An Examination of ASMR Triggers, Misophonia, and Adverse Childhood Experiences from a Sensorimotor Trauma Lens

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Dedication

I dedicate this work to Dr. Sylvia Marotta-Walters, who I strive to emulate in my professional life. Her clear vision, discernment and objectivity have been an invaluable source of guidance to many.

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Abstract

An Examination of ASMR Triggers, Misophonia, and Adverse Childhood Experiences from a Sensorimotor Trauma Lens

This dissertation aimed to investigate individual differences in sensory sensitivities in relation to childhood trauma. Participants provided demographic information and completed instruments evaluating ASMR responsiveness, misophonia severity, and histories of adverse childhood experiences. A confirmatory factor analysis was first conducted, which supported the factor structure of the ASMR Trigger Checklist and affirmed its suitability for use in ASMR research. Correlation and regression analyses showed that adverse childhood experiences had a positive relationship with ASMR and misophonic responsiveness, with Adverse Childhood Experiences significantly predicting ASMR Trigger Intensity and Misophonia Symptom Severity. The findings are discussed within a polyvagal framework to address potential mechanisms underlying ASMR and misophonia responses, highlight implications for mental health practice, and offer recommendations for future research.

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CHAPTER 1: INTRODUCTION

This chapter provides an overview of the present study. This includes an introduction of key concepts, statement of the problem, importance of the study, research questions, hypothesis, a brief introduction of the theoretical framework used, methodology, limitations, delimitations and key terms.

Overview

The last ten years have seen a booming rise in technology-based mental health aids, mobile health apps, and online content aimed at improving mental health. These media claim to improve users' mental health by helping users monitor their mood, access articles which provide education regarding specific symptoms, connect to certified mental health professionals, self-soothe with guided meditations, and provide interventions which can decrease symptoms such as depression and anxiety. ASMR, coined as the term to mean "Autonomous Sensory Meridian Response" is one such internet phenomenon, which consumers use for improved mental health outcomes such as improved sleep, reduced chronic pain, relief from symptoms of depression and anxiety, and relaxation (Poerio et al., 2018; Smejka & Wiggs, 2022). ASMR content is mediated through social media apps, such as YouTube and TikTok, and eHealth Apps, such as Calm. ASMR has been compared to self-affirmations (Lochte et al., 2018), mindfulness and meditation (Poerio et al., 2018), hypnosis (Barratt & Davis, 2015), music-induced frissons (McErlean & Banissy, 2018), and sound therapy (Poerio et al., 2022). However, ASMR seems to be its own unique internet-based content that has evolved into a mental health tool. ASMR videos have mimicked many therapeutic interventions, such as pseudo-social interaction, binaural sounds, an empathetic presence, medical assessments and examinations, and personal attention. Implications for ASMR being used as an intervention or mental health screening tool are uncertain, as

research on ASMR is just beginning. Some literature already suggests that ASMR has mental health benefits, such as improved sleep and decrease in feelings of depression and anxiety (Barratt & Davis, 2015; Poerio et al., 2018; Fredborg et al., 2021; Lochte et al., 2018). However, the literature is still lacks a consensus on the definition of ASMR and a reliable assessment tool to measure ASMR experience. The ASMR Trigger Checklist is the only ASMR measurement tool designed to capture modality-specific structure of ASMR triggers, rather than treating ASMR as a single, undifferentiated construct (Poerio et al., 2023). This dissertation aims to validate the ASMR Trigger Checklist to assess its appropriateness for use in future ASMR research by being the first study to test whether the data truly support the theoretical structure the instrument claims to measure.

Individual differences in response to ASMR may also be related to individual differences in nervous system operations due to past experiences. Some individuals are uniquely able to feel something called the "ASMR sensation", which refers to a relaxing sensation felt on the spine or back of the neck in response to an auditory or visual trigger. These "ASMR-responders" seek out specific sounds or visuals, called ASMR triggers, to induce the pleasurable feeling. However, little is known about why only some individuals are capable of this sensation. The study also seeks to understand the unique capacity of experiencing ASMR in light of individuals past experiences, as the study of polyvagal theory seems to suggest. The theoretical background of polyvagal theory states that unique bodily experiences are related to our past experiences (Porges, 1995). According to this outlook, negative experiences can change our bodies and contribute to a heightened nervous system, which increases sensitivity and responsivity to stimuli in the environment. The unique physiological ability to experience the ASMR sensation has also been correlated with neuroticism, and higher state anxiety, but studies have not investigated

whether ASMR responders report higher traumatic experiences (Fredborg et al. 2018). Therefore, the study will also aim to answer the question of whether ASMR-responders have statistically significantly higher exposure to childhood trauma, based on an assessment of Adverse Childhood Experiences (ACEs), which measures individuals' exposure to potentially traumatic experiences before the age of 18.

In summary, this study aims to 1) provide descriptive information about how ASMR is used as a mental health tool, 2) introduce a means for understanding ASMR through the theoretical framework of polyvagal theory, 3) investigate validity of the ATC using factor analysis on a population of adults, and 4) examine the relationship between ASMR triggers and other demographic and clinical constructs (e.g., misophonia and ACEs).

Statement of the Problem

Despite the growing popularity and anecdotal support for ASMR (Autonomous Sensory Meridian Response) as a self-soothing tool, empirical research on the phenomenon remains limited and inconsistent—particularly in relation to its psychological underpinnings and association with other sound-related conditions such as misophonia (Barratt & Davis, 2015; Campo & Kehle, 2016; Poerio et al., 2018; McErlean & Banissy, 2018).While some studies suggest a potential overlap between ASMR and misophonia in terms of heightened sensory sensitivity, findings remain inconclusive (Kasper & McErlean, 2023), and few have examined these constructs through an integrated theoretical lens.

Furthermore, existing measures of ASMR responsiveness, including the ASMR Trigger Checklist (ATC), have not been psychometrically validated through confirmatory factor analysis, limiting their utility in empirical research (Poerio et al., 2023). The creators of the ATC did not

validate the checklist using CFA because the instrument was intended as a content-mapping descriptive inventory, not a latent psychological measure (Poerio et al., 2023). Since its creation in the year 2023, the instrument has not been tested on any other population and has not been tested for its latent structure. The developers of the ATC organized items into modality-based groupings and cautioned against interpreting these categories as independent ASMR processes due to potential interpretive oversimplification. Although the groupings showed internal consistency, the extent to which these pragmatic groupings reflect an empirically coherent latent structure has not been formally evaluated. The present study addresses this gap by using oblique confirmatory factor analysis to examine whether the modality-based item groupings demonstrate a coherent measurement model while allowing the latent factors to correlate.

At the time the ATC was developed, ASMR research lacked a sufficiently defined theoretical structure to justify such modeling. For these reasons, the authors relied on descriptive validation rather than structural validation (Poerio et al., 2023). However, the ASMR Trigger Checklist now meets the assumptions for CFA because the field has developed a clear, theoretically supported model of ASMR as a multimodal sensory phenomenon composed of distinguishable visual, auditory, and interpersonal dimensions, a structure supported across several empirical studies (Barratt & Davis, 2015; Fredborg et al., 2017; Poerio et al., 2018). As a result, the ATC can now be validated using CFA even though such modeling was not feasible at the time of its original development.

A deeper understanding of ASMR is also hindered by the lack of research examining individual differences in ASMR responses in relation to adverse childhood experiences (ACEs) and the autonomic nervous system. Polyvagal theory offers a compelling framework to explore these relationships by positing that early trauma and chronic stress may influence physiological

and emotional responses to environmental stimuli, which may provide insight into individual differences in ASMR responsiveness. This study seeks to address these gaps by validating the factor structure of the ASMR Trigger Checklist and investigating the relationship between ASMR, misophonia, and ACEs, thereby contributing to the literature on sensory-emotional responses and advancing the clinical understanding of ASMR.

Statement of Significance

The present study holds significance across multiple dimensions of psychological research, theory, and applied mental health practice. As ASMR (Autonomous Sensory Meridian Response) continues to gain widespread popularity as a digital phenomenon used for stress relief and emotional regulation, empirical research on its psychological underpinnings remains sparse and fragmented (Engelbregt et al., 2022; Lochte et al., 2018). This dissertation addresses this critical gap by applying polyvagal theory to explore the relationship between ASMR, misophonia (an aversive reaction to sound), and adverse childhood experiences (ACEs), while also validating a psychometric measure of ASMR responsiveness—the ASMR Trigger Checklist (ATC).

By confirming the factor structure and construct validity of the ATC, this study contributes a reliable tool for assessing individual differences in ASMR experiences, which can be used in both clinical and research settings. In addition, the juxtaposition of ASMR and misophonia, often considered opposing emotional responses to auditory stimuli, provides a novel lens through which to examine sensory processing, affect regulation, and autonomic nervous system functioning. This investigation supports the expansion of trauma-informed research grounded in polyvagal theory by exploring how chronic stress or early adverse experiences may influence one's sensory-emotional landscape.

This research offers several potential benefits to society. First, by examining how individuals respond differently to auditory stimuli, especially in relation to trauma and stress histories, the study may enhance therapeutic approaches for individuals with sensory sensitivities and stress-related disorders. The application of polyvagal theory to the ASMR phenomenon further enriches our understanding of the autonomic nervous system's role in emotional regulation, offering new directions in trauma-informed psychological research and intervention.

Moreover, as ASMR content is frequently used informally for anxiety relief and emotional comfort, a deeper understanding of its psychological mechanisms may support the development of evidence-informed, scalable, and accessible digital tools for mental health support. This is particularly beneficial in underserved or resource-limited communities where traditional mental health services may be less accessible. The study may also offer insight into how younger populations engage with digital media to manage emotional well-being. These findings can inform media literacy education and counseling practices that integrate emotional regulation strategies into youth-focused interventions.

Finally, the validation of the ASMR Trigger Checklist (ATC) establishes a much-needed instrument for future studies and clinical assessments, contributing to the standardization of ASMR research. The availability of a validated measure will facilitate more rigorous investigations of ASMR and support its integration into broader discussions of mental health.

Research Questions

1. How well does the four-factor structure of the ASMR Trigger Checklist (ATC) fit the observed data?

2. How do the four factors of the ATC (as identified by the ATC in R1) correlate to Misophonia Symptom Severity and adverse childhood experiences (ACEs)?

Hypotheses

1. The four-factor structure of the ASMR Trigger Checklist (ATC) will fit the observed data.
2. The four factors of the ATC (as identified by the ATC in R1) will be statistically significantly correlated with Misophonia Symptom Severity and ACEs.

Theoretical Underpinnings

Polyvagal Theory, developed by Stephen Porges, emphasizes the role of the autonomic nervous system, particularly the vagus nerve, in regulating both physiological and psychological responses (Porges, 1995). The vagus nerve has multiple branches that affect various bodily functions, including the Dorsal Vagal Complex, the Sympathetic Nervous System, and the Ventral Vagal Complex. Polyvagal Theory offers insight into how trauma and chronic stress can disrupt nervous system functioning, leading to responses such as immobilization, disconnection, or heightened stress (Porges, 1995). According to the theory, trauma can alter how individuals orient to stimuli, often resulting in involuntary reactions to reminders of past experiences (Porges, 1995). Autonomous Sensory Meridian Response (ASMR), characterized by pleasurable physical sensations triggered by certain sounds or stimuli, can be understood through this framework. ASMR may represent a mechanism through which individuals regulate their nervous systems, promoting neuroplasticity and reorganizing the brain's response to sensory stimuli (McGeoch & Rouw, 2020). This aligns with the notion of directed mindfulness, a therapeutic technique designed to help individuals re-engage with their body's sensory systems, improving

emotional regulation and healing from trauma (Fisher & Ogden, 2009). ASMR may, therefore, function as a form of self-directed therapy, offering a means of restoring balance to the autonomic nervous system and facilitating healing from past traumatic experiences (Fredborg et al., 2017; Smejka & Wiggs, 2018).

Methodology

English-speaking adults 18 years or older were recruited online via Qualtrics to complete the ASMR Trigger Checklist, Duke Misophonia Questionnaire, Adverse Childhood Experiences Questionnaire, and the demographic questionnaire. Listwise deletion was used to delete cases with any missing data on the ATC for analysis resulting in 243 viable cases. When excluding individuals who did not report to be ASMR-responders, 215 were used for the CFA. The average age of the participants was 41.96 years (SD=10.71). The participants were mostly Male and White identifying.

Prior to conducting analyses, all relevant statistical assumptions were evaluated, such as normality, linearity, and multicollinearity. In order to confirm the four-factor structure of ASMR Triggers proposed by the authors of the ATC (Poerio et al., 2023), this study is the first to conduct a Confirmatory factor analysis to assess whether the structure of the ATC fits the sampled data. Further analyses were conducted using the four factors of the ATC (as identified by the ATC in R1) to assess whether they are statistically significantly correlated with other clinical variables such as Misophonia Symptom Severity and ACEs. Zero-order correlations were examined among the four composite scores, Misophonia Symptom Severity and adverse childhood experiences. Supplemental analyses were also conducted to further illuminate the influence of ACEs. Therefore, simple linear regression was conducted between ACEs and ASMR Trigger Intensity. Simple linear regression was also conducted on ACEs and Misophonia

Symptom Severity. ANOVA was conducted to examine the group mean differences in ASMR Trigger Intensity, Misophonia Symptom Severity and Adverse Childhood Experiences by gender. ANOVA was also conducted to examine group mean differences in Misophonia Symptom Severity and Adverse Childhood Experiences by ASMR response groups.

Limitations

Several limitations of this study should be acknowledged. First, identifying ASMR responders and non-responders was difficult. The study benchmarked other researchers' efforts to minimize false negatives by allowing respondents to watch an ASMR video and report their real-time reactions. This reliance on a single video introduces the potential for response bias, including individuals reacting to the particulars of that video that are not related to the triggers themselves. Secondly, the sampling strategy, which primarily involves recruitment through online platforms (e.g., YouTube, Reddit, blogs, and Amazon Mechanical Turk) and self-reports, may result in selection bias. Participants recruited via online methods are more likely to be individuals who are already familiar with ASMR or engaged in online mental health communities, potentially limiting the generalizability of findings to the broader population. The study also relied on self-reports, which may affect the reliability of participants' responses to the ASMR Trigger Checklist, the Duke Misophonia Questionnaire, and the Adverse Childhood Experiences (ACEs) questionnaire. Particularly, retrospective reports of childhood experiences by adults have been called into question. Research that has quantified assessment of the validity of retrospective recall of adverse childhood experiences show a substantial rate of false negatives and rare cases of false positives (Hardt & Rutter, 2004). These studies suggest that although bias may exist, it is not sufficiently great to invalidate retrospective reports of major adversities of an easily defined kind. In order to mitigate this error, the instrument used in this study offered

readily operationalized childhood experiences, rather than situations which are more subtle and open-to-interpretation. However, even then, the ACEs questionnaire has its limitations and is not inclusive of all types of adverse childhood experiences. Thirdly, the cross-sectional design of the study limits the ability to draw causal inferences. Although the study aims to explore associations among ASMR responsiveness, Misophonia Symptom Severity, and ACEs, temporal sequencing and directionality of these relationships cannot be determined.

Delimitations

This study also includes several delimitations, which reflect intentional decisions made by the researcher to define the scope of inquiry. First, the study is limited to English-speaking adults aged 18 and above. This age and language criterion was established to ensure informed consent and reduce linguistic variability in instrument interpretation, but it consequently excludes younger individuals and non-English speakers. Second, the study focuses specifically on three constructs—ASMR responsiveness, Misophonia Symptom Severity, and adverse childhood experiences—as framed by polyvagal theory. Other potentially relevant psychological or neurological variables (e.g., sensory processing sensitivity, current mental health diagnoses, or neurodevelopmental conditions) were outside the scope of this study. The instruments selected for the study—the ASMR Trigger Checklist (ATC; Poerio et al., 2023), the Duke Misophonia Questionnaire (Rosenthal et al., 2021), and the ACEs questionnaire (Felitti et al., 1998) —were chosen based on their theoretical alignment and practical feasibility for online administration. The choice to use these specific tools necessarily excludes other potentially informative measures. Third, the methodology is quantitative and survey based. While this approach allows for statistical analysis and confirmatory factor analysis of the ASMR Trigger Checklist, it does

not capture the nuanced, subjective experiences that qualitative methods (e.g., interviews might provide.

Key terms

Autonomous Sensory Meridian Response (ASMR): A perceptual phenomenon characterized by a tingling sensation typically originating on the scalp and moving down the neck and spine, often accompanied by feelings of relaxation or calm, and commonly elicited by specific auditory, visual, or interpersonal stimuli.

ASMR Trigger Intensity: The self-reported strength or magnitude of the ASMR sensation experienced in response to a given trigger, often measured across multiple sensory modalities.

ASMR Triggers: Specific auditory, visual, tactile, or interpersonal stimuli that have the potential to elicit an ASMR response in ASMR-capable individuals.

ASMR-responders: Those who experience the sensation of ASMR. They may not experience it every time they watch an ASMR video, but they are capable of experiencing the sensation of ASMR. Self-reported ASMR-responders can be reasonably considered ASMR-responders. Also known as “ASMR-capable”. This term is interchangeable with “ASMR-sensitive individuals” or “ASMR-experiencers”.

ASMR non-responders: Refers to individuals who are not capable of experiencing the sensation of ASMR at the given time. Individuals who self-report to be non-responders may not be familiar with ASMR and therefore think they are non-responders when they are. Some non-responders who are familiar with ASMR may, in the future, experience the tingling sensation if

they find the right trigger for them. This term is interchangeable with “ASMR non-experiencers”.

Tingle-immunity: Individuals who used to be able to experience the sensation but cannot any longer because they have had extended exposure to ASMR content. Usually, a period of time away from watching ASMR content restores the ability.

ASMRtist: Actor who performs a scenario to illicit ASMR response in viewers.

Misophonia: A condition characterized by decreased tolerance to specific sounds, often resulting in strong negative emotional, physiological, or behavioral responses disproportionate to the acoustic properties of the stimuli.

Misophonia Symptom Severity: The degree to which misophonic reactions interfere with emotional regulation, daily functioning, or interpersonal relationships, typically assessed through self-report measures.

Adverse Childhood Experiences (ACEs): Potentially traumatic events occurring before the age of 18, including various forms of abuse, neglect, and household dysfunction, which have been associated with long-term physical, psychological, and neurobiological outcomes.

Sensory Processing Sensitivity: An individual difference trait reflecting heightened sensitivity to internal and external sensory input, including deeper cognitive and emotional processing of sensory information.

Polyvagal Theory: A theoretical framework proposing that autonomic nervous system responses are hierarchically organized and play a central role in emotional regulation, social engagement, and responses to perceived safety or threat.

Confirmatory Factor Analysis (CFA): A statistical technique used to test whether observed data fit a hypothesized measurement model, commonly employed to evaluate the latent structure and construct validity of psychometric instruments.

Psychometric Validation: The process of evaluating the reliability and validity of a measurement instrument, including assessments of factor structure, internal consistency, and relationships with theoretically related constructs.

CHAPTER 2: LITERATURE REVIEW

This literature review provides a background on ASMR including its history as an internet phenomenon and an overview of the rising research on ASMR. It introduces polyvagal theory as a framework to understand ASMR and reinforces the possibility of ASMR being a result of enhanced sensory activity in certain individuals who have experienced potentially traumatic experiences or chronic stress. It also provides grounds for understanding the practice of ASMR by users as an act of directed mindfulness, which is a technique to help us feel better and calmer and decrease activity in the parts of the brain that register distress. By having a framework of ASMR as a directed mindfulness tool, we can better understand the physiological activity that contextualizes ASMR and its sensations.

This chapter provides a comprehensive review of the relevant literature on ASMR and the assessments used to measure ASMR, including the ASMR Trigger Checklist (ATC) (ATC; Poerio et al., 2023). The review includes the psychometrics of the ATC and articulates that as a newly developed instrument, it has yet to be used on any different populations. The ATC uniquely contributes to the literature on ASMR due to its incorporation of common elicitors of the experience. However, the factor structure has yet to be verified, and further research is required to confirm its validity. This literature review will also include the scientific footprint of ASMR. ASMR began arising on internet platforms and garnered fandom by those who utilized it for entertainment and mental health benefits (Leung et al., 2024). Definitions of ASMR in the literature have mainly referenced the first article published on ASMR by Barratt & Davis (2015), and instruments to measure ASMR have been developed, such as the ASMR Experience Questionnaire and ASMR-15 (Roberts et al., 2019). Research supports the relationship between ASMR and various mental health benefits, such as improved mood and sleep issues, but there

remains more to be explored (Barratt & Davis, 2015; Poerio et al., 2018; Fredborg et al., 2021; Lochte et al., 2018).

Previous research highlights the positive mental health outcomes in ASMR users (Barratt & Davis, 2015; Poerio et al., 2018; Fredborg et al., 2021; Lochte et al., 2018) and the need for a psychometrically strong assessment tool to measure ASMR for future research (Leung, 2024; Poerio et al., 2023). The term "ASMR or Autonomous Sensory Meridian Response" was searched on PsycINFO, which yielded 69 results, 23 of which only tangentially addressed the topic of ASMR. Of the 46 articles which focused on the phenomenon of ASMR, there were 4 conceptual studies, 2 literature reviews and 40 empirical studies exploring ASMR and other variables such as personality, cognitive, physiological and mental health related outcomes, which have been included in this review.

Background on ASMR

ASMR, or Autonomous Sensory Meridian Response, got its name in 2010 via an online forum, which named it intending to have the following meanings: 'Autonomous' meaning spontaneous, 'sensory' meaning a sensation, 'meridian' signifying a peak, and 'response' referring to an experience triggered by an external stimulus (Keiles, 2019). It refers to a pleasant tingling sensation in the spine or the back of the neck in spontaneous response to an auditory or visual stimulus such as the sound of a whispering voice or stepping on fallen leaves (Barratt & Davis, 2015). Individuals have different capacities of experiencing this sensation. Some have experienced it since childhood and others have only become aware of their ability with exposure to the rise of ASMR videos, which are videos intended to induce the sensation of ASMR with auditory and sensory "triggers". It is estimated that 1 in 5 people may be able to experience ASMR (Poerio et al., 2022), and those individuals are referred to as "ASMR responders" or

"Individuals with ASMR sensitivity" or "Individuals capable of experiencing ASMR". Individuals capable of experiencing ASMR do not experience the sensation with every trigger, and there is a lack of research looking into different groups of individuals and whether they respond to different triggers (Fredborg et al., 2017; Poerio et al., 2018; Barratt & Davis, 2015; Swart et al., 2022). The ASMR response is said to be involuntary and inconsistent. Watching too much ASMR can even lead to "tingle immunity", where an individual who used to be able to trigger their own ASMR with their favorite triggers cannot trigger the feeling anymore due to overexposure and tolerance build up (Lohaus, 2023). Tingle immunity can usually be "cured" by refraining from watching ASMR videos for a time or being exposed to a novel, more aggressive trigger (Lohaus, 2023). Studies have also suggested there are expectancy effects, or "placebo" effects, in the experience of ASMR (Lohaus, 2023).

ASMR is also used to describe the media content (videos, soundscapes, etc.) that is created to induce the sensation of ASMR. ASMR is largely transmitted through platforms such as YouTube, TikTok, or ASMR-specific Apps. ASMR videos receive millions of views online, and there are thousands of ASMR channels on YouTube with over 24 million subscribers (Swart et al, 2022). Large cooperations such as IKEA, Apple, and Mercedes-Benz have used ASMR-style videos in their advertisements to engage with a younger audience familiar with the trend. ASMR became widely known in 2019 when it was used in a beer commercial during the Super Bowl (Johnson, 2019). These videos usually depict someone speaking softly or whispering, typically directly to the camera, although there are some ASMR content creators who do not expose their face. ASMR videos typically use binaural recording techniques, which use two microphones to transmit the sound separate to both ears, to simulate the acoustics of a three-dimensional environment, eliciting in viewers and listeners the experience of intimacy and

realism. Common ASMR content includes role plays of getting a haircut or going to the doctor's office for a checkup. The person on the screen often offers a gentle, caring and empathic presence while virtually touching your face or coming close to your ear. Some ASMR content features ambient sounds, visual and auditory experience of tapping on wood with long nails, soft spoken affirmations, bible-reading, ear-to-ear whispering, and even simulations of EMDR, among others. The majority of "ASMRtists" (ASMR content creators) are usually women who empathically look into the camera, with videos simulating an experience of social connection and intimacy (Klausen, 2019). Prior studies do not report strong gender differences in ASMR ability, with some studies showing no statistically significant gender difference between responders and non-responders (McErlean & Banissy, 2018).

Consumers do not only watch ASMR to trigger the pleasurable ASMR sensations. The comment sections and forums claim that ASMR helps with relaxation, insomnia, chronic pain, loneliness, anxiety and depression (Barratt & Davis, 2015; Poerio et al., 2018). Many consumers of ASMR report that they watch ASMR videos for the above benefits although they do not feel the tingling sensation of ASMR. Many ASMR content creators remind their viewers through directly speaking on the subject or writing a disclaimer in the description of their content that ASMR is not a replacement for medical intervention or professional mental health counseling. In recent years, mobile applications have become the predominant method for digital mental health solutions. Apps such as Tingles and Whisper exclusively provide ASMR content for relaxation and sleep and include features such as being able to turn your phone off and keep the audio running for many hours for sleep. Digital health has the notion that it is more personal, accessible, equitable, reliable, impactful, and affordable than traditional means. Some digital health innovations are widely used by clinicians as a therapeutic tool. The UCLA Mindful app is

often used during counseling sessions for guided mediation or breathing exercises (Ben-Zeev et al., 2019). There are also many mHealth apps which claim to use EMDR techniques, such as EMDR+, EMDR 101 and iEMDR (Marotta-Walters et al., 2018).

A critique of such advancements in technology has been issues of privacy, regulation, lack of expertise and effectiveness. Many of these apps are under-regulated and under-supervised by certified professionals (Torous & Roberts, 2017). Associations that accredit these apps, such as the URAC (Utilization Review Accreditation Commission), Joint Commission and NCQA (National Committee for Quality Assurance) have differing standards for effectiveness and supervision. The extent to which these apps follow HIPPA guidelines to ensure data privacy is discrepant (Marotta-Walters et al., 2018). In terms of effectiveness, there is the question of whether more health data actually translates to better health outcomes. There are also psychological risks associated with these apps that involve misinterpretation of psychoeducational materials, inappropriate use of the materials in the app, and possible destabilization after recalling painful memories (Marotta-Walters et al., 2018; Torous & Roberts, 2017). For example, a counselor is trained to check-in with clients about how they understand information provided to them about a diagnosis or possible next steps. Clinicians who administer EMDR are trained to guide possible strong emotional reactions when clients are overwhelmed with disturbing memories elicited during EMDR treatment. Therefore, there is concern with vulnerable clients using these apps independent from the oversight of a clinician (Marotta-Walters et al., 2018). There is also the critique that these technologies undermine the relational aspect of therapy. Traditional psychotherapy, however, is also not without its limitations. E-mental health services are found to be particularly promising for certain subpopulations, such as rural communities, individuals with financial or language barriers, and those who avoid

treatment due to stigma (Tillfors et al., 2011). Tillfors et al. have demonstrated the effectiveness of using internet-based guided self-help program in the treatment of high school students with social anxiety disorder (Tillfors et al., 2011). The anonymity that internet-based programs afford may create great potential in delivering mental health services in ethnicity minorities, especially in those who experience lack of language-congruent care or cultural stigma about seeking mental health services (Zheng & Woo, 2017). YouTube (YTB), launched in 2005, has become the dominant global platform for video-based social media and app-based video consumption (Burgess & Green, 2018; Snelson, 2016). YTB offers users many options to share and consume in the form of a keyword-based search engine, embedded videos, a comment section, text-based messages to channel subscribers, highlights or short content. Health care professionals have criticized the platform for failing to censor incorrect opinions on health and mental health (Haslam et al., 2019). A study assessing the validity of health-related YTB videos found that non-evidence-based materials were more likely to be recommended by a YTB search (Haslam et al., 2019). YouTube (94%) and Facebook (75%) were identified in a study as the most commonly visited sites by young adults with a first episode of psychosis (Lal et al., 2015). YouTube disseminates information in the form of videos, rather than short text-based messages as employed by most Facebook and Skype users. With the goal of delivering mental health services to a greater audience, YouTube's video format certainly has advantages over others by allowing for simple uploading of recorded workshop content (Zheng & Woo, 2017). Many studies cite YouTube as a source of eHealth (Zheng & Woo, 2017).

There has been booming research on ASMR since 2015 in medical and psychology journals, with some in the field of business. These studies vary in the way ASMR is defined and measured. However, they are unified by a common understanding that the study of this topic is

of significant importance due to its popularity among the younger generation, as it may have implications for mental health of younger individuals or how the younger generation addresses and copes with mental health issues via mobile applications. Counselors and mental health professionals may also notice that ASMR seems to adapt certain aspects of therapeutic mechanisms, such as empathy, personal attention, a calm voice, informed consent, and even binaural brain stimulation. The importance in studying ASMR also lies in the fact that it may contribute to our understanding of individual variations in human perceptions of the social world, as only some individuals are able to experience ASMR. This study aims to introduce the concept that this individual variation in responses to visual and auditory stimuli may be understood as a difference in polyvagal responses, which is the result of altered nervous system states after potentially traumatic experiences or chronic stress. This is further bolstered by the reported co-occurrence between ASMR and misophonia, which is a condition where certain sounds (i.e. the sound of chewing) uniquely trigger negative emotional reactions in some individuals (Rouw & Erfanian, 2018). Perhaps the theory of sensorimotor psychotherapy, which is grounded in polyvagal theory and which considers the body and its sensations a way in to healing from past trauma, can help us conceptualize individual differences in our capacities to respond to stimuli such as ASMR.

