# Do intelligence and personality traits influence ASMR perception?

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*"This thesis is submitted in partial fulfillment of the Honours degree of Bachelor of Psychological Science (Honours)"*

Words count: 9,158

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**Abstract**

The Autonomous Sensory Meridian Response (ASMR) is an atypical perceptual sensory condition in which the presence of specific audiovisual stimuli triggers pleasant static-like tingles in the crown of the head and the back of the neck region that might extend down to other body parts. Individuals who experience ASMR have reported its use to reduce chronic pain, stress, anxiety, alter their mood, aid with insomnia, and as a form of alternative medicine. It is important to explore whether intelligence and personality traits influence these sensory perceptions, to provide the bases for appropriate usage and the types of individuals whom it may be beneficial for. This research aimed to explore whether intelligence and personality traits, with a focus on Neuroticism and Openness to Experience, can predict whether individuals use or perceive ASMR and how these attributes may influence ASMR perception. $N$ = 262 individuals were recruited and completed intelligence measures, broad and facet specific personality trait measures, watched six ASMR inducing videos, and custom ASMR experience questionnaire. We found that 42% of participants who used ASMR did so for relaxation. We concluded that Openness and Neuroticism domains and sub-facets along with CAB can predict the usage and intensity of ASMR perception.

## Declaration

*"This thesis contains no material which has been accepted for the award of any other degree of diploma in any University, and, to the best of my knowledge, this thesis contains no material previously published except where due reference is made. I give permission for the digital version of this thesis to be made available on the web, via the University of Adelaide's digital thesis repository, the Library Search and through web search engines, unless permission has been granted by the School to restrict access for a period of time".*

Toloue Askarirad

**Acknowledgments**

I want to take this opportunity to thank my supervisor Professor Nick Burns and to extend my appreciation for his guidance, time, and support through the completion of this research project. I would like to sincerely thank my wonderful family whose endless love and support has helped me through this journey. A special thank you to my lovely sister who introduced me to ASMR. I am especially grateful to my amazing spouse, who has given me his absolute support and understanding throughout this year.

# CHAPTER 1

## Introduction

### 1.1 Preamble

Many of us fail to take notice of the sounds surrounding us due to our fast-paced, high pressure, on the go lifestyles. Being surrounded by ever-changing technology, mercurial/transient/capricious internet sensations, and viral hits, we constantly seek adrenaline rushes. We have become so deeply consumed by technology that we have forgotten to rely on our senses to guide us. For example, with regards to the decline of analogue watches, Generation Z (post-millennials) are the largest consumer group, surpassing Generation Y (millennials) who were the original driving force behind the push towards technologizing everyday accessories. Generation Z includes the population born between 1995-2015. We have for some years now stopped relying on our senses and have become bound to our screens and phones. We have failed to notice the stimulation in our presence until pop culture and YouTube shed a light on some of what we have forgotten concerning our senses. The internet has allowed people with hidden/unique experiences to find each other and build communities over common grounds. An example of this is the birth of the Autonomous Sensory Meridian Response (ASMR) online community in 2010. The goal of this research is to explore intelligence and personality traits, with a focus on Neuroticism and Openness to Experience, and how these may contribute to ASMR usage and perception in individuals, and the extent to which they experience it.

### 1.2 Autonomous Sensory Meridian Response

The Autonomous Sensory Meridian Response (ASMR) is an atypical perceptual sensory condition in which the presence of specific audio-visual stimuli triggers pleasant static-like tingles in the crown of the head and the back of the neck region that might extend

down to other parts of the body (Fredborg, Clark & Smith, 2017). These tingling sensations are accompanied by feelings of euphoria and a sense of relaxation.

The ASMR inducing stimuli typically involve rapid movements, and repetition of words or sounds. These triggering stimuli, presented as online videos, aim to soothe, nurture and calm the viewers (Rajan, 2019). To elicit the sensations, videos created include a variety of interpersonal triggers, imitation of medical examinations (Ahuja, 2013), crinkling paper, tapping on objects, scratching objects, soft whispers, etc. Individuals who describe the sensory patterns of ASMR claim the experience has persisted since childhood (Ahuja, 2013).

Online, there is a large ASMR community that has grabbed the attention of journalists and researchers (Vyas, 2019). The ASMR community members have connected through their shared ASMR experiences when many of them were not aware that the phenomenon even had a name. Individuals calling themselves ASMRtists have been making videos using auditory and visual stimuli to induce this ASMR experience for those who are capable of feeling it. The ASMRtists have been using binaural microphones to enhance the auditory experience and, usually, ask their audience to use earphones to experience the maximum effect of ASMR. Up close and personal style videos are commonly known as personal attention videos, in which the viewers get pampered or receive a haircut (in roleplay form). Others may include soft sounds, crisp sounds, and repetitive hand movements. Some of these YouTube videos have had millions of views (Poerio, et al, 2018). For an example, see the following ASMR video: (https://www.youtube.com/watch?v=GWs2_7i7t1A).

Concerning the different stimuli used to elicit ASMR, a study conducted by Fredborg, et. al, (2017) found whispering, tapping and scratching sounds were correlated with the highest incidence of ASMR out of the sixteen stimuli presented to their participants. It is important to note variation in how individuals experience ASMR, from the types of triggers to the intensity of the experience. For example, someone who feels intense ASMR from

whispers may not have the same degree of intensity when listening to eating sounds (Fredborg et al., 2017). ASMR perception is a relatively new phenomenon for psychological research and there is little research on the determinants of ASMR experience. Indeed, there have only been a couple of personality related researches (Fredborg, et. al, 2017; Barrett & Davis, 2015) completed in this area which will be discussed further below.

### 1.3 Background on ASMR

The exact history of ASMR is unknown. There is no clear date of when ASMR was first experienced, and for a long time, this phenomenon had no name to describe the sensations appropriately. For those who experienced the sensation, there were no terms to describe the feeling so as to explain it to others who were not able to perceive it. That was the case until Jennifer Allan coined the pseudoscientific term Autonomous Sensory Meridian Response (ASMR) in 2010 (Marshall, 2018). Now one could try to explore the undocumented history of ASMR by researching the background of certain triggering stimuli that we know of today. Through an evolutionary lens, the social grooming habits of many animals, particularly primates, may contribute to our pleasure in social grooming (Collins, 2012; Ahuja, 2013). For example, a strong ASMR trigger is video representing receiving haircuts and general hair grooming. Dr. Craig Richard speaks about the history of ASMR on his podcasts on ASMR University (www.asmruniversity.com), highlighting the television show – *The Joy of Painting* – hosted by the American artist Bob Ross. The show was extremely relaxing, as he tapped his paintbrushes and spoke gently while he dabbed the canvas to create his masterpieces (Cheadle, 2012; Ahuja, 2013). He is credited as the first unintentional ASMRtist. Dr. Richard then dives further into history, elaborating on the rise of professional hairdressers in the 1600 and 1700s and, furthermore, speaking about barber shop operations going as far back as 300 BC. The idea that these professional groomers came about could be linked to our biology. Grooming is a common ASMR trigger, as there are

many examples of primates grooming each other which have been attributed to biological behaviours. We cannot determine if primates experience ASMR; however, it has been demonstrated that grooming in primates results in reduced heart rate and other physiological and emotional determinants (Aureli & Waal, 2000).

A crucial indicator of emotions is reflected in self-directed behaviours such as grooming. Nonhuman primates have been documented to self-groom in situations of uncertainty, high levels of stress, and social tension to deflect these unsettling emotions. Self-directed behavioural characteristics are also observed in humans, when experiencing high levels of stress, and anxiety. To investigate the primate's emotional responses, researchers monitored changes as they occurred. Their data have been measured by physiological responses such as heart rate, blood pressure, skin resistance, muscle tension, and hand temperature. Social grooming has been revealed to elicit a variety of health benefits in nonhuman primates, such as macaques (Aureli & Waal, 2000). While the positive effects of grooming in humans can be observed on the autonomous nervous system, physical touches - for example, a caress - can be used to reduce stress and potentially help individuals suffering from chronic pain and depression (Grandi & Ishida, 2015). Now more than ever, we have replaced human contact by relying on and using the digital world.

