleepiness, suggesting a more plausible link between sleepiness and reduced cognitive load or boredom.

These results suggest that post-ASMR effects were more evident in emotional self-report measures, such as pleasure, than in participants' self-reported perceptions of bodily sensations. Although emotional responses, such as pleasure, showed a temporal pattern following ASMR exposure, most self-reported physical signs of relaxation remained consistent. This dissociation aligns with earlier studies suggesting that ASMR-related relaxation may involve subtle regulatory mechanisms that are not readily accessible via conscious bodily awareness (Poerio et al., 2018; Swart et al., 2022). Future research might employ objective measures of physiological responses to better understand these effects.

5.5 Implications

The findings from this pilot study contribute to three interconnected areas: ASMR research, sensory marketing within retail settings, and stimulus-organism-response (S-O-R) theory. Most ASMR research has focused on responses during the stimulus, examining both psychological and physiological effects (Fredborg et al., 2020; Hozaki et al., 2025; Swart et al., 2022; Tan et al., 2022). Much less attention has been given to what occurs after the stimulus ends. By investigating post-exposure emotional changes, this study demonstrates that the effects of ASMR are typically brief and primarily emotional, rather than sustained in self-reported physiological terms. This

research emphasises that organism-level responses to ASMR may follow a short-term temporal pattern, indicating that the duration of affective responses should be considered when applying the S-O-R framework to sensory stimuli.

As a pilot study, this research also contributes to the methodology by demonstrating the feasibility of examining post-exposure organismic states across defined time intervals in a consumer-relevant setting. Future research should integrate objective physiological measures and behavioural outcomes to further clarify the durability and functional significance of ASMR-induced states.

In the sensory marketing literature, environmental cues are viewed as stimuli that influence individual-level (organism-level) responses (emotional, cognitive, and physiological), in line with the S-O-R framework. The findings indicate that while ASMR may immediately affect pleasure after exposure, its effects quickly stabilise and do not significantly change arousal or perceived physiological activation. This adds a temporal nuance to S-O-R applications by showing that ASMR-induced organism-level responses may be short-lived rather than sustained after exposure. Instead, ASMR may act as a subtle cue for mood regulation. This also extends the broader sensory marketing literature by demonstrating that ASMR's emotional effects may stem from feelings of calm rather than increased excitement. This distinction is especially relevant in consumer environments, where calm, low-arousal states can impact attention and emotional comfort without inducing excitement or urgency (Kaltcheva & Weitz, 2006).

From a consumer perspective, this may indicate that ASMR-induced states are relatively resistant to immediate competing stimuli, such as the passive shopping video presented during the study. It is important to note that the post-listening stimulus was low in sensory intensity and did not involve active decision-making. The findings should be interpreted with caution when considering more dynamic or immersive retail environments (Bitner, 1992; Krishna, 2011). Consistent with this pattern, ASMR functioned as a low-arousal affective cue, maintaining emotional calm rather than stimulating urgency or excitement. (Barratt & Davis, 2015; Kence et al., 2022)

From a retailer's perspective, these findings suggest that ASMR-inspired auditory cues may be better suited to environments designed to promote calm engagement rather than stimulation. Retailers looking to reduce perceived stress or improve comfort could benefit from low-arousal sensory cues, whereas settings requiring urgency or high energy may not fit with ASMR's emotional profile. Further research is needed to test these ideas out.

The observed increase in sleepiness during the post-listening period underscores the need for caution when using ASMR in consumer settings. While a calm, low-arousal state may be beneficial in stressful or demanding environments, increased sleepiness could also signal disengagement or reduced alertness, which may be counterproductive if sustained attention or active decision-making are required. This indicates that the emotional effects of ASMR may not always align with desired consumer outcomes.

Overall, these findings suggest that ASMR does not produce strong or sustained emotional shifts in a consumer-relevant setting. Its effects appear subtle, short-lived, and sensitive to timing and individual differences. Future research should examine ASMR within more immersive and ecologically valid retail environments to better understand how these short-term affective changes may translate into consumer perceptions or behaviours.

5.6 Limitations

Several limitations should be considered when interpreting the findings of this study. These limitations do not undermine the results but help define the scope and boundaries within which the findings should be understood. First, the study relied on self-reported measures to assess physiological indicators, including muscle tension, breathing rate and heart rate. While self-report provides valuable insights into participants' subjective experiences, it may not accurately capture subtle or unconscious physiological changes compared to objective measures (Bell et al., 2018; Serfas et al., 2014). Interoception may also be at play, as participants are unaware of

their physiological changes (Chua & Bliss-Moreau, 2016), especially given the self-report nature of the data (Barratt & Davis, 2015; Kence et al., 2022; Poerio et al., 2018). This might partly explain the stability observed across several physiological indicators during the post-listening period. This has previously been observed in ASMR research, which characterises it as a complex blend (Poerio et al., 2018).

Second, following ASMR exposure, the post-listening window was relatively short, focusing on responses within 10 minutes. Although this timeframe was sufficient to detect immediate and short-term changes, it limits conclusions about longer lasting or delayed effects. Previous research indicates that ASMR-related effects may develop over longer periods up to 3 hours (Barratt & Davis, 2015). Considering the scale of this project and the limited resources (time and money), the study's design allowed for the examination of ASMR effects not only at a single point of exposure but over an extended period. Although short, it allowed testing the hypotheses.

