The Effects of Autonomous Sensory Meridian Response (ASMR) Videos and ASMR Group on State Anxiety

Presley Jairom

Faculty of Behavioral Sciences
HELP University

Corresponding e-mail: [presley.j@help.edu.my]

The aim of this study is to investigate the effects of Autonomous Sensory Meridian Response (ASMR) videos and ASMR group on state anxiety, 212 Malaysians with no history of anxiety disorders were asked to watch both ASMR and non-ASMR videos. State anxiety levels were recorded immediately after watching each video. The participants were then characterised into either ASMR and non-ASMR group based on their responses on a grouping statement. Supplementary data analyses on participants' subjective ASMR experiences and triggers were also explored. Results showed that non-ASMR group had higher state anxiety after watching the ASMR video, but no significant differences were found in the ASMR group. The findings contradict the hypotheses that ASMR group would have lower state anxiety after watching ASMR video. This suggests that a different form of atypical sensory phenomenon may be elicited in part of ASMR.

Keywords: ASMR, state anxiety, relaxation, misophonia

Autonomous Sensory Meridian Response (ASMR), also known as "Brain Tingles" (Etchells, 2016), is a sensory phenomenon known to elicit pleasant tingling sensations that starts from the upper-back portion of the scalp, down to the neck, and if intensity suffice, may spread throughout other areas of the body (Barratt & Davis, 2015). This physiological reaction is often accompanied by a state of calmness, elicited by various auditory and/or visual triggers that may be interpersonal or impersonal in nature, albeit often co-presenting in any given ASMR-type video (Barratt & Davis, 2015).

Interestingly, ASMR has been termed as an "atypical" sensory phenomenon as it is only reported by individuals capable of experiencing tingles and consistently reports them upon exposure to relevant triggers; neural correlates have also been reported, with brain activation found in regions associated to reward and emotional arousal within ASMR sensitive individuals (Lochte et al., 2018; Smith et al., 2017). In the past decade, the ASMR phenomenon has made numerous popular media coverage largely due to claims over its use as a mood booster and sleep aid (Poerio, 2016). In the field of scientific research, ASMR is a relatively new subject of interest; with the first relevant publication dating back to 2015 (Barratt & Davis, 2015).

To date, large numbers of ASMR videos are available on Youtube – a free video-sharing platform – produced and uploaded by content creators that are otherwise known as "ASMRtist" (Kovacevich & Huron, 2019). Views on these videos could bolster up to millions, with hundreds of thousands of individuals subscribing to channels of their liking (Waldron, 2017). Table 1 depicts a list of popular ASMR Channels, and its view count documented by Barratt and Davis (2015) as of 10th December 2014 in comparison to a recent count as of 4th July 2021, with respective

percentage change calculated for each channel; this illustrates the rapid growth in popularity of the phenomenon within the past decade.

Table 1

Popular ASMR channels and its total views as well as percentage change from 10 December 2014 up to 4 July 2021

Name	Channel URL	Total Views (as of 10 December 2014)	Total Views (as of 4 July 2021)	Percentage Change in Total Views
WhisperTalkStudios	https://www.youtube.com/user/WhisperTalkStudios	218,900	4,069,502	~1759%
GentleWhispering	https://www.youtube.com/user/GentleWhispering	88,311,107	896,392,213	~915%
MassageASMR	https://www.youtube.com/user/MassageASMR	46,575,761	360,139,552	~673%
Fairy Char ASMR	https://www.youtube.com/user/feirychaRstaRs	9,008,828	136,212,486	~1411%
Ephemeral Rift	https://www.youtube.com/user/EphemeralRift	27,053,163	417,330,021	~1442%
ASMRRequests	https://www.youtube.com/user/ASMRrequests	648,590	139,038,421	~21337%
TheUKASMR	https://www.youtube.com/user/TheUKASMR	7,734,238	N/A (No Longer Active)	N/A

Note. Adapted from "Autonomous Sensory Meridian Response (ASMR): a flow-like mental state" by E. L. Barratt and N. J. Davis, 2015, *PeerJ*, *3*, e851. (https://doi.org/10.7717/peerj.851). Copyright 2015 by Barratt and Davis. Adapted with permission.