### 1.4 ASMR and Social Media

The internet and social media have provided a platform for ASMR to be made, shared, and accessed worldwide. There are in excess of 10 million ASMR videos uploaded online (DiSalvo, 2018) to various platforms to engage audiences. There are many genres within ASMR and some of these YouTube videos have millions of views (Barrett & Davis, 2015). There is a phone application named *Tingles*, which is dedicated to ASMR videos and audios covering a range of triggers featuring worldwide ASMRtists. *W Magazine* (https://www.wmagazine.com/) interviews celebrities using an ASMR style video as they

take the audience through a sonic tour of their professional careers. These videos are published on *W Magazine*'s YouTube channel (https://www.youtube.com/user/wmagazinedotcom) and Snapchat. *Calm*, a very popular meditation application with more than 40 million downloads, has also introduced ASMR videos. The House of Wellness – Season 3, Episode 11 covered ASMR as one of their topics ("The House of Wellness TV - Season 3, Episode 11", 2019). *AcousticSheep*, a sporting and sleep earphone company, released limited edition earphones called "SleepPhones®: ASMR Edition" for individuals who use ASMR. The US National Football League's (NFL) Super Bowl is one of the most watched sporting events in the United States. The game (American Football) is played between the top two teams in the NFL. This year's viewers reached over 111.3 million ("What Is the Super Bowl? - Who HQ", n.d.). In 2019, one of the sponsors, *Michelob* beer, produced a commercial shown during the game which starred Hollywood actress Zoë Kravitz as their ASMRtist to promote the beer through an ASMR style video. This video has now been viewed more than 33,000 times (https://www.youtube.com/watch?v=zqU8ar4gSyI). This video not only promoted the brand, but also created a sense of affirmation by providing descriptions, such as "pure" to create a sense of calmness. American rapper, Cardi B., was featured in a Pepsi ad by tapping on a diamond can ASMR style (Lucas, 2019). YouTube and social media platforms allow ASMR to market different products that are advertised in the following way: creating a sense of calmness and relaxation, to promote their products featuring celebrities and magazines to target a variety of audiences. Many ASMRtists reflect an attentive, focused, trustworthy, empathetic, and caring style in their videos aimed to reduce stress, and nurture and affirm the audience through interpersonal bonding and affiliative behaviours (Richard, 2014). The next section discusses positive affirmation as utilised by these artists.

### 1.5 Positive Affirmation

Positive affirmation is an important element of many videos in the ASMR genre. The personal attention videos mainly consist of the ASMRtists utilising affirmative language-speaking directly to the viewer, making those videos especially calming and reassuring. Stating things such as “you are doing well” and “it will be okay" creates a positive thinking pattern. Some ASMRtist will even “pluck/pull” negativity away from the viewers and promote positive thinking. ASMR is mainly based on repetitive movements or words and, occurs when the individual is attuned and in a flow like state of mind (Barrett & Davis, 2015). The flow state is a form of concentrated focus with reduced awareness of time passage, which is frequently associated with optimum performance on activities (Barrett & Davis, 2015). Social aspects, such as bullying, and psychological aspects such as anxiety, depression, and stress are often mentioned, while the ASMRtists declare their understanding and empathise with what their viewer might be experiencing. Creating such bonds and social intimacy may be the reason why many of the ASMRtists tend to be female, as they are more in demand compared to their male counterparts. Richard (2014) argues this may be due to the idea that women are nurturers or held as mother figures, and/or trusting friends which enables them to create and maintain these social bonds. These personal bonds include the parent and infant attachments, which involves certain behaviours that stimulate the release of dopamine, oxytocin, serotonin, and endorphins. The hormone release could provide an explanation for the responses associated with experiencing ASMR (Richard, 2014). Interpersonal bond and parental bonds between an infant and primary caregiver rely on the parent having the ability to comfort, relax and soothe the infant. The same response is produced by ASMR. The next section considers how ASMR relates to other similar phenomena.

### 1.6 Frisson and Synaesthesia vs. ASMR

It is important to note ASMR is not the only phenomena characterized by atypical visual-sensory perceptions. Other distinctive sensory perceptions namely frisson and

synaesthesia have previously been explored. Frisson and synaesthesia are involuntary sensory responses, with distinguished differences. Frisson can be defined as a psycho-physiological pleasurable reaction to music, or aesthetic chills (Clover & El-Alayi, 2015). Frisson is experienced when an individual is emotionally aroused or excited (Del Campo & Kehle, 2016). Synaesthesia can be defined as merging senses, or one sensory stimulation leading the other one to be perceived. There are 61 known variations of this sensory phenomenon synaesthesia. This multivariate condition is normally induced when one stimulus is presented which causes the other to be triggered. For example, someone may experience a particular taste when they are reading something, this is known as lexical–gustatory synaesthesia (Simner, 2012). ASMR and synaesthesia share some characteristics. Barratt and Davis (2015) found five and a half percent of the ASMR experiencers to perceive synesthetic experiences, implying a potential overlap between the two conditions. There is a possible link between synaesthesia and ASMR, which occurs when two or more senses are attached/intertwined with each other. The stimulation of one sensory pathway, leads to an automated experience in the second one. ASMR is induced by sight or sound resulting in the tingling sensation as its distinct feature accompanied by a deep sense of relaxation.

Synaesthesia is completely involuntary and is perceived automatically, whereas frisson may occur at some point but not at another while listening to the same musical piece (Smith, Fredborg & Kornelsen, 2017). These phenomena are similar such that they tend to emerge whilst one is engaged fully with the presented stimulus. While being mindful, resulting in the associated experiences with vast variation in triggers (Nusbaum et al., 2014). A distinctive feature is the tingling sensation that accompanies these two phenomena. Frisson tingles are described as rapid and spreading through the body. Whereas ASMR tingles are described as wave-like and may last up to several minutes. These tingling waves tend to morph and disperse to the periphery of the body (Del Campo & Kehle, 2016; Barratt &

Davis, 2015). Atypical sensory associations such as frisson and synaesthesia could have possible links to ASMR.

Through an artistic lens, ASMR may suggest correlations with chills experienced during aesthetic peaks (Ahuja, 2013). Neuroimaging has previously revealed frissons association with increased activity in motivation, emotion, arousal, and reward regions (Lochte et al, 2018). There are levels of similarities and dissimilarities between these three sensory phenomena. Both atypical sensory perceptions are associated with altered brain patterns in the functional connectivity region which suggest a potential neural structure of experience formation (Smith et al., 2017). A distinctive feature between ASMR and synaesthesia is the secondary sensory experience – in which synaesthesia is uncontrollable and automatic whereas ASMR perception is autonomous, induced by choice of triggering stimulus and intentionally stopped by disengagement from a stimulus (Barratt & Davis, 2015).

### 1.7 ASMR: Physiology and fMRI

Functional brain imaging has allowed neuroscientists to explicitly define affective pathways accessed by several forms of physical contact (Morrison et al, 2010). Psychological research of sensory illusions has demonstrated existence of intricate neural networks predisposed to numerous types of cross wiring (Ahuja, 2013). Research by Smith, et. al., (2017) suggested the presence of functional and structural variations between ASMR perceivers and non ASMR perceivers. The Functional Magnetic Resonance imaging (FMRi) was operated to explore the default mode network (DMN) in ASMR perceivers, which revealed evidence of decreased functional connectivity. However, it also provided an increased level of connectivity between the occipital cortices, temporal cortices, and frontal brain regions compared to the control group (Smith, Fredborg & Kornelsen, 2019). The researchers found evidence for merging of several resting state networks that may have

accommodated the atypical sensory sensations during an ASMR experience. Barratt and Davis (2015) suggested that individuals with altered functional brain connectivity suffering from chronic pain may benefit from ASMR to control brain state, implying an impaired ability to maintain the balance between active executive state and resting state. A study conducted by Lochte et al (2018), provided evidence that individuals who perceive ASMR displayed a significant activation in brain regions associated with emotional arousal (dACC and Insula/IFG) and reward (NAcc). During ASMR exposure, brain activities projected similar patterns observed in frisson (aesthetic chills) along with affiliative behaviours.

Theta waves – with 4-7 Hz range produce rhythmic neural oscillatory observable by electroencephalogram (EEG) are presented during rapid eye movement during sleep. This pattern is also observed on EEG, during states of drowsiness, hypnosis, and meditation (Lega, 2011). Meditation – a process associated with an attuned, fully alert yet extremely relaxed mental activity process which may decrease levels of stress and anxiety (Sharma, 2015). The theta cortical waves have associations with attention, alertness, and enhanced perceptual and cognitive performances (Aftanas and Golocheikine, 2001). The theta waves can be achieved by utilising binaural earphones and ASMR to improve cortical function by creating a meditative mental activity (Lee, et al, 2019). Jirakittayakorn & Wongsawat (2017) demonstrated that theta waves are induced via 6 Hz to create a meditative (flow like) state of mind. A certain level of attention and flow state seems to be at play when ASMR experiences are brought about. The next section discusses previous literature on ASMR perception and how it varies with personality traits.

### 1.8 Personality and ASMR

Fredborg et al. (2017) suggested that persons who perceive ASMR would score higher compared to individuals who do not on the Openness to Experience and Neuroticism domains of the Big Five personality inventory. Such prediction was founded on the

presumption that ASMR perceivers would have a heightened receptivity and sensitivity to sensations. They also have increased sensitivity to aesthetic experiences, as measured by the Openness to Experience domain, which could generalise to physical sensations, being the main characteristic of ASMR. Neuroticism is generally associated with anger, depression and anxiety (Barrett & Davis, 2015). Those scoring higher on Neuroticism have less emotional stability and more mood swings, potentially having heightened somatic and other interceptive sensations, allowing this personality trait to possibly be a predictor of ASMR perception (Fredbog, et. al., (2017). Their findings were consistent with their suggestion and revealed that those scoring higher on Neuroticism and Openness to Experience on the Big Five Personality Inventory, were more likely to experience ASMR. These individuals also scored lower on Agreeableness, Consciousness, and Extraversion compared to a control group.