Third, the passive nature of the waiting period and retail-related stimuli should be acknowledged. Participants were exposed to silent, non-interactive retail content and were not actively involved in a shopping task. While this provided a controlled setting for examining post-ASMR responses, it may not reflect the complexity of real-world consumer environments, which often involve multiple sensory cues, social interactions, and decision-making demands (Bitner, 1992; Krishna, 2011). Because the video's arousal levels were not independently pre-tested, it is possible that visual exposure introduced additional environmental confounds, resulting in a limitation when interpreting the findings. This might also explain why participants felt sleepy during the 5-10 minute mark of the study.

The sample size and context of participation limit the generalisability of the results. The present study involved a small group of participants who were not screened for prior ASMR usage ($N = 25$), which may have contributed to the moderate emotional responses observed, as previous ASMR research used participants who are familiar with ASMR (Mohammadi et al., 2024; Poerio et al., 2018). Participants were not randomly allocated to conditions. Although the within-subject design inherently

controlled for individual differences by allowing participants to serve as their own comparison, certain ASMR characteristics were not assessed. For example, prior exposure to ASMR, individual reactions to the trigger itself, or trait-level differences in affective responsiveness may have influenced the magnitude of the observed effects. The study was adequately powered to detect moderate effects; smaller or more subtle changes may not have been identified (Cohen, 2013). A convenience sampling was employed, which should be considered when interpreting the findings, as it is not generalisable across sociodemographic groups, leading to insufficient power in the results (Bornstein et al., 2013). Participants were recruited from a university-based sample, which can limit the generalisability of the results to broader consumer populations (see Ashraf & Merunka, 2017, for a discussion on the use of student samples).

The demographic makeup of the sample should be considered when interpreting the results. Participants were mainly Indian, with a relatively limited representation of Europeans compared to national population trends. This differs from the broader New Zealand population profile reported in the 2023 census (Stats NZ, 2024), where European ethnicity is the largest group. Therefore, the sample is not fully representative of the national population, which could limit the generalisability of the findings. Cultural differences in emotional expression or sensory experiences may influence responses to ASMR, and future research should aim to include a more demographically representative sample. The gender distribution of the sample was uneven, with a higher proportion of females than males. This imbalance may limit the generalisability of the findings, as potential gender differences in emotional reporting of sensory responsiveness were not examined. Future research should aim for a more balanced gender distribution. This is also a concern in other ASMR studies, where there were more females than males as participants (Barratt et al., 2017; McErlean & Osborne-Ford, 2020; Poerio et al., 2018)

Another key limitation is the absence of a no-ASMR control condition. Without a comparison group (e.g., silence, non-ASMR audio, or neutral content), it is not possible to rule out alternative explanations such as time-on-task effects (Möckel et al., 2015),

repeated-measures reactivity (Charness et al., 2011), or general relaxation/fatigue from participating in a quiet, seated experiment. The observed post-exposure patterns should be interpreted as associations consistent with ASMR exposure rather than definitive evidence of ASMR-specific causation.

5.7 Future Research Directions

Future research can build on the findings of the present study to deepen the understanding of ASMR's effects in consumer contexts. Future studies could examine longer post-exposure periods. Barratt & Davis (2015), for example, investigated the self-reported mood and pain-relief effects of ASMR in individuals who regularly engage with ASMR content, finding that certain benefits persisted for up to three hours following exposure. However, their study was not conducted within a consumer or retail setting. Extending this work by examining longer post-exposure periods within a consumer-relevant context would help determine whether previously observed residual effects persist when individuals are exposed to competing stimuli.

Incorporating objective physiological measures would strengthen conclusions about bodily relaxation. While self-report measures capture subjective experiences, they may not detect subtle physiological changes. Future research in this area of ASMR's effects on consumers should include the use of heart rate variability and skin conductance measures to better assess autonomic and neural responses following ASMR exposure and to compare subjective and objective indicators of relaxation

Future research should move beyond passive post-exposure periods by introducing structured cognitive or decision-making tasks immediately following a single ASMR exposure. This would allow researchers to assess whether the induced state influences attentional capacity, engagement, or decision processes without reintroducing the stimulus or confounding the experimental manipulation. Such designs would clarify how ASMR-related states function when individuals are required to remain cognitively active.

In addition, future research could directly examine consumer behaviour outcomes. While the present study focused on self-reported emotional and physiological responses, subsequent work could examine whether post-ASMR states influence behaviour, such as decision-making speed, impulse purchasing, attention to information, or perceived effort during shopping tasks. Investigating these outcomes in more immersive and interactive consumer environments such as a retail store may help establish the practical relevance of ASMR beyond emotional regulation alone.

These results reinforce the importance of careful operationalisation of relaxation in ASMR research. Treating relaxation as a unitary construct risks conflating emotional comfort, physiological down-regulation, and disengagement. Consistent with calls in the literature for greater methodological precision (Fredborg et al., 2018; Hozaki et al., 2025; Poerio et al., 2018; Roberts et al., 2019; Swart et al., 2022), the present findings suggest that future research would benefit from integrating subjective measures with objective physiological tools to more accurately capture how relaxation unfolds following ASMR exposure.

Future research could further investigate stress as a potential moderating variable influencing the persistence and progression of ASMR-related pleasure states over time. Given the significant stress & time interaction observed in the present study, additional research may help clarify how stress shapes emotional responsiveness to ASMR during the post-exposure period. This may be worthwhile given broader evidence suggesting that stress can influence reward-related emotional processing and responsiveness to positive affective experiences (Baik, 2020).