In 2015, Barratt and Davis ran a large-scale survey study involving 475 ASMR-sensitive individuals to understand the motivation behind the usage of such media type and the means of which it is usually consumed. Consistent with various news coverage (Marsden, 2012; Taylor, 2013), they found that almost all of their participants (98%) used ASMR as a way of achieving calmness, whilst 80% reported an improvement in subjective mood; these findings were replicated in subsequent studies with similar percentage ranges (Janik McErlean & Banissy, 2017). Suggestively, the affective changes were hypothesised to be a result of mindfulness practice (Barratt & Davis, 2015; del Campo & Kehle, 2016); ASMR media requires its viewers to closely attend to triggers found within its content, combined with intrinsic oriented attention placed on psycho-physiological reactions, the whole act resembles meditative practices in which requires the individual to be attentively present (Baer, 2003).

Recently, an empirical study was conducted to provide statistical evidence to these affective changes; Poerio and colleagues (2018) explored the effects of such media type in relation to ASMR sensitivity to an array of different affects – such as calmness, sadness, excitement,

stress, and connectedness. Participants were exposed to both ASMR and non-ASMR videos, before reporting their immediate affective states. As an extension, they conducted a second study to explore potential physiological changes as well.

Overall, positive affects were found to significantly increase in the ASMR group in response to ASMR videos, more importantly, these affective changes were found in tandem with physiological ones (Poerio et al., 2018); a decrease in heart rate resembling anxiety-reducing interventions involving the use of music and mindfulness practice (Bradt et al., 2013; Campbell-Sills et al., 2006), as well as an increase in skin conductance response level. It is theorized that the lowered heart rate levels may be directly linked to the calming feature of ASMR, whilst higher skin conductance levels may be relevant to reported tingling sensations (Valtakari et al., 2019).

A reduction in heart rate is a common physiological change found in relaxation responses (Benson, 1977); a term used to describe a set of physio-psychological adjustments elicited when repetitive live or mental actions are being executed – this then results in diverted attention away from negative experiences (Benson et al., 1974). These responses are often achieved through varied relaxation techniques such as meditative practices and yoga, with its efficacy in lowering stress symptomology attributable to the incompatibility between the relaxation response and the heightened autonomic nervous response (Benson et al, 1974; Peters et al., 1977). Furthermore, based on James-Lange's theory of emotions, the increase in relaxation response could aid in the perception of being in a relaxed state (Cannon, 1987), given that emotions – in this theoretical context – are perceived based on the individual's present physiological arousal.

As mood improvements from ASMR seem to decrease following immediate disengagement (Barratt & Davis, 2015), it is likely that a transient form of anxiety – which involves a sense of unease, worry and increased bodily arousal that shifts from time to time, depending on the situation – is the most affected by the physio-psychological effects of ASMR, as opposed to trait anxiety – which is similar to state anxiety except for its stability across time and space (Hodges & Spielberger, 1969).

Unfortunately, empirical evidence in presenting causal effect is lacking – so far, research on anxiety and ASMR has mostly been reports on subjective motivation for its use. Thus, more research is required to explore its direct anxiolytic properties. Furthermore, if ASMR videos do show significant attenuation in state anxiety amongst ASMR sensitive individuals, this could prompt further research on ASMR in regards to the relaxation response, and investigation in its potential use as a tool for anxiety management in both clinical and non-clinical population.

The current study aims to investigate the effects of ASMR videos and ASMR group on state anxiety, with the research question, "What are the effects of ASMR videos and ASMR group on state anxiety?". Based on the literature review, four hypotheses were made;

(H1) There will be an interaction effect between ASMR videos and ASMR group on state anxiety.

(H2) Participants in the ASMR group will have a lower state anxiety level compared to participants in the non-ASMR group after watching the ASMR Video.

(H3) Participants in the ASMR group will have a lower state anxiety level after watching the ASMR video compared to participants in the non-ASMR group after watching the neutral video.

(H4) Participants in the ASMR group will have lower state anxiety level after watching the ASMR video, compared to watching the neutral video.