Description and Critique of Scholarly Literature on ASMR

ASMR and Mental Health

Watching ASMR videos or experiencing ASMR has been shown to be positively correlated with the following: improved mood (Smejka & Wiggs, 2022), pleasant affect (Poerio et al., 2018), positivity and openness to experience (Fredborg et al., 2017), neuroticism (Fredborg et al., 2017), psychological stability (Lee et al., 2019), short-term improvement in

mood and chronic pain (Barratt & Davis, 2015), and mindfulness (Fredborg et al., 2017). It has been negatively associated with conscientiousness (Fredborg et al., 2017), agreeableness (Fredborg et al., 2017), extraversion (Fredborg et al., 2017), state anxiety (Eid et al., 2022), and mindfulness, producing contradicting results for mindfulness. Qualitative studies on ASMR show that consumers report ASMR as a reliable mindfulness tool and sleep aid (Woods & Turner-Cobb, 2023). One study reported that watching ASMR for one week did not improve mental health related outcomes, such as anxiety and depression (Ditchburn & Bedwell, 2019), whereas another study reported that watching ASMR for two weeks was related to reduced stress and anxiety (Park & Lim, 2022). Watching ASMR has shown to increase sleep or sleepiness (Wang & Li, 2020; Yusaira & Bennett, 2021) and decrease joy, love, thankfulness, and prayerfulness (Yusaira & Bennett, 2021). However, predictive outcomes in these studies may be dependent on whether the group was ASMR-responders or ASMR-non-responders or whether the content consumed was auditory-only or visual and auditory (multimodal). For example, cognitive absorption mediated the relationship between multimodal ASMR on mood and state mindfulness but only for visual-only unimodal ASMR (Kim & Lee, 2023). There are some studies that provide evidence of physiological correlates of ASMR, for instance, altered heart rate and skin conductance response when viewing ASMR videos in individuals that reported experiencing ASMR versus those who did not (Poerio et al., 2018). There is also neuroimaging work showing that ASMR experience is associated with neural correlates in brain regions associated with social cognition and self-awareness (Lochte et al., 2018; Smith & Kornelsen, 2021). Collectively, the evidence points to ASMR as an emerging sensory-affective experience with measurable psychological and physiological effects, though its benefits appear to depend on

personal susceptibility and the nature of the sensory input, warranting further investigation into its potential as a targeted regulatory tool.

Contributing valuable clarity to the mixed literature on ASMR's affective and physiological impact, Smejka and Wiggs (2022) conducted a large-scale study examining how ASMR influences mood and arousal across diverse symptom groups. The recent study (Smejka & Wiggs, 2022) surveyed a group of 1037 adults (267 males, 756 females, 14 'prefer not to say'). The researchers measured their insomnia, depression, mood, and arousal and divided the participants into four groups: those who had insomnia symptoms, those who had depressive symptoms, those who had both (Combined group), and those who had neither (Control group). They were also asked to watch a 2-minute ASMR video and categorized into two groups: Those who experienced ASMR and those who did not. Two 4 by 2 ANCOVAs were run to assess the effect of the symptoms and ASMR experience on changes in mood and arousal. Ratings of positivity towards the ASMRtist were used as a covariate to control for participants' conscious response to watching the video. There was a statistically significant main effect between symptom group and ASMR on change in mood and arousal. Specifically, participants who experienced ASMR had a significant improvement in mood and decrease in arousal, with those in the Combined group showing significant increase in mood and decrease in arousal compared to the other groups. These results are consistent with findings of others (Barratt & Davis, 2015; Poerio et al., 2018) which suggest that the experience of ASMR is related to increased positive mood and relaxation. This study specifically demonstrates that ASMR not only produces the opposite emotional response to misophonia but also has the opposite physiological effect—reducing arousal rather than increasing it, as misophonia does.

A recent experimental study by Park and Lim (2022) provides additional evidence that repeated ASMR exposure may influence anxiety, stress, and sleep quality. Park & Lim (2022) conducted an experimental study in South Korea where they asked 30 college students to watch ASMR videos every night before sleep for two weeks. The participants were mostly female-identifying and self-reported to not have any mental health problems. They were assessed for anxiety symptoms, stress, and quality of sleep before and after the intervention. Results showed a statistically significant decrease in anxiety and stress and an increase in quality of sleep (Park & Lim, 2022). Researchers of the study attributed these results to ASMR simulating white noise and theta and alpha brain waves, which promote relaxation in the parietal lobe, which processes sensory information (Park & Lim, 2022). Researchers discuss that ASMR sounds and visuals decrease arousal in the nervous system and relax the body, thereby inducing sleepiness (Park & Lim, 2022). The researchers also state that it induces sleep by allowing the consumer to focus on the content of the video, which provides an immersion experience that allows for thoughts to stop wandering before sleep (Park & Lim, 2022). The study stipulates that ASMR, like white noise, will possibly have positive effects on concentration for college students who may use ASMR for studying (Park & Lim, 2022). This study further links ASMR to our orienting response, which is a protective factor after a potentially traumatic event to focus our attention on producing a flow-like state.

By comparing ASMR experiencers with non-experiencers across emotional and neurological outcomes, Engelbregt et al. (2022) offer important insight into how ASMR differentially influences mood, heart rate, and EEG patterns. This study, conducted on a sample of 38 Dutch undergraduate psychology students who did not meet diagnostic criteria for any mental health disorder (33 female and 5 male), shows that those who experience ASMR

experienced decreased feelings of depression after watching an ASMR video (Engelbregt et al., 2022). Across groups of ASMR experiencers and non-experiencers, watching ASMR videos resulted in decreased heart rate. With respect to electroencephalogram (EEG) results, the current results indicate a decrease of alpha power after watching an ASMR video in individuals who experience tingles compared to individuals who do not experience tingles and an increase of beta power in the left temporal area irrespective of ASMR sensitivity after watching an ASMR video (Engelbregt et al., 2022). Research suggests that there is a relationship between increased beta power and immersion, which may be comparable with flow, a deeply absorbed state characterized by sustained attention (Lim et al., 2019). As flow may be necessary to achieve feelings associated with ASMR (Barratt & Davis 2015), ASMR experience could be accompanied with an increase in beta power. This increase may reflect improved focused attention. In a review by Travis & Shear (2010), focused attention was characterized by beta activity which appeared to increase during meditation. This idea is further supported by previous findings of elevated absorption in ASMR-experiencers, suggesting that the ability to get deeply immersed with the current experience substantially contributes to the experience of ASMR (McErlean & Osborne-Ford, 2020; Roberts et al. 2019).

ASMR Assessments

Responding to the need to develop quantitative measures to characterize and explain ASMR itself first, researchers have developed several measures. The ASMR-15 (Roberts et al., 2021), ASMR-Experience Questionnaire (AEQ; Swart et al., 2022), and the ASMR Trigger Checklist (ATC; Poerio et al., 2023) are assessments used to measure trait-ASMR. ASMR trait is the capability of experiencing ASMR generally rather than the propensity to experience ASMR at a given moment at a given intensity (Hostler et al., 2019).

ASMR-15

The ASMR-15 (Robers et al., 2021) measures propensity or likeliness to experience ASMR. Participants are asked 15 questions about their experience of ASMR and respond from 1 (completely untrue for me) to 5 (completely true for me). A higher score indicates greater ASMR response propensity. The 15 items are distinguished in 4 subscales, with 4 items measuring altered consciousness, 5 measuring sensation, 3 measuring relaxation, and 3 measuring affect. Altered consciousness includes items such as "I experience time distortions". Sensation includes items such as "I experience an unusual sensation in my head and body". Relaxation includes items such as "I find the experience calming". Affect includes items such as "The experience is blissful". The ASMR-15 (Robers et al., 2021) was administered to self-selected ASMR samples (online interest groups) and participants naive to ASMR (generalized sample). It was also administered on 100 undergraduate psychology students, the majority of whom were female. The ASMR-15 (Robers et al., 2021) demonstrated good internal consistency ($\alpha = .78$), consistent across subsequent studies ($\alpha = 0.90$ to 0.92). Altered consciousness reports a Cronbach's alpha value of 0.88, sensation reports a Cronbach's alpha value of 0.70, relaxation reports a Cronbach's alpha value of 0.78 and affect reports a Cronbach's alpha value of 0.66. However, ASMR-15 relies on retrospective self-reporting, and there is no clear data-driven cut-off score used to differentiate groups or sub-groups (Robers et al., 2021).

ASMR-Experience Questionnaire

In order to counter the limitation of the ASMR-15 (Robers et al., 2021), a new instrument was developed that sought to minimize the inaccuracies introduced through prolonged memory recall. The AEQ (Swart et al., 2022) introduced a method of assessment whereby the participants watch ASMR-inducing material so that they do not have to reflect on previous ASMR

experience with an unknown lag time. It also adopts a data-driven k-means cluster analysis to identify groupings instead of using arbitrary thresholds for sub-groupings of responders. The AEQ (Swart et al., 2022) aims to classify individuals into ASMR-responders (ASMR-Strong, ASMR-Weak) and ASMR-nonresponders (Control+, Control-, False-Positive), with False-Positive denoting atypical sensory responses to ASMR stimuli. The AEQ (Swart et al., 2022) does this by first showing five ASMR videos with a wide range of ASMR triggers and asking participants to report how pleasant and calm they found the video to be on a scale of -5 to 5, whether they experienced the ASMR sensation and to rate the intensity. Depending on the response, participants are grouped into five possible categories by a k-means clustering algorithm. Control + refers to the group of participants who do not experience the ASMR tingles but do feel relaxed. Control – refers to the group of participants who do not experience the ASMR tingles and find the videos unpleasant. False-Positive refers to the group of individuals who report tactile sensations which were unpleasant. Research shows that 46% of test-takers were strong ASMR responders, 29% were weak ASMR responders, 13% were Control +, 4.5% were Control – and 7.5% were false positives. The AEQ (Swart et al., 2022) was validated on the sample of 266 individuals, mostly females averaging the age of 24. No sample selection criteria were mentioned. Sixteen participants who provided incomplete responses or took too long (>2 hours) or too short (<20 min) to complete the questionnaire were excluded (Swart et al., 2022). Although these measures and others are adept at measuring individual differences in the propensity to experience ASMR, do not explicitly measure ASMR triggers.

ASMR Trigger Checklist

The ASMR Trigger Checklist (ATC; Poerio et al., 2023) is a 37-item scale that measures the individual differences in the number and intensity of ASMR triggers across auditory, visual,

and interpersonal stimulus domains. The ATC is unique compared to other existing measures of ASMR in that it aims to operationalize and assess ASMR experiences using a 'trigger' oriented approach. The ATC (Poerio et al., 2023) seeks to identify the core set of triggers that are implicit in instruments such as the ASMR-15 (Robers et al., 2019) and the AEQ (Swart et al., 2022). For example, the ASMR-15 asks individuals to rate their responses to "certain sounds, such as whispering, crinkling, tapping" (Robers et al., 2019) and the AEQ chooses pre-selected videos that include what are considered to be common triggers. While triggers are implicit in these scales it does not provide a comprehensive list of ASMR triggers and trigger categories.

The ASMR Trigger Checklist (Poerio et al., 2023) was developed by Poerio and others by referring to Fredborg et al., (2017)'s ASMR Checklist. Fredborg and authors developed this 14-item checklist by interviewing ASMR responders and gathering data from internet forums. Initially researchers proposed 16 triggers but later deleted 2 triggers, which were too specific ("watching others refill fountain pens" and "watching others sweep"), and many responders responded that they did not know whether it was a trigger, because of their lack of exposure to the unique situation. Principal components analysis suggested 5 possible factors of triggers: watching, touching, repetitive sounds, simulations, and mouth sounds. Poerio et al. (2023) revised the ASMR Checklist in several ways. They took 6 items directly from the checklist: whispering, chewing, scratching sounds (e.g., writing), make-up application, hair play, and massage. They devised an initial 31 item checklist, grouping triggers into 4 categories: visual, vocal auditory, non-vocal auditory, and tactile/interpersonal triggers. They introduce the possibility that online ASMR content is a simulation of real-world, naturalistic ASMR experiences. They suspect that touch-based or tactile triggers have been neglected in prior ASMR measurement tools, because of the digitally mediated nature of ASMR. The ATC (Poerio

et al., 2023) seeks to emphasize touch as a powerful trigger category. They sought to fix the underrepresentation of tactile triggers by giving tactile/interpersonal triggers their own category. They administered the original 31-item checklist to 90 self-reported ASMR-responders, who provided feedback about the triggers by responding to open-ended questions such as "Any comments about categories" and "Anything to add or remove?" Triggers which were suggested more than two times were added to the revised checklist per author's discretion. This process yielded 8 new triggers (Poerio et al., 2023).

The ATC (Poerio et al., 2023) categorizes ASMR triggers into four categories: tactile/interpersonal, vocal auditory, non-vocal auditory, and visual triggers. There are 37 triggers in total, which can be given a number between 1 to 6 based on the intensity of ASMR the trigger would induce for the individual. Individuals can also choose '0' if they do not experience ASMR from the trigger and 'Unknown' if they do not know. In any budding area of research, the development of reliable scales is important. Convergent validity was reported by examining correlations with other ASMR questionnaires such as the ASMR-15 (Roberts et al., 2019) and Flow to ASMR Scale (Barratt & Davis, 2015). Although the scale allows for scores in both intensity and trigger count, authors recommend ASMR intensity, rather than ASMR trigger count scores, to be a more reliable metric for propensity to experience ASMR (Poerio et al., 2023).

In a study where participants responded to the ATC (Poerio et al., 2023), the ASMR Experiences Questionnaire (AEQ; Swart et al., 2022), the ASMR-15 (Roberts et al, 2019), and the Flow-to-ASMR scale (Barratt & Davis, 2015), results showed that ATC trigger intensity was significantly positively correlated with the ASMR-15, all ASMR-15 subscales and the flow to ASMR scale (Table 1). Those with higher ATC intensity scoring higher on all other measures of

ASMR suggests that the ATC trigger intensity metric has a high degree of convergent validity. ATC trigger count was also significantly positively correlated with the ASMR-15 and the ASMR flow to ASMR scale, which also suggests a high degree of convergence for the ATC trigger count metric.

Table 1

Pearson's Correlations Between ATC Count and Intensity Scores and Other ASMR Instruments

		ASMR Trigger Checklist			
		Count		Intensity	
		r	P	r	p
	ASMR-15	0.20	0.016	0.42	<0.001
ASMR-15 Subscales	Altered Consciousness	Not reported	>.05	0.28	<0.001
	Sensation	0.20	<0.016	0.30	<0.001
	Relaxation	Not reported	>.05	0.40	<0.001
	Affect	Not reported	>.05	0.30	<0.001
	Flow to ASMR Scale	0.23	0.007	0.36	<0.001

Previous research that aimed to examine convergent validity of the ATC (Poerio et al., 2023) by conducting correlation analysis with openness to experience (Fredborg et al., 2018; McErlean & Banissy, 2017; Poerio et al., 2018), trait absorption (Roberts et al., 2019; McErlean & Osbourne-Ford, 2020), aesthetic experiences (Fredborg et al., 2018; Poerio et al., 2022; Roberts et al., 2019), and mindfulness (Fredborg et al., 2018; Poerio et al., 2022) found that ATC intensity was significantly positively correlated with openness to experience, trait absorption, aesthetic experiences, and the observing facet of mindfulness. ATC (Poerio et al., 2023) trigger count was also significantly positively correlated with trait absorption and aesthetic experiences but not with openness to experience or the observing facet of mindfulness. These studies were conducted on a

population of 295 participants who were mostly in their 30s, female and white identifying. However, since its creation in the year 2023, the instrument has not been tested on any other population and has not been tested for its latent structure.

Rather than aiming to model underlying psychological constructs, Poerio et al. (2023) explicitly conceptualized the ATC as a descriptive inventory intended to catalogue ASMR-eliciting stimuli. For this reason, the instrument was not designed as a latent-variable measure and cautioned against interpreting trigger categories as independent subscales, noting that such use could oversimplify the complex and overlapping ways in which ASMR is elicited. However, this does not reflect a lack of theoretical or empirical basis for modality-based distinctions in ASMR. Instead, it reflects a deliberate analytic choice by the authors of content mapping rather than construct modeling. This descriptive intent does not preclude subsequent psychometric evaluation of the ATC as a multidimensional measure, particularly when the research question shifts from cataloguing triggers to examining individual differences in sensory responsivity.

Within the broader ASMR literature, recurring evidence supports the conceptualization of ASMR as a multimodal sensory phenomenon involving distinguishable visual, auditory, and interpersonal or tactile domains (Barratt & Davis, 2015; Fredborg et al., 2017; Poerio et al., 2018). More recent research has stated that ASMR is triggered by gentle audio-visual stimuli and tactile elements, and that individuals vary greatly in which sensory modalities are effective (Greer et al., 2025; Liu et al., 2025). These studies consistently demonstrate that while ASMR triggers across modalities are highly correlated, they nonetheless form coherent groupings that align with established sensory and social-affiliative processing systems. These studies support conceptualizing multiple sensory domains rather than a single unidimensional trigger structure.

Misophonia

Sensory defensiveness is defined as a condition where individuals display oversensitivity and aversive reactions to certain sensory stimuli (e.g., tactile, auditory, olfactory) that are typically innocuous (Kinnealey, Oliver & Willbarger, 1995). Sensory defensiveness encompasses a broader range of sensory modalities (e.g., tactile, visual, olfactory), while misophonia is specifically related to auditory triggers. Only recently has there been a consensus definition of misophonia for research and clinical purposes as a 'disorder of decreased tolerance to specific sounds or stimuli associated with such sounds, known as "triggers", which evokes strong negative responses that are not seen in other people' (Campbell, 2023). Misophonia is a condition characterized by distress or anger to specific sounds, often described as "trigger sounds," which can include chewing, breathing, or tapping. Additionally, the emotional responses in misophonia are often more intense and focused on specific sounds compared to the more generalized discomfort seen in sensory defensiveness.

While the exact causes of misophonia are not fully understood, it is said to be associated with enhanced auditory, limbic, and autonomic nervous system neural connections (Jastreboff & Jastreboff, 2015) and affects 20% of the population (Wu et al., 2014) and up to 60% in people with tinnitus (Sztuka et al., 2010). Misophonia usually begins in childhood (Rouw & Erfanian, 2018) and is comorbid with PTSD (Erfanian, et al., 2019), obsessive-compulsive disorder (OCD), and related conditions (e.g., Tourette Disorder; Edelstein et al., 2013). It is suggested that an individual's previous negative experience with a sound may contribute to the distress experienced with continued exposure to the sound (Jastreboff & Jastreboff, 2015). There is a lack of research on misophonia, and only two clinical studies (Edelstein et al., 2013; Schroder et al., 2013) have been published to date. For example, literature shows inconclusive results about

gender differences in prevalence of misophonia, with some studies reporting greater symptom severity in females, and other studies reporting no statistically significant gender difference (McErlean & Banissy, 2018).

Manohar et al. (2023) showed that chronic stress caused an increase in sound over-responsivity and auditory cortex hyperactivity in rats. Hasson et al. (2013) found that sound sensitivity reflected in uncomfortable loudness levels significantly increased in a group of women after stress exposure. Emotional exhaustion was also negatively correlated with uncomfortable loudness levels in non-clinical participants (Wallen et al., 2012). Altogether, these studies support the idea that misophonia can be a result of enhanced sensory activity in certain individuals.

Misophonia has been increasingly conceptualized as a disorder of heightened autonomic responsivity, in which specific auditory cues evoke disproportionately strong sympathetic activation—such as increased heart rate, skin conductance, and muscle tension—or rapid shifts into defensive parasympathetic states (Kumar et al., 2017; Schroder et al., 2013). According to Polyvagal Theory, individuals vary in the stability and efficiency of their ventral vagal regulation, which governs the capacity to maintain social engagement and emotional regulation in the presence of stressors (Porges, 2011).

Misophonia is widely theorized to involve classical conditioning, in which specific auditory cues become paired with intense negative affect, autonomic arousal, or interpersonal conflict. Over time, neutral sounds—such as chewing, breathing, tapping, or throat clearing—acquire conditioned aversive meaning, triggering immediate physiological distress (Schroder et al., 2013). These reactions are then maintained and intensified through operant conditioning:

avoidance, suppression, or escape behaviors temporarily relieve distress, reinforcing the perception of the triggers as dangerous and strengthening the misophonic response. Thus, rather than habituating to the sound, individuals become more sensitized to it, with repeated pairings deepening the conditioned emotional response.

Neural entrainment refers to the brain's tendency to synchronize its oscillatory activity with rhythmic external stimuli. (Kumar et al., 2017) Misophonia triggers—often repetitive and temporally patterned sounds—may promote aversive neural entrainment, particularly in networks associated with threat detection, interoception, and autonomic arousal. Neuroimaging studies show that misophonia involves hyperactivation in the anterior insula, amygdala, and salience network when individuals are exposed to trigger sounds (Kumar et al., 2017). Repeated exposure strengthens these patterns, causing the brain to rapidly synchronize to—and escalate in response to—trigger-relevant auditory rhythms, increasing physiological arousal (heart rate, muscle tension, skin conductance) and emotional distress. Instead of leading to habituation, entrainment leads to increasingly rapid activation of defensive systems.

Some researchers (McGeoch & Rouw, 2020) have speculated that ASMR-response and misophonia are the result of atypical "synesthetic" cross-activation of the insula by the auditory cortex to generate the sense of wellbeing and euphoria described in the case of ASMR and unease in the case of misophonia. From this viewpoint, a genetic predisposition interacts with environmental factors (potentially traumatic experiences and/or chronic stress) to shape ASMR and misophonic responses that become more consistent, automatic and stronger over time as they are continuously triggered (McGeoch & Rouw, 2020). Therefore, ASMR can be further or better explained as an altered hypervigilant state in response to prior experiences. This idea is further bolstered by what we know about potentially traumatic experiences and the ways in which they

recalibrate the brain and alter our filtering system to only look at information relevant to survival.

Misophonia Assessment

While consensus of a definition of misophonia has been created (Campbell, 2023), it is an initial step in defining the disorder and clinical guidance on assessment is still lacking. Assessments of misophonia including the Misophonia Questionnaire (MQ; Wu et al., 2014), Duke Misophonia Questionnaire (DMQ; Rosenthal et al., 2021), and Amsterdam Misophonia Scale (A-MISO-S; Schroder et al., 2013), are used to assess symptoms specific to misophonia but are not an audiological assessment of misophonia. The MQ is a self-report questionnaire that assesses symptom presence, resulting emotions and behaviors and the severity of the sensitivity. The A-MISO-S (Schroder et al., 2013) is based on misophonia as a form of obsessive-compulsive disorder and is a self-report measure of the severity and type of symptoms of misophonia. The DMQ (Rosenthal et al., 2021) is unique because it captures the full biopsychosocial picture of misophonia including the following domains: Trigger frequency, Emotional responses, Physiological arousal, Behavioral responses, Functional impairment, Beliefs and appraisals, and Coping behaviors. It is also the most psychometrically advanced having undergone multi-stage development including qualitative item generation, factor analytic refinement, and multidimensional item response theory modeling. This breadth, combined with advanced structural modeling, clinical cut-scores, and strong convergent and discriminant validity results makes the DMQ (Rosenthal et al., 2021) more robust, useful, and psychometrically sophisticated than both the A-MISO-S (Schroder et al., 2013) and MQ (Wu et al., 2014).

Adverse Childhood Experiences (ACEs)

ACEs is a term coined by Felitti et al. (1998) who discovered that childhood abuse and household dysfunction are strongly correlated with negative health outcomes, such as death and mental health disorders. ACEs are defined as potentially traumatic events occurring in the first 17 years of life and are widely assessed using the 10-item ACEs Questionnaire developed as part of the original study. The seminal work by Felitti et al. (1998) is a large-scale study that followed over 17,000 participants. This measure was first created for use in primary care settings to assess the correlation between long-term health problems and childhood experiences before the age of 18 (Felitti et al., 1998). By this metric, childhood exposure to trauma is placed into the following categories: psychological, physical, sexual, and household dysfunction (Felitti et al., 1998). Household dysfunction is categorized by substance abuse, mental illness, mother being treated violently, and criminal behavior in the household (Felitti et al., 1998). In the original study, it was found that experience of ACES before the age of 17 was related to elevated risk of negative mental health outcomes such as depression, substance abuse, suicidal ideation and attempts, and other physical health ailments. Prior studies on ACES consistently report that females report higher ACES exposure overall, especially sexual and emotional abuse (Martin et al., 2023).

Since this publication, studies have confirmed the long-term negative health impact of ACEs, including socioeconomic consequences which exacerbate the cycle of disadvantage by causing toxic stress which impairs brain development and alters stress-response systems (Bellis et al., 2019). Research also shows that ACEs can lead to changes in the brain (Teicher et al., 2016). ACEs have shown to cause changes in the sympathetic nervous system (Danese & McEwen, 2012) and the parasympathetic nervous system (Porges, 2011). ACEs causes the amygdala to become overactive to a state of hypervigilance and exaggerated fear responses

(Bucci et al, 2016). It may also cause reduced volume in the hippocampus, which causes difficulties with learning, memory and regulating stress hormones (Bucci et al, 2016). The prefrontal cortex can also be underdeveloped or show reduced connectivity with the amygdala, impairing higher-order functions like impulse control, decision-making, emotional regulation and attention (Bucci et al, 2016). ACEs can also have an impact on the senses, resulting in heightened sensitivity or altered perceptions to sounds, touch, and pain (Groenewald et al., 2020). The ACEs framework is not without its limitations, as the 10-item questionnaire has been critiqued for excluding questions about other forms of trauma that are not related to abuse, neglect, and household dysfunction. Also, the efficacy of retrospective reporting of ACEs has also been called into question (Bethell et al., 2017; Cronhom et al., 2015).

Extensive evidence suggests that exposure to childhood adversity is associated with alterations in the functioning of the autonomic nervous system (Leitzke et al., 2015; Oosterman et al., 2010; Propper & Holochwost, 2013; Voellmin et al., 2015). Theories have been brought forward suggesting that prolonged exposure to adversity during sensitive developmental periods can modify the maturation of brain regions involved in stress regulation (Danese & McEwen, 2012; Lupien et al., 2009). Given that sensitive periods during which brain regions undergoing maturation are particularly vulnerable to stressors (Boyce & Ellis, 2005; Lupien et al., 2009), the timing of exposure may be important to examine. Potential sensitive periods have been identified for brain regions involved in vagal regulation, including the amygdala, and prefrontal cortex (Koenig, 2020; Teicher & Samson, 2016). Although there are no consistent cut-offs for these sensitive periods across studies, broadly speaking, the amygdala appears particularly sensitive to adversity during early childhood, whereas the prefrontal cortex is likely rather sensitive during adolescence (Andersen & Teicher, 2008; Gard et al., 2020; Humphreys et al., 2019; Pechtel et

al., 2014). Therefore, it is important to consider childhood exposure to adversity and its impacts compared to later life exposures.

As childhood adversity has been linked to alterations in structure and functioning of brain regions involved in vagal regulation (Teicher & Samson, 2016), it is likely that individuals with a history of adversity demonstrate alterations in sensitivity to external stimuli. While a number of studies show that experiences of childhood adversity are associated with alterations in baseline vagal activity and vagal reactivity to challenge, findings are mixed, revealing lower or higher reactivity or no significant association with childhood adversity (Busso et al., 2017; Wesarg et al., 2022). This inconsistency may be the result of the considerable heterogeneity in how childhood adversity has been defined and operationalized, and differences in study populations.

The measurement of childhood adversity may also yield differences in observed effects of childhood adversity on vagal regulation. Childhood adversity can be quantified by self-, parent-, or teacher-report (e.g., through questionnaires or interviews), or by extracting information from official records (e.g., from Child Protective Services). Official records or reports from parents/teachers only capture adversity that was reported, detected or documented. Many forms of abuse are undocumented, and anonymous self-reports allow for ease of disclosure (Hardt & Rutter, 2004). Tourangeau and Yan reviewed showed that questions about sensitive behaviors (e.g., abuse, sexual behavior) are prone to reporting errors and that confidentiality or anonymity improves disclosure in self-report surveys. (Tourangeau & Yan, 2007).

Theoretical Framework

Polyvagal Theory

Polyvagal theory emphasizes the role the autonomic nervous system (specifically the vagus nerve) plays in regulating health and behavior (Porges, 1995). The autonomic nervous

system (ANS) is the portion of the peripheral nervous system responsible for regulating involuntary physiological functions such as heart rate, respiration, and digestion, and Polyvagal Theory proposes that fluctuations in ANS state influence perception, emotional regulation, and behavioral responses (Porges, 2011). Created and developed by Stephen Porges, the theory describes the physiological and psychological states which underlie our behavior and individual differences. According to Porges (2011), humans constantly move among distinct physiological states—calm and socially engaged, mobilized for action, or immobilized—based on neuroception, the brain's unconscious detection of safety or threat cues.

The "vagal" in Polyvagal Theory refers to the vagus nerve, which is part of the parasympathetic nervous system. The vagus nerve serves as a bidirectional communication pathway between the brain and body, carrying sensory information upward and regulatory signals downward, making it central to emotional and physiological regulation (Porges, 2011). It is the longest cranial nerve in our body, which also connects to the central nervous system. Due to its widespread distribution throughout the thoracic and abdominal organs, the vagus nerve plays a key role in supporting homeostasis, stress recovery, and the regulation of arousal (Porges, 2007).

The "poly-" prefix means "many," highlighting the idea that the vagus nerve has multiple branches with distinct functions. Porges (2011) suggests that these branches evolved hierarchically, reflecting different adaptive survival strategies—ranging from social engagement to fight-or-flight to shutdown—depending on environmental demands. The three branches are the Dorsal Vagal Complex, the Sympathetic Nervous System, and the Ventral Vagal Complex. Each branch supports a unique pattern of behavioral and physiological responses: sympathetic activation prepares the body for mobilization, the dorsal vagal pathway supports immobilization

or shutdown states, and the ventral vagal pathway enables prosocial behavior, calmness, and connection (Dana, 2018; Porges, 2011).