5.8 Conclusion

The aim of this study was to examine how emotional and physiological responses to ASMR develop during post-exposure periods, with particular attention to whether these responses persist when individuals are exposed to intervening, retail-related stimuli. Listening to ASMR audio resulted in a small, immediate increase in pleasure, as measured by the PAD scale (Mehrabian & Russell, 1974), immediately

following exposure. However, this effect did not strengthen over time and was not accompanied by consistent changes in self-reported physiological indicators. Rather than producing sustained changes in self-reported physiological indicators, ASMR appeared to be associated with a relatively low-arousal emotional state.

Overall, the findings showed that post-ASMR responses are state-specific and time-dependent, rather than uniform. Pleasure demonstrated some temporal sensitivity, peaking immediately after exposure before stabilising, while arousal and most physiological indicators remained largely stable across the post-listening period. These patterns in the present study suggest that ASMR primarily influences positive affect (pleasure) rather than activation or self-reported physiological changes.

The present study does not provide strong evidence that ASMR substantially enhances emotional response within a consumer-relevant context. Instead, its contribution lies in characterising participants' short-term emotional response patterns following ASMR exposure, highlighting the subtle, low-arousal nature of its effects and their sensitivity to context. By focusing on post-listening dynamics rather than in-stimulus responses, this research provides a foundation for future work examining how such states may operate in consumer retail settings.

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Appendix

Appendix A: Ethics Approval

Auckland University of Technology Ethics Committee (AUTEC)

10 December 2025

Megan Phillips
Faculty of Business Economics and Law

Dear Megan

Re Ethics Application: **25/350 Investigating the emotional responses to audio stimuli**

Thank you for your responses to AUTEC's conditions.

Your ethics application has been approved for three years until 10 December 2028.

Standard Conditions of Approval

1. The research is to be undertaken in accordance with the Auckland University of Technology Code of Conduct for Research and as approved by AUTEC.
2. All public facing documents must have the AUTEC approval number and be of a high standard of spelling and grammar. Dates on the Information Sheet(s) and Consent Form(s) must be consistent.
3. Any amendments to the project must be approved by AUTEC prior to being implemented.
4. A progress report is due annually on the anniversary of the approval date.
5. A final report is due at the expiration of the approval period, or, upon completion of project.
6. Any serious or adverse events must be reported to AUTEC, this includes unforeseen issues that might affect continued ethical acceptability of the project.
7. AUTEC grants ethical approval only. You are responsible for obtaining management permission for access from any institution or organisation at which your research is being conducted and you need to meet all ethical, legal, public health, and locality obligations or requirements for the jurisdictions in which the research is being undertaken.

The application number and title need to be referenced on all correspondence related to this project.

All forms are available online http://www.aut.ac.nz/research/researchethics

For any enquiries, please contact the Secretariat at ethics@aut.ac.nz
(This is a computer-generated letter for which no signature is required)

The AUTEC Secretariat
Auckland University of Technology Ethics Committee

Cc: fpm0956@autuni.ac.nz; Helene Wilkinson

Auckland University of Technology, D-88, Private Bag 92006, Auckland 1142, New Zealand.
T: +64 9 921 9999 ext. 8316: E: ethics@aut.ac.nz: www.aut.ac.nz/researchethics

Appendix B: Participant Information Sheet

Participant Information Sheet

Date that data collection will start: 12/01/2026

Project Title

Investigating the emotional responses to auditory stimuli

Invitation

Kia Ora. You are invited to participate in a research study involving listening to sounds and answering questions about your feelings and experiences. Participation will take approximately 35 minutes in total. Urvi Dhanji is conducting this study from the Auckland University of Technology, New Zealand. Other research team members include Dr Megan Phillips and Dr Helene Wilkinson, who are supervisors for this project.

The study is being carried out as a requirement for the Bachelor of Business (Honours) degree.

Some aspects of the study cannot be fully explained at this stage, as this ensures that participants' natural reactions are measured accurately. Complete information about the true purpose of the research will be provided immediately after participation in a debriefing process.

What is the purpose of this research?

This study aims to investigate how people's feelings may change after listening to an audio clip, providing preliminary insights into short-term changes in emotional states. These findings may contribute to future research in areas such as marketing and consumer behaviour.

Participation will involve listening to a short audio clip and completing brief questionnaires before and after the audio, focusing on your feelings and responses. To help capture participants' natural responses, some details about the specific purpose of the study cannot be explained in advance. A debrief will take place after everyone has completed the survey.

The researcher will know who is participating during the classroom session, no names or student IDs will be collected in the survey. Your responses will remain confidential and will be reported in summary form, ensuring that no individual participant can be identified. Findings may be presented in

Academic publications and conferences. This project has no external funding.

How was I identified, and why am I being invited to participate in this research?

You are being invited to participate because you are a student at the Auckland University of Technology or a member of the wider AUT community who may be interested in this research.

Participants are being recruited through a combination of classroom announcements, campus posters, and social media posts. Participation is completely voluntary—you do not have to take part if you do not wish to.

You are being invited to participate because you meet the **eligibility criteria** for this study. **To be eligible, you must:**

- be 18 years of age or older
- have no hearing impairments

You received this Information Sheet because the study is being advertised through university channels and social platforms.

In addition, the study has **exclusion criteria** to ensure there is no conflict of interest or risk of discomfort.
You cannot take part if you:

- are under 18 years old
- have hearing impairments
- are enrolled in classes taught by Helene Wilkinson or Megan Phillips
- Are sensitive to changes in sound level, close-up audio, or repetitive sound patterns that could cause discomfort, irritation, or strong negative reactions

How do I agree to participate in this research?