Method

Design

This was an online experimental study with a 2 x 2 mixed design; the between-subjects variable was ASMR Group with two levels (ASMR Group, Non-ASMR Group), whereas the within-subjects variable was ASMR Video with two levels (ASMR Video, Neutral Video).

Two online google forms were constructed. These forms were identical except for the video placement order (ASMR video followed by neutral video, or vice versa). Participants were directed to the forms at random using a randomizing-redirecting tool; the tool generates a new link that redirects the participant to either one of the two forms. The new link was provided to participants to reduce order effects.

Participants

To participate in the study, individuals must be aged 18 – 80 years old, Malaysian and has not been clinically diagnosed with an anxiety disorder. A total of 217 participants were recruited, of which five were excluded from the analyses as they failed to meet the eligibility criteria. The final sample size was 212 (40 males, 171 females, 1 prefer not to say). Based on a priori power analysis with a medium effect size of 0.25, a sample size of 82 participants (41 ASMR participants, 41 non-ASMR participants) was determined – although a larger sample size was collected as it may yield greater statistical power (Asendorpf et al., 2013). The final sample had 104 ASMR participants and 108 non-ASMR participants.

Individuals were recruited via advertisements and through the university's online experimental portal. Both purposive and snowball sampling were implemented; purposive sampling was used as certain criteria had to be fulfilled. Malaysian citizens were recruited to examine socio-cultural differences in trigger intensity, whilst a non-clinical sample was collected to control for the "dampening effect" of positive affects in individuals with anxiety disorders (Eisner et al., 2009). Snowball sampling was used as participants were asked to share the online experimental link to other individuals that may be interested and have met the eligibility criteria.

Instruments

The ASMR grouping statement was used to categorize participants into either ASMR or non-ASMR groups (Poerio et al., 2018). The statement is phrased as, "Having watched these videos, or just from your everyday life, would you classify yourself as somebody who experiences ASMR?". Responses could either be "Yes" or "No", with "Yes" being indicative of ASMR Group membership, and "No" indicative of non-ASMR Group membership.

The six-item state scale of Spielberger State-Trait Anxiety Inventory (STAI-6) was used to measure participants' state anxiety (Marteau & Bekker, 1992). The inventory consists of six items that describes how a person may be feeling at real-time, such as, "I feel calm" and "I am tense". Instructions on the inventory directs participants to answer in a way that best represents their current feelings. Responses were recorded on a 4-point Likert scale, with "1" being "Not at all" and "4" being "Very much". Furthermore, reverse-scoring was implemented for items 1, 4 and 5. Thus, low scores on all items equated to low state anxiety. The total score calculated was multiplied by 20 over 6; this conversion was made for easier reference to Spielberger's scoring manual. STAI-6 had good internal consistency with a Cronbach's alpha of 0.82.

Two types of videos were used in this study, both of which were approximately 3 minutes long and was retrieved with permission to use from Poerio et al. (2018). The ASMR video depicted a tutorial on how to fold towels, with the actor facing the viewer whilst using slow hand gestures, close attention, and whispers throughout the demonstration. The neutral video depicted a tutorial on how to make fresh pasta. In this video, the actor faces the viewer and demonstrated the steps in making pasta whilst providing verbal instructions. The style of the video mimics the ASMR video but did not contain any ASMR triggers.

Supplementary Instruments

Supplementary questionnaires do not directly test the hypotheses but were administered to further elaborate patterns of data found.

The Tingle Frequency scale was used to measure how frequently participants experienced tingles throughout the videos (Poerio et al., 2018). The scale only consists of one item, phrased as, "How frequently (if at all) did you experienced tingling sensations during the video?". Responses for this item were recorded on a 7-point Likert scale, whereby "1" indicates "None of the time" and "7" indicates "All of the time"; a high rating on the item represents high tingle frequency.

The ASMR Checklist was included to study ASMR triggers and subjective ASMR experiences amongst participants (Fredborg et al., 2017). The checklist consists of 16 items that describes common ASMR triggers, such as "Whispering" and "Haircut Simulation". Instructions given on the checklist informs the participant to rate the intensity of their ASMR experience in relation to each individual trigger. Responses were recorded on a 7-point Likert scale, with "0" being "No Tingles" and "6" being "Most intense ASMR experience". Moreover, participants were given the option to choose an "Unknown" response if uncertainty arises. Thus, high scores on items would indicate a high-intensity ASMR experience. In addition, supplemental questions in the checklist also explored the duration of time needed for ASMR to manifest in response to individual triggers, participants' viewing habits, and their perception of ASMR. The ASMR Checklist has been found to be reliable, with a Cronbach's alpha of 0.81.