This theory is useful in understanding how traumatic exposures impact the body as well as the mind, by positing that experiences of trauma cause people to be stuck in the dorsal vagal complex, leading to immobilization, disconnection, and hopelessness. Trauma researchers note that chronic or overwhelming stress can shift individuals into a dorsal vagal state characterized by emotional numbing, dissociation, and physiological collapse—responses understood not as voluntary behaviors but as adaptive defensive mechanisms (van der Kolk, 2014; Porges, 2011). By framing trauma reactions as survival states mediated by the autonomic nervous system, Polyvagal Theory provides a neurobiological explanation for the patterns of withdrawal and shutdown frequently observed in trauma survivors (Dana, 2018).

Our brain is a complicated, multifaceted, and mysterious organ that drives our behavior. The left hemisphere is responsible for explicit verbal processing, while the right hemisphere is responsible for implicit emotional and body processing (Porges, 1995). Our autonomic nervous system is called autonomic because it works mostly without our control. It allows us to breathe, digest, and make blood cells without our conscious awareness. It is also constantly discerning risk without involving the thinking parts of our brain. According to Porges, it is the pre-linguistic right side of the brain that dominates human behavior. This means that explicit verbal language does not always explain how humans react to their environment. In this light, a limitation of talk therapy may be that it focuses heavily on attending to and interpreting the cognitive processes of the client manifested in their narrative processes. Following the notion that humans do not only have a soul but also a body, there are psychotherapeutic treatment avenues that go beyond linguistic communications (Porges, 1995). Some theories of treatment seek to maximize clinical

efficacy by attending also to the implicit, non-verbal processes of bodily senses in alternative schools of thought, such as sensorimotor approaches. This paradigm focuses on the underlying language of the body as the dominating force for human action and reaction.

We, as humans, are often unaware of our own bodily sensations because our attention is on other things or because we have learned to disconnect from our bodies (van der Kolk, 2014). Early experiences, although we do not remember them, shape our sensory, motoric, and somatic systems, such as sounds, smells, and feelings (van der Kolk, 2014). Trauma first stimulates our bodies by invoking an intense physical survival response in our amygdala and hippocampus, which are part of the midbrain structure associated with emotion and memory (van der Kolk, 2014). When we cannot successfully fight back or run away, our bodies freeze and become numb to protect us from the trauma (van der Kolk, 2014). The problem is that we may continue to overreact or underreact to stimuli even when our environment no longer requires it, because our nervous system has become dysregulated by potentially traumatic experiences or chronic stress (van der Kolk, 2014). Many individuals who have experienced trauma feel disconnected or distant from their bodies (Porges, 1995). A temporary disconnection from the body can be adaptive at the time of trauma to distance ourselves from the pain, but we may continue to disconnect in anticipation of pain, as our autonomic nervous system's risk detection system has become faulty due to this disconnect. When we are not connected with our bodies, we ignore and discount physical sensations, and it becomes more difficult to be aware of the messages our body sends us (Porges, 1995). Potentially traumatic experiences in the early years continually remind us as adults that the world and our bodies within the world are unstable, unsupported, and unsafe. Especially when our bodies have been the object of the trauma in the form of constant criticism, abuse, or injury, it becomes harder for us to feel at home and have a deep connection with our

bodies and those around us. Because protection supersedes connection, constantly living in a survival state becomes the reality for some who have experienced traumatic experiences. This hypervigilance in the survival state is debilitating and often dysfunctional strategies, such as substance use, are used to cope. Polyvagal Theory encourages individuals to heal from past trauma by slowly reconnecting and regulating their nervous system by drawing upon their physical movement and sensations (Fisher & Ogden, 2009).

A lesser known but integral tenet of Polyvagal Theory is the concept of the orienting response (Porges, 1995). We orient to find out more about a stimulus so that we can assess whether we need to move away because it is a threat or move towards because it will meet our needs. Accordingly, we are continuously and unconsciously assessing to take the appropriate actions for our survival. Past trauma has a powerful consequence on what we orient our attention towards in the present. To better protect ourselves, our psyche automatically orients us towards reminders of the past. Some individuals, when triggered by reminders of the past, experience disturbing bodily sensations, smells or sounds or movement impulses (Fisher & Ogden, 2009). In this way, past trauma can be a cause for involuntary and inconsistent bodily reactions to harmless stimuli. It is this sensitivity to stimuli that may be the key to understanding individual differences in physiological reactions to sounds, touch and visual triggers as is the case with ASMR Triggers.

Sensorimotor Psychotherapy

A fundamental tenet of polyvagal theory is the neuroplasticity of the brain, or the brain's capacity for change. The mind is able to become more adaptive and build new mental capacities by strengthening synaptic linkages when new experiences are created (Siegel, 2007). This means that the brain can actually change for the better in response to the practice of novel actions.

Therapeutic techniques leverage this mechanism to provide an opportunity for individuals to engage the neuroplasticity of their brains. Pat Ogden (2009) provides a theoretical framework for one such understanding. Sensorimotor Psychotherapy, developed by Ogden (2009), is a body-centered approach that integrates somatic therapy with cognitive and emotional approaches. Directed mindfulness, a sensorimotor psychotherapeutic technique grounded on the orienting response, is the practice of bringing awareness to the specific building blocks which help us feel better and calmer (Fisher & Ogden, 2009). It not only helps us develop new patterns but also can decrease activity in the parts of the brain that register distress. Therefore, the act of directed mindfulness itself can settle upsetting feelings (Fisher & Ogden, 2009). Directed mindfulness is particularly recommended for those who find it difficult to alter their automatic and physical reactions or control their orienting response. The act of purposely focusing our attention on particular thoughts, feelings, movements or sensations to create neural firing patterns which integrate different parts of the brain (Siegel 2010; Ogden 2007) may elicit the ASMR experience. ASMR may be a practice of directed mindfulness in that it fires the synaptic linkages to restructure the parts of the brain that have been disconnected. Therefore, this practice can be especially helpful for individuals who have experienced potentially traumatic experiences and chronic stress.

Fisher and Ogden's (2009) concept of *directed mindfulness* elicits experiences similar to ASMR because both involve sustained attention to subtle bodily sensations that generate a sense of soothing or pleasure. Directed mindfulness cultivates interoceptive awareness, enabling individuals to notice micro-sensations—temperature shifts, tingles, soft vibrations—without judgment, a process linked to improved emotional regulation (Khalsa et al., 2018). This focus on gentle internal cues activates the ventral vagal system, facilitating autonomic settling and a felt

sense of safety (Porges, 2011). ASMR similarly relies on perceiving delicate sensory stimuli, such as soft sounds or slow movements, which evoke tingling or warmth, responses associated with decreased heart rate and relaxation (Poerio et al., 2018; Fredborg et al., 2021). Because both directed mindfulness and ASMR engage slow, predictable, parasympathetically oriented sensory pathways, they may function as bottom-up regulation strategies that help modulate physiological arousal (van der Kolk, 2014). Repeating and recreating the ASMR experience may therefore help bring arousal back into a person's window of tolerance—the optimal zone of autonomic functioning—thereby decreasing dysregulated reactions (Siegel, 2007; Ogden et al., 2006). In this sense, ASMR may represent an accessible pathway to autonomic downregulation for individuals who benefit from sensory-based regulation strategies.

Implications of Framework in this Study

Misophonia and ASMR are two auditory phenomena that elicit strong but opposing emotional and physiological responses to everyday sounds. Whereas misophonia is marked by involuntary anger, distress, or autonomic arousal in response to specific trigger sounds, ASMR reliably induces pleasant tingling sensations, positive mood, and relaxation. Although conceptually opposite, research shows that the two conditions frequently co-occur (Barratt et al., 2015; McErlean & Banissy, 2018; Rouw & Erfanian, 2018), suggesting that they may share underlying sensory or affective mechanisms. Both can therefore be understood as atypical responses in mood and arousal in which ordinary auditory cues generate disproportionately strong emotional reactions.

A growing body of research suggests that individual differences in sensory processing and interoception may help explain ASMR and misophonia. Poerio and others (Poerio et al., 2022) found that people who experience ASMR demonstrate greater interoceptive sensitivity,

heightened bodily awareness, and stronger responsiveness to sensory input than non-responders. These findings support the hypothesis that ASMR may arise from a form of enhanced sensory-affective processing, and that ASMR responders may possess a distinctive physiological profile that shapes how they engage with sensory stimuli.

Building on these insights, this study considers the possibility that ASMR responsiveness reflects an altered pattern of nervous-system functioning shaped by prior experiences, potentially including chronic stress or trauma. For such individuals, the recurrent use of ASMR videos may operate as an unconscious self-regulatory strategy. By repeatedly eliciting pleasurable tingling sensations, ASMR may activate the same neural circuits over time, thereby engaging neuroplastic processes that reinforce calmer or more regulated patterns of responding. In this view, ASMR seeking could represent an attempt to reorganize habitual patterns of arousal through repeated exposure to soothing sensory cues.

Polyvagal Theory and sensorimotor psychotherapy posit that healing begins with cultivating mindful awareness of familiar physiological responses and then intentionally shifting attention toward cues that generate more adaptive or pleasurable states (Ogden et al., 2006). ASMR shares this attentional structure: responders frequently describe the intense, focused concentration needed to induce tingles (Smejka & Wiggs, 2018), and research suggests that ASMR intensity can be enhanced through mindfulness practices (Campo & Kehle, 2016). Personality and neurobiological findings further support this connection. ASMR sensitivity has been linked to decreased connectivity between frontal regions and sensory-attentional areas (Smith et al., 2017), as well as to openness to experience (Fredborg et al., 2017), heightened fantasizing (McErlean & Banissy, 2017), and elevated mindfulness (Fredborg et al., 2018). These patterns point to deep interrelationships between ASMR, attentional engagement,

interoceptive awareness, and the ventral vagal complex—the system responsible for social engagement, emotion regulation, and physiological calming.

The theoretical background of polyvagal theory suggests that unique bodily experiences are related to our past experiences. According to this outlook, negative experiences can change our bodies and contribute to a heightened nervous system, which increases sensitivity and responsivity to the environment. Misophonia and trait ASMR both may be a result of potentially traumatic experiences and chronic stress and its effect on the nervous system. Therefore, further illumination on the relationship between the two is important to understanding the polyvagal response and the implications for ASMR for the mental health field.

Summary

The research gap on ASMR includes conflicting results on the relationship between ASMR and misophonia and assessments on ASMR trigger types that have not been validated extensively. There are also no known age or other demographic differences in ASMR response, trigger types, or intensity. The present study serves to fill this knowledge gap by contributing to the literature regarding ASMR, and its use in understanding individual differences in the autonomous nervous system as a response to potentially traumatic events and chronic stress. The literature on ASMR reveals evidence supporting the positive impact of ASMR on improved mental health outcomes. The literature introduces instruments used to measure propensity for ASMR, including the ATC (Poerio et al., 2023). Misophonia has been studied as a neurological condition and can be considered an antithesis to ASMR in its emotional effect. The literature reveals significant association between misophonia and other mental health issues. Misophonia has also been shown to co-occur with ASMR. Several instruments were used to measure misophonia, with the DMQ (Rosenthal et al., 2021) being the most recently developed

instrument and more comprehensive compared to others. The literature on ACEs (Felitti et al., 1998) were also explained, including the history and appropriate usage of the ACEs Questionnaire. Polyvagal theory provides a framework for understanding both ASMR and misophonia as an orienting response to a stimulus which reminds us of our past experiences, such as adverse childhood experiences, which can be alleviated by the neuroplasticity of the brain with directed mindfulness.

CHAPTER 3: METHODS

This chapter describes the methods used to explore research questions. The aim of this study is to explore the validity of the ASMR Trigger Checklist among English-speaking adults to assess its utility in future ASMR research. This section will discuss what the research questions are, what the author hypothesized the results to be based on the literature, information about the participants, ethical considerations, instruments used, the procedure of the study, and statistical analyses conducted.

Research Questions

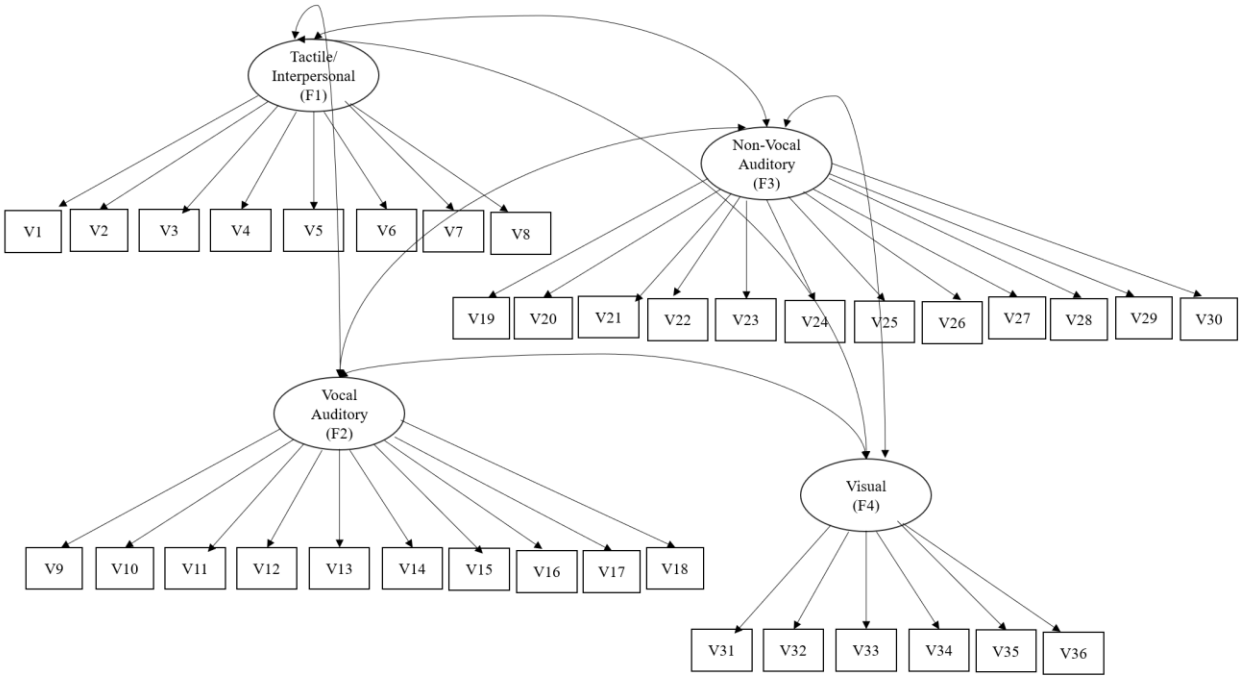
1. Does the four-factor structure of the ASMR Trigger Checklist (ATC) fit the observed data?
2. How do the four factors of the ATC (as identified by the ATC in R1) correlate to ASMR Trigger Intensity, Misophonia Symptom Severity and Adverse Childhood Experiences (ACEs)

Hypotheses

1. The four-factor structure of the ASMR Trigger Checklist will best fit the observed data.
2. The composite scores of the four factors of the ATC (as identified by the ATC in R1) will be statistically significantly correlated with ASMR Trigger Intensity, Misophonia Symptom Severity and ACEs.

Figure 1

Factor Structure of the ASMR Trigger Checklist



Participants

The overall population being measured were ASMR-responder and non-responder adults. The sample consists of English-speaking adults (18+ years old) who have access to the internet. Individuals must have been 18 years or older to participate by completing the assessments and the demographics questionnaire. Participants were asked their age in years, and none reported a number 17 or under. Participants were recruited online via Reddit, Amazon Mechanical Turk (MTurk), and Email. Investigator solicited participants on ASMR Reddit platforms such as "r/misophonia" and "r/asmr". There was some engagement with the post in Reddit as evidenced by direct comments on the post. While some comments made on the open-ended questions in the

survey revealed that more than one participant was a Reddit user, it is unsure how many participants in total came from Reddit. Investigator also emailed listservs such as CESNET, which is a moderated listserv concerning counselor education and supervision.

Amazon Mechanical Turk (MTurk) is a crowdsourcing marketplace that allows individuals to post surveys and compensate those who complete them. MTurk has been widely used in research and by companies looking for consumer information. MTurk has been shown to provide data comparable to traditional samples (Buhrmester et al., 2011). Investigator did not require participants to be physically located in the United States. To enhance data quality, the investigator required prior high internal performance ratings for individuals to access the survey. There were 213 total responses to the survey in MTurk.

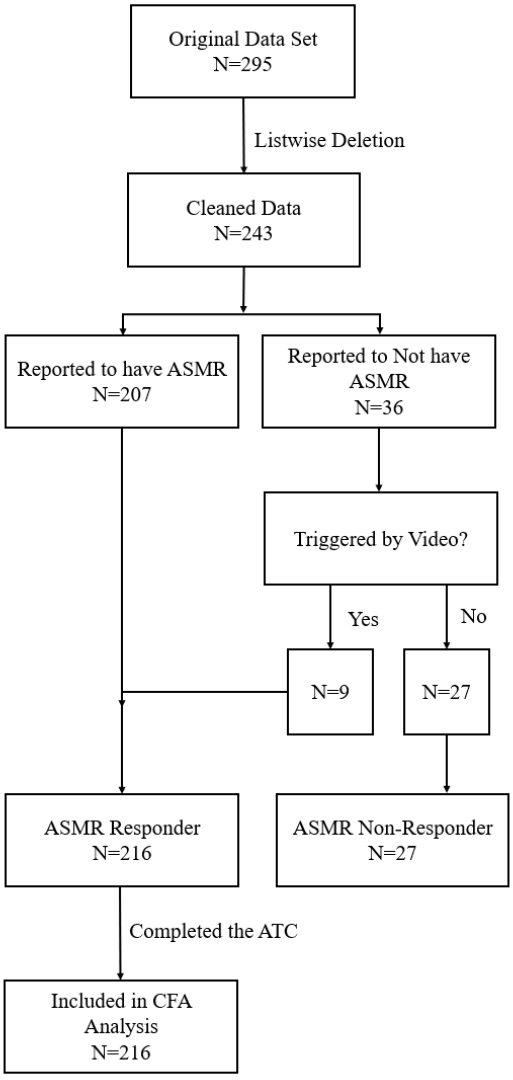
To determine the appropriate sample size for a Confirmatory Factor Analysis (CFA) of a 37-item instrument with four latent factors, common guidelines suggest a participant-to-item ratio of 5:1 to 10:1 (Bentler & Chou, 1987; Kline, 2016). For 37 items, this would suggest a sample size between 185 and 370 participants. However, given the complexity of models with multiple latent factors, researchers typically recommend a minimum of 250 to 500 participants to ensure stable factor loadings, reliable parameter estimates, and adequate model fit (Kline, 2016). Based on these recommendations, a more conservative approach would suggest aiming for 250 to 500 participants, with a preference for larger samples. The total number of times the survey was completed on Qualtrics was 295.

The raw data was used for analysis to estimate the composite scores (Latent variable scores) rather than a covariance matrix. Data was missing at random. For handling missing data, listwise deletion was used to exclude cases with missing values to preserve the data structure (Seaman & White, 2020). Listwise deletion was used to drop all cases with any missing data for

analysis. This was done by filtering only finished surveys and any cases with a missing data point. The investigator also viewed the distribution of the validity question (Which of the following is not a day of the week?) and deleted the ones that did not answer correctly, eliminating 52 cases. After data cleaning, the total number of participants in the data was 243. Since only ASMR-responders completed the ASMR Trigger Checklist, 216 participants were included in the Confirmatory Factor Analysis (Figure 2).

Figure 2

Flow Cart of Sample Size Reduction



Demographic variables, such as age, gender, ethnicity, and socioeconomic status were measured and are illustrated in Table 2. Participants were also asked additional questions regarding their use of mobile health apps and past mental health diagnoses. The demographic questionnaire included a question to gather the respondent's age at the time of survey completion. Age was measured as a continuous variable as participants were asked to input their age in years manually. Participants (N = 243) had a mean age of 41.96 years (SD = 10.71). Age groups were as follows: 18–29 years (7.8%), 30–39 years (36.2%), 40–49 years (27.6%), 50–59 years (12.3%), 60–69 years (6.2%), 70–79 years (1.6%), and 8.2% did not report their age.

Gender was measured as a categorical variable with three response options: Male, Female, and Other. Gender was dummy coded into two binary variables, using Male (1) as the reference category. Regarding gender, 50.2% identified as male, 41.6% as female, and 0.4% as another gender identity.

Ethnicity was measured categorically as there were the following options: 1) American Indian or Alaska Native, 2) Asian, 3) Black or African American, 3) Hispanic, Latino or Spanish Origin, 4) Middle Eastern or North African, 5) Native Hawaiian or Other Pacific Islander, 6) White, 7) Multiethnic, 8) Other. In terms of ethnicity, participants identified as Asian (36.2%), White (45.3%), Black or African American (4.5%), Hispanic/Latino (2.9%), Middle Eastern or North African (1.2%), American Indian or Alaska Native (0.4%), and Multiethnic (0.8%). No participants identified as Native Hawaiian or Pacific Islander. An additional 1.6% selected "other," and 7.0% did not report their ethnicity.

SES was measured by yearly income. Income is one SES indicator widely used in research. Research shows that income captures material resources, purchasing power, and exposure to economic stressors more directly than other SES indicators. Income correlates

moderately to strongly with education and occupational status (Krieger et al., 1997; Entwisle & Astone, 1994). These relationships demonstrate that income captures a substantial portion of overall socioeconomic position even when measured alone. Unlike subjective SES or categorical occupation codes, income provides a continuous, quantifiable measure with high differentiating power across individuals and populations, which makes it highly useful in statistical models (Diemer et al., 2013). Participants were asked to report their yearly salary in USD, as participants were recruited from the United States. Yearly salary was used instead of monthly salary to consider seasonal or contract workers. Responses were required to be in numeric form. Annual income levels, entered by participants as continuous, were subsequently categorized as follows: less than $15,000 (18.5%), $15,000–39,999 (20.2%), $40,000–64,999 (17.3%), $65,000–113,400 (18.1%), and above $113,400 (18.5%); 7.4% did not report income. Obvious errors, such as "$30" instead of "$30K" for annual income were accounted for.

Table 2

Sociodemographic Characteristics of Participants

Variable	M	SD	n (%)
Age	41.96	10.71	
Gender			
Male			122 (50.2)
Female			101 (41.6)
Other			1 (0.4)
Missing			18 (7.8%)
Race/ Ethnicity			
American Indian or Alaska Native			1 (0.4)
Asian			88 (36.2)

Black or African American			11 (4.5)
Hispanic, Latino or Spanish Origin			7 (2.9)
Middle Eastern or North African			3 (1.2)
Native Hawaiian or Other Pacific Islander			0 (0)
White			110 (45.3)
Multiethnic			2 (0.8)
Other			4 (1.6)
Missing			17 (7.0)
Income	74406	102104	

Ethical Considerations

This study received an exemption from the Institutional Review Board at George Washington University (NCR256537). A study is registered as exempt when it poses less than minimal risk to subjects. Minimal risk involves harm that is not greater than those ordinarily encountered in daily life. The content of the survey was non-invasive and posed no more than minimal risk, equivalent to everyday digital media exposure. The questions in the survey are those that may be ordinarily encountered in daily life. They were sent a link in which they could read about the study, provide informed consent, watch a 1-minute video to determine ASMR responder status, and complete the survey. The video chosen was a widely viewed video with no vulgar or explicit content. The ASMR video was chosen with the following criteria 1) short in duration 2) low-intensity and 3) high in viewership. The video chosen is publicly available, widely accepted (over 2 million videos and 80K likes), no talking, and does not include

potentially sensitive triggers such as role-plays, sexually explicit content, or content that alludes to violence, etc. A paragraph that provides resources the participants can contact if they feel discomfort was included at the end of the survey. The resources given (hotline numbers and a resource to find a therapist) were up-to-date and state-wide.

Other ethical considerations include de-identification of human subjects' data to minimize risks to privacy. No identifying information (such as personal email, name, address, IP address) was gathered about participants. IP tracking was disabled in Qualtrics and MTurk. The researcher provided personal contact information to be reached within 1 business day should there be any concerns or inquiries about the study. Data was stored on the secure, password-protected Qualtrics account and password protected personal computer. Anonymous responses were coded with subject numbers.

All participants electronically acknowledged reading the informed consent to participate before proceeding with the study. When Amazon Mechanical Turk (MTurk) was used, only standard compensation was offered in line with platform norms to ensure fairness and reduce undue influence. To avoid coercion or undue influence, all recruitment materials clearly stated that participation is completely voluntary and that participants can withdraw from the study at any time without penalty by clicking out of the browser. Potential participants were contacted via public platforms (e.g., email, Reddit, YouTube comment sections, blogs) and invited to participate through neutral language that does not pressure or persuade. The survey did not have a time limit, allowing individuals to take as much time as they need before providing consent. Estimated completion time was stated up front (e.g., 10 to 15 minutes) to help participants plan accordingly.

Measures

The ASMR Trigger Checklist (ATC), Adverse Childhood Experiences (ACES) Questionnaire, and the Duke Misophonia Questionnaire (DMQ) were chosen to measure the variables of interest. While these variables are adequate in answering the research question, in light of polyvagal theory, confounding variables may be present. For this reason, demographic variables were also measured to identify the correlational effect of participant characteristics on the variables of interest.

ASMR Trigger Checklist

The ASMR Trigger Checklist (ATC) is a 37-item checklist developed by Poerio et al., (2023) to measure individual differences in the frequency and intensity of response to certain categories and items of ASMR triggers. It addresses other ASMR instruments' over-reliance on audio-visual ASMR stimuli by emphasizing tactile and interpersonal triggers. The ATC seeks to identify the core set of triggers an individual responds to and provides a more comprehensive list of triggers compared to prior instruments. The ATC provides the following scores 1) Responder Type 2) Trigger Count and 3) Trigger Intensity.

Responder Type

The ATC first explains ASMR and asks whether the individual believes they can experience ASMR in order to screen for ASMR-responder status. If an individual answered "yes" to this yes-or-no question, the ATC can be administered. However, this type of categorization includes a high risk for false negatives, especially among individuals who are not familiar with ASMR. Some individuals may have the propensity to experience ASMR but are not familiar with the concept or have not yet had exposure to ASMR content. In order to filter

out these false negatives, the researcher added a second question to determine responder type. If a respondent answered “no” to the yes-or-no question, they were prompted to watch a 1-minute video of ASMR triggers. Following the video, the respondent was asked whether they experienced ASMR while watching the video. If they responded “yes” they were sorted into the ASMR responder category. Only ASMR responders were given the rest of the ASMR Trigger Checklist items (Poerio et al., 2023). Results showed that 85.2% of participants reported that they had the ability to experience ASMR (n=207). Of the 14.8% (n=36) that reported that they did not have the ability, 25% (n=9) reported that they experienced ASMR while watching the video. Therefore, 216 individuals were sorted into the ASMR-responder category. These proportions indicate the possibility that participants were more likely to respond to the survey if they were knowledgeable about ASMR. Only individuals who identified as ASMR-responders were given the ASMR Trigger Checklist and included in the Confirmatory Factor Analysis.

Trigger Count

Trigger count can be scored by the total number of endorsed triggers out of 37. The instrument categorizes ASMR triggers into four categories: tactile/interpersonal (8 items), vocal auditory (10 items), non-vocal auditory (12 items), and visual triggers (7 items). There are 37 triggers in total, which can each be given a number between ‘1’ to ‘6’ based on the intensity of ASMR the trigger would induce for the individual. Individuals can also choose ‘0’ if they do not experience ASMR from the trigger and ‘Unknown’ if they do not know. If an individual responded between ‘1’ and ‘6’for an item, they were given 1 count score for that item. Respondents could receive a trigger count score between 0 and 37. Items 31, 35 and 36 were edited for minor grammatical consistency with other items in that category (Poerio et al., 2023).

Trigger Intensity

Trigger intensity can be scored by taking the average intensity score (on a range of 0 to 6) across all 37 triggers, with "Unknown" responses recorded as 0. Range of possible trigger intensity scores were a minimum score of 0 and a maximum score of 6. Authors of the scale reported that ASMR Trigger Intensity, rather than ASMR Trigger Count, should be used to determine one's general propensity for ASMR (Poerio et al., 2023). Higher scores indicate higher propensity for ASMR.

Psychometric Properties of the ASMR Trigger Checklist

Tactile and Interpersonal triggers (F1) were touch mediated or close up social interaction stimuli, such as "Eye Contact" and had reported a Cronbach's Alpha value of 0.83. Vocal Auditory triggers (F2) were auditory stimuli produced by the human vocal tract, such as "Breathing" and had a Cronbach's Alpha value of 0.88. Non-Vocal Auditory triggers (F3) were auditory stimuli, such as "Tapping sounds" and had a Cronbach's Alpha value of 0.76. Visual triggers (F4) were predominantly visual stimuli, such as "Delicate hand movements" and had a Cronbach's Alpha value of 0.78. The overall reliability was Cronbach's Alpha value of 0.90. The ATC reports strong test-retest reliability. A study on endorsed ASMR triggers over a 5-month period shows that 84% of endorsements remained the same over time (Poerio et al., 2023). In this study, internal consistency for each subscale was also evaluated using Cronbach's Alpha. Results indicated strong to excellent reliability across all four factors: F1 ($\alpha = .86$), F2 ($\alpha = .91$), F3 ($\alpha = .93$), and F4 ($\alpha = .91$).