Your participation in this research is voluntary — it is entirely your choice. Whether you choose to participate will neither advantage nor disadvantage you. ***Your decision to participate will have no impact on your grades, assessment, or relationship with the lecturer or the university***

By proceeding with the survey, you are providing your informed consent to take part in the study. You will be assigned a unique participant ID, which you will use to complete the survey. You do not need to provide your name on the survey itself, and no identifying information will be collected during the survey, only in the signup sheet for organising purposes & distribution of results if you agree to receive it.

Because the study is confidential, it is not possible to withdraw your responses after submitting the survey.

All survey responses will be stored securely, and access to the data will be restricted to the researcher and the supervisory team. Published results will be reported in aggregated form so that no individual can be identified.

What will my participation involve?

You will take part in an in-person experiment that will last approximately 30–35 minutes. During the session, you will listen to a 5-minute audio clip and then complete three short questionnaires at 1, 5, and 10 minutes after the audio. Some sounds may be unusual or unfamiliar. The audio includes variances in level and type of sound, some of which may be unusual, unfamiliar, or uncomfortable for certain individuals. If you are sensitive to these types of sounds, you may stop the study at any time before submitting your responses. During these intervals, you will remain silent and watch a video projected on the classroom's screen. The questionnaires include a mix of multiple-choice and scale-based questions designed to measure your feelings as well as collect some neutral information about behaviour and personal factors such as sleep, caffeine intake, and stress. All participants will listen to the same audio clip.

Participants are asked to bring their own device and headphones. If you do not have a device or headphones, classroom computers and a limited number of university-provided headphones (10) will be available. Provided headphones must be plugged into the classroom computer, as they are not compatible with personal phones. All participants are required to wear headphones during the sound test to ensure consistent audio delivery and privacy in the group setting.

Please note that sessions are run in a group setting, so participants will be aware of each other's presence. While your survey responses are anonymous and cannot be linked back to you, you should be aware that other participants may be nearby during the session.

To ensure natural responses, the exact purpose of the study cannot be fully explained beforehand. After the session, you will receive a full explanation of the study during a debriefing.

Participants will receive a $10 voucher in person at the end of the study session. If a participant leaves early due to discomfort or chooses not to complete the session, the voucher will be provided to them on their way out. Vouchers are distributed directly by the researcher and are not linked to survey responses, ensuring anonymity of the collected data.

What are the benefits?

For you (the participant): There are no guaranteed personal benefits, although some individuals may find listening to the audio interesting. Participation may also offer a

learning opportunity, as you will gain insight during the debrief about what the study is trying to measure.

For the researcher: The study will provide preliminary insights into how specific audio-based stimuli are perceived, which is essential for designing future research on consumer behaviour.

What are the costs?

The main cost of participating in this study is your time, which will be approximately 35 minutes. There may be minor additional costs, such as transportation or parking, depending on your circumstances. No other expenses will be incurred. As a thank-you for participating, you will receive a $10 voucher.

Will the results of the study be published?

The results of this research will be included in a Bachelor of Business (Honours) dissertation, which will be publicly available through the AUT library. Results may also be published in peer-reviewed journals and presented at conferences or seminars. You will not be identifiable in any publication or presentation.

What are the discomforts and risks?

The study involves listening to a short audio clip and completing questionnaires, which is generally considered a low-risk activity. Possible discomforts may include mild irritation or discomfort from wearing headphones, minor boredom or fatigue from completing questionnaires, or feeling slightly unsettled by unfamiliar sounds in the audio.

You can stop participating at any time if you feel uncomfortable, and you are also free to remove your headphones at any point. The researcher will be present during the session to answer questions and provide support if needed.

If you experience any distress during or after participation, please don't hesitate to contact AUT Support Services, who offer free and confidential wellbeing support. Support is also available to anyone through 1737, a free 24-hour text and phone service for mental health and wellbeing assistance. Contact details for these services will be provided during the session and are available on the AUT website.

What will happen to information about me?

- **Your data will be confidential. No names or other identifying information will be collected in the actual survey. Names and email addresses will be collected to**

learning opportunity, as you will gain insight during the debrief about what the study is trying to measure.

For the researcher: The study will provide preliminary insights into how specific audio-based stimuli are perceived, which is essential for designing future research on consumer behaviour.

What are the costs?

The main cost of participating in this study is your time, which will be approximately 35 minutes. There may be minor additional costs, such as transportation or parking, depending on your circumstances. No other expenses will be incurred. As a thank-you for participating, you will receive a $10 voucher.

Will the results of the study be published?

The results of this research will be included in a Bachelor of Business (Honours) dissertation, which will be publicly available through the AUT library. Results may also be published in peer-reviewed journals and presented at conferences or seminars. You will not be identifiable in any publication or presentation.

What are the discomforts and risks?

The study involves listening to a short audio clip and completing questionnaires, which is generally considered a low-risk activity. Possible discomforts may include mild irritation or discomfort from wearing headphones, minor boredom or fatigue from completing questionnaires, or feeling slightly unsettled by unfamiliar sounds in the audio.

You can stop participating at any time if you feel uncomfortable, and you are also free to remove your headphones at any point. The researcher will be present during the session to answer questions and provide support if needed.

If you experience any distress during or after participation, please don't hesitate to contact AUT Support Services, who offer free and confidential wellbeing support. Support is also available to anyone through 1737, a free 24-hour text and phone service for mental health and wellbeing assistance. Contact details for these services will be provided during the session and are available on the AUT website.

What will happen to information about me?