The Beck Anxiety Inventory (BAI) was used to indicate the severity of participants' trait anxiety levels (Beck et al., 1988). The inventory consists of 21 items that describe symptoms of anxiety, such as "Dizzy or lightheaded" and "Hands trembling". Written instructions in the inventory direct the participants to rate the severity of each item in the past month. Responses were recorded on a 4-point Likert scale, with "0" being "Not at all" and "4" being "Severely – it bothered me a lot". Thus, high scores on items indicate severe anxiety. The BAI has been found to have high internal consistency, with a Cronbach's alpha of 0.92. A demographic questionnaire was also constructed; items include questions on age, gender, nationality, ethnicity, occupation and whether they have had a clinical diagnosis of an anxiety disorder in the past. Information collected was used to screen participants that did not fulfil the eligibility criteria.

Procedure

After providing informed consent, participants were given a brief introduction to the study; they were advised to complete the online form in a quiet and secluded space, as well as to complete sections involving the video clips, tingle frequency scale, STAI-6 and the ASMR grouping statement in one sitting; this was to ensure that immediate effects of ASMR were measured after each video.

Participants first had to fill in the demographic questionnaire and were then

given a brief description of ASMR in the form of an "ASMR Map" (Barratt & Davis, 2015). Once the description was read and understood, they could proceed further.

Depending on the google form that participants were redirected to, a video clip will be presented – either neutral or ASMR video – to watch, optimally with earphones or headphones. Once done, they were then given the Tingle Frequency Scale to indicate how frequently they felt tingles throughout the first video clip, followed by the STAI-6.

Participants were then presented with the second video clip. Similarly, they were required to watch the video, fill in the Tingle Frequency Scale, and subsequently the STAI-6. Once done, the participants were given the ASMR grouping statement that categorizes them to either ASMR or non-ASMR group.

Following this, the participants had to fill in the ASMR Checklist and the BAI before submitting the form. They were thanked for their participation and were requested to share the experimental link to individuals that were interested and fulfilled the eligibility criteria.

Results

Participants in the non-ASMR group had the highest state anxiety level after watching the ASMR video, followed by the ASMR group after watching both neutral and ASMR video, and lastly the non-ASMR group after watching the neutral video. Table 2 illustrates the descriptive statistics for state anxiety across all levels and conditions.

Table 2

Descriptive statistics for state anxiety across levels and conditions

	M	*SE*	95% CI		*n*
			LL	*UL*	
ASMR Group	41.81	0.84	40.15	43.47	104
Non-ASMR Group	41.91	0.83	40.29	43.54	108
ASMR Video	43.04	0.80	41.47	44.62	212
Neutral Video	40.68	0.71	39.28	42.09	212
ASMR Group, ASMR Video	41.80	1.14	39.55	44.04	104
ASMR Group, Neutral Video	41.83	1.02	39.82	43.83	104
Non-ASMR Group, ASMR Video	44.29	1.12	42.08	46.50	108
Non-ASMR Group, Neutral Video	39.54	1.00	37.57	41.50	108

The Shapiro-Wilk test revealed that assumptions of normality of state anxiety was met for the ASMR group, Shapiro-Wilk (104) = .98, p = .200, but not for the non-ASMR group, Shapiro-Wilk (108) = .98, p = .053, after watching the neutral video. The assumption of normality of state anxiety was also not met for ASMR Group, Shapiro-Wilk (104) = .96, p = .002, and for non-ASMR Group, Shapiro-Wilk (108) = .97, p = .026, both after watching the neutral video. However, given that the sample size was relatively big and equal in number, the ANOVA is robust to this violation (Pallant, 2013).

The assumption of homogeneity of variances were met at both levels of the within-subjects variable; ASMR Video, *F*

(1, 210) = 0.18, p = .671, and non-ASMR video, F (1, 210) = 0.15, p = .699.