Adverse Childhood Experiences Questionnaire for Adults

The 10-item Adverse Childhood Experiences (ACE) Questionnaire for Adults, also known as the ACE-10, is a tool developed for the original ACEs study (Felitti et al., 1998) and is used to identify and assess the impact of traumatic events experienced before the age of 18. In creating this instrument, Felitti and colleagues (1998) adopted questions from previous scales. Questions used to define emotional abuse, physical abuse, and growing up with domestic violence were adapted from the Conflict Tactics Scale (CTS; Straus, 1979). Questions on emotional and physical neglect were adapted from the Childhood Trauma Questionnaire (CTQ; Bernstein et al., 1994). The 10-item questionnaire covers ten types of childhood trauma, which fall into three categories: abuse (3 items), neglect (2 items), and household dysfunction (2 items). Each item of adverse experience is given a score of 1 if it was experienced and 0 if it was not. The scores are then summed to produce a single composite ACE score, which ranges from 0 to 10. Higher scores indicate a higher number of adverse experiences during childhood (Felitti et al., 1998). Anda and others (2006) reported a Cronbach's alpha coefficient of 0.81 for this instrument.

The highest endorsed Adverse Childhood Experience was swearing, insult or a put-down by an adult in the home (n=92, 37.9%). The second highest was living with someone who was mentally ill (n=68, 28%). Table 3 shows the endorsement patterns across the ten ACE items. Overall, the pattern suggests that this sample experienced relatively high rates of emotional abuse, household mental illness, parental substance misuse, and physical abuse, while adversities such as incarceration or sexual abuse were less prevalent but still present. The number of "yes" (endorsed items) were summed for each person to create a frequency value for each person, called the composite ACEs score. A total of 80 individuals (32.9%) endorsed experiencing no

adverse childhood experiences. The average number of adverse childhood experiences endorsed in the sample was 2.55 (SD=1.38).

Table 3

ACEs Endorsement in the Sample

Item Number	Adverse Childhood Experience	Endorsed n (%)
1	Did you feel that you didn't have enough to eat, had to wear dirty clothes, or had no one to protect or take care of you?	41 (16.9%)
2	Did you lose a parent through divorce, abandonment, death, or other reason?	61 (25.1%)
3	Did you live with anyone who was depressed, mentally ill, or attempted suicide?	68 (28%)
4	Did you live with anyone who had a problem with drinking or using drugs, including prescription drugs?	69 (28.4%)
5	Did your parents or adults in your home ever hit, punch, beat, or threaten to harm each other?	61 (25.1%)
6	Did you live with anyone who went to jail or prison?	23 (9.5%)
7	Did a parent or adult in your home ever swear at you, insult you, or put you down?	92 (37.9%)
8	Did a parent or adult in your home ever hit, beat, kick, or physically hurt you in any way?	66 (27.2%)
9	Did you feel that no one in your family loved you or thought you were special?	50 (20.6%)
10	Did you experience unwanted sexual contact (such as fondling or oral/anal/vaginal intercourse/penetration)?	38 (15.6%)

Duke Misophonia Questionnaire

The Duke Misophonia Questionnaire (DMQ; Rosenthal et al., 2021) is a self-report measure of misophonia that was validated with exploratory factor analysis and convergent validity testing with existing misophonia scales. While previous measures focus on assessing the nature of negative symptoms as a result of misophonia, the DMQ looks comprehensively at the processes that occur in response to misophonic cues in the areas of affective, cognitive, behavioral, and physiological functioning. It also assesses individual efforts to cope with misophonia and how it affects one's self-concept (Rosenthal et al., 2021).

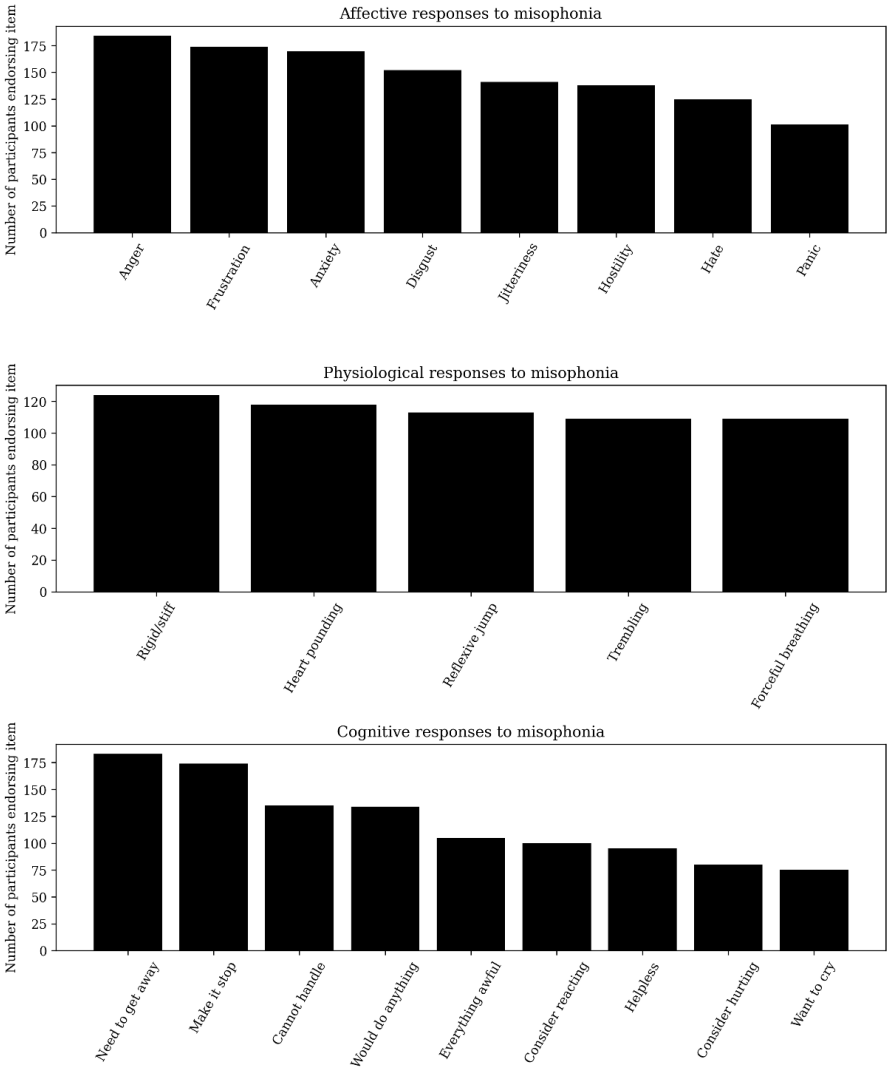
The DMQ is an 86 item scale that measures self-reported misophonia with 9 subscales, which are: Trigger Frequency (16 items), Affective Responses (8 items), Physiological Responses (5 items), Cognitive Responses (10 items), Coping Before (triggered) (6 items), Coping During (triggered) (10 items), Coping After (triggered) (5 items), Impairment (12 items), and Beliefs (14 items). Notably, the Trigger Frequency subscale includes a trigger checklist of yes or no questions, similar to the trigger checklist in the ATC (Poerio et al., 2023). The trigger frequency score is the total number of triggers endorsed, with a possible score range of 0 to 16 (Rosenthal et al., 2021).

The Affective Responses score is the sum of Affect items #1-8. The Psychological Responses Score is the sum of Physical items #1-5. The Cognitive Responses Score is the sum of Cognitive items #1-10. Affective Responses include items such as "I felt hostile". The most commonly used affective responses to misophonia was "anger" and the least was "panic". Physiological Responses include items such as "My heart pounded or raced". The most commonly used physiological response to misophonia was "I became rigid or stiff". Cognitive Responses include items such as "I am helpless". The most commonly reported cognitive

response to misophonia was “I need to get away from the sound”. Sum of above scores is intended to be the Symptoms Severity Composite Score (Rosenthal et al., 2021). Scores greater than 41 are indicative of higher misophonia symptoms (Rosenthal et al., 2021). Data shows there are 22 values above 42, which is about 23.7% of all non-missing responses. Frequencies of the affective, physiological and cognitive responses to misophonia are shown in Figure 3

Figure 3

Frequencies of Affective, Physiological and Cognitive Responses to Misophonia

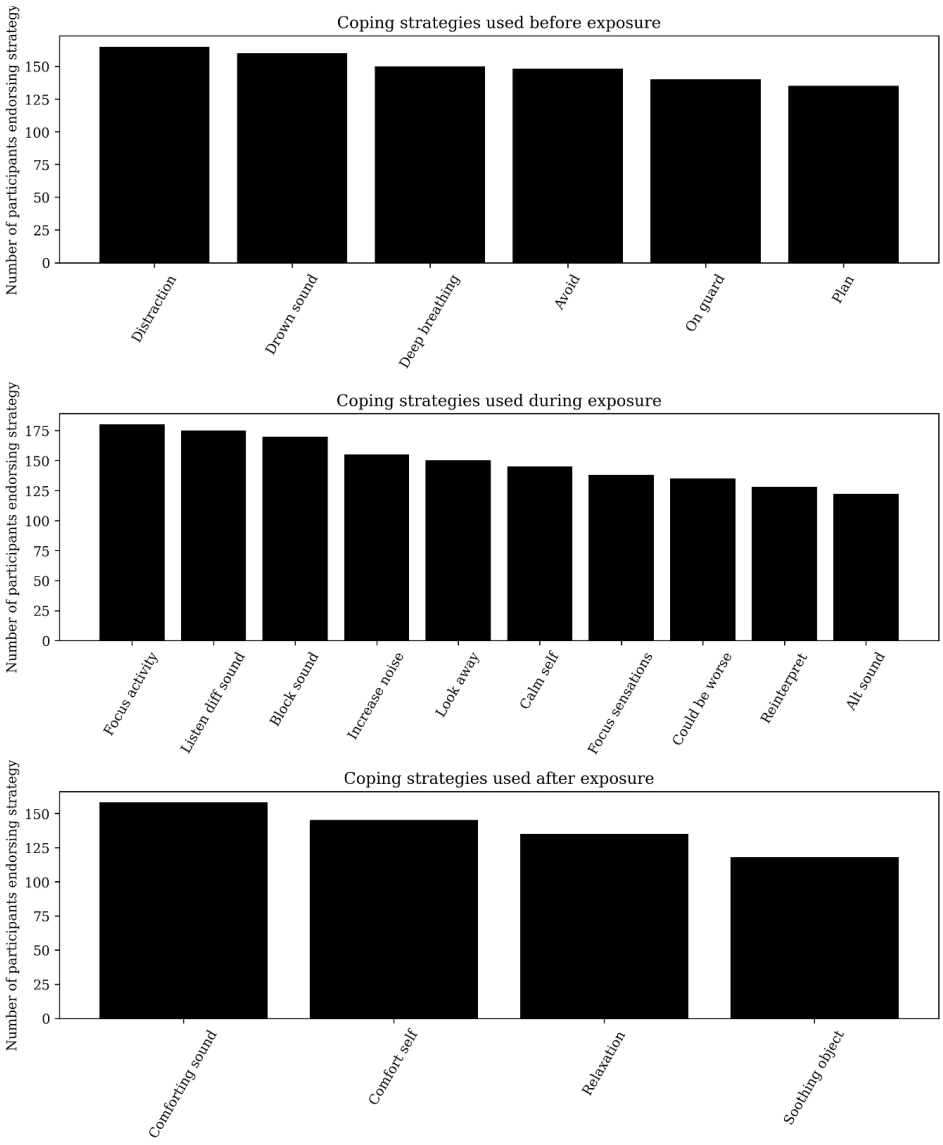


Coping Before, Coping During, and Coping After subscales (measured on a 0 to 4 Likert-type scale) can be used collectively to identify common coping strategies that may be helpful or unhelpful (See Figure 4 for frequencies). Coping Before Triggered is measured by the sum of Coping Before items # 1-6. Coping During Triggered is measured by the sum of Coping During items #1-10. Coping After Triggered is measured by the sum of Coping After items #1-5. However, the subscales are not compounded, and it is recommended that the coping subscales be used at the item level qualitatively. Coping-Before includes items such as "I avoided certain people, places or things so I would not have to hear sounds I dislike." Coping During includes items such as "I blocked the sound". Coping After includes items such as "I did something to comfort myself". Participants reported a range of coping strategies used before exposure to trigger sounds (shown in Figure 3). Distraction was the most frequently endorsed strategy (n = 165, 67.9%), with drowning out the sound also reported by a majority of participants (n = 158, 65%). Deep breathing (n = 151, 62.1%), avoiding the situation (n = 148, 60.9%), being on guard (n = 141, 58%), and making a plan (n = 134, 55.1%) were also commonly used. During exposure to trigger sounds, participants most often focused on an activity (n = 182, 74.9%). Listening to a different sound (n = 174, 71.6%) and blocking the sound (n = 173, 71.2%) were similarly prevalent. Other frequently reported strategies included increasing background noise (n = 155, 63.8%), looking away (n = 149, 61.3%), using calming techniques (n = 145, 59.7%), focusing on bodily sensations (n = 138, 56.8%), reminding oneself that the situation "could be worse" (n = 135, 55.6%), reinterpreting the sound (n = 129, 53.1%), and producing an alternate sound (n = 122, 50.2%). For coping after exposure, listening to a comforting sound was most frequently endorsed (n = 159, 65.4%), followed by doing something to comfort oneself (n = 145, 59.7%)

and engaging in relaxation exercises (n = 135, 55.6%). The least commonly used strategy in this category was using the sight, smell, or touch of a soothing object (n = 117, 48.1%).

Figure 4

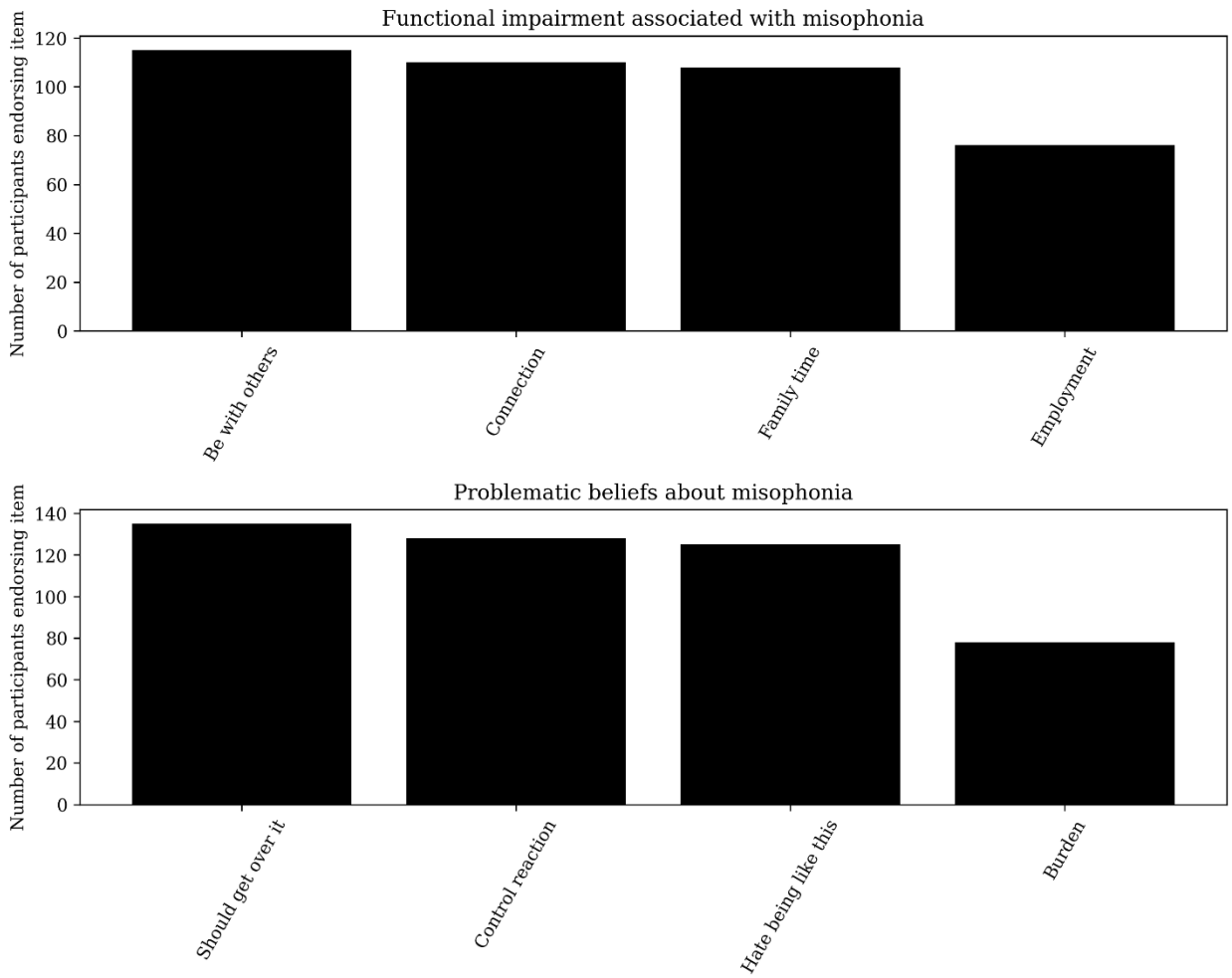
Frequencies of Coping Strategies Used Before, During and After Exposure to Misophonic Sounds



Impairment can be scored by taking the sum of Impairment #1-12 (each item measured on a 0 to 4 Likert-type scale). The possible range of scores for this subscale is 0 to 48, with a score of 0 to 13 indicating minimal to mild impairment, a score of 14 to 38 indicating moderate impairment, and a score of 39 to 48 indicating severe impairment. Beliefs can be scored by taking the sum of Beliefs #1-14 (each item measured on a 0 to 4 Likert-type scale). The possible range of scores for this subscale is 0 to 56. This can be used to identify problematic ways of thinking that can be changed. The Beliefs items should be used at the item level qualitatively. No other composites of subscales are recommended (Rosenthal et al., 2021). Impairment includes items such as “My self-esteem [was impaired]”. Beliefs included items such as “No one can help me”. The most frequent form of impairment participants experienced due to misophonia was “ability to be with other people” (n = 119, 49.0%), followed by “feeling of connection with other people” (n = 110, 45.3%), and then by “enjoyment found in spending time with family” (n = 108, 44.4%). The lowest proportion of non-zero responses was observed for “ability to maintain employment” (n = 77, 31.7%). 66.7% (n = 62) of the sample reported minimal to mild impairment due to misophonia. 31.2% (n = 29) reported moderate impairment. 2.2% (n=2) of the sample reported severe to very severe impairment. Most commonly held problematic way of thinking was “I should get over it” (n = 138, 56.8%), followed by “I should be able to control my reaction to these sounds (n = 129, 53.1%), and then by “I have being like this” (n = 123, 51%). The most infrequent belief was “I am a burden on others” (n = 78, 32.1%). Frequencies of impairment and beliefs domains are illustrated in Figure 5.

Figure 5

Frequencies of Functional Impairment Domains and Problematic Beliefs Associated with Misophonia



Marginal reliability for the general composite scores was good (ρ_{xx} = 0.877; Kim & Feldt, 2010). These coefficients can be interpreted on the same scale as other reliability coefficients, such as Cronbach's alpha (Rosenthal et al., 2021). Exploratory Factor Analysis determined that the DMQ items were best represented within a framework that captures both general factors (symptom severity) and specific factors (like different types of responses to triggers). This bipartite approach is supported by omega hierarchical coefficients indicating a significant proportion of variance attributable to the general factor. Overall, the exploratory factor analysis provided empirical support for the DMQ's structure, clarifying how various aspects of misophonia—ranging from the frequency of triggers to emotional responses and coping strategies—interrelate and how they contribute to the overall experience of individuals suffering from this condition (Rosenthal et al., 2021).

In terms of its validity, the DMQ underwent a rigorous two-phase development process. Phase 1 involved generating items based on literature reviews, qualitative interviews with misophonia sufferers and their family members, and feedback from experts. Phase 2 focused on psychometric validation, where a large community sample (N = 424) completed the DMQ alongside other misophonia scales. The population consists of residents in the U.S. who are fluent in English and are between the ages of 18 to 65. Most identified as Male (54.5%) and White (75%). Of the sample, 80.2% were never diagnosed with a mental health or addiction problem, and 44.8% were college educated. The validation process demonstrated that the DMQ has good internal consistency, with correlation among the subscales all within the range of 0.430 to 0.839. Furthermore, the DMQ composite scores were found to correlate significantly with existing measures of misophonia, such as the Misophonia Questionnaire (MQ; Wu et al., 2014),

Misophonia Assessment Questionnaire (MAQ; Johnson et al., 2013), Misophonia Emotional Responses Scale (MER; Ferrer-Torres & Giménez-Llort, 2021), Misophonia Coping Responses Survey (MCR; Ferrer-Torres & Giménez-Llort, 2021), and the Amsterdam Misophonia Scale (A-MISO-S; Schroder et al., 2013), establishing convergent validity, with high correlations being observed (r's ranging from 0.72 to 0.81) between scores in four other misophonia Questionnaires. Overall, the DMQ is regarded as the first psychometrically validated measure of misophonia, intended for use in both research and clinical settings, making it the most sophisticated instrument on misophonia to date. However, the DMQ is not without its limitations. The initial validation of the DMQ was conducted using a convenience sample from Amazon Mechanical Turk (MTurk). While this offers a diverse demographic, the generalizability of the findings to clinical populations or those with more severe misophonia symptoms may be limited. Like many subjective self-report measures, the DMQ may be susceptible to self-report bias. The DMQ includes multiple subscales, and while they add depth to the assessment, they could also complicate the interpretation of results (Rosenthal et al., 2021).

Procedure

After receiving institutional IRB (Institutional Review Board) approval, an internet-based survey was conducted on Qualtrics, an independent online surveying company, and distributed via online channels such as Email, Reddit, YouTube, and MTurk. The survey was estimated to take 10 to 15 minutes to complete. A short 1-minute video depicting at least one trigger in each trigger category was shown to participants who identified as not being ASMR-responders. This was done in order to more effectively sort individuals in the ASMR-responder and non-responder group. This is a method adapted from the AEQ (Swart et al., 2022). The AEQ aimed to decrease the false positives in ASMR-responders by distinguishing and excluding cases where

individuals may experience something, but it does not align with the hallmark features of ASMR, which would make more genuine ASMR-responder groupings (Swart et al., 2022). If a participant answered "yes" to the ASMR response question and reported experiencing ASMR by watching the video, they were sorted into the ASMR-responder group. If a participant answered "yes" to the question but did not experience ASMR tingles by watching the video, they were sorted into the ASMR-responder group. If a participant answered "no" to the question but reported to experiencing ASMR by watching the video, they were sorted into the ASMR-responder group. If a participant answered "no" to the question and reported not to experience ASMR by watching the video, they were sorted into the ASMR-non-responder group. ASMR-responders continued to complete the ATC, ACEs Questionnaire and DMQ. ASMR non-responders were only prompted to complete the ACEs Questionnaire, DMQ, and demographics.

Internet-based data collection has its strengths and limitations (Kraut et al., 2004). Although internet surveys have limited respondent availability among populations without internet access, Tolstikova & Chartier (2010) reported that there is more variation in internet samples as compared to traditional samples. Despite their limitations, it has been reported in the literature that internet-based studies are an acceptable way to collect data (Kraut et al., 2004) and that internet-based data is reliable and psychometrically equivalent to other forms of data collection (Meyerson & Tryon, 2003). MTurk allows researchers to efficiently recruit diverse adult participants, deliver survey instruments, and collect responses through a controlled task interface (Buhrmester et al., 2011). Studies show that MTurk samples are generally more diverse than typical college samples and produce data of comparable quality to traditional laboratory methods when appropriate attention checks and eligibility screens are implemented (Buhrmester et al., 2011; Chandler & Shapiro, 2016). Researchers commonly use MTurk for its rapid

recruitment, cost efficiency, and reliability in generating high-quality datasets across a range of psychological constructs (Chandler & Shapiro, 2016). The monetary incentive given via Mturk was at a rate consistent with standard Mturk practices and not great enough to coerce participation, ensuring that respondents engaged voluntarily and without undue influence.

Statistical Analyses

Assumptions Testing

Prior to conducting analyses, all relevant statistical assumptions were evaluated to ensure the appropriateness of the analytic approach. The variables examined included the four ASMR composite scores, ASMR Trigger Intensity, Adverse Childhood Experiences (ACEs), Misophonia Symptom Severity, Age, and Income. Assumption checks addressed normality, linearity, outliers, and measurement level.

Normality was assessed using skewness and kurtosis statistics and visual inspection of histograms. The four ASMR composite scores demonstrated skewness values between –0.61 and +0.15, indicating distributions close to symmetrical. ASMR Trigger Intensity showed near-zero skew. Misophonia Symptom Severity exhibited modest positive skew. Age was positively skewed to a moderate degree. As expected for these constructs, ACEs showed positive skew, and Income demonstrated substantial positive skew. Kurtosis values for most variables fell within generally acceptable ranges, with no variables displaying extreme kurtotic deviation. No variables exceeded thresholds that would preclude the use of Pearson correlations in a sample of this size.

To evaluate linearity, bivariate scatterplots were examined for all variable pairs. Visual inspection indicated that the relationships among variables followed linear or monotonic patterns, with no evidence of non-linear relationships or curved distributions. No variable pairs showed signs of quadratic or other higher-order patterns. The linearity assumption was therefore considered met.

Standardized z-scores, boxplots, and distributional plots were used to identify potential outliers. Across the ASMR composite scores, misophonia variables, ASMR Trigger Intensity, ACEs, and Age, no extreme outliers were identified. Income displayed several higher values consistent with expected right-skewed distributions; however, none exceeded typical cutoffs for extreme influence (e.g., $|z| > 3.29$). Because outliers were rare and did not exceed accepted thresholds, all data points were retained.

To assess multicollinearity among composite variables and demographic indicators, variance inflation factor (VIF) values and tolerance statistics were examined. All variables demonstrated VIF values below the commonly accepted cutoff of 10 and tolerance values above .10, indicating an absence of problematic multicollinearity.

Confirmatory Factor Analysis

In order to answer the first research question (How well does the four-factor structure of the ASMR Trigger Checklist (ATC) fit the observed data?) R version 4.4.1 using the Lavaan package was used to conduct the confirmatory factor analysis (CFA) using diagonally weighted least squares estimation among the 216 participants who completed the ATC. In order to validate the ATC, oblique confirmatory factor analysis (CFA) was conducted as it is useful in evaluating the hypothesized factor structure of each subscale (tactile/interpersonal, vocal auditory, non-

vocal auditory and visual triggers) while allowing the factors to correlate. There were no cross loadings, as each item was only loaded onto one factor. This estimation of model parameters is the first step to ensuring reliable and meaningful interpretation of data and is needed to accurately measure latent constructs (Thompson & Daniel, 1996). CFA is a measurement technique that indirectly measures latent constructs and determines whether the factor model is identified/estimated. CFA provides the most rigorous and theory-driven approach for evaluating whether the proposed four-factor structure of the ATC adequately represents the underlying latent construct. CFA also offers several psychometric advantages, including the ability to estimate latent factors free from measurement error, evaluate convergent and discriminant validity, and assess model adequacy using well-established fit indices such as the CFI (Comparative Fit Index), TLI (Tucker-Lewis Index), RMSEA (Root Mean Square Error of Approximation), and SRMR (Standardized Root Mean Square Residual). CFA is used instead of exploratory factor analysis (EFA) when the latent variables are already identified and a scale already developed. The ATC is a scale that has been developed by Poerio et al. (2023) with 4 latent factors and 8, 10, 12, 7 indicators specified on each factor, respectively. These have been developed according to careful analysis of the triggers that are available online, and there is little room for re-specification. Therefore, CFA was chosen over EFA although the instrument has not yet been tested for its factor structure. The Thomson (Regression) method will be used to compute composite scores for each participant, which is the default method used in the Lavaan package.

Correlations

In order to test the second research question (How do the four factors of the ATC (as identified by the ATC in R1) correlate to Misophonia Symptom Severity and adverse childhood

experiences (ACEs)?), Pearson product-moment correlations were conducted among the continuous variables. SPSS version 31 was used to test correlations between the composite score for visual, composite score for vocal auditory, composite score for non-vocal auditory tactile/interpersonal triggers, Misophonia Symptom Severity, the adverse childhood experiences score, age and income. Pearson correlation coefficients were calculated as this approach is appropriate for variables measured on interval or ratio scales and assumes linear associations. The continuous demographic variables, age and income, were also included in the matrix to provide additional descriptive context, even though they were not central to the primary research question.

CHAPTER 4: Results

This chapter presents the results of the data analyses conducted for the study and is organized in a manner that reflects the sequence of the research questions. The chapter begins with a description of the sample and the presentation of descriptive statistics for all primary study variables, including demographic characteristics, ASMR responsiveness, Misophonia Symptom Severity, and Adverse Childhood Experiences. These descriptive findings provide the contextual foundation necessary to interpret the subsequent analyses and offer insight into the composition and variability of the study sample. Following the descriptive statistics, the results associated with each research question are presented in the order in which the questions were posed. For each research question, the specific analytic procedures are identified, the relevant statistical findings are reported, and the results are interpreted in relation to the study's hypotheses.

Descriptive Statistics

Prior to conducting the primary analyses, preliminary analyses were performed to examine descriptive statistics and bivariate associations among study variables. Means and standard deviations were calculated for all continuous variables. Pearson zero-order correlations were computed to examine associations among ASMR Trigger Intensity, adverse childhood experiences, and misophonia symptom severity. Descriptive statistics and zero-order correlations among continuous study variables are presented in Table 4.