- **Your data will be confidential. No names or other identifying information will be collected in the actual survey. Names and email addresses will be collected to**

Megan Phillips (megan.phillips@aut.ac.nz)
Helene Wilkinson (helene.wilkinson@aut.ac.nz)

Approved by the Auckland University of Technology Ethics Committee on *10/12/2025*
AUTEC Reference number *25/350*

Appendix C: Participant Consent Form

Consent Form

Project title: *Investigating the emotional responses to audio stimuli*

Project Supervisor: *Dr Megan Phillips & Dr Helene Wilkinson*

Researcher: *Urvi Dhanji*

- ○ I have read and understood the information provided about this research project in the Information Sheet dated 12/01/2026
- ○ I have had an opportunity to ask questions and to have them answered.
- ○ I understand that taking part in this study is voluntary (my choice) and that I may withdraw from the study at any time without being disadvantaged in any way.
- ○ I understand that once my survey responses are submitted, they are **anonymous** and **cannot be removed or linked back to me**. Any contact details I provided during sign-up can be deleted on request.
- ○ I am 18 years of age or older, do not have hearing impairments, and meet the inclusion/exclusion criteria outlined in the Information Sheet.
- ○ I agree to take part in this research.

I wish to receive a summary of the research findings (please tick one): Yes○ No○

Participant's signature: .....

Participant's name: .....

Participant's email address :

.....

.....

.....

.....

Date :

Approved by the Auckland University of Technology Ethics Committee on 10/12/2025 AUTEC Reference number 25/350

Appendix D: Recruitment Materials

Appendix D1: Recruitment Poster – AUT Students and Staff

Appendix D2: Recruitment Advertisement – External Participants

Help us explore sounds!

Join Our Audio Study!

📍 **Location: AUT City Campus**

🕒 **Time Commitment: Around 30–35 minutes**

👤 **Who can take part: Anyone aged 18 or older**

Scan the QR code or click the link to find session times.

Dates: 12th January 2026 - 16th January 2026

This study involves listening to audio recordings with variances in sound patterns. If you are sensitive to unusual, repetitive, or discomforting sounds, please do not participate.

AUT
TE WĀNANGA ARONUI O TĀMAKI MAKAU RAU

Scan for more info and to book a time slot!!

This research is part of an Honours dissertation project in Marketing at AUT
Student contact: Urvi Dhanji fpm0956@autuni.ac.nz

Approved by the Auckland University of Technology Ethics Committee on 10/12/2025
AUTEC Reference: 25/350

Appendix E: Survey Instrument

welcome message

Hi, and welcome! 👋
Thanks so much for taking a moment to take part in this study. You'll be guided through a short audio experience and a few simple questions about how you're feeling along the way. There are no right or wrong answers, just go with what feels true for you in the moment. Feel free to ask any question at any time if you are unsure.

When you're ready, click Next to read the information sheet and decide whether you'd like to take part.

Participant_InformationSheet

Information sheet investigating the emotional responses to audio stimuli

Information sheet investigating the emotional responses to audio stimuli

By continuing with this survey, you confirm that you:
- Have read and understood the Participant Information

Sheet.
- Understand that your participation is voluntary and confidential.
- Know that you may stop the survey at any time before submission.
- Agree to take part in this research.

Once you submit your responses, they cannot be withdrawn because the survey does not collect identifying information and submitted data cannot be linked back to you.

Sound_comfort

On the next screen you will listen to an audio clip. Before we get started we would like you to adjust the volume on your device.

Using the sound test below, we would like you to set the volume of your headphones so that the sound plays at a comfortable level.

As we move forward with the study, please make sure that you do not change the volume level once you listen to the first sound. That is, you need to keep

the volume level constant from beginning to end.

Please use headphones (earbuds or over-ear) and ensure you use the same device for the duration of the study.

0:00 / 0:04

What type of sound do you hear?

AUDIO

In this part of the study, you will listen to a short 5-minute audio clip through your headphones.

- Please make sure your headphones are plugged in and comfortable.

- Adjust the volume to a level that feels comfortable for you.
- Sit quietly and listen to the audio until it finishes.
- Do not talk or interact with others during this time.
- Once the audio ends, you will be asked to complete some short questions about your feelings and experiences.

0:00 / 5:06

Filler - Wait 1 minute

Please take a short break and turn your attention to the video. The next part of the study will appear automatically once the timer ends. You do not need to do anything right now. Thank you for your patience

Please do not refresh!!

Post 1 min questionnaire

Now that you've listened to the audio, please answer a few short questions about how you're feeling right now.
- These questions are about your current mood, relaxation, and general state.
- Please respond based on your experience.
- There are no right or wrong answers; choose what best reflects how you feel.

Select the point on the scale that best represents how you feel right now

	Very unhappy	Unhappy	Slightly unhappy	Neither happy nor unhappy	Slightly happy	Happy	Very happy
How do you feel right now?	○	○	○	○	○	○	○

Select the point on the scale that best represents how you feel right now

	Very displeased	Displeased	Slightly displeased	Neither pleased nor displeased	Slightly pleased	Pleased	Very pleased
How do you feel right now?	○	○	○	○	○	○	○

Select the point on the scale that best represents how you feel right now

	Very dissatisfied	Dissatisfied	Slightly dissatisfied	Neither satisfied nor dissatisfied	Slightly satisfied	Satisfied	Very satisfied
How do you feel right now?	○	○	○	○	○	○	○

Select the point on the scale that best represents how you feel right now

	Very relaxed	Relaxed	Slightly relaxed	Neither relaxed nor stimulated	Slightly stimulated	Stimulated	Very Stimulated
How do you feel right now?	○	○	○	○	○	○	○

Select the point on the scale that best represents how you feel right now

	Very calm	Calm	Slightly calm	Neither calm nor excited	Slightly excited	Excited	Very excited
How do you feel right now?	○	○	○	○	○	○	○

Select the point on the scale that best represents how you feel right now

	Very tense	Tense	Slightly tense	Neither tense nor relaxed	Slighly relaxed	Relaxed	Very relaxed
How relaxed do you feel right now?	○	○	○	○	○	○	○

Select the point on the scale that best represents how you feel right now.