ASMR perception in individuals may arise from different triggering stimuli. There are vast individual differences when it comes to triggering stimuli. One reason for ASMR perception could be due to attentional aspects and cognition which allows certain individuals to experience it (Fredborg et al., 2017). Previous research by Barret and Davis (2015) emphasised the level of mindfulness may explain such connection and lead to a sensory-emotional perception of ASMR.

State of flow – a deep immersive sense of engagement and relaxation – and ASMR share common characteristics (Csikszentmihalyi, 1979). Flow state consists of two parts: part 1) at peak performance and part 2) at passive experiences such as passing time at in altered rate (Barrett, Spence & Davis, 2017). The passive experience phase is similar to that of ASMR; in both states a deep relaxation sense and well-being is observed (Barrett, Spence and Davis, 2017). Previous research (Barrett and Davis, 2015) has indicated a link between the flow state and ASMR which is believed to be useful in domains, such as education and sports.

### 1.9 Neuroticism

Neuroticism can be described as tending to experience negative emotions in response to perceived punishments or threats (Weinsberg, DeYoung & Hirsh, 2011). This domain includes six facets which are as follows (Goldberg, 1992): Anxiety, Anger, Depression, Self-Consciousness, Immoderation, and Vulnerability. Costa et al., (2001), found that females tend to score higher on most facets in this domain and particularly, on anxiety. Conversely, males tend to score higher on the anger facet.

### 1.10 Openness to Experience

The term Open refers to those who actively seek diverse experiences as reflective of the ideas they encounter (McCrea & Costa, 1997). Individuals who are considered Open, not only have the ability to grasp new ideas, they enjoy a variety of new experiences. They embrace an ever-increasing range of interests beyond intellectual quests. Research (McErlean & Banissy, 2017; Fredborg, et. al., 2017) provided elevated levels of Openness on personality factors suggesting a potential predisposition in individuals to experience or seek ASMR (Barrett, Spence & Davis, 2017).

### 1.11 Openness to Experience and Intelligence

Domain Openness comprises six facet levels, they are as follows (Goldberg, 1992): Imagination (creativity), Artistic Interests, Emotionality, Adventurousness, Intellect, and Liberalism. Openness to Experience and intelligence have been found to be highly associated (Weinsberg, DeYoung & Hirsh, 2011). Aspects of Openness to Experience reflect on cognitive engagement with perception fantasy aesthetics. Creativity, intellectual curiosity, aesthetic experiences, and imagination relate to the interest and the ability to process and attend to complex processes.

While emotions with intellect reflect cognitive engagement with abstract and semantic information, when we speak of intellect facet level, we do not refer to a level of intelligence. Openness to Experience and crystallised intelligence have been found to be positively correlated (Schretlen et al, 2010). The fluency of openness to experience is the novelty to chase after aesthetic experiences. Creativity is a balance of useful and novel idea. Domain Openness alone from the OCEAN measure has positively correlated with psychometric measures for intelligence and other cognitive abilities (McCrea & Costa, 1997). Cognitive abilities may facilitate world exploration to some degree. Intelligent individuals tend to hold well-developed interests in highly specialised areas which they excel at (McCrea & Costa, 1997). This could explain how chasing aesthetic experiences and creativity or intellect in openness to experience could lead individuals having an enhanced and richer experiences which may contribute to their ASMR perception. Any relationship of intelligence with ASMR perception has not been explored previously.

### 1.12 Implications of ASMR Usage

Barrett and Davis (2015) found many of the participants turned to ASMR as a form of alternative intervention when, traditional interventions were not helpful. This effect mainly corresponded with a participant whose stress and anxiety interfered with daily functions. The main time for ASMR engagement (81%) was reported as night and sleep time, while 30% reported watching ASMR for leisure in their spare time. Majority of ASMR perceivers reported having their first experience between the ages of five to ten (Barrett and Davis, 2015). However, Poerie et al, (2018) suggested an onset of 15 years of age for ASMR perception. They found 80% of participants reported a positive effect associated with watching ASMR. 50% of the participants reported an improvement in their mood even when they did not experience the ASMR tingling sensations. ASMR appears to provide temporary relief to those suffering from chronic pain, depression, and stress (Barrett & Davis, 2015).

Poerio et al, (2018) found ASMR perceivers reported an increased level of calmness compared to non-ASMR perceivers and a decrease in the level of sadness and stress. They also found ASMR perceivers demonstrated a significantly greater reduction in heart rate (3.41 bpm) compared to non-ASMR perceivers. Along with a significantly greater increase in skin conduction (0.30 μS) compared to non-ASMR perceivers. Such somatic differences indicate a pattern of underlying neural interaction.

### 1.13 Aims of this Thesis

There remains a divide when it comes to ASMR experience; it appears that some individuals are capable of feeling these tingly static sensations while others are not. Those who can experience this perceptual experience use it for a variety of reasons. Some people have reported using ASMR to reduce chronic pain and change their mood as an alternative approach to medicine (Barratt & Davis, 2015), whereas others have utilised it to combat insomnia, stress, and anxiety (Poerio et al., 2018; Ahuja, 2013). The intensity of the experience may vary based on the type of stimulus provided and the purpose for which it is being used. In a study conducted by Barratt and Davis (2015), 98% of the participants indicated they used ASMR for relaxation, 82% used it as a sleeping aid and 70% used it as a tool to deal with stress.

This research aims to explore whether intelligence and personality traits can predict whether individuals use and perceive an effect known as the Autonomous Sensory Meridian Response (ASMR). The secondary aim is to explore whether intelligence and personality traits, in particular, Neuroticism and Openness to Experience as domains and on facet levels, can predict the perception of ASMR in individuals who are capable of perceiving it. In this study we will:

1. Predict ASMR usage with respect to personality and intelligence levels,
2. Investigate whether ASMR perception varies with intelligence levels,

3. Investigate whether ASMR perception varies with personal.

# CHAPTER 2

## Methodology

### 2.1 Participants

For the purposes of this study, two near identical surveys were created on SurveyMonkey Inc. One survey was placed on the Research Participation System (Sona) for first-year psychology students from the University of Adelaide. The second survey was made for the general public which also included students across various levels and disciplines. General public participants were recruited via social media sources Facebook and LinkedIn. A link to the survey was also uploaded on the ASMR University website (https://asmruniversity.com/2019/04/30/asmr-research-intelligence-personality/). Participants included ranged between the ages of 16-83yrs with first year psychology (*N* =142) students' age being (M = 19.9yrs, *SD* = 4.09) and the general public sample's (*N* =120) age being (M = 30.8yrs, *SD* = 14.5). This study included a total sample of (*N*= 262) participants. (*N*=178) females, (*N*=83) males, and (*N*=1) other gender completed the study. Several surveys were excluded from the study because they were started but abandoned after only a few questions were answered. Participants were required to be proficient in the English language. No other exclusion criteria were in place for participation.

### 2.2 Demographics information

Demographic questions consisted of age, gender and residential country of the participants. The general public survey yielded three categories of location: the majority residing in the United States, followed by 'other' countries of residence, followed by Australia as the minority group. Participants from other locations were required to write the name of the country they were participating from. They were: Argentina, Austria, Canada, Check Republic, France, Germany, Hong Kong, Iceland, India, Indonesia, Ireland, Japan,

Jordan, Mexico, Netherlands, New Zealand, Philippines, Spain, Sweden, and the United Kingdom.

### 2.3 Materials

The surveys included six short (1:30-2 minutes) ASMR eliciting videos. The videos were selected based on the stimulating triggers. The video stimuli included in the study were as follows: ear cleaning, eating/chewing sounds, hair-cut simulation, scratching sounds, tapping sounds, and whispering. The selection was made based on some of the most popular triggers based on the number of likes on Instagram (https://www.instagram.com/explore/tags/asmr/ ) – a social media platform, which allow individuals to post short videos sampling the different triggers, via ASMR hashtag. The ASMRtists tend to announce their new videos which they upload on YouTube by showcasing the preview of what the full video will include, on Instagram. The researcher spent in excess of 40 hours watching and reweaving numerous videos. Various online clips were combined and edited to shorter segments presenting the target triggering stimuli. This was completed with the aim to provide the participants with more than one style of delivery for each trigger and more than one ASMRTist was presented in each video. For example, the Tapping video included two ASMRtists and each had a unique style of delivery. This included slow tapping, fast tapping, long nail tapping, short nail tapping, tapping on various object to produce crisp or soft sounds. To create the opportunity for participants to engage with the ASMRtist based on their personal preferences. The same process was repeated for the remaining five videos. The ASMRtitst have been credited at the end of the survey, see Appendix A for screenshots and brief descriptions of the videos used in this study. Participants were asked to rate their ASMR experience on a 6-point scale after viewing each video.