Table 4

Zero Order Correlations, Means, and Standard Deviation among Variables

Variable	1	2	3	4	5

1. ASMR Trigger Intensity	–				
2. Adverse Childhood Experiences	.36*	–			
3. Misophonia Symptom Severity	.59*	.59*	–		
4. Age	–.30*	–.22*	–.12	–	
5. Income	.09	.20*	.12	-.02	–
M	2.43	2.55	25.56	41.96	74406
SD	1.33	1.39	20.18	10.71	102104

Note. N=243, *p<.05

ASMR Trigger Intensity was moderately and positively associated with adverse childhood experiences (r = .36, p < .05) and misophonia symptom severity (r = .59, p < .05), indicating that individuals reporting greater childhood adversity and higher misophonia symptoms also tended to report stronger ASMR responses. Adverse childhood experiences were also positively correlated with misophonia symptom severity (r = .59, p < .05), suggesting that greater exposure to childhood adversity was associated with higher levels of misophonia-related distress. Age demonstrated negative associations with ASMR Trigger Intensity (r = −.30, p < .05) and adverse childhood experiences (r = −.22, p < .05), indicating that younger participants reported stronger ASMR responses and higher ACE scores. The correlation between age and misophonia symptom severity was small and not statistically significant (r = −.12, p > .05). Income was not significantly associated with ASMR Trigger Intensity (r = .09, p > .05), misophonia symptom severity (r = .12, p > .05), or age (r = −.02, p > .05). However, income was positively associated with adverse childhood experiences (r = .20, p < .05), indicating a small but statistically significant relationship.

Research Question #1

Confirmatory factor analysis was used to test the assumption that the four-factor structure fits the data. Because of the dichotomous indicators, diagonally weighted least squares (DWLS) estimator was used instead of maximum likelihood estimation (Bandalos, 2014). The four-factor model was compared to a 1-factor, 2-factor and 3 factor model. The 2-factor model was made with the following two factors: F1 + F4 and F2 + F3. The 3-factor model was comprised of the following three factors: F1, F2 + F3, and F4. Fit indices for all tested models are presented in Table 5. According to Hu & Bentler (1999) and Steiger (2007), who suggested that the SRMR be below .06, RMSEA be below .07, and CFI and TLI be above .95 for the model to be considered a good fit to the data, all models demonstrated good fit. Although the one-factor model demonstrated very good global fit, successive increases in model complexity resulted in statistically significant improvements in fit (See Table 5). Chi-square difference testing indicated that the two-factor model fit significantly better than the one-factor model, $\Delta\chi^2(1) = 45.22$, $p < .001$. The three-factor model further improved fit relative to the two-factor model, $\Delta\chi^2(2) = 65.70$, $p < .001$. Finally, the four-factor model provided a statistically significant improvement over the three-factor model, $\Delta\chi^2(3) = 37.88$, $p < .001$.

Table 5

Model Fit Indices for CFA Models

Model	Factors	χ^2	df	p	CFI	TLI	RMSEA (90% CI)	SR MR
1-Factor	General ASMR	764.10	629	< .001	.996	.996	.032 (.023–.040)	.070
2-Factor	Tactile/Interpersonal +Visual; Auditory	718.88	628	< .001	.997	.997	.026 (.017–.034)	.068

3-Factor	Tactile/Interpersonal ; Auditory; Visual	653.18	626	< .001	.999	.999	.014 (.000–.023)	.065
4-Factor	Tactile/Interpersonal ; Vocal Auditory; Non-Vocal Auditory; Visual	615.30	623	.579	1.000	1.000	.000 (.000–.020)	.063

Note. N=216

Standardized factor loadings for the four-factor and best-fitting model (shown in Table 6) ranged from .564 .82, with one loading of .32, and were all statistically significant (s < .001). With the exception of one item exhibiting a low standardized factor loading (.32), all remaining items demonstrated moderate to strong loadings on their intended factors. In confirmatory factor analysis, standardized loadings of .70 or higher are typically considered strong, as they indicate that approximately 50% or more of the variance in an observed indicator is explained by the latent construct, while loadings of .50 are often considered acceptable (Kline, 2016). The comparatively low loading for the physical touch item likely reflects its reliance on direct somatosensory input (e.g. “Physical touch on your body”) rather than visually mediated interpersonal cues, which characterize the majority of indicators within the Visual factor (e.g. “Someone providing care for you”).

Table 6

Standardized Factor Loadings for the Four-Factor ASMR Trigger Checklist

Item	Visual (F1)	Vocal Auditory (F2)	Non-Vocal Auditory (F3)	Tactile / Interpersonal (F4)
Someone providing care for you (e.g., nursing, affirmations)	.822			

Eye contact (e.g., prolonged or focused gaze)	.774	
Altruistic acts toward you (e.g., kind words, lending items)	.746	
Blowing (e.g., into your hair or ear)	.737	
Close-up movements directed at you	.684	
Close personal attention (e.g., service encounters, appointments)	.612	
Light touch on your face (e.g., makeup application)	.564	
Physical touch on your body (e.g., hair play, massage)	.320	
Eating sounds (e.g., chewing, swallowing)		.785
Reading out loud (e.g., books, magazines)		.782
Mouth sounds (e.g., lip smacking, humming)		.771
Certain letter sounds (e.g., 'toasted coconut')		.760
Breathing sounds (e.g., delicate breath, inhaling)		.734
Specific voice timbre or pitch (e.g., female voices, children’s voices)		.712

Inaudible/unintelligible speech	.702	
Soft-speaking (e.g., slow, rhythmic speech)	.645	
Accents (e.g., foreign accents)	.638	
Whispering	.568	
Rubbing sounds (e.g., hand rubbing, fabric sounds)		.818
Solid material sounds (e.g., glass clinking, scissors cutting)		.814
Page-turning sounds		.787
Blowing sounds / white noise (e.g., hair dryers, vacuums)		.779
Sticky fingers sounds		.773
Buzzing sounds (e.g., vibrations, humming)		.744
Scratching sounds (e.g., writing with a fountain pen)		.737
Crinkling sounds (e.g., metallic foil, clothing)		.724
Brushing sounds		.715
Liquid sounds (e.g., water pouring, spray bottles)		.714
Tapping sounds (e.g., nails on hard surfaces)		.664
Nature sounds (e.g., rain, fire crackling)		.593

Watching someone concentrate on a task (e.g., cooking, applying makeup)	.824
Watching repetitive actions (e.g., folding towels, coloring in)	.820
Observing someone complete a task with expertise (e.g., painting, playing an instrument)	.817
Watching delicate hand movements (e.g., hand strokes, tracing)	.799
Watching someone being touched (e.g., massage, hair brushing)	.782
Having a light flashed near your face	.707
Watching "oddly satisfying" triggers (e.g., kinetic sand, soap cutting)	.689

Note. N=216, Items by rank order not item number. All standardized loadings were statistically significant at $p < .001$.

As shown in Table 7, bivariate correlations among the four latent ASMR trigger factors were strong and statistically significant, indicating substantial shared variance while remaining below thresholds typically associated with factor redundancy (Kline, 2016). Construct reliability estimates were high across all factors, with coefficient H values ranging from .87 to .93, supporting the internal consistency of the latent constructs and aligning with recommended standards for latent variable reliability in confirmatory factor analysis (Hancock & Mueller, 2001; Raykov,

1997). Average variance extracted (AVE) values indicated adequate convergent validity for three of the four factors, with AVE values exceeding the recommended .50 criterion (Hair et al., 2019). The Visual factor demonstrated slightly lower variance extracted (AVE = 48.9%), likely attributable to one weakly loading indicator; however, its construct reliability remained strong, a pattern that has been noted as acceptable when overall reliability is high and model fit is excellent (Hair et al., 2019). Taken together, the pattern of inter-factor correlations, reliability estimates, and variance extracted provides further support for the four-factor model as a coherent, reliable, and theoretically meaningful representation of ASMR trigger responsiveness.

Table 7. Factor Correlation Matrix and Reliability Values

Factor	Visual (F1)	Vocal Auditory (F2)	Non-Vocal Auditory (F3)	Tactile / Interpersonal (F4)
Visual (F1)	—			
Vocal Auditory (F2)	.68*	—		
Non-Vocal Auditory (F3)	.61*	.85*	—	
Tactile / Interpersonal (F4)	.67*	.79*	.83*	—
Coefficient H	0.87	0.92	0.93	0.91
AVE (%)	48.9%	52.7%	54.4%	58.8%

Note. N=216, * $p < .05$. Coefficient H indicates construct reliability. AVE represents average variance extracted.

Research Question #2

To answer the second research question, "How do the four factors of the ATC (as identified by the ATC in R1) correlate to ASMR Trigger Intensity, Misophonia Symptom Severity and Adverse Childhood Experiences (ACEs)?", Pearson correlations were used among those continuous variables. Table 8 presents correlations for the study variables, including the four ASMR composite scores (visual, vocal-auditory, non-vocal auditory, and tactile/interpersonal), ASMR Trigger Intensity, Misophonia Symptom Severity and Adverse Childhood Experiences (ACEs). ASMR Trigger Intensity was strongly correlated with each of the ASMR composite scores (r = .80 to .94, p < .01). The strongest associations were observed for Non-Vocal Auditory (r = .94) and Vocal Auditory (r = .93) factors, followed closely by Tactile/Interpersonal (r = .91) and Visual (r = .80) factors. Misophonia Symptom Severity demonstrated moderate to strong correlations with all four ASMR factors (r = .49 to .63, p < .01). ACEs showed small to moderate positive correlations with the four ASMR factors (r = .25 to .36, p < .01), suggesting that individuals with higher ACE scores tended to report somewhat stronger ASMR responsiveness across trigger modalities.

Table 8. Associations Between ASMR Factors and External Variables

ASMR Factors/ External Variables	ASMR Trigger Intensity (r)	Misophonia Symptom Severity (r)	Adverse Childhood Experiences (r)
Visual (F1)	.80*	.50*	.25*
Vocal Auditory (F2)	.93*	.49*	.36*

Non-Vocal Auditory (F3)	.94*	.52*	.36*
Tactile/ Interpersonal (F4)	. 91*	.63*	.31*

Note. *p<.05

Supplemental Analyses

Although the supplemental analyses did not directly address the primary research questions, they were included to offer a more comprehensive understanding of the dataset and to contextualize the main findings within broader patterns observed in the sample. Supplemental analyses are appropriate when they provide theoretically relevant insights, enhance transparency, or help clarify unexpected results (Behrens & Smith, 1996; Tukey, 1972). Particularly, the relationship between ACEs and ASMR response and misophonia have been theoretically informed to be predictive by the theoretical framework. Therefore, follow-up regression analyses were conducted to further clarify the nature of these relationships. Simple Linear Regression analyses were used to further understand the relationship between ACEs and ASMR response and ACEs and misophonia. A one-way between groups analysis of variance (ANOVA) was also conducted to determine mean differences of variables between the two groups of gender and two groups of ASMR response to further contextualize the correlational and regression findings.

Simple Linear Regressions

Several residual diagnostics were examined in detail before conducting the regression analyses (Figures 6–9). A histogram of the standardized residuals was inspected to assess normality, and the distribution appeared approximately symmetric with no substantial deviations. Standardized residuals ranged from about –2.20 to +2.62 in one output and –2.8 to +2.8 in

another, with no cases exceeding ±3.0—an accepted threshold for identifying severe outliers—indicating that no individual observation disproportionately influenced the model. The standard error of the estimate (16.33) reflected a moderate degree of unexplained variability around the regression line, which is typical in psychological data. A scatterplot of standardized residuals plotted against ACEs (Q18A) was used to evaluate linearity and homoscedasticity. The residuals were randomly dispersed across all levels of ACE exposure, with no evident curvilinear trend, supporting the assumption of linearity between ACEs (Q18A) and misophonia symptom severity (Q41S) and ACEs and ASMR Trigger Intensity (Q6TI). The vertical spread of residuals remained relatively consistent across low, moderate, and high ACE scores. Although slight variations in dispersion appeared at some mid-range and higher ACE levels, the pattern did not indicate a meaningful violation of constant error variance. Taken together, the normal, independent, and evenly distributed residuals suggest that the assumptions of linearity, homoscedasticity, normality of residuals, and the absence of influential outliers were adequately satisfied. Thus, the regression models can be interpreted with confidence.

Figure 6

Standardized Residual Distribution for the ASMR Trigger Intensity Regression Model

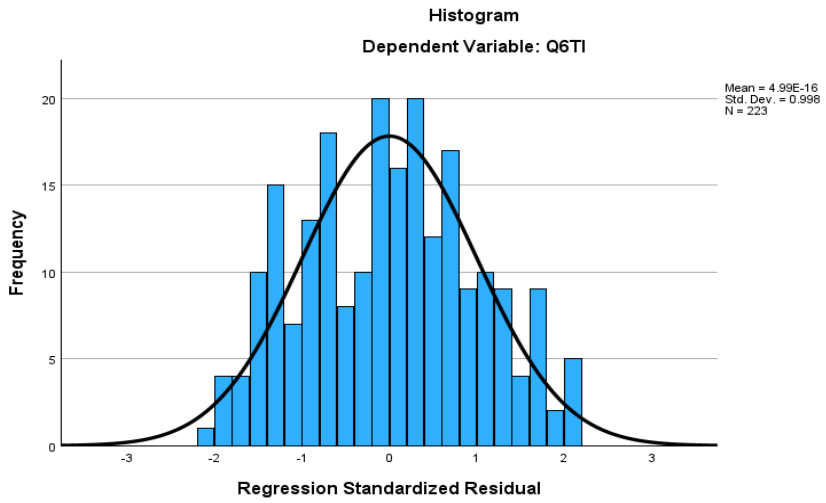


Figure 7

Standardized Residual Distribution for the Misophonia Symptom Severity Regression Model

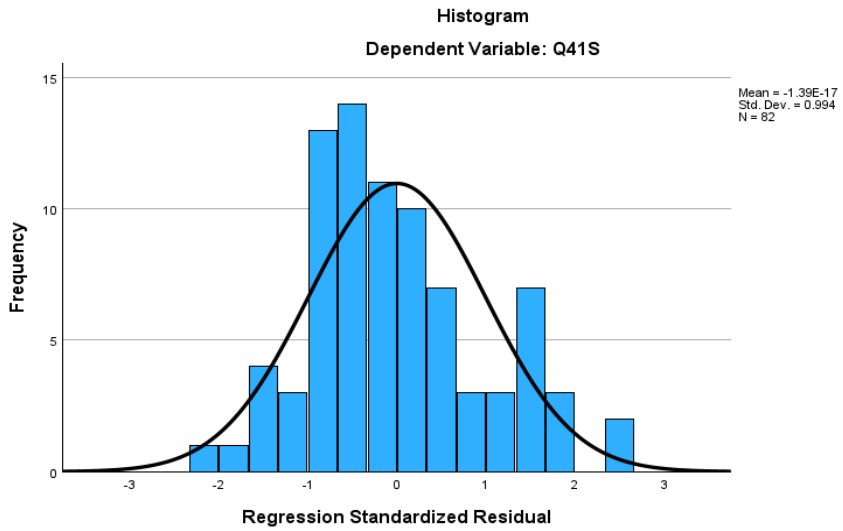


Figure 8

Residuals vs. ACEs Scatterplot for the Misophonia Symptom Severity Regression Model

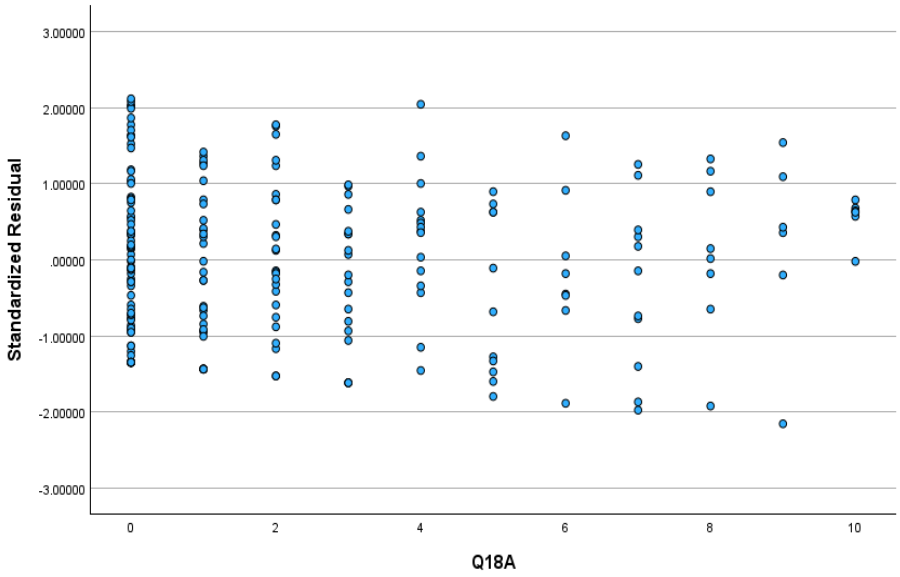
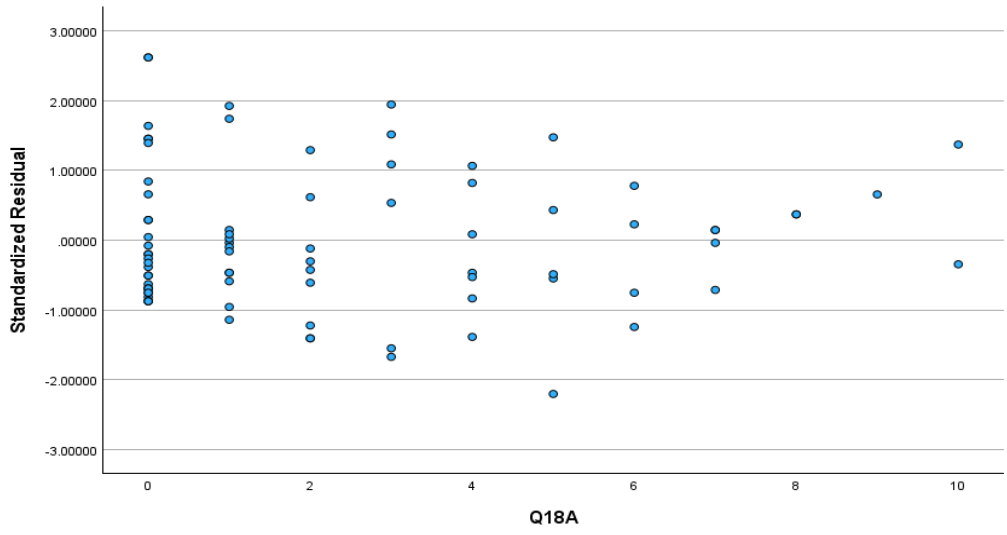


Figure 9

Residuals vs. ACEs Scatterplot for the ASMR Trigger Intensity Regression Model



After assumptions for regression were met, ordinary least squares linear regression was conducted to examine whether Adverse Childhood Experiences (variable name Q18A) predicts ASMR Trigger Intensity (variable name Q6TI). The simple regression model was statistically significant, $F(1, 221) = 15.28$, $p < .001$, $R^2 = .07$, explaining approximately 6.5% of the variance in the outcome.

An ordinary least squares linear regression was also conducted to examine the predictive relationship between ACES and Misophonia Symptom Severity (variable name Q41S. The overall regression model was statistically significant, $F(1, 80) = 42.75$, $p < .001$, $R^2 = .35$, indicating that Q18A was a meaningful predictor of Q41S. The predictor accounted for 34.8% of the variance in Q41S, representing a large effect size according to conventional benchmarks.

Analysis of Variance

A series of one-way between-groups analysis of variance (ANOVA)s were conducted to examine differences in Adverse Childhood Experiences (ACEs), Misophonia Symptom Severity, and ASMR Trigger Intensity by ASMR response status and gender.

A one-way between groups ANOVA was conducted to determine if average ACEs score differed depending on ASMR response (responders vs. non-responders). Statistically significant differences were not found in the average ACEs score between the two groups $F(1,221) = 1.445$, $p = .231$, $d = 0.16$ with responders not reporting significantly higher ACEs scores than non-responders, although responder reported slightly higher scores Levene's statistic was not significant, showing that the homogeneity of variances assumption was met.

A one-way between groups ANOVA was conducted to determine if average Misophonia Symptom Severity score differed depending on ASMR response (responders vs. non-

responders). Statistically significant differences were not found in the average ACEs score between the two groups F(1,80) = 1.369, p = .245, d = 0.26 with responders not reporting significantly higher Misophonia Symptom Severity scores than non-responders, although responders reported slightly higher scores. Levene's statistic was not significant, showing that the homogeneity of variances assumption was met.

A one-way between groups ANOVA was conducted to determine if average ACEs score differed depending on gender (male vs. female). Statistically significant differences were not found in the average ACEs score between the two groups F(1,221) = .084, p = .773, d = 0.04 with females not reporting significantly higher ACEs scores than non-responders, although females reported slightly higher scores. Levene's statistic was not significant, showing that the homogeneity of variances assumption was met.

A one-way between groups ANOVA was conducted to determine if average Misophonia Symptom Severity score differed depending on gender (male vs. female) Statistically significant differences were not found in the average Misophonia Symptom Severity score between the two groups F(1,80) = .067, p = .797, d = 0.06 with females not reporting significantly higher Misophonia Symptom Severity scores than non-responders and only a slightly higher mean score. Levene's statistic was not significant, showing that the homogeneity of variances assumption was met.

A one-way between groups ANOVA was conducted to determine if average ASMR Trigger Intensity score differed depending on gender (male vs. female). Statistically significant differences were not found in the average ASMR Trigger Intensity score between the two groups F(1,221) = 1.756, p =187, d = 0.18 with responders not reporting significantly higher ASMR

Trigger Intensity scores than non-responders, while males have slightly higher scores. Levene's statistic was not significant, showing that the homogeneity of variances assumption was met.

Summary

The four-factor model of ASMR Triggers, according to the ATC, was tactile/interpersonal, vocal auditory, non-vocal auditory, and visual with 8, 10, 12 and 7 items loaded on each latent factor. Having tested the measurement model with Confirmatory Factor Analysis, CFI (Comparative Fit Index) was 1.00, TLI (Tucker-Lewis Index) was .1,00, SRMR (Standardized Root Mean Square Residual) was .063, and RMSEA (Root Mean Square Error of Approximation) was .000 (90% Confidence Interval = .0000 - .020). This indicates that the model was an excellent fit with the data and that the data supports both distinct ASMR sub-trigger domains and a higher-order ASMR responsiveness factor. Chi-square difference testing indicated that four-factor model provided a statistically significant improvement over the other models.

According to the correlation analysis, the four ASMR factors were all strongly related to one another, with correlations ranging from $r = .61$ to $r = .85$. All ASMR factors were also very strongly correlated with overall ASMR Trigger Intensity, with correlations ranging from $r = .80$ to $r = .94$. ACEs demonstrated modest associations with ASMR responsiveness, with correlations ranging from $r = .25$ to $r = .36$. Participants who reported stronger ASMR responses also tended to report higher Misophonia Symptom Severity and greater functional impairment, with correlations between ASMR Trigger Intensity and misophonia variables ranging from $r = .59$ to $r = .67$. Younger participants reported higher ASMR responsiveness, and more ACEs, with age showing correlations from $r = –.12$ to $r = –.36$ across the relevant variables. Income was largely unrelated to ASMR or misophonia variables, with correlations ranging from $r = –.00$ to $r = .14$, except for a small positive association with ACEs ($r = .20$).

Supplemental analyses further revealed the predictive relationship between ACEs and ASMR and misophonia. A simple linear regression was conducted to examine the relationship between Adverse Childhood Experiences (ACEs) and ASMR Trigger Intensity. The model was statistically significant, $F(1, 221) = 15.28$, $p < .001$, with an R^2 of .65. A simple linear regression was also conducted to examine the predictive relationship between ACEs and Misophonia Symptom Severity. The overall regression model was statistically significant, $F(1, 80) = 42.75$, $p < .001$, $R^2 = .35$.

A series of one-way between-groups ANOVAs were conducted to examine differences in Adverse Childhood Experiences (ACEs), Misophonia Symptom Severity, and ASMR Trigger Intensity by ASMR response status and gender. No statistically significant group differences were observed across analyses. ACEs scores did not differ significantly between ASMR responders and non-responders, $F(1, 221) = 1.45$, $p = .231$, $d = 0.16$, nor did Misophonia Symptom Severity, $F(1, 80) = 1.37$, $p = .245$, $d = 0.26$, although responders reported slightly higher mean scores in both cases. ACEs scores also did not differ significantly by gender, $F(1, 221) = 0.08$, $p = .773$, $d = 0.04$, nor did Misophonia Symptom Severity, $F(1, 80) = 0.07$, $p = .797$, $d = 0.06$. ASMR Trigger Intensity did not differ significantly by gender, $F(1, 221) = 1.76$, $p = .187$, $d = 0.18$, although males reported slightly higher mean scores. Levene's tests were not significant for any analysis ($p > .05$), indicating that the assumption of homogeneity of variances was met. Across comparisons, Cohen's d effect sizes were small, suggesting minimal practical differences between groups.

CHAPTER 5: DISCUSSION

This chapter provides an integrative discussion of the findings, with an emphasis on the key findings. The key findings highlighted in this chapter were selected based on their overall impact on the study's aims as well as the degree to which they yielded unexpected or particularly meaningful results. Particular emphasis was given to making meaning of the results of the supplemental analyses and how they bolster the literature review, theoretical framework, and the major research questions. This section includes identification of key findings, interpretation of the findings, implications for practice in counseling, limitations of the study, and recommendations for future research.

Interpretation of Key Findings

Four-Factor Structure of ASMR Triggers

The developers of the ATC organized items into modality-based groupings. Although the groupings showed internal consistency, the extent to which these pragmatic groupings reflect a psychometrically coherent latent structure has not been formally evaluated (Poerio et al., 2023). The present study addressed this gap by using oblique confirmatory factor analysis to examine whether the modality-based item groupings demonstrate a four-factor mode. The four-factor model was the best fit compared to the 1-factor, 2-factor and 3-factor models, indicating that indicating that ASMR triggers are best conceptualized as a multidimensional construct composed of distinct but related sensory–interpersonal domains rather than a single or overly simplified latent dimension.

The strong and statistically significant correlations among the four ASMR sensory factors ($r = .61–.85$) shown in this study indicate that although the factors represent distinct categories of

triggers—visual, vocal-auditory, non-vocal auditory, and tactile/interpersonal—they appear to tap into a shared underlying sensitivity. In other words, individuals who respond strongly to one type of ASMR stimulus tend to respond strongly to others as well. This is also consistent with the strong correlation ASMR Trigger Intensity had with each of the ASMR composite scores (r= .80 to .94, p < .01). This pattern suggests that ASMR is not simply a collection of unrelated sensory experiences but is instead tied to a broader, trait-like predisposition toward ASMR responsivity. However, the cross-sectional nature of the present study precludes conclusions regarding traitness. Future research could test this interpretation more directly through longitudinal designs or test–retest reliability analyses to examine whether ASMR responsivity remains stable across time and contexts. Alternative explanations should also be considered. The observed factor intercorrelations may reflect a more general sensory sensitivity, heightened affective reactivity, or shared attentional engagement with affiliative and soothing cues, rather than a distinct ASMR-specific trait. As discussed previously, prior literature has linked ASMR responsiveness to constructs such as mindfulness, frisson, and sensitivity to social-affiliative cues, suggesting that the shared variance among ASMR modalities may arise from broader dispositional or neurophysiological processes rather than modality-specific mechanisms alone. The fact that ASMR Trigger Intensity was also highly correlated with all composite scores further supports the interpretation that these sensory dimensions converge on a common latent construct representing overall ASMR reactivity. Taken together with the results of the confirmatory factor analysis, which indicates that the four-factor structure was an excellent fit with the data, these findings strongly suggest that ASMR is best understood as a multidimensional yet unified sensory–affective construct. Each factor reflects a specific modality of ASMR triggers, but the high intercorrelations and strong associations with overall ASMR

Trigger Intensity imply the presence of a higher-order latent trait that organizes and drives responsivity across modalities. The coherence among factors also aligns with theoretical accounts proposing that ASMR arises from shared neurobiological mechanisms—such as multisensory integration, affiliative cue processing, and parasympathetic activation—that simultaneously influence responses to visual, auditory, and tactile stimuli. Thus, the combined CFA and correlation results affirm that ASMR is not merely a set of independent reactions to disparate triggers, but rather reflects a stable, trait-like propensity toward experiencing ASMR across multiple sensory domains. The coherence among factors also aligns with polyvagal theory, which emphasizes the role of the autonomic nervous system—particularly the ventral vagal pathway—in detecting and responding to cues of safety through social and sensory channels (Porges, 2011). Many ASMR triggers across visual, auditory, and tactile/interpersonal modalities share features characteristic of affiliative and calming signals, such as gentle vocal prosody, slow and predictable movements, personal attention, and soft tactile cues. From a polyvagal perspective, these multimodal stimuli may converge on a common neurobiological mechanism that promotes parasympathetic regulation and social engagement, thereby eliciting the characteristic ASMR response. Accordingly, the CFA results suggest that ASMR is not merely a set of independent reactions to discrete sensory triggers but rather reflects an integrated pattern of responsivity to safety-related cues across sensory domains. Although the present cross-sectional findings cannot establish temporal stability, they are consistent with the interpretation that individual differences in ASMR responsiveness may reflect a relatively stable predisposition toward heightened sensitivity to affiliative, regulation-supportive stimuli.

The strong model fit also suggests that the ATC is a psychometrically valid measure for assessing ASMR trigger responsiveness in U.S. adult populations. The factor separation suggests

that people's ASMR responses correspond to distinct sensory pathways that together form a coherent ASMR profile. It does not explain why individuals respond to ASMR or whether certain triggers cause ASMR. It also does not mean that this is the final or only possible structure as other models were not tested and compared. Future studies should investigate factorial (measurement) invariance in comparable populations to determine whether the proposed factor structure generalizes across samples.

Taken together, these findings indicate that the ASMR construct operates at two complementary levels: a unified, higher-order sensitivity that gives rise to ASMR across modalities, and a set of distinct sensory domains through which that sensitivity is expressed. In other words, while individuals tend to experience ASMR consistently across visual, auditory, and tactile triggers—as reflected in the strong factor intercorrelations—they also differentiate between the specific types of stimuli that elicit these responses, a pattern confirmed by the excellent fit of the four-factor confirmatory factor analysis model. Thus, the multidimensional structure revealed by the CFA does not contradict the presence of a broader ASMR disposition; instead, it supports the interpretation that ASMR is both unified and modular, reflecting modality-specific pathways that are organized under a cohesive sensory–affective response system.