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
My muscles feel tense	○	○	○	○	○	○	○
I feel sleepy / drowsy	○	○	○	○	○	○	○
My Breathing is faster than usual	○	○	○	○	○	○	○
My Heartrate is faster than usual	○	○	○	○	○	○	○

5 minute block

Please take a short break and turn your attention to the video. The next part of the study will appear automatically once the timer ends. You do not need to do anything right now. Thank you for your patience

Please do not refresh!!

questions post timeframes

You have now spent a few minutes watching the browsing video. Please answer the following questions about how you are feeling.
- These questions ask about your current mood, relaxation, and general state.
- Please respond based on your immediate experience.
- There are no right or wrong answers — select what feels most accurate for you.

Select the point on the scale that best represents how you feel right now

	Very unhappy	Unhappy	Slightly unhappy	Neither happy nor unhappy	Slightly happy	Happy	Very happy
How do you feel right now?	○	○	○	○	○	○	○

Select the point on the scale that best represents how you feel right now

	Very displeased	Displeased	Slightly displeased	Neither pleased nor displeased	Slightly pleased	Pleased	Very pleased
How do you feel right now?	○	○	○	○	○	○	○

Select the point on the scale that best represents how you feel right now

	Very dissatisfied	Dissatisfied	Slightly dissatisfied	Neither satisfied nor dissatisfied	Slightly satisfied	Satisfied	Very satisfied
How do you feel right now?	○	○	○	○	○	○	○

Select the point on the scale that best represents how you feel right now

	Very Relaxed	Relaxed	Slightly Relaxed	Neither Relaxed or Stimulated	Slightly Stimulated	Stimulated	Very Stimulated
How do you feel right now?	○	○	○	○	○	○	○

Select the point on the scale that best represents how you feel right now

	Very Calm	Calm	Slightly calm	Neither calm or excited	Slighly excited	Excited	Very excited
How do you feel right now?	○	○	○	○	○	○	○

Select number 6 on the scale below

	1	2	3	4	5	6	7
select a number	○	○	○	○	○	○	○

Select the point on the scale that best represents how you feel right now

	Very tense	Tense	Slightly tense	Neither tense nor relaxed	Slightly relaxed	Relaxed	Very relaxed
How relaxed do you feel right now?	○	○	○	○	○	○	○

Select the point on the scale that best represents how you feel

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
My muscles feel tense	○	○	○	○	○	○	○
I feel sleepy / drowsy	○	○	○	○	○	○	○
My breathing is faster than usual	○	○	○	○	○	○	○
My heartrate is faster than usual	○	○	○	○	○	○	○

10 minute timeframe

Please take a short break and turn your attention to the video. The next part of the study will appear automatically once the timer ends. You do not need to do anything right now. Thank you for your patience

Please do not refresh!!

post 10 mins

You have now spent a few minutes watching the browsing video. Please answer the following questions about how you are feeling.

- These questions ask about your current mood, relaxation, and general state.
- Please respond based on your immediate experience.
- There are no right or wrong answers — select what feels most accurate for you.

Select the point on the scale that best represents how you feel right now

	Very Unhappy	Unhappy	Slightly unhappy	Neither happy nor unhappy	Slightly happy	Happy	Very Happy
How do you feel right now?	○	○	○	○	○	○	○

Select the point on the scale that best represents how you feel right now

	Very displeased	Displeased	Slightly displeased	Neither pleased nor displeased	Slightly pleased	Pleased	Very pleased
How do you feel right now?	○	○	○	○	○	○	○

Select 5 for this question

	1	2	3	4	5	6	7
Select	○	○	○	○	○	○	○

Select the point on the scale that best represents how you feel right now

	Very dissatisfied	Dissatisfied	Slightly dissatisfied	Neither satisfied nor dissatisfied	Slightly satisfied	Satisfied	Very Satisfied
How do you feel right now?	○	○	○	○	○	○	○

Select the point on the scale that best represents how you feel right now

	Very relaxed	Relaxed	Slightly relaxed	Neither relaxed nor stimulated	Slightly stimulated	Stimulated	Very stimulated
How do you feel right now?	○	○	○	○	○	○	○

Select the point on the scale that best represents how you feel right now

	Very calm	Calm	Slightly calm	Neither calm nor excited	Slightly excited	Excited	Very excited
How do you feel right now?	○	○	○	○	○	○	○

Select the point on the scale that best represents how you feel right now

	Very tense	Tense	Slightly tense	Neither tense nor relaxed	Slightly relaxed	Relaxed	Very relaxed
How relaxed do you feel right now?	○	○	○	○	○	○	○

Select the point on the scale that best represents how you feel

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly Agree
My muscles feel tense	○	○	○	○	○	○	○
I feel sleepy / drowsy	○	○	○	○	○	○	○

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly Agree
My breathing is faster than usual	○	○	○	○	○	○	○
My heartrate is faster than usual	○	○	○	○	○	○	○

Post study Assesment

These questions cover topics such as caffeine intake, stress levels, and sleep patterns.
- Please answer as honestly as you can
- There are no right or wrong answers.
- This will only take 1–2 minutes.