### *2.3.1 Broad Personality Measures*

The Openness Conscientiousness Extraversion Agreeableness Neuroticism Index Condensed (OCEANIC; Schulze & Roberts, 2006) was used to assess personality, based on the five-factor model of personality (FFM). OCEANIC contains 45 items. Participants were asked to rate how often they engage in particular behaviours on a 6-point Likert scale, ranging from never (1) to always (6).

### *2.3.2 Personality Facet Level Measures*

The International Personality Item Pool (IPIP) (Goldberg et al, 2006) scale was administered at the facet level for Neuroticism and Openness to experience. Each personality trait includes 6 facet level dimensions with positive and negative traits aspects. For this study, 3 positive and 3 negative descriptive statements were selected from each facet for the two traits assessed. The Openness to experience facets are: imagination, artistic interest, emotionality, adventurousness, intellect, and libertarianism. While Neuroticism facets are: anxiety, anger, depression, self-consciousness, immoderation, and vulnerability.

### *2.3.3 Intelligence Measures*

The Comprehensive Abilities Battery-Inductive Reasoning (CAB-I; Hakstian and Cattell, 1975) test was used as a measure of fluid intelligence (Gf). The CAB-I consists of a set of twelve inductive reasoning well-defined, knowledge-lean items, for participants to solve. This task evaluates human cognitive abilities with respect to fluid intelligence.

Raven's Advanced Progressive Matrices – Short Form (APM-SF; Raven et al., 1998). is an analytic perceptual reasoning task made of sequential diagrams with a missing section, one of the eight potential pieces fits within a blank space. This captures clear thinking capabilities, observation skills, and intellectual competence. The APM-SF was used as a measure of fluid intelligence.

Word Meanings (WM) was used to assess crystallised intelligence (Gc) (WM; Raven, Raven and Court, 1998). WM measure is made up of 34 items that ask participants to choose from six available choices. The word closest to the target word should be selected.

#### *2.3.4 ASMR Self-Report Questionnaire*

An ASMR self-reported questionnaire containing 8 questions were included by the researcher. These questions assessed the frequency of ASMR watching, the reason for which ASMR was utilised along with the level of pleasure of their ASMR experience. Ranging from Never to Everyday on a 6-point scale.

### 2.4 Procedure

An information sheet along with consent prior to partaking in the survey were provided to participants. There were two versions of the online data collection forms available via SurveyMonkey Inc. The first version was made available to Psychology 1 students of the University of Adelaide, where the students were required to provide their research participation ID numbers to gain credit through the Research Participation System SONA. The second version of the survey was published on ASMR University, Facebook, and LinkedIn. The surveys were available for nearly two months. The surveys included basic demographics such as age and geographical location. An optional spot was made available to participants at the end of the survey to provide their email addresses if they wished to receive the outcomes of the study. For access to the full survey see Appendix C.

### 2.5 Ethical Consideration

This research has received ethical approval from the University of Adelaide School of Psychology Human Research Ethics Subcommittee. Participants were made aware that their responses were anonymous, and no one could be identified. They were informed that their participation was completely voluntary, and they had the freedom to withdraw at any given

time. Feedback would also be provided to those who wanted to become informed of the results.

### 2.6 Analysis

The software R (R Core Team, 2015) was utilised to analyse the data by employing various statistical analysis including t-tests, ordinal regression, and logistic regression to explore possible relationships.

# CHAPTER 3

## Results

In the following section of the thesis, the findings of the current study are presented. The aim of this research was to explore whether intelligence and personality traits, specifically Neuroticism and Openness to Experience, could predict usage and perception of the effect known as the Autonomous Sensory Meridian Response (ASMR). The following, three aims were considered:

1. Predict ASMR usage with respect to personality and intelligence levels,
2. Investigate whether ASMR perception varies with intelligence levels,
3. Investigate whether ASMR perception varies with personality.

Table 1 provides an overview of the sample, including age, country of residence and gender. Participants in both samples were asked to provide their country of residence at the time of participation. All participants from the Psychology 1 course resided in Australia, by definition. The general public participants resided worldwide, with the majority ($n$ = 47) residing in the United States of America followed by $n$ = 38 of Australian residence, along with seven Canadians, followed by six United Kingdom residents, four Spanish residence, two German residents etc. For full details see Appendix B. The table also includes $t$-tests and effect sizes for comparisons between the two groups.

Female participants were nearly double the number of male participants across the sample. Psychology students were on average 10.9 years younger than the general public sample. Furthermore, psychology students scored higher on the Word Meanings (WM) task. WM produced ($p$ = .003, $d$ = 0.34) a small-to-medium effect in favour of the psychology students, and the Comprehensive Ability Battery- Inductive Reasoning (CAB) yielded ($p$ = .001, $d$ = 0.44) yielded a significant $p$-value with moderate effect size in favour of the general public group. Psychology students scored higher on the OCEANIC Neuroticism domain. The

general public sample scored higher on the Openness to Experience domain. On the broad personality measures, Openness to Experience produced a significant and moderate effect ($p < .001$, $d = 0.52$) in favour of the general public sample. Two of the six facet levels of Openness to Experience, O5 – intellect ($p = .001$, $d = 0.41$) and O6 – liberalism ($p < .001$, $d = 0.57$) also produced significant $p$-values with moderate effect sizes favouring the general public group. Moreover, N5 – Impulsiveness yielded significant $p$-values ($p = .006$, $d = 0.36$) with a small-to-medium effect favouring the psychology student group.

Table 1. Demographics, *for* two sample groups based on intelligence and personality measures along with *t*-tests and effect sizes for comparison of the groups

| | Psychology 1 (*N*=142) | | Public (*N*=120) | | *t* | df | *p* [a] | *d* [b] |
|---|---|---|---|---|---|---|---|---|
| | | *SD* | | *SD* | | | | |
| Age in years | 19.9 | (4.09) | 30.8 | (13.5) | - | - | - | - |
| Female | 96 | - | 82 | - | - | - | - | - |
| Male | 45 | - | 38 | - | - | - | - | - |
| Other | 1 | - | - | - | - | - | - | - |
| Intelligence Measures | | | | | | | | |
| Word Meaning (WM) | 20.1 | (5.97) | 17.0 | (9.90) | 2.95 | 188.9 | .003 | 0.34 |
| Comprehensive Ability Battery (CAB) | 6.79 | (3.89) | 8.51 | (3.30) | 2.75 | 152.5 | .001 | 0.44 |
| Raven's Advance Matrices (APM) | 6.59 | (3.04) | 6.94 | (2.64) | 0.91 | 241.9 | .362 | 0.12 |
| Broad Personality Measures | | | | | | | | |
| O – Openness to Experience | 32.7 | (6.90) | 36.4 | (7.42) | 4.05 | 216.9 | <.001 | 0.52 |
| C – Consciousness | 36.4 | (7.40) | 37.4 | (7.44) | 0.96 | 225.7 | .338 | 0.12 |
| E – Extroversion | 32.6 | (6.69) | 30.7 | (7.19) | 2.11 | 217.1 | .035 | 0.27 |
| A – Agreeableness | 40.1 | (5.64) | 39.9 | (4.97) | 0.26 | 239.2 | .794 | 0.03 |
| N – Neuroticism | 30.2 | (7.46) | 28.1 | (8.03) | 2.04 | 216.8 | .042 | 0.26 |
| Facets levels of Openness to Experience | | | | | | | | |
| O1 – Imagination / fantasy | 26.4 | (4.55) | 27.7 | (4.73) | 2.25 | 245.6 | .025 | 0.28 |
| O2 – Aesthetics/ artistic interest | 28.3 | (4.88) | 29.2 | (4.37) | 1.39 | 232.0 | .163 | 0.18 |
| O3 – Emotionality | 26.5 | (4.21) | 27.4 | (4.42) | 1.56 | 206.9 | .121 | 0.17 |
| O4 – Adventurousness | 24.8 | (4.15) | 25.9 | (4.46) | 2.07 | 203.6 | .040 | 0.27 |
| O5 – Intellect / ideas | 23.9 | (5.25) | 26.1 | (4.91) | 3.24 | 233.7 | .001 | 0.41 |
| O6 – Values/ liberalism | 19.8 | (3.81) | 22.4 | (5.12) | 4.38 | 192.8 | <.001 | 0.57 |
| Facet levels of Neuroticism | | | | | | | | |
| N1 – Anxiety | 22.3 | (5.07) | 21.1 | (5.53) | 1.81 | 240.2 | .071 | 0.23 |
| N2 – Anger/Hostility | 19.3 | (4.40) | 18.8 | (4.58) | 0.84 | 227.6 | .403 | 0.11 |
| N3 – Depression | 20.2 | (4.76) | 18.9 | (5.34) | 2.09 | 211.1 | .038 | 0.27 |
| N4 – Self-Consciousness | 21.5 | (4.92) | 20.5 | (5.90) | 1.39 | 195.3 | .167 | 0.17 |
| N5 – Impulsiveness | 20.3 | (4.52) | 18.8 | (4.44) | 2.74 | 222.1 | .006 | 0.36 |
| N6 – Vulnerability | 19.8 | (4.11) | 18.5 | (4.73) | 2.11 | 194.2 | .036 | 0.28 |