ACEs and Misophonia

The present findings demonstrate a robust relationship between Adverse Childhood Experiences (ACEs) and misophonia symptomatology. ACEs were significantly associated with Misophonia Symptom Severity ($r = .59$), indicating that individuals with greater exposure to early adversity tended to report both more intense misophonia symptoms. The regression

analysis further underscores the strength of this association: ACEs accounted for approximately 35% of the variance in Misophonia Symptom Severity, representing a large effect and indicating that early adversity is not merely correlated with misophonia but is a substantial predictor of symptom intensity.

This pattern aligns with emerging theoretical perspectives suggesting that misophonia may be rooted in heightened autonomic reactivity, threat sensitivity, and altered emotional processing—domains known to be shaped by early-life stress (Kumar et al., 2017; Schroder et al., 2013). Exposure to adverse experiences during critical developmental periods has been linked to long-term alterations in stress-response systems, including heightened sympathetic activation, reduced parasympathetic regulation, and increased vigilance to environmental cues perceived as threatening. Within this framework, misophonic trigger sounds may be processed not as neutral auditory stimuli but as signals of threat or intrusion, eliciting disproportionate autonomic and affective responses. Neurobiological models of misophonia further support this interpretation, highlighting atypical connectivity between auditory processing regions and limbic structures involved in emotional salience and threat detection (Kumar et al., 2017), as well as clinical observations of intense anger, anxiety, and physiological arousal in response to specific sounds (Schroder et al., 2013).

These results may reflect the cumulative impact of early adversity on the development of neural systems responsible for sensory gating, emotion regulation, and defensive responding. Research shows that individuals with higher ACE exposure often develop heightened amygdala responsivity, reduced prefrontal regulatory control, and increased autonomic arousal, leading to stronger physiological reactions to aversive sensory cues (McLaughlin, 2015). Misophonia—characterized by disproportionate affective and physiological responses to specific sound

triggers—may therefore be more intense among individuals whose childhood environments contributed to dysregulated stress-response circuitry. Additionally, ACEs may contribute to hypervigilance or attentional biases toward perceived threats, potentially magnifying the salience and emotional impact of misophonia triggers. According to Polyvagal Theory, individuals orient to find out more about a stimulus so that we can assess whether we need to move away because it is a threat or move towards because it will meet our needs (Porges, 1995). Accordingly, we are continuously and unconsciously assessing to take the appropriate actions for our survival. To better protect ourselves, our psyche automatically orients us towards reminders of past traumatic events. Some individuals, when triggered by reminders of the past, experience disturbing bodily sensations, smells or sounds or movement impulses (Fisher & Ogden, 2009). In this way, past trauma can be a cause for involuntary and inconsistent bodily reactions to harmless stimuli. Therefore, it is possible that the triggers that cause misophonic symptoms in individuals are related to memories of past trauma. For example, olfactory cues have been shown to trigger vivid emotional and physiological reactions, including flashbacks, even in the absence of conscious autobiographical recall, reflecting the implicit and sensory-bound nature of traumatic memory (Herz, 2004; Vermetten & Bremner, 2003). We know from previous discussions about sensorimotor psychotherapy that memories are often encoded in a fragmented, nonverbal form, involving somatic sensations and affective states (van der Kolk, 2014). Extending this logic, it is plausible that auditory stimuli may function in a similar manner for some individuals, serving as triggers for unprocessed potentially traumatic experiences. Sounds associated with early adverse experiences—particularly those characterized by intrusiveness, repetition, or lack of perceived control—may become implicitly linked with heightened autonomic arousal and threat detection systems. When encountered later in life, these sounds may activate conditioned defensive

responses, resulting in the intense emotional, physiological, and behavioral reactions characteristic of misophonia (Schroder et al., 2013; Kumar et al., 2017).

Taken together, the findings indicate that early-life adversity may play a meaningful role in shaping vulnerability to misophonia, particularly in the intensity of symptom expression. Future research should investigate different misophonia triggers as they may be linked to past traumatic experiences. These results highlight the need for clinicians to consider trauma histories when assessing and treating misophonia and suggest that sensory-informed approaches may be beneficial for individuals with elevated ACE exposure and heightened sound sensitivity.

ACEs and ASMR

The correlation and regression results indicate a meaningful but modest relationship between Adverse Childhood Experiences (ACEs) and ASMR responsiveness. The small to moderate positive correlations between ACE scores and the four ASMR sensory factors ($r = .25–.36$, $p < .01$) suggest that individuals with higher levels of childhood adversity tended to report somewhat stronger ASMR responses across visual, auditory, and tactile/interpersonal trigger modalities. This pattern implies that early adversity may be associated with increased sensitivity to the kinds of affiliative, gentle, or soothing cues that commonly elicit ASMR. Although the relationship is not large, it is consistent and cross-modal, indicating that ACEs are linked not to a specific type of ASMR trigger but to a broader pattern of heightened ASMR responsivity.

The regression results further clarify this relationship. ACEs significantly predicted overall ASMR Trigger Intensity, though the effect size was modest ($R^2 = .065$), meaning ACEs accounted for about 6.5% of the variance. This indicates that while early adversity contributes to

understanding individual differences in ASMR intensity, it is only one of many factors shaping ASMR responsiveness. The significant regression model—despite the small amount of explained variance—reinforces that the ACE–ASMR association is reliable, but also that ASMR is influenced by a complex network of sensory, emotional, interpersonal, and neurobiological factors beyond childhood adversity.

The observed associations may reflect shared underlying mechanisms. ACEs are known to shape the development of affective and autonomic regulatory systems, including heightened sensitivity to interpersonal cues, increased reliance on external soothing stimuli, and strengthened responsiveness to affiliative signals after early stress (McLaughlin et al., 2015). ASMR triggers often mimic social-affiliative cues—such as gentle vocal prosody, slow movements, and simulated close attention—which may be especially salient to individuals with histories of inconsistent caregiving or increased threat sensitivity (Cassidy & Shaver, 2016). In this context, ASMR may serve as a compensatory or regulatory mechanism for some individuals, offering a parasocial sense of safety, predictability, and calm that resonates with altered stress-response systems shaped by early adversity. This aligns with polyvagal theory's emphasis on ventral vagal activation through cues of safety (slow movement, gentle prosody, predictable rhythms) (Porges, 2011). The importance of this affectionate disposition in babies is evident in the 'Still Face' experiments (Tronick et al., 1978). Mothers' softly speaking, whispering and touching their infants help regulate their temperature, sleep and heart rate (Feldman, 2012). This first social interaction is beneficial and manages many aspects of infants' stress response system, including the hypothalamic-pituitary-adrenal axis and the autonomous nervous system. Multi-modal sensory inputs, such as sound and touch, are consistently present during early nurturing, in which visual modality is also relevant, such as the mother's face (Cassidy & Shaver, 2016). The

visual cue of eye contact, close attention and slow, affectionate hand movements help to regulate stress during this critical age (Cassidy & Shaver, 2016; Feldman, 2012). These audio-visual signals turn out to be the same ones reported as triggers for ASMR (Baratt & Davis, 2015; Poerio et al., 2018).

Although ACEs significantly predicted ASMR Trigger Intensity in regression analyses, no significant mean differences in ACEs scores were observed between ASMR responders and non-responders according to the ANOVA supplemental analysis. Taken together, these findings suggest that childhood adversity is associated with variability in the intensity of ASMR experiences rather than with the categorical presence or absence of ASMR responsiveness. This distinction highlights the importance of conceptualizing ASMR as a dimensional phenomenon, with early adversity influencing the degree of sensory reactivity rather than determining whether ASMR occurs at all. This is consistent with the variability of the size of predictive effect of ACEs on ASMR versus Misophonia. In contrast to misophonia symptom severity, which showed a strong association with ACEs, ASMR responsiveness appears to reflect a sensory trait that is only modestly shaped by early adversity and is not defined by trauma exposure per se.

In sum, the results indicate that higher ACE exposure is associated with stronger ASMR responses, but the relationship is modest, suggesting that ACEs may influence ASMR responsivity as one part of a broader biopsychosocial profile rather than serving as a primary determinant. These findings point to the possibility that ASMR experiences may be intertwined with developmental histories of stress and regulation, and they highlight the need for future research examining trauma-related pathways, autonomic sensitivity, and social-affective processing in ASMR and misophonia. Together with the findings about ACEs and Misophonia, results suggest that adverse childhood experiences are more strongly related to the severity and

impact of misophonic symptoms than to sensory responsivity itself. This pattern supports conceptual models in which early adversity contributes to heightened vulnerability to distress and dysregulation in response to sensory input, rather than uniformly increasing sensory sensitivity. Comparison of the differential influence of Adverse Childhood Experiences on ASMR and Misophonia is described in Table 9.

Table 9

Comparison of the Effects of ACEs on ASMR vs. Misophonia

Dimension	ACES -> ASMR	ACES -> Misophonia
Correlation strength	Small to moderate (r = .25–.36)	Moderate to strong (r = .38–.59)
Regression effect size	R^2 = .065 (6.5% of variance explained)	R^2 = .348 (35% of variance explained)
Interpretation of strength	Modest predictor	Large
Affected sensory/affective domains	Slightly increased sensitivity to affiliative, soothing cues (visual, auditory, tactile)	Heightened negative affect, autonomic hyperreactivity, threat sensitivity
Likely underlying mechanism	Enhanced attunement to gentle interpersonal cues; possible compensatory soothing response (Shields & Cicchetti, 2001; Poerio et al., 2018)	Trauma-related hypervigilance, emotion dysregulation, and neural sensitization to threat (McLaughlin et al., 2015; Kumar et al., 2017)
Nature of sensory response	Pleasant, calming, regulatory (parasocial caregiving cues)	Aversive, intense, distress-driven (fight/flight/freeze activation)
Clinical relevance	Minor factor; ASMR may serve as adaptive self-regulation for some individuals	Major factor; misophonia may reflect trauma-linked autonomic dysregulation

Implication for assessment	Consider ASMR as potential soothing strategy in clients with trauma histories	Essential to assess ACEs when misophonia symptoms are present

ACEs and Socioeconomic Status

Income was statistically significantly correlated with only one variable, which was ACEs. Income was not statistically significantly correlated with any of the four factors, ASMR Trigger Intensity or Misophonia Symptom Severity, or age. The relationship between income and ACEs indicates that the higher the income, the higher the experienced adverse childhood experiences were. This is inconsistent with the literature, which shows that lower income and lower childhood SES are associated with higher ACE exposure, and that higher ACE load predicts lower income or SES in adulthood (Metzler et al., 2017). Several mechanisms may explain this unexpected pattern.

First, this finding may reflect resilience and upward social mobility among individuals who experienced early adversity. Prior research shows that some individuals with high ACE exposure develop compensatory traits such as heightened perseverance, achievement motivation, or "post-traumatic growth," which can contribute to later educational and occupational success (Afifi & MacMillan, 2011; Fritz et al., 2018). Adults with higher ACE scores sometimes pursue upward mobility as a coping or meaning-making strategy, particularly when adversity fosters a strong internal drive for stability, autonomy, or financial security (Miller-Lewis et al., 2013). Thus, in a non-representative sample, higher ACE exposure may co-occur with higher adult income due to resilience-related trajectories rather than socioeconomic disadvantages.

Second, this pattern may be influenced by reporting and selection biases. Individuals with higher income and higher education often demonstrate greater mental health literacy and greater accuracy in recalling and labeling adverse childhood events (Hardt & Rutter, 2004). They may also be more comfortable endorsing sensitive items in anonymous survey research compared to individuals with lower SES, who tend to underreport childhood adversity due to stigma, normalization of hardship, or limited access to psychological language (Lacey et al., 2020). As a result, ACE scores may appear elevated among higher-income participants not because adversity was actually more prevalent, but because it was more readily disclosed.

Finally, because income in this study was measured as current adult income, not childhood household income, it does not function as a proxy for childhood SES. Studies show that adult income is only moderately correlated with childhood SES and often reflects later-life influences such as education, career field, geographic location, or intra-family mobility (Galobardes et al., 2006). Therefore, the small positive correlation found in this study likely reflects sample-specific characteristics, upward mobility in a subset of participants, or differential reporting patterns, rather than a reversal of the well-established SES–ACEs relationship observed in research.

ACEs and Age

Age was also statistically significantly negatively correlated with adverse childhood experiences. The negative association between age and ACE scores in this sample aligns with emerging research suggesting that younger adults tend to report more childhood adversity than older adults (Baglivio et al., 2014; Finkelhor et al., 2015). Several explanations may account for this pattern. First, cohort effects may play a role, as younger generations have grown up during

periods marked by increased family instability, economic stress, and mental health challenges that elevate risk for early adversity (Baglivio et al., 2014). Second, shifting social norms and improved trauma literacy have increased awareness and recognition of psychological and interpersonal forms of adversity—such as emotional neglect, witnessing violence, or parental mental illness—that older adults may not conceptualize as "adverse" or may be less likely to label as trauma (Finkelhor et al., 2015). Third, younger individuals appear more willing to disclose childhood adversity due to changing cultural attitudes toward mental health, greater comfort with vulnerability, and widespread public dialogue about trauma in media and online spaces (Twenge, 2020). Finally, retrospective recall differences may contribute; older adults often underreport ACEs due to memory decay, emotional distancing, or normalization of hardship (Hardt & Rutter, 2004). Taken together, these factors suggest that higher ACE scores among younger adults may reflect both true generational differences in exposure and greater willingness and ability to disclose adversity, rather than necessarily indicating higher actual prevalence of trauma solely within younger cohorts.

Age and ASMR

Age was statistically significantly negatively associated with ASMR Trigger Intensity. This indicates that younger participants reported stronger ASMR responses to triggering stimuli than older participants. There are two possible explanations for this: Firstly, emotional processing shifts with age, with older adults exhibiting reduced physiological arousal in response to affective stimuli, potentially attenuating the tingling sensations characteristic of ASMR (Urry & Gross, 2010). Secondly, younger adults may engage more readily with digital media that amplifies ASMR experience, as ASMR response may be heightened by exposure to ASMR content.

Qualitative and mixed-methods studies report that frequent ASMR video users describe becoming more attuned to triggers over time, learning which stimuli reliably evoke tingles, and experiencing stronger ASMR sensations with repeated viewing. For example, Barratt & Davis (2015) found that participants commonly reported "learning what works for them" and experiencing "more reliable tingles" over time. Poerio et al. (2018) also noted that regular ASMR consumers develop preferences for specific triggers and experience heightened relaxation and tingling with repeated exposure.

These findings suggest a process similar to sensory conditioning, where familiarity increases physiological readiness. Repeated exposure to specific auditory–visual cues can increase the brain's ability to anticipate and respond to those triggers. For example, Smith et al. (2020) argue that ASMR relies on learned associations between prosodic and tactile cues, and these associations become stronger through repeated exposure. Smith and Kornelsen (2021) suggest ASMR may engage dopaminergic reward pathways that condition the nervous system to respond more consistently over time. This aligns with broader neuroscience literature showing that repeated exposure to multisensory stimuli enhances neural entrainment and perceptual sensitivity. Because ASMR is a parasocial or pseudo-tactile response embedded in predictable auditory rhythms, it fits well within models of affective entrainment (Hari & Kujala, 2009). Thus, habituation (diminishing response) is not expected; sensitization (strengthening) is more plausible.

However, this finding must be considered in light of the phenomenon commonly referred to as "tingle immunity." Within ASMR communities, tingle immunity describes a reduction in tingling sensations following repeated exposure to the same trigger. This pattern aligns with well-established principles of stimulus-specific habituation, in which repetitive presentation of a

constant sensory cue leads to diminished physiological arousal as the nervous system adapts to predictable input (Rankin et al., 2009). Importantly, however, tingle immunity does not imply a global reduction in ASMR responsiveness. Empirical studies demonstrate that overall ASMR capacity may actually strengthen with varied and repeated engagement, as users learn which triggers are most effective, develop greater attentional attunement to subtle auditory–visual cues, and form strengthened predictive associations that facilitate physiological readiness for ASMR responses (Kumar et al., 2017; Smith et al., 2020). Thus, trigger-specific habituation and broader sensitization can coexist, with habituation occurring for overused individual stimuli, while overall ASMR responsiveness becomes more accessible and reliable through exposure-based learning. This dual-process framework helps reconcile anecdotal reports of tingle immunity with emerging evidence that ASMR responsivity may increase through repeated, varied exposure.

Younger age was statistically significantly correlated with the auditory triggers and tactile triggers but not the visual triggers. The finding that younger adults showed stronger responses to auditory and tactile/interpersonal ASMR triggers, but not visual triggers, may reflect developmental differences in how sensory modalities mature and integrate over time. Auditory and tactile systems are closely tied to social communication, interpersonal proximity, and affective cue processing—domains that exhibit heightened sensitivity in adolescence and young adulthood due to increased social vigilance, stronger responsiveness to prosodic and affiliative cues, and ongoing maturation of multisensory integration networks (Casey et al., 2008; Taylor et al., 2020). Younger adults also tend to display greater autonomic reactivity to subtle auditory and interpersonal signals, which may amplify ASMR's characteristic warm, soothing, or tingling sensations associated with soft speech, tapping, or simulated touch. In contrast, visual processing is more stable across adulthood, with less age-related variation in the perception of

repetitive or low-arousal visual stimuli. Moreover, ASMR's auditory and interpersonal triggers rely heavily on perceived intimacy—such as whispering, proximity cues, or simulated personal attention—experiences that younger individuals may be more attuned to due to developmental priorities around social belonging and affective connection. Consequently, auditory and tactile ASMR triggers may show stronger age-related variation, whereas visual triggers, which may be less interpersonally loaded, remain comparatively consistent across age groups.

Given that dual-sensitivity models account for both heightened positive and negative sensitivity to sensory cues, the strong correlations between ASMR and misophonia that some individuals may possess an underlying sensory-affective system that is more reactive overall—meaning they experience stronger-than-average responses across both positive (soothing, rewarding) and negative (aversive, distressing) sensory modalities. Rather than categorizing individuals as globally hypersensitive or hyposensitive, dual-sensitivity models recognize that sensory responsiveness can diverge in direction while sharing magnitude. Because there were strong correlations between ASMR and misophonia and ACEs predicted both misophonia and ASMR intensity, the dual-sensitivity model fits the results of this study. In the context of ASMR, this means that individuals who are highly sensitive to sensory input may be predisposed to experience stronger ASMR responses. The current study's findings support this conceptualization. Individuals may find certain sounds aversive (e.g., chewing, tapping, repetitive noises) while finding other auditory cues soothing (e.g., soft whispering, gentle prosody). This divergence highlights that ASMR and misophonia are not opposites, nor do they exist along a single continuum; instead, they may stem from a shared reactivity architecture that yields both comfort and discomfort depending on the nature of the sensory cue.

From a neurobiological perspective, the dual-sensitivity model is consistent with research showing that heightened reactivity in the salience network (e.g., anterior insula, anterior cingulate cortex) can amplify both positive and negative sensory experiences. Individuals with highly responsive salience systems may experience ASMR triggers as especially calming or rewarding, while experiencing misophonia triggers as overwhelmingly aversive. Similarly, polyvagal theory helps explain this duality. Cues associated with interpersonal safety—such as soft vocal prosody or slow rhythmic movement—activate the ventral vagal complex and promote calm states, whereas cues associated with unpredictability or threat may activate sympathetic arousal and produce misophonic distress. ASMR and misophonia may therefore reflect distinct branches of a shared sensory-affective system, with differential activation depending on whether a stimulus is perceived as "safe" or "threatening." The dual-sensitivity model also aligns with the observed correlations between ASMR Trigger Intensity and Misophonia Symptom Severity. Individuals with histories of early adversity may develop heightened autonomic and sensory reactivity as adaptive responses to unpredictable or threatening environments. Over time, such individuals may become especially sensitive to both positive and negative sensory cues—intensifying their experience of ASMR triggers while also increasing vulnerability to misophonia. The dual-sensitivity model thus has some practical implications for treatment.

Implications for Practice

eHealth Apps

Studies have shown the following advantages associated with e-mental health: improved accessibility, reduced costs, flexibility in terms of standardization and personalization, interactivity, and consumer engagement (Lal & Adair, 2014). These advantages of e-mental

health provide unique solutions in addressing the gap between the existing need for mental health services and the limited resources by consumers and limited capacity by providers to provide conventional treatment services (Hilty et al., 2016, Lal and Adair, 2014). For example, it has been reported that many individuals benefit from using the internet to gather information before health care appointments and to verify health care information, which empowers individuals by increasing personal comfort level and coping strategies regarding diagnosis and treatment (Antheunis et al., 2013).

Digital mental-health tools, including eHealth and mHealth applications, are increasingly used to assess, track, monitor, and store symptoms, psychometrics, and bioinformatic data, sometimes integrating these data with provider dashboards for treatment coordination or research (Torous & Roberts, 2017; Mohr et al., 2017). Many apps interface with wearable devices such as Fitbit or Apple Health to gather physiological markers including heart rate, sleep, and activity levels (Piwek et al., 2016). Some platforms—for example, Evidation—use incentive systems that allow users to earn redeemable points for submitting data or completing health-related tasks (Evidation Health, 2021). Depending on user needs or presenting concerns, apps may recommend psychoeducation, guided meditations, soundscapes, self-assessments, mindfulness or breathing exercises, and health-behavior prompts (Baumel et al., 2019; Schueller et al., 2016).

Other digital tools extend further by offering EMDR-inspired bilateral stimulation, ASMR content, mindfulness or breathing practices, gamified behavior-change tasks (e.g., for sleep or anxiety), symptom monitoring with alerts for irregularities such as arrhythmias (Apple, 2022), peer-support discussion boards, or telehealth access to licensed mental-health providers (Torous & Roberts, 2017). For instance, the Apple Watch includes built-in detection for abnormal heart rhythms and can initiate emergency calls when needed (Apple, 2022).

TimelyCare, a telehealth platform for students, provides on-demand emotional support, coaching, and basic-needs assistance. Although peer-reviewed research on the clinical efficacy of TimelyCare is not yet available, internal executive summaries report significant pre–post improvements in GAD-7 anxiety scores following use of the platform (TimelyCare, 2023).

Integrating these eHealth apps into clinical practice should be done with care. We should be cautious of music-based interventions aimed to regulate the nervous system or reduce sensory sensitivities when considering the reality of the dual-sensitivity model. Results of this study suggests that digital interventions may not be appropriate for clients with heightened sensory sensitivity, misophonia, or trauma-related autonomic instability. Because apps cannot adapt in real time to a client's shifting arousal level, clinicians should caution clients that self-guided digital tools may have unpredictable effects and should not replace therapeutic monitoring. For clients with complex trauma, dissociation, or pronounced sensory triggers, clinicians may need to provide structured, clinician-guided exposure rather than relying on app-based delivery. For example, within the broader movement toward sensory-informed and polyvagal-informed treatment models, the Safe and Sound Protocol (SSP) has gained increasing visibility as an intervention designed to modulate autonomic regulation through filtered auditory stimulation (Porges, 2017). Although the SSP is grounded in principles that parallel some of the mechanisms observed in this study, several limitations warrant careful consideration, especially when applied to populations with heightened sensory sensitivity.

The SSP is based on the premise that exposure to modulated prosodic sounds can down-regulate states of threat, reduce hyperarousal, and increase social engagement behavior (Porges, 2017). The SSP prompts users to listen to music from pop and other genres that has been altered to enhance mid-range frequencies to mimic that of soothing speech. However, the current

findings suggest that individuals with significant misophonia or trauma histories may exhibit dual sensory reactivity, meaning that the same individual who responds positively to certain auditory cues may simultaneously experience severe distress in response to others. This is especially bolstered by the results that Misophonia Symptom Severity showed moderate to strong correlations with all ASMR factors (r = .49–.63). Therefore, ASMR and misophonia may reflect related but divergent sensory processing pathways—both involving heightened responsivity to sensory stimuli yet differing in emotional valence (soothing vs. aversive).

Because the SSP relies exclusively on auditory delivery of intervention, it may inadvertently introduce sensory stimuli that some clients find overwhelming, intrusive, or dysregulating. For individuals with misophonic impairment, filtered vocal frequencies—even when designed to be calming—may provoke autonomic activation rather than reducing activation. This raises important clinical concerns about the protocol's narrow sensory modality and its assumption that prosodic auditory input is widely experienced as soothing (Porges, 2017). The SSP also operates on a relatively prescriptive and standardized sequence of auditory exposures that may not adequately accommodate trauma histories. The findings from this study indicate that participants varied not only in the sensory modalities that elicited soothing responses but also in those that evoked distress. A protocol that privileges auditory channels while neglecting tactile, visual, or interpersonal cues may be misaligned with the nuanced and individualized patterns of sensory-affective processing. Clients who experience strong ASMR responses to visual or tactile-interpersonal stimuli, for example, may derive little benefit from an auditory-only approach and may even experience discomfort when required to remain passively exposed to auditory input for prolonged periods.

Incorporating sensory awareness into trauma-informed care may require clinicians to explore how clients use sensory inputs to self-regulate. For example, ASMR triggers—particularly those involving gentle vocal prosody, predictable rhythmic sounds, or slow visual movements—may function as adaptive tools that help clients down-shift from states of hyperarousal. Recognizing ASMR as a potentially intentional regulatory strategy, rather than dismissing it as a niche or trivial response, can broaden the repertoire of acceptable coping strategies within therapy. Conversely, understanding that misophonia may reflect an exaggerated alarm response to specific sensory cues can help clinicians frame the experience as a neurobiological sensitivity rather than a behavioral overreaction or interpersonal difficulty.

Sensory-Aware Practice

Mental health providers who work with clients with a history of trauma and chronic stress seek to understand signs and consequences of such exposure, as these effects are often extensive and can impact psychological, physiological, and relational functioning of clients (van der Kolk, 2014).The findings of the present study suggest that sensory–affective responsiveness—specifically as manifested through ASMR and misophonia—may represent an underrecognized dimension of clients' trauma histories and regulatory capacities. In this light, ASMR and misophonia screening can be used to signal potential nervous system regulation issues. Clinicians may benefit from attending not only to traditional trauma symptoms such as hyperarousal, avoidance, and intrusive memories, but also to the ways in which clients respond to subtle auditory, visual, and interpersonal cues in their daily environments as a way to conceptualize client presenting problems holistically. Understanding these sensory responses may provide valuable insight into patterns of autonomic regulation, emotional reactivity, and interpersonal functioning for the individual and guide the planning and execution of treatment.

Individuals with elevated adverse childhood experiences may present with heightened sensitivity across both pleasurable and aversive sensory modalities, reflecting broad disruptions in autonomic regulation. As such, clinicians should consider conducting a nuanced sensory assessment during intake, exploring clients' reactions not only to distressing stimuli but also to cues that promote safety, comfort, and parasympathetic activation. This is consistent with contemporary trauma models that emphasize the central role of the autonomic nervous system and sensory processing in shaping emotional and behavioral outcomes (Courtois & Ford, 2013; Herman, 2015).

Sensory-aware practice may also enhance therapeutic relationships. Many ASMR triggers involve interpersonal elements that mimic caregiving or co-regulatory interactions, such as soft tones of voice or focused attention. Therapists can draw on these principles by cultivating an environment characterized by predictable rhythms, gentle prosody, and mindful pacing. Such elements align with polyvagal-informed therapeutic practices and may facilitate clients' access to states of safety and calm during sessions. At the same time, clinicians should be mindful that some clients may experience heightened reactivity to particular auditory or visual cues and should collaboratively identify environmental factors that support comfort and engagement. As part of treatment, clinicians may help clients identify specific sensory triggers that evoke distress and differentiate these from those that promote grounding or regulation. Tailoring interventions to the client's unique sensory profile—rather than applying a one-size-fits-all approach—may increase the effectiveness of trauma-informed care and enhance clients' capacity for self-regulation.

Summary of Implications

Overall, these findings encourage a broadened conceptualization of sensory-aware practice, one that incorporates sensory processing, autonomic regulation, and the nuanced interplay between soothing and distressing sensory experiences. Mental health providers who learn to recognize and work with these patterns may be better positioned to support clients in developing flexible, adaptive, and embodied strategies for managing stress, trauma, and emotional dysregulation. The results of the study imply that technology-based interventions for the treatment of trauma should be used with caution when considering that a "one-size-fits-all" digital interventions can be misleading due to differences between ASMR responders and non-responders, the influence of sensory sensitivity, and the role of interoception and autonomic regulation.

Study Limitations

A limitation of the present study concerns the use of a single ASMR trigger video to identify potential false negatives among participants who initially reported that they did not experience ASMR. Although the inclusion of an ASMR stimulus was intended to provide an additional screening mechanism for identifying individuals who might exhibit ASMR responses despite not endorsing them on self-report, relying on a single video necessarily restricts the range of possible sensory triggers. ASMR is a highly heterogeneous phenomenon, and individuals vary widely in the specific auditory, visual, or interpersonal cues to which they respond. It is therefore possible that some participants who were genuinely ASMR-responsive did not react to the particular set of triggers contained in the video. Some individuals may have responded negatively or neutrally due to distractions, production artifacts, dissociative symptoms, or idiosyncratic aspects of the specific video, rather than because of a true absence of ASMR

sensitivity. Additionally, the unusually large proportion of participants to endorse ASMR suggests that participants were more likely to choose to participate in this study if they were knowledgeable about ASMR. This tendency poses a limitation in the generalizability of the results as it is not representative of the population.

A second limitation of the study involves the measurement of trauma exclusively through the Adverse Childhood Experiences (ACE) framework. While the ACE questionnaire is widely used and supported by substantial empirical literature, it captures only a limited range of early life adversities and does so through broad categorical indicators. The instrument does not assess key dimensions such as the timing, severity, chronicity, or subjective impact of traumatic experiences, nor does it address forms of adversity outside the original ACE categories, including emotional neglect, attachment disruptions, community violence, racial trauma, or chronic family instability. Consequently, the measure may underestimate the complexity of participants' trauma histories and may fail to capture more nuanced associations between trauma exposure and sensory–affective phenomena such as ASMR responsiveness and Misophonia Impairment. Relying solely on the ACE framework therefore constrains the interpretive scope of the study's trauma-related findings and highlights the need for future work utilizing more comprehensive, developmentally sensitive assessments of early adversity.