How much caffeine have you consumed today? (Select the closest option)
coffee/tea/energy drink/soft drink

- ○ None
- ○ 1 drink
- ○ 2 drinks

- ○ 3 drinks
- ○ 4+ drinks
- ○ Unsure

How many hours of sleep did you get prior to this study

- ○ Less than 4 hours
- ○ 4-6 hours
- ○ 7-9 hours
- ○ 9+ hours

What are your current stress levels

	Not stressed at all	Very slightly stressed	Slightly stressed	Moderately stressed	Quite stressed	Very stressed	Extremely stressed
Select	○	○	○	○	○	○	○

Demographics

What is your ethnicity

- ○ Māori/Pasifika
- ○ Asian
- ○ European

- ○ Middle eastern
- ○ African
- ○ Indian
- ○ Prefer not to say

What is your gender

- ○ Male
- ○ Female
- ○ Non-binary / third gender
- ○ Prefer not to say

What is your age?

Once you submit your responses, they cannot be withdrawn because the survey does not collect identifying information and submitted data cannot be linked back to you.

Appendix F: ASMR Audio Stimulus Description

Stimulus Source:
Video: “ASMR for Sleep & Relaxation – Soothing Sounds & Whispering”
Platform: YouTube
URL: https://www.youtube.com/watch?v=hiSvTQM3K1E

Stimulus Segment:
Timestamp used: 12:31 – 17:31
Duration: 5 minutes

Description:
The selected excerpt contains auditory triggers of soft tapping on a sketchbook designed to elicit relaxation and sensory engagement consistent with Autonomous Sensory Meridian Response (ASMR) content.

Participants in the ASMR condition listened to this segment via headphones. Instruction emphasised comfortable listening volume to ensure standardised exposure across participants.

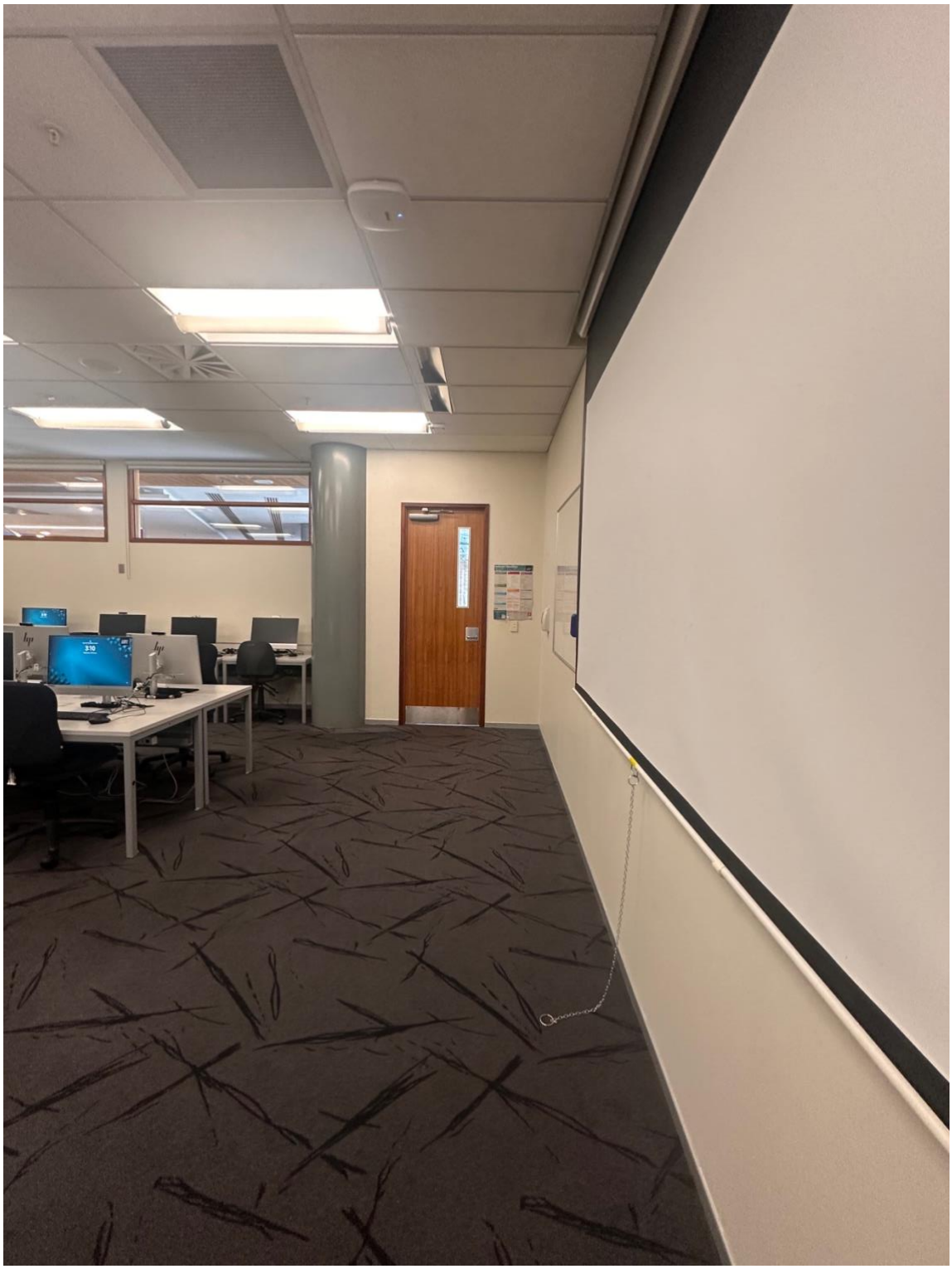
Appendix G: Grocery Shopping Filler Video Stimulus