[a] *p* represents p-values.
[b] d represents Cohen's d effect size

Table 2. Reasons for ASMR use and chi-square comparison between the two sample groups

| ASMR Questionnaire | Psychology 1 | Public | Chi-square (5) [a] | *p* |
|---|---|---|---|---|
| How often do you watch/listen to ASMR? | *n* | *n* | 23.7 | <.001 |
| Never (0) | 78 | 25 | | |
| Less than a month (1) | 25 | 10 | | |
| Once a month (2) | 12 | 3 | | |
| 2-3 times a month (3) | 8 | 5 | | |
| 2-3 times a week (4) | 8 | 17 | | |
| Every day (5) | 5 | 8 | | |
| How often do you watch/listen to ASMR for relaxation? | | | 27.3 | <.001 |
| Never (0) | 94 | 25 | | |
| Less than a month (1) | 19 | 10 | | |
| Once a month (2) | 6 | 4 | | |
| 2-3 times a month (3) | 6 | 7 | | |
| 2-3 times a week (4) | 7 | 14 | | |
| Every day (5) | 4 | 8 | | |
| How often you watch/listen to ASMR to aid with sleep? | | | 18.6 | .002 |
| Never (0) | 104 | 34 | | |
| Less than a month (1) | 11 | 5 | | |
| Once a month (2) | 5 | 7 | | |
| 2-3 times a month (3) | 5 | 7 | | |
| 2-3 times a week (4) | 6 | 7 | | |
| Every day (5) | 5 | 8 | | |
| How often you watch/listen to ASMR to aid with depression? | | | 8.79 | .118 |
| Never (0) | 117 | 53 | | |
| Less than a month (1) | 13 | 5 | | |
| Once a month (2) | 1 | 3 | | |
| 2-3 times a month (3) | 3 | 5 | | |
| 2-3 times a week (4) | 0 | 1 | | |
| Every day (5) | 2 | 1 | | |
| How often you watch/listen to ASMR to aid with anxiety? | | | 16.5 | .006 |
| Never (0) | 115 | 43 | | |
| Less than a month (1) | 11 | 7 | | |
| Once a month (2) | 2 | 4 | | |
| 2-3 times a month (3) | 5 | 6 | | |
| 2-3 times a week (4) | 1 | 5 | | |
| Every day (5) | 2 | 3 | | |

| | | | | |
|---|---|---|---|---|
| * How often you watch/listen to ASMR to as meditation guide? | | | - | - |
| Never (0) | - | 42 | | |
| Less than a month (1) | - | 13 | | |
| Once a month (2) | - | 2 | | |
| 2-3 times a month (3) | - | 5 | | |
| 2-3 times a week (4) | - | 5 | | |
| Every day (5) | - | 1 | | |
| How often you watch/listen to ASMR to reduce/cope with stress? | | | 28.7 | <.001 |
| Never (0) | 109 | 35 | | |
| Less than a month (1) | 14 | 7 | | |
| Once a month (2) | 6 | 7 | | |
| 2-3 times a month (3) | 4 | 8 | | |
| 2-3 times a week (4) | 1 | 9 | | |
| Every day (5) | 2 | 2 | | |
| How pleasurable is the ASMR experience? | | | 19.9 | .001 |
| Do not experience ASMR (0) | 40 | 8 | | |
| Not pleasurable (1) | 23 | 6 | | |
| Neutral (2) | 19 | 11 | | |
| Somewhat pleasurable (3) | 27 | 12 | | |
| Pleasurable (4) | 19 | 18 | | |
| Extremely pleasurable (5) | 8 | 13 | | |

[a] represents the degrees of freedom

* *Note*: the researcher did not add ASMR question six, and no results were recorded for the psychology 1 sample group. Therefore, a chi-square could not be calculated for this question.

Table 2 shows data on the usage of ASMR and reasons for usage of ASMR. Chi Square tests explore if the two sample groups differ in their ASMR usage and reasons for usage. Eight questions were used to determine some of the reasons which ASMR was being used for. The ASMR questionnaire is shown below and participants were provided with a 6-point scale of rating for usage and their subjective pleasurable experience of ASMR experience. Each of the scale points was assigned a corresponding number. The results showed that the general public sample responded with fewer ‘never’ responses compared to the student sample. Six of the questionnaires yielded significant *p*-values and this demonstrates there was a difference between the two groups in usage and reason for usage.

This is unsurprising given the majority of Psychology 1 sample reported as being non-ASMR users.

Table 3. Mean intensity of ASMR inducing videos based on Intelligence and Personality variables

| | Psychology 1 | *SD* | Public | *SD* | t [a] | df | *p* [b] | *d* [c] |
|---|---|---|---|---|---|---|---|---|
| Tapping | 2.44 | 1.73 | 2.76 | 1.74 | 1.48 | 239.6 | .140 | 0.187 |
| Ear Cleaning | 3.19 | 1.94 | 2.69 | 1.93 | 2.02 | 226.9 | .045 | 0.259 |
| Scratching | 2.46 | 1.93 | 2.29 | 1.76 | 0.75 | 232.6 | .456 | 0.096 |
| Whispering | 3.13 | 1.98 | 2.93 | 2.07 | 0.77 | 211.6 | .443 | 0.117 |
| Eating/Chewing Sounds | 3.01 | 2.14 | 1.85 | 2.19 | 4.09 | 208.2 | <.001 | 0.507 |
| Haircut Simulation | 2.33 | 1.84 | 2.22 | 1.92 | 0.43 | 196.2 | .669 | 0.099 |

[a] t represents t-tests
[b] *p* represents p-values
[c] *d* represents Cohen's d for effect size

Table 3 compares the groups on the mean intensity ratings for the six ASMR inducing videos presented to the two groups. The Eating/Chewing sounds (video 5) yielded the greatest difference between the groups with a significant *p*-value and a moderate effect size ($p < .001$, $d = 0.507$) in favour of psychology students rating it as more intense. There was a small difference for Ear Cleaning (video 2) ($p = .045$) and there were no differences for the other videos.

### 3.1 Aim 1

Given the foregoing analyses, it was considered safe to combine the two samples for subsequent analyses. The first aim of the study was to predict ASMR usage with respect to personality and intelligence levels. Individuals were divided into two groups based on their ASMR use: that is, individuals who reported watching ASMR at any level of frequency were contrasted with those who did not watch ASMR at all; they were thus classified on a binary scale. The total of ASMR users yielded from the combined sample was 101 ASMR users versus 103 non-ASMR users. Logistic regression analysis was employed to predict ASMR use.

Table 4 provides the logistic regression model parameters and odds ratio. The odds ratio suggests that for every point increase on the measures, the corresponding ratio will increase by that amount in prediction of the ASMR usage. That is, for every point increase on CAB correct response, for example, the odds ratio increases by 1.15 times, and represents the increasing likelihood of ASMR use. The results show a significant level of prediction for Comprehensive Ability Battery – Inductive Reasoning (CAB), for Openness on the broad domain level, and for Openness facets O2 – Aesthetics, O3 – Emotionality, and O6 – Liberalism. The results suggest higher scores on CAB (fluid intelligence measure), Openness domain along with three Openness facets predict ASMR usage.

Table 4. Logistic regression models to predict usage of ASMR stimuli – Never vs. Any

| Intelligence | | | 95% CI for Odds Ratio | | |
|---|---|---|---|---|---|
| Intercept | 20.2 | Standard Error | Lower | Odds Radio | Upper |
| Word Meaning (WM) | -0.13 | 0.10 | 0.95 | 1.00 | 1.06 |
| Comprehensive Ability Battery (CAB) | -0.36 | 0.19 | **1.05** [a] | **1.15** | **1.27** |
| Raven's Advance Matrices (APM) | 0.12 | 0.24 | 0.80 | 0.91 | 1.03 |
| Broad Personality Measures | | | | | |
| Intercept | 11.0 | | | | |
| O – Openness to Experience | -0.01 | 0.07 | **1.03** | **1.07** | **1.12** |
| C – Consciousness | 0.03 | 0.07 | 0.94 | 0.98 | 1.02 |
| E – Extroversion | 0.04 | 0.08 | 0.93 | 0.97 | 1.02 |
| A – Agreeableness | -0.04 | 0.10 | 0.97 | 1.03 | 1.09 |
| N – Neuroticism | 0.14 | 0.06 | 0.94 | 0.98 | 1.02 |
| Openness to Experience | | | | | |
| Intercept | 20.6 | | | | |
| O1 – Imagination / fantasy | 0.10 | 0.12 | 0.98 | 1.06 | 1.14 |
| O2 – Aesthetics/ artistic interest | -0.03 | 0.13 | **1.00** | **1.08** | **1.17** |
| O3 – Emotionality | 0.22 | 0.13 | **1.00** | **1.08** | **1.18** |
| O4 – Adventurousness | -0.14 | 0.12 | 0.85 | 0.92 | 0.99 |
| O5 – Intellect / ideas | -0.23 | 0.11 | 0.87 | 0.94 | 1.00 |
| O6 – Values/ liberalism | -0.15 | 0.11 | **1.02** | **1.09** | **1.19** |
| Neuroticism | | | | | |
| Intercept | 9.86 | | | | |
| N1 – Anxiety | -0.26 | 0.14 | 0.92 | 0.99 | 1.08 |
| N2 – Anger/Hostility | -0.09 | 0.14 | 0.90 | 0.98 | 1.07 |
| N3 – Depression | -0.19 | 0.13 | 0.88 | 0.96 | 1.03 |
| N4 – Self-Consciousness | 0.08 | 0.12 | 0.94 | 1.01 | 1.08 |
| N5 – Impulsiveness | 0.13 | 0.12 | 0.91 | 0.98 | 1.05 |
| N6 – Vulnerability | 0.68 | 0.18 | 0.94 | 1.04 | 1.16 |

[a] Numbers in bold represent significance.