Thirdly, the cross-sectional nature of the research design represents another important limitation. Because all variables were assessed at a single point in time, the study cannot determine temporal ordering or causal relationships. Although misophonia severity emerged as the strongest unique predictor of ASMR responsiveness, this does not confirm whether misophonia precedes, develops alongside, or results from patterns of sensory reactivity associated with ASMR. Similarly, while adverse childhood experiences predicted ASMR

intensity the design does not clarify whether early adversity leads to heightened sensory reactivity or whether other developmental, biological, or contextual factors mediate or moderate these relationships. Longitudinal designs are needed to determine the developmental sequencing of these sensory–affective traits. The cross-sectional design of the study limits the ability to infer causal directionality among ASMR, misophonia, and ACEs and draw causal inferences. Although the study aims to explore associations among ASMR responsiveness, Misophonia Symptom Severity, and ACEs, temporal sequencing and directionality of these relationships cannot be determined.

Fourthly, the sample, which was limited to English-speaking individuals over 18 who were recruited online using self-report measures, poses limitations. The sampling strategy, which primarily involves recruitment through online platforms (e.g., YouTube, Reddit, blogs, and Amazon Mechanical Turk), may result in selection bias. Participants are more likely to be individuals who are already familiar with ASMR or engaged in online mental health communities, potentially limiting the generalizability of findings to the broader population. Demographic limitations may arise from the nature of internet-based recruitment, which tends to overrepresent younger, technologically literate, and English-speaking individuals. As a result, the findings may not reflect the experiences of older adults, non-English speakers, or individuals with limited internet access. The reliance on self-report measures introduces the potential for response bias, including recall inaccuracies and social desirability effects, which may affect the reliability of participants' responses to the ASMR Trigger Checklist, the Duke Misophonia Questionnaire, and the Adverse Childhood Experiences (ACE) questionnaire. Particularly, retrospective reports of childhood experiences by adults have been called into question. Research that has quantified assessment of the validity of retrospective recall of adverse childhood

experiences show a substantial rate of false negatives and rare cases of false positives (Hardt & Rutter, 2004). These studies suggest that although bias may exist, it is not sufficiently great to invalidate retrospective reports of major adversities of an easily defined kind. In order to mitigate this error, the instrument used in this study offers readily operationalized childhood experiences, rather than situations which are more subtle and open-to-interpretation.

Lastly, although the study examined ASMR responsiveness, misophonia symptoms, and ACEs, the research did not include all constructs that may be theoretically relevant. Variables such as sensory-processing sensitivity, neurodivergence, current mental-health symptoms, or physiological measures were not assessed and may have provided additional explanatory power. The study did not include any direct assessment of cultural, linguistic, or contextual factors that might shape how individuals interpret or respond to ASMR triggers, misophonia stimuli, or trauma items. Cultural norms regarding sound tolerance, interpersonal space, vocal prosody, and expressions of distress vary across groups and may moderate sensory–affective responses in ways the study was not equipped to capture. Without detailed cultural data, the generalizability of the factor structure of the ASMR Trigger Checklist and the predictive patterns observed in the regression analyses remain uncertain across more diverse populations.

Recommendations for Future Research

Future research on ASMR would benefit from expanding methodological, theoretical, and technological approaches in ways that address the limitations of the current study and advance the scientific understanding of sensory–affective responsiveness more broadly. One limitation of the present study concerns the use of different analytic frameworks across primary and supplemental analyses. Although latent variable modeling (LVM) was employed for RQ1 to account for measurement error and to model relationships among constructs at the latent level,

supplemental analyses relied on measured-variable approaches (e.g., correlations, t-tests, and ANOVAs). This decision was made to prioritize analytic parsimony and interpretability for exploratory and follow-up questions that were not central to the primary hypotheses. Measured-variable analyses are commonly used for descriptive and supplemental purposes and can provide straightforward estimates that are more readily comparable with prior literature that has relied on observed scores. However, this approach introduces limitations, as measured-variable methods do not account for measurement error and may yield attenuated effect sizes relative to latent-variable approaches (e.g., Structural Equation Modeling frameworks). This limitation is particularly relevant given the high correlation between ASMR and misophonia, which are often moderately to strongly correlated yet conceptually distinct constructs. Failure to account for measurement error and shared variance at the latent level may obscure the unique contributions of each construct and inflate or attenuate observed relationships. As such, reliance on measured-variable approaches may limit the precision with which overlapping versus distinct aspects of ASMR and misophonia are captured. Therefore, future research should consider applying latent-variable approaches across both primary and supplemental analyses to enhance precision, reduce bias due to measurement error, and evaluate whether conclusions differ when constructs are modeled at the latent level.

One of the most notable limitations of this study is the heavy reliance on self-report measures to assess ASMR responsiveness, trigger sensitivity, and emotional effects. Although self-report tools are valuable for capturing subjective sensory experiences, they cannot fully establish the physiological or neurobiological underpinnings of ASMR. Objective indices of arousal and autonomic activity using physiological neuroimaging techniques —such as Transcranial Direct Current Stimulation (tDCS), Transcranial Magnetic Stimulation (TMS),

Near-Infrared Spectroscopy (fNIRS), Magnetoencephalography (MEG), Galvanic Skin Response (GSR), Electrodermal Activity (EDA), Electroencephalography (EEG)—are needed to substantiate self-reported trigger effects and determine whether subjective reports correspond to measurable changes in physiological regulation. Prior studies using these measures have typically been limited by small sample sizes, including experimental studies involving as few as thirty-eight young adults and neuroimaging investigations with roughly twenty participants (Smith et al., 2017). Larger, more diverse samples are needed to provide sufficient statistical power, enhance generalizability, and permit more robust modeling of individual differences in sensory responsiveness. Prior research also rarely includes baseline measurements, which are also needed for determining whether observed changes in mood, arousal, or symptom outcomes are attributable to the stimulus itself rather than pre-existing individual differences. Incorporating pre-stimulus baseline assessments would strengthen internal validity and improve interpretive clarity regarding the specific physiological shifts associated with ASMR exposure.

Virtual reality represents another promising direction for future research. Early studies have shown that immersive VR-based ASMR can enhance tingle intensity, reduce onset latency, and increase both the duration and the pleasantness of ASMR sensations (Liu & Zhou, 2019; Smith & Kornelsen, 2021). Participants also report heightened feelings of presence and authenticity during VR-enhanced ASMR experiences, suggesting that immersive environments may amplify the regulatory and emotional benefits of ASMR triggers (Hjorth et al., 2022). Despite these early indications, empirical research on VR-based ASMR remains limited, particularly with respect to mental-health outcomes. Systematic investigations using VR platforms could determine whether VR-enhanced ASMR is effective for reducing stress,

improving sleep, supporting emotional regulation, or complementing trauma-informed therapeutic interventions.

Longitudinal research represents another key recommendation. Much of the existing ASMR research, including the current study, relies on cross-sectional designs that cannot determine whether ASMR experiences produce lasting changes in autonomic functioning, emotional regulation, or overall well-being. Longitudinal or repeated-measures designs could address whether regular engagement with ASMR triggers leads to cumulative benefits over time, whether individuals' sensory responsiveness changes across developmental periods, or whether ASMR can mitigate the effects of chronic stress or early adversity (Poerio et al., 2018; Smejka & Wiggs, 2022).

Future research should also expand the assessment of trauma beyond the Adverse Childhood Experiences (ACE) framework. While ACEs are a widely used indicator of early adversity (Felitti et al., 1998), they capture only a narrow subset of potentially traumatic experiences and do not account for subjective distress, relational dynamics, cultural factors, or experiences such as emotional neglect, chronic instability, racialized trauma, and community-based stressors (Finkelhor et al., 2015; Hamby et al., 2021). More comprehensive trauma assessments—including dimensional measures, interview-based tools, or clinician-administered instruments—would allow researchers to examine more nuanced relationships between trauma history, sensory reactivity, and autonomic regulation. Such approaches could clarify whether particular types of adversity—such as attachment disruptions, chronic emotional invalidation, or environmental unpredictability—are uniquely associated with ASMR responsiveness, misophonia-related symptoms, or patterns of dual sensory sensitivity.

Finally, future studies should determine whether childhood adversity is more strongly associated with emotional appraisal of sensory input rather than sensory sensitivity per se. In the present study, increases in ACEs were associated with higher levels of ASMR Trigger Intensity and misophonia symptom severity; however, individuals classified as ASMR responders did not differ in childhood trauma exposure from ASMR non-responders. This pattern suggests that childhood adversity does not determine whether individuals experience ASMR, but instead modestly modulates the intensity with which sensory stimuli are experienced within an existing sensory system. Importantly, this finding argues against conceptualizing ASMR as a trauma-based or pathological phenomenon, as sensory responsivity can occur in the absence of elevated adversity. In contrast, the strong association between ACEs and misophonia symptom severity suggests that early adversity may be more closely linked to how sensory stimuli are emotionally appraised and regulated, rather than to sensory sensitivity itself. From this perspective, misophonia-related distress may reflect heightened threat appraisal, reduced regulatory capacity, or difficulty tolerating sensory input, processes that are more likely to translate into functional impairment. Accordingly, future research should move beyond measuring symptom severity to examine functional impairment associated with misophonia, as impairment may represent a more clinically meaningful outcome through which childhood adversity shapes maladaptive sensory experiences.

Taken together, these recommendations suggest that future research on ASMR should adopt a more multimethod, interdisciplinary, and developmentally informed approach. Integrating objective physiological measures, advanced neuroimaging techniques, immersive technologies, comprehensive trauma assessments, and longitudinal designs will provide a richer and more accurate understanding of ASMR as a complex sensory–affective phenomenon. This

expanded approach has the potential not only to advance scientific knowledge, but also to inform evidence-based clinical applications that harness the regulatory potential of ASMR in therapeutic contexts.

Conclusion

A non-clinical sample of participants completed measures of ASMR response, misophonic response and potentially traumatic childhood experiences. The main finding was that the sample data fit the four-factor structure of ASMR Triggers as proposed by the authors of the ATC (Poerio et al., 2023). This validation of the ATC contributes to further research on ASMR by providing empirical support for its use as a psychometrically sound measure of ASMR trigger domains in future research. Confirmatory factor analysis findings indicate that ASMR reflects a unified yet modular sensory–affective system, in which a general predisposition toward ASMR responsivity is expressed through distinct sensory pathways. Across analyses, ASMR and misophonia were strongly correlated. Regressions further underscored the power of ACEs to predict ASMR Trigger Intensity, and to a greater extent, Misophonia Symptom Severity.

Beyond measurement validation, the study revealed differential relationships between adverse childhood experiences (ACEs), ASMR, and misophonia. ACEs showed a modest but consistent association with ASMR Trigger Intensity across sensory domains, indicating that early adversity may slightly modulate the intensity of ASMR experiences. Importantly, ACEs did not distinguish ASMR responders from non-responders, suggesting that childhood adversity does not determine whether ASMR occurs but instead influences variability in responsivity within an existing sensory system. This finding argues against pathologizing ASMR as a trauma-based phenomenon and supports a dimensional, non-pathological conceptualization of ASMR.

In contrast, ACEs demonstrated a strong association with misophonia symptom severity, accounting for a substantial proportion of variance and highlighting early adversity as a meaningful predictor of misophonic distress. This pattern suggests that childhood adversity may be more closely linked to emotional appraisal, autonomic reactivity, and functional impairment in response to sensory stimuli than to sensory sensitivity itself. Taken together, the results support models in which ASMR and misophonia reflect divergent expressions of a shared sensory–affective reactivity architecture, with early adversity exerting a much stronger influence on maladaptive, distress-driven outcomes than on adaptive or soothing sensory responses. These findings underscore the importance of distinguishing sensory responsivity from impairment and have implications for both future research and sensory-informed, trauma-aware clinical practice.

Present findings suggested that technology-based health tools should be integrated cautiously for clients with high sensory sensitivity, misophonia, or trauma-related autonomic instability because apps cannot adjust in real time to a client's shifting arousal state and may produce unpredictable effects. In such cases, clinician-guided interventions and structured exposure may be safer than self-directed app use. For individuals with misophonic impairment or trauma histories, auditory-only interventions may inadvertently provoke autonomic activation, and standardized delivery may fail to accommodate individualized sensory profiles or the importance of visual, tactile, and interpersonal cues. Overall, the findings support a sensory-aware, trauma-informed approach in clinical practice.

References

Afifi, T. O., & MacMillan, H. L. (2011). Resilience following child maltreatment. *Current Psychiatry Reports, 13*(1), 26–32.

Anda, R. F., Felitti, V. J., Bremner, J. D., Walker, J. D., Whitfield, C., Perry, B. D., Dube, S. R., & Giles, W. H. (2006). The enduring effects of abuse and related adverse experiences in childhood: A convergence of evidence from neurobiology and epidemiology. *European Archives of Psychiatry and Clinical Neuroscience, 256*(3), 174–186. https://doi.org/10.1007/s00406-005-0624-4

Andersen, S. L., & Teicher, M. H. (2008). Stress, sensitive periods and maturational events in adolescent depression. *Trends in Neurosciences, 31*(4), 183–191.

Antheunis, M. L., Tates, K., & Nieboer, T. E. (2013). Patients' and health professionals' use of social media in health care: Motives, barriers and expectations. *Patient Education and Counseling, 92*(3), 426–431. https://doi.org/10.1016/j.pec.2013.06.020

Apple Inc. (2022). *Heart health notifications on Apple Watch.* https://support.apple.com/en-us/HT208931

Baglivio, M. T., Epps, N., Swartz, K., Huq, M. S., Sheer, A., & Hardt, N. S. (2014). The prevalence of adverse childhood experiences (ACE) in the lives of juvenile offenders. *Journal of Juvenile Justice, 3*(2), 1–17.

Bandalos, D. L. (2014). Relative performance of categorical diagonally weighted least squares and robust maximum likelihood estimation. *Structural Equation Modeling: a multidisciplinary journal, 21*(1), 102-116.

Barratt, E. L., & Davis, N. J. (2015). Autonomous Sensory Meridian Response (ASMR): a flow-like mental state. *PeerJ, 3*, e851.

Baumel, A., Faber, K., Mathur, N., Kane, J. M., & Muench, F. (2019). Enlight: A comprehensive quality and therapeutic potential evaluation tool for mobile and web-based eHealth interventions. *Journal of Medical Internet Research, 21*(3), e11489. https://doi.org/10.2196/11489

Behrens, J. T., & Smith, M. L. (1996). Data and data analysis. *Handbook of educational psychology*, 945–989.

Bellis, M. A., Hughes, K., Leckenby, N., Perkins, C., & Lowey, H. (2019). Life course health consequences and associated annual costs of adverse childhood experiences across Europe and North America: A systematic review and meta-analysis. *The Lancet Public Health, 4*(10), e517–e528.

Bentler, P. M., & Chou, C. P. (1987). Practical issues in structural modeling. *Sociological Methods & Research, 16*(1), 78-117.

Ben-Zeev, A., Young, M. A., & Swendsen, J. (2019). Understanding triggers and emotional reactivity in misophonia. *Journal of Affective Disorders, 256*, 146–152.

Bernstein, D. P., Stein, J. A., Newcomb, M. D., Walker, E., Pogge, D., Ahluvalia, T., Stokes, J., Handelsman, L., Medrano, M., Desmond, D., & Zule, W. (1994). Initial reliability and validity of a new retrospective measure of child abuse and neglect. *American Journal of Psychiatry, 151*(8), 1132–1136. https://doi.org/10.1176/ajp.151.8.1132

Bethell, C. D., Davis, M. M., Gombojav, N., Solloway, M. R., & Sege, R. (2017). Methods to assess adverse childhood experiences of children and families toward approaches to promote child well-being in policy and practice. *Academic Pediatrics, 17*(7S), S51–S69.

Boyce, W. T., & Ellis, B. J. (2005). Biological sensitivity to context: I. An evolutionary–developmental theory of the origins and functions of stress reactivity. *Development and*

Psychopathology, 17(2), 271–301.

Bucci, M., Marques, S. S., Oh, D., & Harris, N. B. (2016). Toxic stress in children and adolescents. *Advances in pediatrics, 63*(1), 403-428.

Busso, D. S., McLaughlin, K. A., & Sheridan, M. A. (2017). Dimensions of adversity, physiological reactivity, and externalizing psychopathology in adolescence: Deprivation and threat. *Psychosomatic Medicine, 79*(2), 162–171.

Buhrmester, M., Kwang, T., & Gosling, S. D. (2011). Amazon's Mechanical Turk: A new source of inexpensive, yet high-quality, data? *Perspectives on Psychological Science, 6*(1), 3–5. https://doi.org/10.1177/1745691610393980

Burgess, J., & Green, J. (2018). *YouTube: Online video and participatory culture* (2nd ed.). Polity Press.

Campbell, J. (2023). Misophonia: a need for audiological diagnostic guidelines. *Journal of the American Academy of Audiology, 34*(07/08), 176-180.

Campo, R. A., & Kehle, T. J. (2016). The efficacy of ASMR in enhancing mindfulness and reducing stress. *Mindfulness Research Journal, 3*(2), 45-56. doi:10.1007/s12671-016-0486-0

Casey, B. J., Jones, R. M., & Hare, T. A. (2008). The adolescent brain. *Annals of the New York Academy of Sciences, 1124*(1), 111–126.

Cassidy, J., & Shaver, P. R. (Eds.). (2016). *Handbook of attachment: Theory, research, and clinical applications* (3rd ed.). Guilford Press.

Chandler, J., & Shapiro, D. (2016). Conducting clinical research using crowdsourced convenience samples. *Annual Review of Clinical Psychology, 12*, 53–81. https://doi.org/10.1146/annurev-clinpsy-021815-093623

Cronholm, P. F., Forke, C. M., Wade, R., Bair-Merritt, M. H., Davis, M., Harkins-Schwarz, M.,

Pachter, L. M., & Fein, J. A. (2015). Adverse childhood experiences: Expanding the concept of adversity. *American Journal of Preventive Medicine, 49*(3), 354–361. https://doi.org/10.1016/j.amepre.2015.02.001

Dana, D. (2018). *The Polyvagal Theory in therapy: Engaging the rhythm of regulation.* W. W. Norton.

Danese, A., & McEwen, B. S. (2012). Adverse childhood experiences, allostasis, allostatic load, and age-related disease. *Physiology & Behavior, 106*(1), 29–39. https://doi.org/10.1016/j.physbeh.2011.08.019

Diemer, M. A., Mistry, R. S., Wadsworth, M. E., López, I., & Reimers, F. (2013). Best practices in conceptualizing and measuring social class in psychological research. *Analyses of Social Issues and Public Policy, 13*(1), 77–113.

Ditchburn, T. A., & Bedwell, S. A. (2019). Autonomous sensory meridian response: An ineffective long-term therapeutic intervention. *PsyPAG, (110)*, 19-24.

Edelstein, M., Brang, D., Rouw, R., and Ramachandran, V. S. (2013). Misophonia: physiological investigations and case descriptions. *Front. Hum. Neurosci. 7*:296. doi: 10.3389/fnhum.2013.00296

Eid, C. M., Hamilton, C., & Greer, J. M. (2022). Untangling the tingle: Investigating the association between the Autonomous Sensory Meridian Response (ASMR), neuroticism, and trait & state anxiety. *Plos one, 17*(2), e0262668.

Engelbregt, H. J., Brinkman, K., Van Geest, C. C. E., Irrmischer, M., & Deijen, J. B. (2022). The effects of autonomous sensory meridian response (ASMR) on mood, attention, heart rate, skin conductance and EEG in healthy young adults. *Experimental Brain Research, 240*(6), 1727-1742.

Entwisle, D. R., & Astone, N. M. (1994). Some practical guidelines for measuring youth's race/ethnicity and socioeconomic status. *Child Development, 65*(6), 1521–1540.

Erfanian, M., Kartsonaki, C., and Keshavarz, A. (2019). Misophonia and comorbid psychiatric symptoms: a preliminary study of clinical findings. *Nord. J. Psychiatry 73*, 219–228. doi: 10.1080/08039488.2019.1609086

Evidation Health. (2021). How Evidation works: Turning everyday actions into better health. https://evidation.com

Feldman, R. (2012). Parent–infant synchrony: A biobehavioral model of mutual influences in the formation of affiliative bonds. *Monographs of the Society for Research in Child Development, 77*(2), 42–51.

Felitti, V. J., Anda, R. F., Nordenberg, D., Williamson, D. F., Spitz, A. M., Edwards, V., & Marks, J. S. (1998). Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults: The Adverse Childhood Experiences (ACE) Study. *American journal of preventive medicine, 14*(4), 245-258.

Ferrer-Torres, A., & Giménez-Llort, L. (2021). An integrative review of misophonia: Trigger sounds, emotions, and coping strategies. *Frontiers in Neuroscience, 15*, 660–678. https://doi.org/10.3389/fnins.2021.660574

Finkelhor, D., Shattuck, A., Turner, H., & Hamby, S. (2015). A revised inventory of Adverse Childhood Experiences. *Child Abuse & Neglect, 48*, 13–21.

Fisher, J., & Ogden, P. (2009). *Sensorimotor psychotherapy. Treating complex traumatic stress disorders: An evidence-based guide*, 312-328.

Fredborg, B., Clark, J., & Smith, S. D. (2017). An examination of personality traits associated with autonomous sensory meridian response (ASMR). *Frontiers in psychology, 8*, 247.

Fredborg, B. K., Clark, J. M., & Smith, S. D. (2018). An examination of personality traits associated with Autonomous Sensory Meridian Response (ASMR): Comparing individuals who experience ASMR to those who do not. *Frontiers in Psychology, 9*, 1243. https://doi.org/10.3389/fpsyg.2018.01243

Fredborg, B. K., Clark, J. M., & Smith, S. D. (2021). Mindfulness and the autonomous sensory meridian response (ASMR). *Mindfulness, 12*(3), 649–661.

Fritz, J., de Graaff, A. M., Caisley, H., van Harmelen, A. L., & Wilkinson, P. O. (2018). A systematic review of the relationship between childhood adversity and resilience processes in adolescence and young adulthood. *Clinical Psychology Review, 64*, 87–105.

Galobardes, B., Shaw, M., Lawlor, D. A., Lynch, J. W., & Smith, G. D. (2006). Indicators of socioeconomic position (part 1). *Journal of Epidemiology and Community Health, 60*(1), 7–12.

Gard, A. M., et al. (2020). Adolescent stress and prefrontal cortical development: A systematic review. *Developmental Cognitive Neuroscience, 45*, 100807.

Greer, J. M. H., et al. (2025). Do whispering minds tingle alike? Exploring ASMR triggers and individual differences. *PLOS ONE* (in press).

Groenewald, C. B., Murray, C. B., & Palermo, T. M. (2020). Adverse childhood experiences and chronic pain among children and adolescents in the United States. *Pain Reports, 5*, e839.

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2019). *Multivariate data analysis* (8th ed.). Cengage.

Hardt, J., & Rutter, M. (2004). Validity of adult retrospective reports of adverse childhood experiences: review of the evidence. *Journal of child psychology and psychiatry, 45*(2), 260-273.

Hari, R., & Kujala, M. V. (2009). Brain basis of human social interaction: From concepts to brain imaging. *Physiological Reviews, 89*(2), 453–479. https://doi.org/10.1152/physrev.00041.2007

Haslam, K., Doucette, H., Hachey, S., MacCallum, T. E. L., Zwicker, D., Smith-Brilliant, M., & Gilbert, R. (2019). YouTube videos as health decision aids for the public: An integrative review. *Canadian Journal of Dental Hygiene, 53*(1), 53–66.

Hasson D, Theorell T, Bergquist J, Canlon B. (2013) Acute stress induces hyperacusis in women with high levels of emotional exhaustion. *PloS One. 2013;8*: e52945. pmid:23301005

Hamby, S., Taylor, E., Jones, L., Mitchell, K., & Turner, H. (2021). Comprehensive assessment of adversity and trauma exposure: Advances and recommendations for future research. *American Psychologist, 76*(2), 278–290.

Hancock, G. R., & Mueller, R. O. (2001). Rethinking construct reliability within latent variable systems. In R. Cudeck, S. du Toit, & D. Sörbom (Eds.), *Structural equation modeling: Present and future* (pp. 195–216). Scientific Software International.

Herz, R. S. (2004). A naturalistic analysis of autobiographical memories triggered by olfactory visual and auditory stimuli. *Chemical Senses, 29*(3), 217–224. https://doi.org/10.1093/chemse/bjh025

Hilty, D. M., Ferrer, D. C., Parish, M. B., Johnston, B., Callahan, E. J., & Yellowlees, P. M. (2013). The effectiveness of tele-mental health: A 2013 review. *Telemedicine and e-Health, 19*(6), 444–454.

https://doi.org/10.1089/tmj.2013.0075

Hjorth, L., Pink, S., Horst, H., & Collings, L. (2022). ASMR and virtual presence: Sensory immersion and affective attunement in digital environments. New Media & Society, 24(8),

1796–1814.

Hostler, T. J., Poerio, G. L., & Blakey, E. (2019). The role of expectancy in the experience of ASMR. *Consciousness and Cognition, 74*, 102798. doi:10.1016/j.concog.2019.102798

Humphreys, K. L., King, L. S., Gotlib, I. H., & Telzer, E. H. (2019). The role of early adversity in shaping the developmental trajectories of amygdala–prefrontal connectivity. *Developmental Cognitive Neuroscience, 35*, 67–74.

Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. Structural Equation Modeling: *A Multidisciplinary Journal, 6*(1), 1–55. https://doi.org/10.1080/10705519909540118

Jastreboff, P. J., & Jastreboff, M. M. (2015). Decreased sound tolerance: hyperacusis, misophonia, diplacousis, and polyacousis. *Handbook of clinical neurology, 129*, 375-387.

Johnson, L. (2019, February 4). *Millions of Americans just learned what ASMR is from Michelob Ultra's Super Bowl commercial — but they aren't loving it.* Business Insider. https://www.businessinsider.com/michelob-ultras-asmr-super-bowl-commercial-2019-2019-2

Johnson, P. L., Rasmusson, A. M., & Potenza, M. N. (2013). Characterizing misophonia: Gender, age, and comorbidity in a sample of adults. *Psychiatry Research, 207*(1–2), 79–85. https://doi.org/10.1016/j.psychres.2012.11.011

Kasper, R. B., & McErlean, A. B. (2023). Autonomous Sensory Meridian Response (ASMR) and misophonia: Emotional, physiological, and sensory profiles. *Consciousness and Cognition, 112*, 103442.

Keiles, Jamie Lauren (4 April 2019). "How A.S.M.R. Became a Sensation". *The New York Times.* ISSN 0362-4331. Archived from the original on 16 May 2023. Retrieved 7 April

2023.

Khalsa, S. S., et al. (2018). Interoception and mental health: A roadmap. *Biological Psychiatry: Cognitive Neuroscience and Neuroimaging, 3*(6), 501–513.

Kim, M., & Lee, S. S. (2023). The effects of autonomous sensory meridian response (ASMR) on modality, mood, and mindfulness (3Ms). *Psychology of Popular Media. doi:10.1037/ppm0000359*

Kim, S., and Feldt, L. S. (2010). The estimation of the IRT reliability coefficient and its lower and upper bounds, with comparisons to CTT reliability statistics. *Asia Pacific Educ. Rev. 11*, 179–188. doi: 10.1007/s12564-009-9062-8

Kinnealey, M., Oliver, B., and Willbarger, P. (1995). A phenomenological study of sensory defensiveness in adults. *Am. J. Occup. Ther. 49*, 444–451. doi: 10.5014/ajot.49.5.444

Klausen, H. B. (2019). 'Safe and sound': What technologically-mediated ASMR is capable of through sound. *SoundEffects-An Interdisciplinary Journal of Sound and Sound Experience, 8*(1), 87-103.

Kline, R. B. (2016). *Principles and practice of structural equation modeling* (4th ed.). Guilford Press.

Kraut, R., Olson, J., Banaji, M., Bruckman, A., Cohen, J., & Couper, M. (2004). Psychological research online: report of Board of Scientific Affairs' Advisory Group on the Conduct of Research on the Internet. *American psychologist, 59*(2), 105.

Krieger, N., Williams, D. R., & Moss, N. E. (1997). Measuring social class in U.S. public health research: Concepts, methodologies, and guidelines. Annual Review of Public Health, 18, 341–378.

Kumar, S., Tansley-Hancock, O., Sedley, W., Winston, J. S., Callaghan, M. F., Allen, M., &

Griffiths, T. D. (2017). The brain basis for misophonia. *Current Biology, 27*(4), 527–533.

Lacey, R. E., Howe, L. D., Kelly-Irving, M., Bartley, M., & Kelly, Y. (2020). The clustering of adverse childhood experiences in the Avon Longitudinal Study of Parents and Children: Are gender and poverty important? *Journal of Interpersonal Violence, 35*(23–24), 5093–5116.

Lal, S., & Adair, C. E. (2014). E-mental health: A rapid review of the literature. *Psychiatric Services, 65*(1), 24–32. https://doi.org/10.1176/appi.ps.201300009

Lee, M., Song, C. B., Shin, G. H., & Lee, S. W. (2019). Possible effect of binaural beat combined with autonomous sensory meridian response for inducing sleep. *Frontiers in human neuroscience, 13*, 425.

Leitzke, B. T., Hilt, L. M., & Pollak, S. D. (2015). Physiological reactivity to stress in children: Associations with early adversity and internalizing symptoms. *Journal of Abnormal Child Psychology, 43*(4), 797–807.

Leung, A. K. Y., Smith, J. L., & Fredborg, B. K. (2024). Autonomous sensory meridian response (ASMR): Online origins, user engagement, and associations with well-being. *Current Psychology*, 43, 12345–12358.