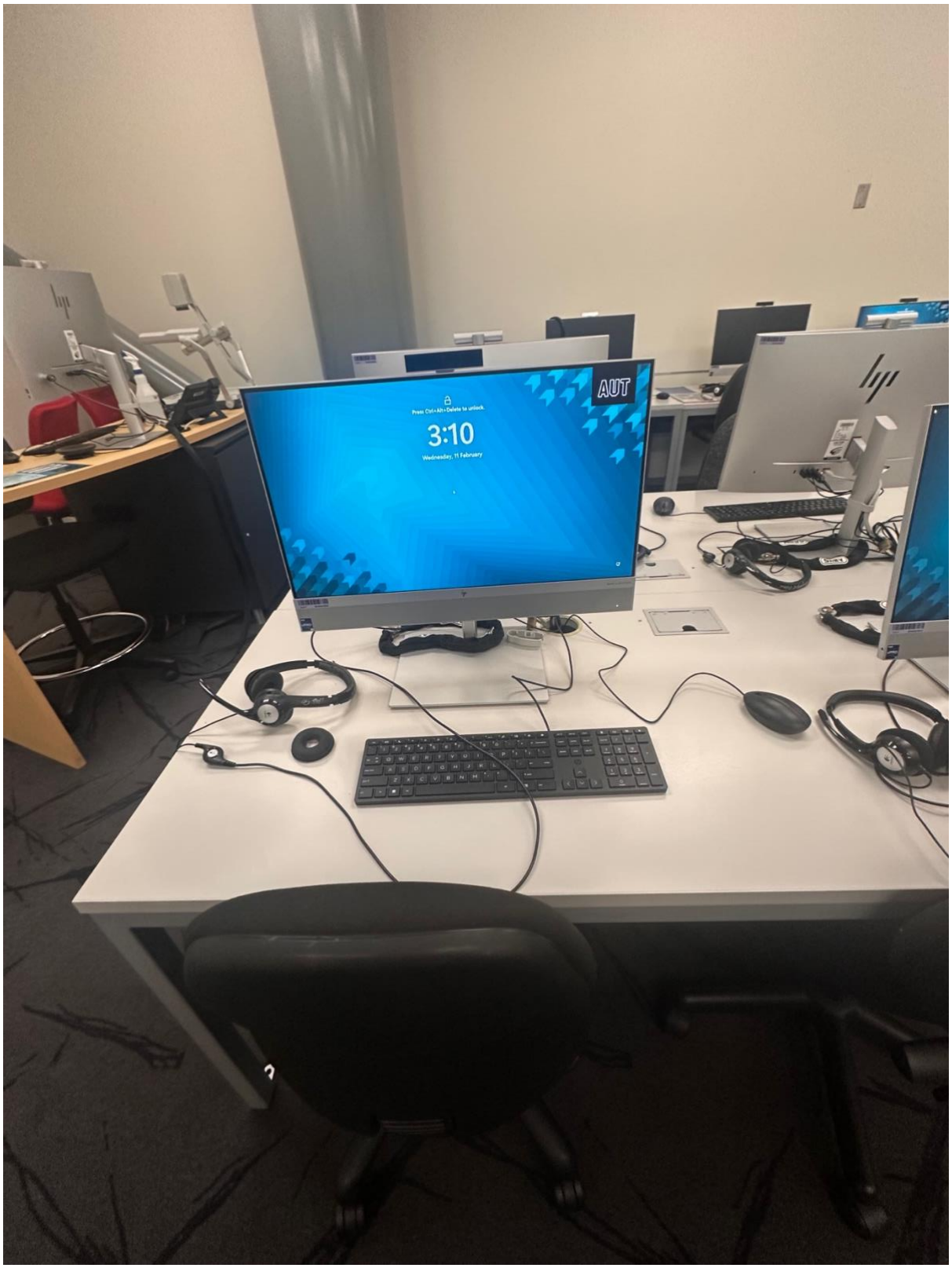
The following video was created by the researcher and used as a filler task between post-ASMR measurement intervals. The video consisted of a screen-recorded walkthrough of a supermarket browsing scenario and was approximately 1 minute, 5 minutes and 10 minutes in length. The video contained no narration, music, or additional audio stimuli.

https://autuni-my.sharepoint.com/personal/fpm0956_autuni_ac_nz/_layouts/15/onedrive.aspx?id=%2Fpersonal%2Ffpm0956%5Fautuni%5Fac%5Fnz%2FDocuments%2FASMR%20study%20materials%20ethics%20%2D%2025%20350&ga=1

Appendix H: Experimental Setting – AUT City Campus Classroom

Classroom setting at AUT City Campus, where data collection was conducted. The environment was controlled for noise and maintained consistent lighting and seating arrangements during all experimental sessions.




AUT
Press Ctrl+Alt+Delete to unlock.
3:10
Wednesday, 11 February

Appendix I: Experimental Setting – AUT South Campus Classroom

Classroom setting at AUT South Campus, where data collection was conducted. The environment was controlled for noise and maintained consistent lighting and seating arrangements during all experimental sessions.