### 3.2 Aim 2

The second aim was to investigate whether ASMR perception varies with intelligence levels. Table 5 provides the mean and standard deviation for each ASMR trigger video, collapsed across groups. A repeated measures analysis of variance was used to explore whether average reported intensity for ASMR varied across the trigger videos. The analysis yielded, $F$ (6,229) = 165.4, $p < .001$. The average intensity across the videos is different.

Pairwise *t*-tests with Holm adjustments yielded the following mean intensity differences of ASMR experiences based on different triggers. The mean intensity between the Tapping and Ear Cleaning videos is statistically significant $p < .005$. The mean intensity between the Tapping and Whispering is significant $p < .005$. The mean intensity between the Ear Cleaning and Scratching videos is significant, $p < .001$. The mean intensity between the Ear Cleaning and Eating/Chewing Sounds videos is significant $p = .007$. The mean intensity between the Ear Cleaning and Haircut Simulation videos is significant $p < .001$. The mean intensity between the Scratching and Whispering videos is significant $p < .001$. The mean intensity between the Whispering and Eating-Chewing Sounds videos is significant $p = .006$. Finally, the mean intensity between the Whispering and Haircut Simulation videos is significant $p < .001$. Altogether, 8 of 15 possible mean differences between videos were significantly different and therefore, exploration of prediction of intensity was conducted separately for each video.

Table 5. Average intensity across six ASMR inducing videos

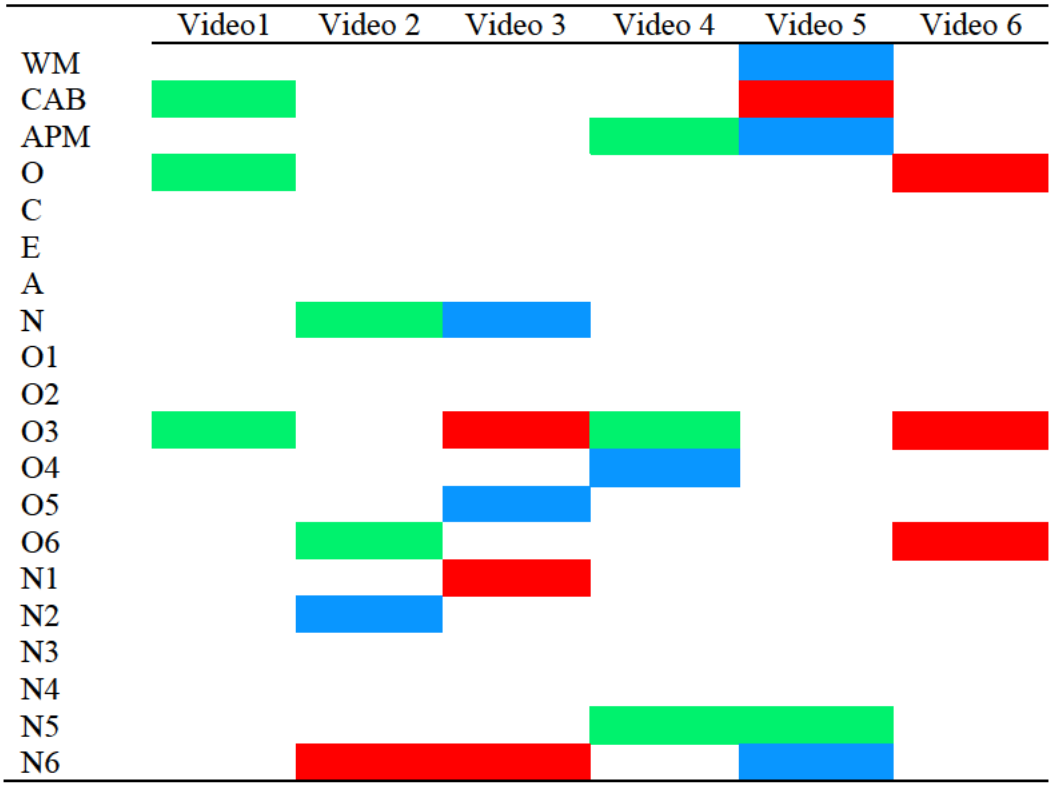
| | Mean | *SD* |
|---|---|---|
| Tapping | 2.58 | (1.74) |
| Ear Cleaning | 2.98 | (1.95) |
| Scratching | 2.39 | (1.85) |
| Whispering | 3.05 | (2.02) |
| Chewing/Eating Sounds | 2.53 | (2.23) |
| Haircut Simulation | 2.29 | (1.87) |

To examine whether intensity of ASMR perception varies with intelligence, ordinal logistic regression was employed to predict the intensity of the ASMR experience based on the six ASMR inducing videos. Because this is an exploratory study, the interest was in whether there was a consistent pattern of prediction across the videos. Therefore, Figure 1 represents the prediction of intensity of ASMR experience based on intelligence and personality. Different colours have been assigned to show the level of significance of prediction for intelligence and personality for each video. Non-significant relationships have not been presented in colour. It can be seen in Figure 1 that all three intelligence measures were significant predictors of intensity for the Chewing/Eating Sounds video and that CAB significantly predicted intensity for the Tapping video and APM significantly predicted intensity for the Whispering video.

### 3.3 Aim 3

The third aim was to investigate whether ASMR perception varies with personality. Again, see Figure 1 where it can be seen Openness domain and Emotionality significantly predicted intensity for the Tapping video. Neuroticism domain, Anger, Vulnerability, and Liberalism significantly predicted intensity for the Ear Cleaning. Neuroticism domain, Anxiety, Vulnerability, Intellect and Emotionality significantly predicted intensity for Scratching video. Emotionality, Adventurousness, and Impulsiveness significantly predicted intensity for the Whispering video. Impulsiveness and Vulnerability significantly predicted intensity for the Eating/Chewing Sounds video. Openness domain, Emotionality, and Liberalism significantly predicted intensity for the Haircut Simulation video. Figure 1 indicates Openness and Neuroticism domains in OCEANIC along with openness facets significantly predicted intensity of experience across the various triggers.

Figure 1. Ordinal regression for predicting the intensity of ASMR experience




WM – Word Meaning, CAB – Comprehensive Ability Battery (Inductive Reasoning) APM – Raven Advanced Progressive Matrices, O – Openness to Experience, C – Consciousness, E – Extraversion, A – Agreeableness, N – Neuroticism, O1 – Imagination, O2 – Aesthetics, O3 – Emotionality, O4 – Adventurousness, O5 – intellect, O6 – Values, N1 – Anxiety, N2 – Anger, N3 – Depression, N4 – Self-Consciousness, N5 – Impulsiveness, N6 – Vulnerability.

Video 1 – tapping, Video 2 – ear cleaning, Video 3 – scratching, Video 4 – whispering, Video 5 – eating/chewing sounds, Video 6 – haircut simulation.

| | | |
|---|---|---|
| $t < 1.65$ | $p > .10$ | White / non-significant |
| $1.65 \leq t < 1.96$ | $p < .10$ | Green / non-significant |
| $1.96 \leq t < 2.88$ | $p < .05$ | Blue / Significant |
| $t \geq 2.88$ | $p < .01$ | Red / Significant |

# CHAPTER 4

## Discussion

The current study had the primary aim to explore whether intelligence and personality traits, specifically Openness to Experience and Neuroticism, could predict the perception and usage of the Autonomous Sensory Meridian Response (ASMR). Previously, relationships between broad personality domains and ASMR have been explored in a limited number of studies (Barrett & Davis, 2015; Fredborg, et. al, 2017). Fredborg, et. al, (2017) have further explored the relationship between personality traits and ASMR. It was anticipated that Openness to Experience and Neuroticism would provide a relationship between the personality traits and ASMR perception based on previous literature. No previous research has yet explored the possible relationship between ASMR and intelligence. Given ASMR is a new area of study, there are many unknown facts about it. The perception, level of intensity, and how this experience arises are understudied. However, a study by Smith et al. (2017) noted atypical functioning patterns of connectivity as a potential causal factor for ASMR perception. The tingles may arise as a result of an increase in sensitivity and receptivity of sensations (Fredborg et al., 2017).