A two-way mixed ANOVA was then conducted to examine the main effects of ASMR Group and ASMR Video, as well as the interaction effect of both variables, on state anxiety; data from the analyses are presented in Table 3.

Table 3

Tests of ASMR Group and ASMR Video effects on State Anxiety

	df	*F*	Sig.	partial η2
ASMR Group	1	0.01	.931	0.00
ASMR Video	1	6.19	.014*	0.03
ASMR Group x ASMR Video	1	6.36	.012*	0.03
Error	210	-	-	

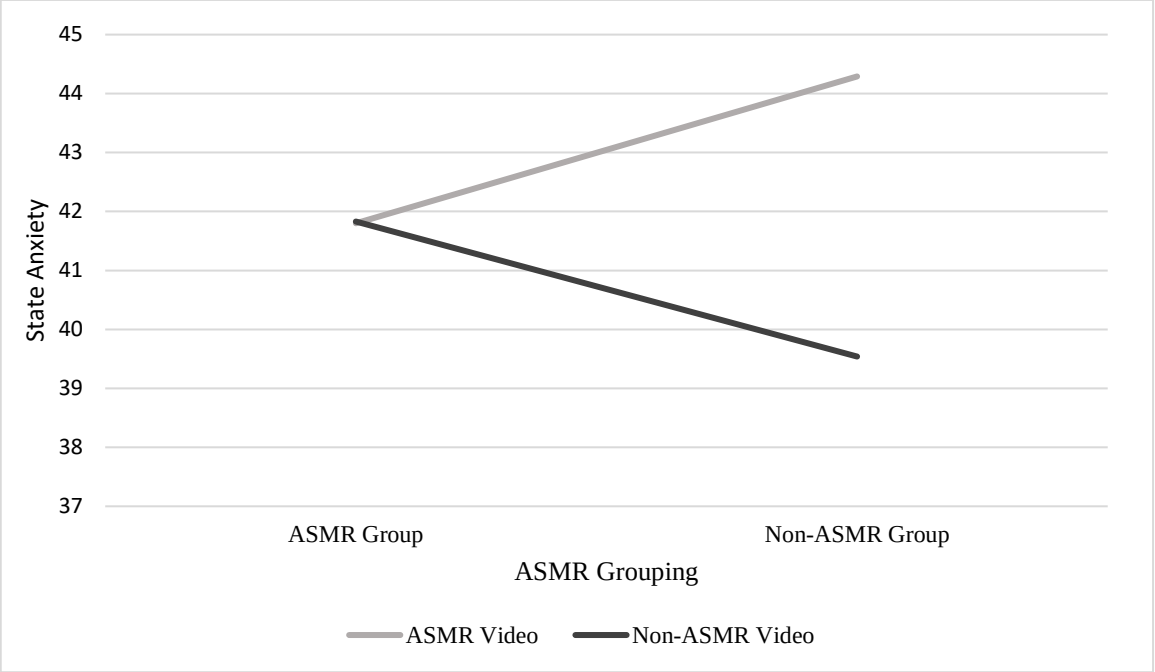
Note. * p <.05

There was no significant main effect of ASMR group on state anxiety, F (1, 210) = 0.01, p = .931, partial η2 = 0.00. State anxiety did not differ between ASMR and non-ASMR group, independent of other variables. However, there was a significant main effect of ASMR video on state anxiety, F (1, 210) = 6.19, p = .014, partial η2 = 0.03. ASMR video type alone produced significant differences in state anxiety; participants had higher state anxiety after watching the ASMR video compared to the neutral video (M_{diff} = 2.36, SE = 0.95, p = .014, 95% CI [0.49, 4.23]).

There was a significant interaction effect of ASMR group and ASMR video on state anxiety, F (1, 210) = 6.36, p = .012, partial η2 = 0.03. Figure 1 illustrates the interaction between ASMR Group and ASMR video on state anxiety.

Figure 1

Interaction between ASMR Group and ASMR video on state anxiety



Note. Participants in the ASMR group reported similar state anxiety ratings for each video type. Participants in the non-ASMR group reported higher state anxiety levels after watching ASMR video compared to the neutral video.