Lim, S., Yeo, G., & Yoon, J. (2019). Comparison between concentration and immersion based on EEG signals. *Sensors, 19*(7), 1669. https://doi.org/10.3390/s19071669

Liu, R., Kano, M., & Okamoto, H. (2025). Affective touch sensitivity shapes tingling intensity in autonomous sensory meridian response (ASMR). *Scientific Reports, 15*(19082). https://doi.org/10.1038/s41598-025-19082-8

Liu, X., & Zhou, T. (2019). Enhancing ASMR through immersive virtual environments: Effects on tingle intensity and emotional response. *International Journal of Human–Computer Interaction, 35*(17), 1593–1603.

Lochte, B. C., Guillory, S. A., Richard, C. C., & Kelley, W. M. (2018). An fMRI investigation of the neural correlates underlying the autonomous sensory meridian response (ASMR). *BioImpacts, 8*(4), 295–304. https://doi.org/10.15171/bi.2018.31

Lohaus, T., Schreckenberg, S. C., Bellingrath, S., & Thoma, P. (2023). Autonomous sensory meridian response (ASMR): A PRISMA-guided systematic review. *Psychology of Consciousness: Theory, Research, and Practice.* Advance online publication. https://dx.doi.org/10.1037/cns0000368

Lupien, S. J., McEwen, B. S., Gunnar, M. R., & Heim, C. (2009). Effects of stress throughout the lifespan on the brain, behaviour and cognition. *Nature Reviews Neuroscience, 10*(6), 434–445. https://doi.org/10.1038/nrn2639

Manohar S, Chen G-D, Li L, Liu X, Salvi R. (2023) Chronic stress induced loudness hyperacusis, sound avoidance and auditory cortex hyperactivity. *Hear Res. 2023;431*: 108726. pmid:36905854

Marotta-Walters, S. A., Jain, K., DiNardo, J., Kaur, P., & Kaligounder, S. (2018). A review of mobile applications for facilitating EMDR treatment of complex trauma and its comorbidities. *Journal of EMDR Practice and Research, 12*(1), 2-15.

Martin, E. L., Neelon, B., Brady, K. T., Guille, C., Baker, N. L., Ramakrishnan, V., Gray, K. M., Saladin, M. E., & McRae-Clark, A. L. (2023). Differential prevalence of Adverse Childhood Experiences (ACEs) by gender and substance used in individuals with cannabis, cocaine, opioid, and tobacco use disorders. *The American journal of drug and alcohol abuse, 49*(2), 190–198. https://doi.org/10.1080/00952990.2023.2171301

McErlean, A. B. J., & Banissy, M. J. (2017). Increased misophonia in individuals with self-reported autonomous sensory meridian response (ASMR*). PeerJ, 5*, e3403.

McErlean, A. B. J., & Banissy, M. J. (2018). Assessing individual variation in empathy: The psychometric properties of the empathy quotient (EQ) and affective empathy subscale (AES) in an ASMR sample. *Multisensory Research, 31*(7), 589–612.

McErlean, A. B. J., & Osborne-Ford, E. D. (2020). Affective responses to ASMR triggers: Individual differences and emotional processing. *Frontiers in Psychology, 11*, 561739. https://doi.org/10.3389/fpsyg.2020.561739

McGeoch, P. D., & Rouw, R. (2020). The role of atypical cross-activation of the insula in ASMR and misophonia. *Journal of Neuroscience Research, 98*(7), 1234-1242. doi:10.1002/jnr.24615

McLaughlin, K. A. (2015). Future directions in childhood adversity and youth psychopathology. *Journal of Clinical Child & Adolescent Psychology, 45*(3), 361–382. https://doi.org/10.1080/15374416.2015.1110823

Metzler, M., Merrick, M. T., Klevens, J., Ports, K. A., & Ford, D. C. (2017). Adverse childhood experiences and life opportunities: Shifting the narrative. *Children and Youth Services Review, 72*, 141–149.

Meyerson, P., & Tryon, W. W. (2003). Validating Internet research: A test of the psychometric equivalence of Internet and in-person samples. *Behavior research methods, instruments, & computers, 35*, 614-620.

Miller-Lewis, L. R., Searle, A. K., Sawyer, M. G., Baghurst, P. A., & Hedley, D. (2013). Resource factors for mental health resilience in early childhood. *International Journal of Mental Health Promotion, 15*(2), 93–103.

Mohr, D. C., Weingardt, K. R., Reddy, M., & Schueller, S. M. (2017). Three problems with current digital mental health research… and three things we can do about them. *Psychiatric*

Services, 68(5), 427–429. https://doi.org/10.1176/appi.ps.201600541

Ogden, P. (2007). *Trauma and the body: A sensorimotor approach to psychotherapy*. W.W. Norton & Company.

Ogden, P. (2009). Sensorimotor psychotherapy: Interventions for trauma and attachment. *Journal of Trauma & Dissociation, 10*(1), 135-150. doi:10.1080/15299730802485109

Ogden, P., Minton, K., & Pain, C. (2006). *Trauma and the body: A sensorimotor approach to psychotherapy.* Norton

Oosterman, M., De Schipper, J. C., Fisher, P., Dozier, M., & Schuengel, C. (2010). Autonomic reactivity in relation to attachment and early adversity among foster children. *Development and Psychopathology, 22*(1), 109–118.

Park, S. A., & Lim, H. S. (2022). The effect of ASMR on anxiety, stress, sleep quality in university students. *The Journal of the Convergence on Culture Technology, 8*(2), 321-327.

Pechtel, P., Lyons-Ruth, K., Anderson, C. M., & Teicher, M. H. (2014). Sensitive periods of amygdala development: The role of maltreatment in preadolescence. *NeuroImage, 97*, 236–244.

Piwek, L., Ellis, D. A., Andrews, S., & Joinson, A. (2016). The rise of consumer health wearables: Promises and barriers. *PLoS Medicine, 13*(2), e1001953.

Poerio, G. L., Blakey, E., Hostler, T. J., & Veltri, T. (2023). The ASMR Trigger Checklist (ATC): Development and validation. *PLOS ONE, 18*(2), e0249137. doi:10.1371/journal.pone.0249137

Poerio, G. L., Blakey, E., Hostler, T. J., & Veltri, T. (2018). More than a feeling: Autonomous sensory meridian response (ASMR) is characterized by reliable changes in affect and physiology. *PloS one, 13*(6), e0196645.

Poerio, G. L., Mank, S., & Hostler, T. J. (2022). The sensory and psychological correlates of ASMR in a general population sample. *Psychological Research, 86*(5), 1125-1137. doi:10.1007/s00426-021-01595-2

Porges, S. W. (1995). Orienting in a defensive world: Mammalian modifications of our evolutionary heritage. A polyvagal theory. *Psychophysiology, 32*(4), 301-318.

Porges, S. W. (2007). The polyvagal perspective. *Biological Psychology, 74*(2), 116–143. https://doi.org/10.1016/j.biopsycho.2006.06.009

Porges, S. W. (2011). *The polyvagal theory: Neurophysiological foundations of emotions, attachment, communication, and self-regulation*. W. W. Norton.

Propper, C. B., & Holochwost, S. J. (2013). The influence of proximal risk on the early development of the autonomic nervous system. *Developmental Review, 33*(3), 151–167.

Rankin, C. H., Abrams, T., Barry, R. J., Bhatnagar, S., Clayton, D. F., Colombo, J., Coppola, G., Geyer, M. A., Glanzman, D. L., Marsland, S., McSweeney, F. K., Wilson, D. A., Wu, C.-F., & Thompson, R. F. (2009). Habituation revisited: An updated and revised description of the behavioral characteristics of habituation. *Neurobiology of Learning and Memory, 92*(2), 135–138. https://doi.org/10.1016/j.nlm.2008.09.012

Raykov, T. (1997). Estimation of composite reliability for congeneric measures. *Applied Psychological Measurement, 21*(2), 173–184.

Roberts, N., Beath, A., & Boag, S. (2019). Autonomous sensory meridian response: Scale development and personality correlates. *Psychology of Consciousness: Theory, Research, and Practice, 6*(1), 22.

Roberts, N., Beath, A., & Boag, S. (2019). Exploring the relationship between ASMR and personality traits. *Journal of Individual Differences, 40*(3), 155-164. doi:10.1027/1614-

0001/a000281

Roberts, N., Beath, A., & Boag, S. (2021). Autonomous sensory meridian response: Individual differences and consciousness correlates. *Psychology of Consciousness: Theory, Research, and Practice, 8*(1), 27.

Rouw, R., and Erfanian, M. (2018). A large-scale study of misophonia. *J. Clin. Psychol. 74*, 453–479. doi: 10.1002/jclp.22500

Rosenthal, M. Z., Anand, D., Cassiello-Robbins, C., Williams, Z. J., Guetta, R. E., Trumbull, J., & Kelley, L. D. (2021). Development and initial validation of the duke misophonia questionnaire. *Frontiers in psychology, 12*, 709928.

Schroder, A., Vulink, N., and Denys, D. (2013). Misophonia: diagnostic criteria for a new psychiatric disorder. *PLoS ONE 8*:e54706. doi: 10.1371/journal.pone.0054706

Schueller, S. M., Washburn, J. J., & Price, M. (2016). Exploring mental health providers' interest in using web and mobile-based tools in their practices. *Internet Interventions, 4*, 145–151.

Seaman, S. R., & White, I. R. (2020). "When Is a Complete-Case Approach to Missing Data Valid? The Importance of Making Assumptions." *American Journal of Epidemiology, 189*(12), 1583–1590.

Siegel, D. J. (2007). *The mindful brain: Reflection and attunement in the cultivation of well-being.* W.W. Norton & Company.

Siegel, D. J. (2010). *The mindful therapist: A clinician's guide to mindsight and neural integration.* W.W. Norton & Company.

Smejka, T., & Wiggs, L. (2018). Misophonia: Review of the evidence and proposed diagnostic criteria. *Journal of Affective Disorders, 226*, 132–140. https://doi.org/10.1016/j.jad.2017.09.056

Smejka, T., & Wiggs, L. (2022). The effects of autonomous sensory meridian response (ASMR) videos on arousal and mood in adults with and without depression and insomnia. *Journal of affective disorders, 301*, 60-67.

Smith, D. V., Clithero, J. A., Boltuck, S. E., & Huettel, S. A. (2017). Functional connectivity with ventromedial prefrontal cortex reflects subjective value for social rewards. *Social Cognitive and Affective Neuroscience, 12*(7), 1117–1126.

Smith, S. D., & Kornelsen, J. (2021). Exploring ASMR in immersive environments: Neural and experiential correlates. *Frontiers in Neuroscience, 15*, 789214.

Snelson, C. (2016). YouTube in the classroom: A scoping review of the research. *Computers & Education, 104*, 109–121. https://doi.org/10.1016/j.compedu.2016.11.001

Steiger, J. H. (2007). Understanding the limitations of global fit assessment in structural equation modeling. *Personality and Individual Differences, 42*(5), 893–898. https://doi.org/10.1016/j.paid.2006.09.017

Straus, M. A. (1979). Measuring intrafamily conflict and violence: The Conflict Tactics (CT) Scales. *Journal of Marriage and the Family, 41*(1), 75–88.

Swart, T. R., Bowling, N. C., & Banissy, M. J. (2022). ASMR-Experience Questionnaire (AEQ): A data-driven step towards accurately classifying ASMR responders. *British Journal of Psychology, 113*(1), 68-83.

Sztuka, A., Pospiech, L., Gawron, W., & Dudek, K. (2010). DPOAE in estimation of the function of the cochlea in tinnitus patients with normal hearing. *Auris Nasus Larynx, 37*(1), 55-60.

Taylor, C. M., Holt, R. J., Socheleau, M. M., & Gage, S. H. (2020). Sensory processing in adolescence: Neurodevelopmental underpinnings and clinical implications. *Neuroscience &*

Biobehavioral Reviews, 112, 196–208.

Teicher, M. H., & Samson, J. A. (2016). Annual Research Review: Enduring neurobiological effects of childhood abuse and neglect. *Journal of Child Psychology and Psychiatry, 57*(3), 241–266. https://doi.org/10.1111/jcpp.12507

Thompson, B., & Daniel, L. G. (1996). Factor analytic evidence for the construct validity of scores: A historical overview and some guidelines. *Educational and Psychological Measurement, 56*(2), 197–208. https://doi.org/10.1177/0013164496056002001

Tillfors, M., Andersson, G., Ekselius, L., Furmark, T., Lewenhaupt, S., Karlsson, A., & Carlbring, P. (2011). A randomized trial of Internet-delivered treatment for social anxiety disorder in high school students. *Cognitive Behaviour Therapy, 40*(2), 147–157. https://doi.org/10.1080/16506073.2011.555486

TimelyCare. (2023). TimelyCare impact report: Student mental health outcomes. https://timelycare.com

Tolstikova, K., & Chartier, B. (2010). Internet method in bereavement research: Comparison of online and offline surveys. *OMEGA-Journal of Death and Dying, 60*(4), 327-349.

Torous, J., & Roberts, L. W. (2017). The ethical use of mobile health technology in clinical psychiatry. *The Journal of Nervous and Mental Disease, 205*(1), 4–8.

Tourangeau, R., & Yan, T. (2007). Sensitive questions in surveys. *Psychological Bulletin, 133*(5), 859–883.

Travis, F., & Shear, J. (2010). Focused attention, open monitoring and automatic self-transcending: Categories to organize meditations from Vedic, Buddhist and Chinese traditions. Consciousness and Cognition, 19(4), 1110–1118. https://doi.org/10.1016/j.concog.2010.01.007

Tronick, E., Als, H., Adamson, L., Wise, S., & Brazelton, T. B. (1978). The infant's response to entrapment between contradictory messages in face-to-face interaction. *Journal of the American Academy of Child Psychiatry, 17*(1), 1–13.

Tukey, J. W. (1972). *Exploratory data analysis.* Addison-Wesley.

Twenge, J. M. (2020*). iGen: Why today's super-connected kids are growing up less rebellious, more tolerant, less happy—and completely unprepared for adulthood.* Atria.

Urry, H. L., & Gross, J. J. (2010). Emotion regulation in older age. *Current Directions in Psychological Science, 19*(6), 352–357. https://doi.org/10.1177/0963721410388395

van der Kolk, B. A. (2014). *The body keeps the score.* Viking.

Vermetten, E., & Bremner, J. D. (2003). Olfaction as a traumatic reminder in posttraumatic stress disorder: Case reports and review. *Journal of Clinical Psychiatry, 64*(2), 202–207.

Voellmin, A., Winzeler, K., Hug, E., Wilhelm, F. H., Schaefer, V., Gaab, J., … Bader, K. (2015). Blunted endocrine and autonomic stress reactivity in young adults exposed to childhood adversity. *Psychoneuroendocrinology, 52*, 21–32.

Wallen MB, Hasson D, Theorell T, Canlon B. (2012) The correlation between the hyperacusis questionnaire and uncomfortable loudness levels is dependent on emotional exhaustion. *Int J Audiol. 2012*;51: 722–729. pmid:22793020

Wang, M., & Li, B. (2020). Research on the Application of ASMR in the Development and Design of Sleeping Products. *In E3S Web of Conferences 179*, 02061. doi:10.1051/e3sconf/202017902061

Wesarg, C., Van den Akker, A. L., Oei, N. Y. L., Wiers, R. W., Staaks, J., Thayer, J. F., & Williams, D. P. (2022). Childhood adversity and vagal regulation: A systematic review and meta-analysis. *Neuroscience and Biobehavioral Reviews, 143,* 104920.

Woods, N., & Turner-Cobb, J. M. (2023). 'It's like Taking a Sleeping Pill': Student Experience of Autonomous Sensory Meridian Response (ASMR) to Promote Health and Mental Wellbeing. *International journal of environmental research and public health, 20*(3), 2337.

Wu, M. S., Lewin, A. B., Murphy, T. K., and Storch, E. A. (2014). Misophonia: incidence, phenomenology, and clinical correlates in an undergraduate student sample. *J. Clin. Psychol. 70*, 994–1007. doi: 10.1002/jclp.22098

Yusaira, F., & Bennett, C. N. (2021). Influence of autonomous sensory meridian response on relaxation states: An experimental study. *NeuroRegulation, 8*(4), 184-184. doi:10.15540/nr.8.4.184

Zheng, X., & Woo, B. K. P. (2017). E-mental health in ethnic minorities: A comparison of YouTube and talk-based educational workshops in dementia. *Asian Journal of Communication*, 27(5), 497–513. https://doi.org/10.1080/01292986.2016.1253535

APPENDIX A. ASMR TRIGGER CHECKLIST

What is ASMR?

Individuals with ASMR consciously and vividly experience pleasurable and calming tingling sensations in their head or scalp in certain situations. Examples include observing or hearing others manipulate objects, receiving personal attention, and experiencing scenarios such as getting a haircut or massage. ASMR is typically attention-grabbing but not necessarily intense, often manifesting as a mild tingling sensation or a general sense of calm. It is important to note that ASMR is neither dangerous nor maladaptive and is often first noticed in childhood as a profound yet unexplained phenomenon.

Frisson/Musical Chills

ASMR differs from music-induced chills (frisson), despite some similarities in sensation. Music-induced chills tend to heighten alertness and are primarily felt along the spine, whereas ASMR induces calmness, can lead to drowsiness, and is felt primarily on the scalp before spreading outward.

Screening Question:

Based on your own experience and the description provided, do you believe you are capable of experiencing ASMR? This question does not refer to watching ASMR content (e.g., YouTube videos) but rather to whether you personally experience the tingling relaxation sensation described above.

◯ Yes

◯ No

ASMR Trigger Ratings

The following is a list of potential ASMR triggers. Please evaluate whether each stimulus triggers ASMR for you. If it does, rate the intensity of your ASMR experience on a scale from 1 (low intensity) to 6 (high intensity). Select 0 if you do not experience ASMR from the trigger. Select "Unknown" if you are unsure.

Rating Scale:

0 = No ASMR Response

1-6 = Intensity of ASMR Experience

Unknown = Uncertain Response

Some triggers may elicit negative emotions under certain circumstances. Only consider those that have the potential to elicit positive feelings.

Trigger Categories:

Tactile/Interpersonal Triggers

1. Physical touch on your body (e.g., hair play, massage)

2. Close personal attention (e.g., service encounters, appointments)

3. Someone providing care for you (e.g., nursing, affirmations)

4. Light touch on your face (e.g., makeup application)

5. Close-up movements directed at you

6. Altruistic acts toward you (e.g., kind words, lending items)

7. Blowing (e.g., into your hair or ear)

8. Eye contact (e.g., prolonged or focused gaze)

Vocal Auditory Triggers

9. Whispering

10. Soft-speaking (e.g., slow, rhythmic speech)

11. Specific voice timbre or pitch (e.g., female voices, children's voices)

12. Certain letter sounds (e.g., "toasted coconut")

13. Accents (e.g., foreign accents)

14. Reading out loud (e.g., books, magazines)

15. Inaudible/unintelligible speech

16. Mouth sounds (e.g., lip smacking, humming)

17. Breathing sounds (e.g., delicate breath, inhaling)

18. Eating sounds (e.g., chewing, swallowing)

Non-Vocal Auditory Triggers

19. Tapping sounds (e.g., nails on hard surfaces)

20. Brushing sounds

21. Scratching sounds (e.g., writing with a fountain pen)

22. Crinkling sounds (e.g., metallic foil, clothing)

23. Page-turning sounds

24. Sticky fingers sounds

25. Buzzing sounds (e.g., vibrations, humming)

26. Rubbing sounds (e.g., hand rubbing, fabric sounds)

27. Blowing sounds/white noise (e.g., hair dryers, vacuums)

28. Liquid sounds (e.g., water pouring, spray bottles)

29. Solid material sounds (e.g., glass clinking, scissors cutting)

30. Nature sounds (e.g., rain, fire crackling)

Visual Triggers

31. Watching delicate hand movements (e.g., hand strokes, tracing)

32. Watching someone being touched (e.g., massage, hair brushing)

33. Observing someone complete a task with expertise (e.g., painting, playing an instrument)

34. Watching someone concentrate on a task (e.g., cooking, applying makeup)

35. Watching repetitive actions (e.g., folding towels, coloring in)

36. Watching "Oddly satisfying" triggers (e.g., kinetic sand, soap cutting)

37. Having a light flashed near your face

APPENDIX B. ADVERSE CHILDHOOD EXPERIENCES QUESTIONNAIRE

While you were growing up, during your first 18 years of life:

1. Did you feel that you didn't have enough to eat, had to wear dirty clothes, or had no one to protect or take care of you? (yes/no)

2. Did you lose a parent through divorce, abandonment, death, or other reason? (yes/no)

3. Did you live with anyone who was depressed, mentally ill, or attempted suicide? (yes/no)

4. Did you live with anyone who had a problem with drinking or using drugs, including prescription drugs? (yes/no)

5. Did your parents or adults in your home ever hit, punch, beat, or threaten to harm each other? (yes/no)

6. Did you live with anyone who went to jail or prison? (yes/no)

7. Did a parent or adult in your home ever swear at you, insult you, or put you down? (yes/no)

8. Did a parent or adult in your home ever hit, beat, kick, or physically hurt you in any way? (yes/no)

9. Did you feel that no one in your family loved you or thought you were special? (yes/no)

10. Did you experience unwanted sexual contact (such as fondling or oral/anal/vaginal intercourse/penetration)? (yes/no)

APPENDIX C. DUKE MISOPHONIA QUESTIONNAIRE

General Instructions

The following questions refer to the experience of being intensely bothered by a sound or sounds, even when they are not overly loud. These can include human or non-human sounds, or the sight of someone or something making a sound that cannot be heard (e.g., the sight of someone biting their nails from across the room).

Your Triggers

Please indicate whether the following sounds and/or sights bother you much more intensely than they do most other people. (Yes / No)

1. People making mouth sounds while eating or drinking (e.g., chewing, crunching, slurping).

2. People making nasal/throat sounds (e.g., sniffing, sneezing, nose-whistling, coughing, throat-clearing).

3. People making mouth sounds when not eating (e.g., making the "tsk" sound, heavy breathing, snoring, whistling).

4. People making repetitive sounds (e.g., typing, tapping nails on table, pen clicking, writing, construction work, using machinery).

5. Rustling or tearing objects (e.g., paper, plastic).

6. Speech sounds (e.g., "p" sounds, hissing "s" sounds, someone speaking with a lisp, high-pitched voices)

7. Body or joint sounds (e.g., snapping fingers, cracking joints, jaw clicking).

8. Rubbing sounds (e.g., hands on pants, hands against one another, Styrofoam rubbing together).

9. Stomping or loud walking (e.g., heels clicking, flip flops, etc.).

10. Muffled sounds (e.g., voices separated by a wall, TV /music in another room).

11. People talking in the background (e.g., phone calls in public, many people talking at once).

12. Repetitive or continuous sounds not made by a person (e.g., clock ticking, air conditioner humming, water running).

13. Animals making repetitive sounds (e.g., licking, chirping, barking, eating, drinking).

14. 14. Seeing someone making or about to make a sound that bothers you, even if you can't hear it (e.g., seeing someone reach into a bag of chips, seeing someone eating on TV with the volume off).

15. Other (please describe): _____

16. There are no specific sounds that bother me much more than they do other people.

Note. If items 1–15 are marked "No" and item 16 is marked "Yes," do not proceed with the following sections.

Frequency of Sound Sensitivity

In the past month, on average across all bothersome sounds, how often were you bothered by a sound or sounds?

- Once per month or less

- 2-3 times per month

- 1-3 times per week

- 4-7 times per week

- 2-5 times per day

- 6 or more times per day

Emotional Responses to Sound

Scale: 0 = Never, 1 = Rarely, 2 = Sometimes, 3 = Often, 4 = Always/almost always

1. I felt angry.

2. I felt anxious.

3. I felt disgusted.

4. I felt hateful.

5. I felt panic.

6. I felt hostile.

7. I felt jittery.

8. I felt frustrated.

Physical Responses to Sound

Scale: 0 = Never, 1 = Rarely, 2 = Sometimes, 3 = Often, 4 = Always/almost always

1. I became rigid or stiff.

2. I trembled or shuddered.

3. My heart pounded or raced.

4. I started breathing intensely or forcefully.

5. I reflexively jumped.

Cognitive Responses to Sound

Scale: 0 = Never, 1 = Rarely, 2 = Sometimes, 3 = Often, 4 = Always/almost always

1. “I am helpless.”

2. “I want to cry.”

3. “How do I make this sound stop?”

4. “Everything is awful.”

5. “I cannot handle this.”

6. “I need to get away from the sound.”

7. “I would do anything to make it stop.”

8. I thought about screaming at, yelling at, or telling off the person making the sound.

9. I thought about pushing, poking, shoving, etc., the person making the sound.

10. I thought about physically hurting the person making the sound.

Coping Strategies: Before the Sound

Scale: 0 = Never, 1 = Rarely, 2 = Sometimes, 3 = Often, 4 = Always/almost always

1. I avoided certain people, places, or things so I would not have to hear sounds I dislike.

2. I used a different sound to drown out the bothersome sound (e.g., turned on the TV).

3. I used strategies to make myself less bothered by sounds I might hear (e.g. deep breathing, meditation, visualization).

4. I was on guard for bothersome sounds.

5. I distracted myself so as not to be bothered by a sound I might hear.

6. I made a plan to cope with bothersome sounds if they occurred.

Coping Strategies: During the Sound

Scale: 0 = Never, 1 = Rarely, 2 = Sometimes, 3 = Often, 4 = Always/almost always

1. I blocked the sound (e.g., covered ears with hands, headphones, ear plugs).

2. I used strategies to calm yourself (e.g., self-talk, breathing exercises).

3. I focused my attention on an activity (e.g., watched TV or videos).

4. I produced an alternate sound (e.g., humming).

5. I reminded myself that it could be worse.

6. I increased the background noise to cover up the bothersome sound (e.g., turn on TV, roll down car window).

7. I changed my way of thinking about the sound.

8. I looked away from the source of the sound.

9. I listened to music or a different sound.

10. I mindfully focused on current sensations without judgement.

Coping Strategies: After the Sound

Scale: 0 = Never, 1 = Rarely, 2 = Sometimes, 3 = Often, 4 = Always/almost always

1. I did something to comfort yourself (e.g., exercise, go somewhere calming, pet an animal).

2. I listened to a comforting sound (e.g., white noise, music).

3. I did some relaxation exercises (e.g., deep breathing, meditation).

4. I used the sight, smell, or touch of an object to soothe myself (e.g., looked at a soothing picture, smelled a scent, or touched a soft blanket).

5. I thought about strategies to cope better next time.

Functional Impact

Scale: 0 = Not at all, 1 = A little, 2 = Moderately, 3 = Quite a bit, 4 = Extremely

1. My ability to be with other people.

2. My performance at work or school.

3. The quality of my romantic relationships.

4. My ability to function in daily activities without help.

5. How much I enjoy spending time with my family.

6. My ability to work with others.

7. My self-esteem.

8. My ability to maintain employment.

9. The quality of my relationships with friends.

10. How connected I feel to other people.

11. My ability to live with other people (e.g. roommate, partner).

12. My ability to “be myself”.

Negative Self-Perceptions

Scale: 0 = Never, 1 = Rarely, 2 = Sometimes, 3 = Often, 4 = Always/almost always

1. “I hate being like this.”

2. “People do not understand me.”

3. “I will be rejected if people find out.”

4. “I am crazy.”

5. “My reactions to sounds are irrational.”

6. “I should get over it.”

7. “This is unfair.”

8. “I am weak.”

9. I should be able to control my reaction to these sounds.”

10. “I am a burden on others.”

11. “I should have known how to cope earlier.”

12. “My sound issues will only get worse with time.”

13. “No one can help me.”

APPENDIX D. ADDITIONAL QUESTIONS

1. “Please choose the option that best describes your situation. How familiar are you with ASMR online content?”

Response scale: 0-6

0 = I have never heard of it until now.

1 = I have a cursory idea of what it may be, but I am not sure.

2 = I know what it is but have not watched an ASMR video or have no opinion of them.

3 = I know what it is (may have involuntarily watched some ASMR videos) but do not enjoy them.

4 = I enjoy ASMR videos and watch them sometimes, but not often/regularly.

5= I am a consumer of online ASMR content and regularly watch it to experience ASMR sensations or for relaxation, entertainment, falling asleep or other mental health benefits.

6 =I would call myself an ASMR fan (part of my daily routine) or an ASMRtist (ASMR content creator).

2. “Do you consider ASMR an aid to your personal mental health?” (Yes/ No)

3. “Do you use mobile applications to monitor/ learn about/ support/ improve your mental health?” (Yes/ No)

4. “Have you been diagnosed with Autism Spectrum Disorder (Aspergers), an Obsessive-Compulsive or related disorder (i.e. obsessive-compulsive disorder, body dysmorphic disorder, hoarding disorder, hair-pulling disorder, skin-picking disorder, etc.), Attention-Deficit/Hyperactivity Disorder (ADHD), an Anxiety Disorder (generalized anxiety disorder, panic disorder, separation anxiety disorder, selective mutism, agoraphobia, specific phobia or social anxiety disorder), Tinnitus, Tourette syndrome, Post-Traumatic Stress Disorder (PTSD) or related disorders?” (Yes/No)

5. “What is your age in years?” (Open answer)

6. “What is your gender?”

Response Scale: 0-3

0 = Male, 1 = Female, 3 = Other

7. What is your ethnicity?”

Response Scale: 1-9

1= American Indian or Alaska Native, 2 = Asian, 3 = Black or African American, 4 = Hispanic, Latino or Spanish Origin, 5 =Middle Eastern or North African, 6 = Native Hawaiian or Other Pacific Islander, 7 = White, 8 = Multiethnic, 9 = Other

8. “What was your total household income before taxes in the last 12 months in USD?”

(Open answer)