The purpose of first aim was to examine whether intelligence and personality traits could predict ASMR usage. Analysis revealed that our sample contained 101 ASMR users and 103 non-ASMR users. The results showed that ASMR usage may be predicted by Comprehensive Ability Battery, a measure of fluid intelligence. Previous research has yielded significant correlations between Openness and fluid intelligence (Ziegler, et al, 2012). The current finding was accompanied by findings of higher scores on the Openness domain in OCEANIC measure, along with the Aesthetic/Artistic, Emotionality, and Values/Liberalism facets of Openness. Thus, there is some consistency in this finding with previous research on Openness and intelligence. This means the higher the score on these measures, the greater the

likelihood of individuals being ASMR users. Fredborg et al. (2017) found individuals who perceive ASMR to score higher on Openness to Experience compared to non-ASMR perceivers. They also found higher scores on Values/Liberalism. This cognitive facet of Openness was correlated with frisson (aesthetic chills). Colver & El-Aliya (2015) also found a positive correlation between Openness to Experience and strong emotional responses, such as those observed with frisson. Our findings have been consistent with Barret and Davis (2015), as they found their participants experienced higher levels of depression, which is a sub-facet of Neuroticism. Fredborg et al. (2017), also found that the ASMR perceiving group scored higher on Neuroticism, when compared to the control group. We found that the mean intensity of ASMR experience between the psychology students and the general public groups to have no difference across five out of the six triggering stimuli. However, we did find a significant difference with a moderate effect favouring the psychology students on the Eating/Chewing Sound stimulus. Fredborg et al. (2017) also examined the level of experience intensity based on the performances on the OCEANIC measure. They found stronger average intensity for individuals who responded to fewer items, which indicated that the ASMR perceivers scored higher on Openness to Experience compared to the non-ASMR perceivers. They also found individuals that reported experiencing more intensity to repetitive sounds to have a lower score on Consciousness domain. We did not find the same results in our study.

The second aim was to explore whether ASMR perception varies based on intelligence. Because ASMR perception arises when the individual is focused on the stimulating trigger, the emphasis is placed on the attentional and cognitive aspects of the experience (Fredborg et al., 2017). Previous research by Barret & Davis (2015), has emphasized the trait level of mindfulness, such that it may assist in explaining this atypical sensory-emotional perception based on the characteristics of ASMR as described by its perceivers. Analysis of experience prediction based on six triggering stimuli; releveled CAB

to be a significant predictor for the Tapping trigger. Raven's Advance Matrices provided a significant prediction for the Whispering trigger. Finally, WM, CAB, and APM measures provided significant predictions for the Eating/Chewing Sound trigger. This was consistent with the findings of Fredborg, et. al, (2017) which reported whispering, tapping and scratching sounds were correlated with the highest incidence of ASMR perception. As observed, individuals who are on the ASMR perception continuum produced different reaction intensity across the six triggering videos. For instance, the individual who responded getting the most intense experience from Chewing/Eating sounds did not report the same level of intensity for another trigger, such as Tapping. It is clear that individuals have different thresholds in terms of perceived intensity; some individuals reported experiencing less intense tingles, while other reported having more intense experiences. The variability of individuals had been reported in the study by Fredborg et al. (2017), which were consistent with our study in the findings of individual differences.

The third aim was to investigate whether ASMR perception varies with personality. Analysis revealed that the Openness domain, and Emotionality, Adventurousness, and Intellect sub-facets significantly predicted the intensity of ASMR perception across five out of the six videos, apart from Eating/ Chewing Sounds. The Emotionality sub-facet in Openness had significantly predicted the intensity of experience across four out of the six videos, the exceptions being Ear Cleaning and Eating/Chewing Sounds. We also found the Neuroticism domain along with the Anxiety, Anger, Impulsiveness, and Vulnerability sub-facets to be significant predictors of ASMR perception intensity across four of out of the six videos. The Tapping and Haircut Simulations videos were the exceptions. The Scratching video highlighted the most personality traits, such that the Neuroticism domain, Anxiety, and Vulnerability sub-facets along with the Emotionality and Intellect sub-facets of Openness precited the intensity of its experience in ASMR perceiving individuals. Openness has also

been found to have associations with frisson by physiological measures (Fredborg et al., 2017). We can observe a pattern of personality traits on ASMR intensity perception, based on the Openness and Neuroticism domains and a couple of their sub-facets. We also found that Extroversion produced ($p$ = .035, $d$ = 0.27) with a small-to- moderate effect in favor of the student sample. It may be the case that social, extroverted people are less likely to perceive ASMR as they express themselves outward and introverts, less sociable individuals looking inwards scoring lower on this domain have the ability to perceive this atypical sensation. DeYoung et al., (2005), found a significant, small-to-moderate correlation between fluid intelligence and the Ideas/Intellect and Values/Liberalism facets of Openness. Enhanced sensitivity to aesthetics could potentially generate the bodily sensations – the tingling waves associated with ASMR.

These findings were in line with Fredborg et al. (2017)'s study where they found ASMR perceivers scored significantly higher on the Openness and Neuroticism domains compared to non-ASMR perceivers, which may indicate a lower level of emotional stability in these individuals. They also found ASMR perceivers scored higher on the Neuroticism's Self-Consciousness sub-facet, however, our findings did not produce the same results. The Self-Consciousness sub-facets in this study did not yield any significance in any of the analyses. Fredborg et al. (2017) suggested this sub-facet is related to heightened physiological and/or psychological awareness during ASMR exposure. They also found that the Neuroticism domain had a positive correlation with various somatic symptoms entwined to internal physical state, hinting ASMR and negative affects share mutual hypersensitivity to interceptive sensations. Barrett & Davis (2015) have noted that ASMR perception is heterogeneous and distinct, and nonetheless highly individualized. However, it could be compared to other atypical sensory perception, such as synaesthesia.

Barrett & Davis (2015) found that 38 individuals with chronic pain reported an improvement. They found ASMR provided temporary relief for individuals with depression, and many used it to improve their mood. They also found individuals with moderate to severe depression to have significant mood improvement after ASMR engagement compared to individuals without depression. Chronic pain sufferers also experienced a significant reduction in their symptoms up to several hours following ASMR. Even in absence of the tingles, they reported mood improvements and reduced pain. These effects may arise as a result of being fully attuned and engaged with ASMR while relaxing and being in a mindful state.

A supplementary analysis of binary categorisation of ASMR perceivers and non-ASMR perceivers revealed that only $n = 13$ participants reported no ASMR perception on all six triggering videos. While $n = 249$ participants reported on perceiving ASMR to some level based on the different triggering stimuli. One of the implications of this study was to explore the positive effects of ASMR. Barrett and Davis (2015), found 98% of their participants thought ASMR to be relaxing. 82% reported it helps them with sleep, and 70% used it as a tool to decrease stress. Many of their participants sought out ASMR as a form of alternative medicine, when medical and other interventions failed to assist. This study revealed 42% of the combined sample used ASMR as a tool for relaxation. A common outcome of ASMR was that it may be used as a strategy to cope with daily stressors and a potential stress-related disorder remedy, along with appropriate treatment/s as needed. The level of intensity and perception varied greatly based on the individual. The triggers, experiences, and level of intensity are all unique to each individual and this variety can be observed across our sample.

$n = 127$ participants reported to perceiving the sensation to some degree along a continuum between neutral to extremely pleasurable ASMR experience. This may be due to a combination of factors, such that as intelligence levels and personality traits that may

contribute to perception and usage of ASMR. Based on the provided evidence, we can conclude that ASMR perception does vary and could be a form of individual differences. We do not have enough empirical research to fully comprehend how ASMR works. It is also clear that not everyone is capable of perceiving ASMR. This could partially be due to certain personality traits and intelligence levels, however that will not be enough to explain the variation and lack of ASMR perception in individuals. Smith, et. al., (2017), found ASMR perceivers to have a reduction in the functional connectivity amongst the default mode network which correlated with atypical and blended brain regions that may give rise to the atypical sensory perception. ASMR is also similar to synaesthesia in that one sensory simulation gives rise to others.

An interesting finding in our sample was that the psychology students scored higher on Word Meaning compared to the general public sample ($p$ = .003, $d$ = .034) with a small-to-moderate effect. The Word Meaning task is designed in a way which favours adults, as crystallised intelligence (Gc) measures accumulation of knowledge, facts, and vocabulary. Literature shows that Gc increases with age (Horn & Cattell, 1966; Horn, 1988); however, our sample provided the opposite, suggesting the student sample was more educated and inclined to know more word meanings, compared to their public sample counterparts. Gender differences and performance on the OCEANIC measure have been well documented (Weinsberg, DeYoung & Hirsh, 2011) and Fredborg, et. al., (2017) also found several differences between the genders. Where ASMR perceiving females scored higher on the Openness to Experience domain compared to their male counterparts. ASMR perceiving females scored higher on the Neuroticism domain compared to males as well. We did not control for the gender of the participants. As a result of that our sample was skewed towards females where the sample contained more than double the number of males, with ($N$=178) females, ($N$=83) males, and ($N$=1). Therefore, no gender differences could be accounted for.

As discussed earlier, ASMR may have a biological foundation and the simulation of social grooming to sooth oneself or another, which leads to a reduction of stress and anxiety. ASMRtists captivate their audience by creating a socially intimate atmosphere and creating virtual interpersonal and social bonds by increasing feelings of closeness and connectedness. Babies and young children are ordinarily soothed with gentle caress and/or soft signing close to their ears. ASMR seems to invoke the same response which leads to calmness in the central nerves system. The calming sensation could be due to the endorphin release in the brain as a result of soft soothing sounds (Ponti, n.d). Babies and young children depend on their primary caregiver or parental figure to meet their needs and sooth them, creating interpersonal bonds and socially intimate atmospheres. Although ASMR targets adults living with anxiety and stress, the content is gradually being used by caregivers and parents to sooth children. For example, it is used as a changeover from playtime to sleep time as a background sound. Due to ASMR's mimicking nature of bonds and closeness to parents, the phenomenon is able to create similar soothing sensations. ASMRtists often display the same qualities as a caregiver would to trigger the same response to nurture and sooth the young child. New parents may be able to use certain triggers to lull a restless child.

A common physiological effect of ASMR is relaxation and a reduction of heart rate; however, Poerio, et al., (2018) found the experience was accompanied by arousal. Apprich (2016) claims ASMR will allow individuals to experience a state of calmness while remaining fully alert. This will allow anxious students to remain calm, while being creative and exercise critical thinking by thought exploration. Apprich (2016), argues that ASMR should be used in educational settings as a relaxation tool, because it will stimulate and inspire students by allowing them to create, perceive and interact by utilising knowledge for innovation. The pressure of the education system, parents, and society creates a generation of anxious and stressed students, who may suffer from panic attacks during examinations. Her

solution is to break the cycle by introducing ASMR to help students, not only survive, but thrive in the education system and showcase their best performance, instead of blanking and missing out on opportunities for their future.

Regardless of how well ASMR is received, it is worth mentioning that this experience is not for everyone. We know that many are unable to experience these sensations, while some individuals may feel uncomfortable or find the reproduction of sounds unnatural. A study done by Rouw & Erfanian (2017) found 49% of misophonic (a sensitivity to select sounds) participants to be predisposed to ASMR perception. This suggests that misophonia and ASMR share heightened levels of sensitivity to particular sounds. This could further suggest that ASMR perception exists on a continuum rather than a set reaction to sounds. A study by Kumar, et al., (2017) using fMRIs on misophonic individuals found salience abnormalities in the functional connectivity region of the anterior insular cortex, which is responsible for mediating and increasing heart rate and skin conductivity of those who responded to the triggering sounds.

This exploratory analysis had a few strengths. The general public sample had individuals from around the world partaking in this study and the results could be more generalisable to the wider public. This study is also the first to consider intelligence factors. The Neuroticism and Openness facets were included to further our understanding of personality factors on ASMR perception and the variations. There were a few weaknesses in the current study. Half of the sample consisted of first year psychology students, as they chose to partake in the study themselves. There was no independent verification to separate ASMR perceivers from non-ASMR perceivers, hence leaving this study without a control group. There are a limited number of research papers to set a larger foundation for what should be included/excluded.

Future research should consider a mixed method model, which may provide a more in depth and detailed response from participants, for better comprehension and insight to this sensory experience. This study has set some foundational grounds for further intelligence testing and exploring of the Openness sub-facet. A larger sample size using an a priori may be beneficial to determining an appropriate sample size. An experimental study whereby non-ASMR eliciting videos along with ASMR eliciting videos be used to test intensity of experiences can reduce or eliminate any placebo effect that may occur. Measurements of heart rate and independent verification of ASMR non-perceivers could expand our knowledge.

## Conclusion

Based on the presented evidence, we can conclude that personality traits, specifically the Openness domain and facets along with Comprehensive Ability Battery (Inductive Reasoning) have provided a more in depth understanding of ASMR usage. The Openness to Experience and Neuroticism domains and facets along with fluid intelligence can predict the intensity of the ASMR experience. The findings have established that individuals have various triggering stimuli they respond to and the level of intensity is variable from one person to another. Nearly half of the participants in the sample reported using ASMR as a relaxation tool. It could be beneficial to individuals who use ASMR as a coping strategy to deal with daily stressors. Those wanting to use ASMR in conjunction with medication or other medical treatments to deal with chronic pain may benefit from it as well. Perception of ASMR is an individual difference and more empirical research is needed to make inferences on how and when it should be used.

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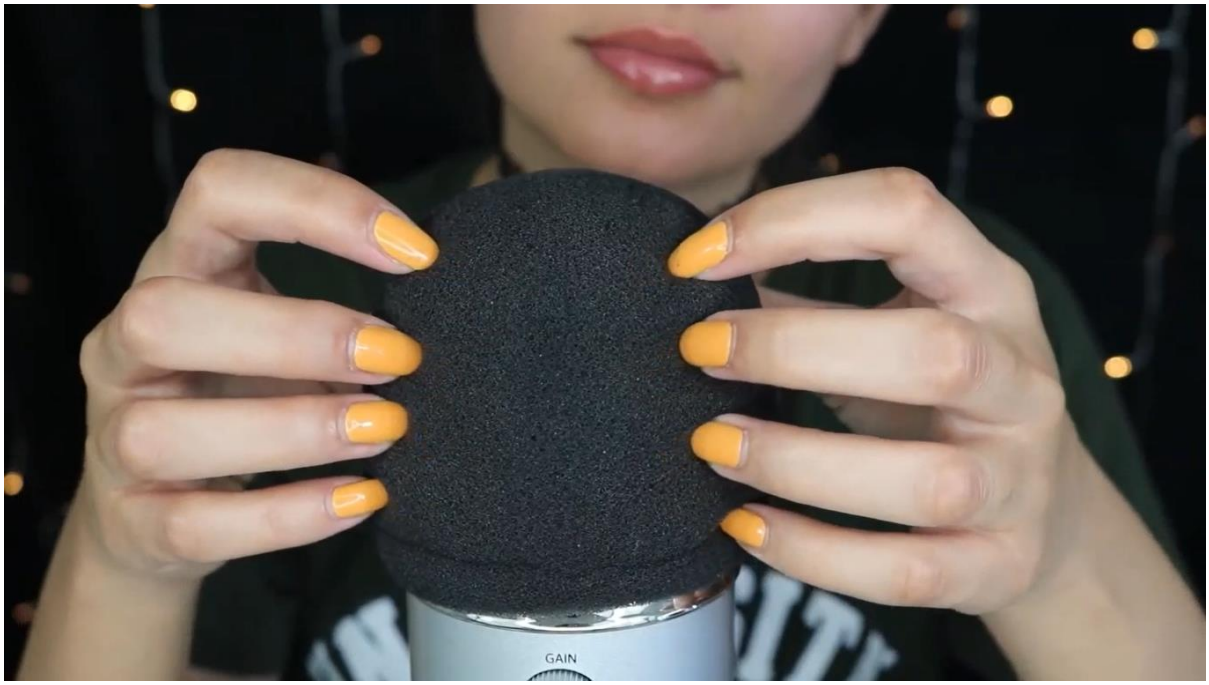
**Appendix A – ASMR video screenshots and brief descriptions.**

Video 1 – Tapping, the ASMRtist uses various objects while tapping on them, the pauses between object changes are edited out of the video.

Video 2 – Ear Cleaning, the ASMRtist is using spoolie brushes on the synthetic ears on a binaural microphone.

Video 3 – Scratching, the ASMRtist uses her nails to scratch various textile microphone covers.




Video 4 – Whispering, the ASMRtist whispers into the binaural microphone while maintaining eye contact and using affirmative language.

Video 5 – Eating/Chewing Sounds, the ASMRtist presents the food first and then starts eating (Mukbang style – popular Asian style of eating in front of the camera).

Video 6 – Haircut Simulation, the ASMRtist is role playing by enacting to be a hairdresser.

**Appendix B – List of countries and number of participants (public group)**

List of countries and number of participants (public group)

| Country or residence | Number of participants |
|---|---|
| Argentina | 1 |
| Australia | 38 |
| Austria | 1 |
| Canada | 7 |
| Chile | 1 |
| Czech Republic | 1 |
| France | 1 |
| Germany | 2 |
| Hong Kong | 1 |
| Iceland | 1 |
| India | 1 |
| Indonesia | 1 |
| Ireland | 1 |
| Japan | 1 |
| Jordan | 1 |
| Netherlands | 1 |
| New Zealand | 1 |
| Philippines | 1 |
| Spain | 4 |
| Sweden | 1 |
| United Kingdom | 6 |
| Unites States of America | 47 |

**Appendix C – Full survey (public group)**


SurveyMonkey_GP.pdf