Simple effects analysis revealed that state anxiety levels significantly differ in the non-ASMR group after watching both videos, F (1, 210) = 12.79, p < .001, partial η2 = 0.06. Specifically, participants in the non-ASMR group reported higher state anxiety level after watching the ASMR video compared to the neutral video, M_{diff} = 4.75, SE = 1.33, p < .001, 95% CI [2.13, 7.37]. State anxiety levels did not significantly differ in the ASMR group after watching both ASMR and neutral video, F (1, 210) = 0.001, p = .981, partial η2 = 0.00.

Furthermore, state anxiety levels of both ASMR and non-ASMR groups were not significantly different from each other after watching the ASMR video, F (1, 210) = 2.44, p = .120, partial η2 = 0.01, and the neutral video, F (1, 210) = 2.58, p = .109, partial η2 = 0.01.

Supplementary Analyses

Tingle frequencies felt in both ASMR and non-ASMR groups whilst watching the video clips were assessed using a two-way mixed ANOVA. There was a significant main effect of ASMR group on tingle frequency, F (1, 210) = 30.99, p < .001, partial η2 = 0.13. Participants in the ASMR group experienced more tingles compared to the non-ASMR group, M_{diff} = 0.91, SE = 0.16, p < .001, 95% CI [0.59, 1.23].

There was also a significant main effect of ASMR video on tingle frequency, F (1, 210) = 112.56, p < .001, partial η2 = 0.35. Participants felt more tingles after watching the ASMR video compared to the non-ASMR video, M_{diff} = 1.27, SE = 0.12, p < .001, 95% CI [1.04, 1.51].

However, no significant interaction effect was found between ASMR group and ASMR video on tingle frequency, F (1,

210) = 3.01, p = .084, partial η2 = 0.01. Frequency of tingles felt by both ASMR group and non-ASMR group were not significantly different to each other regardless of video type. Table 4 illustrates the descriptive statistics for tingle frequency across all levels and conditions.

Table 4

Descriptive statistics for tingle frequency across all levels and conditions

	M	*SE*	95% CI		*n*
			LL	*UL*	
ASMR Group	2.98	0.12	2.75	3.21	104
Non-ASMR Group	2.07	0.12	1.84	2.30	108
ASMR Video	3.16	0.12	2.93	3.39	212
Neutral Video	1.89	0.90	1.72	2.06	212
ASMR Group, ASMR Video	3.72	0.17	3.40	4.05	104
ASMR Group, Neutral Video	2.24	0.12	2.00	2.48	104
Non-ASMR Group, ASMR Video	2.60	0.16	2.28	2.92	108
Non-ASMR Group, Neutral Video	1.54	0.12	1.30	1.77	108

Table 5

Tests of ASMR Group and ASMR Video effects on Tingle Frequency

	df	*F*	Sig.	partial η2
ASMR Group	1	30.99	.000**	0.13
ASMR Video	1	112.56	.000**	0.35
ASMR Group x ASMR Video	1	3.01	.084	0.01
Error	210	-	-	

Note. ** p < .001

Means and standard deviations for trigger intensity were calculated for each trigger type; unknown responses were dropped out from the mean score of each trigger. The top three triggers found to be most intense were “whispering”, followed by “scratching sounds” and “watching someone cook”. Table 6 summarizes the means and standard deviations, as well as the number of kept responses for each trigger.

Table 6

Means, standard deviations and valid responses for intensity ratings of each individual trigger

	M	*SD*	*n*
Whispering	4.08	1.54	104
Scratching Sounds	3.66	1.88	103
Watching others cook	3.54	2.00	102
Chewing Sounds	3.43	2.02	103
Tapping Sounds	3.27	1.70	104
Haircut Simulation	3.21	1.84	98
Watching others open a package	3.21	1.76	100
Watching others paint	3.15	1.83	100
Watching others draw	3.09	1.79	100
Dentist Simulation	2.65	1.90	97
Watching others apply makeup and/or nail polish to another person	2.53	1.92	96
Watching others apply makeup and/or nail polish to themselves	2.48	1.90	98
Watching someone touch another person's hair	2.26	1.74	98
Watching others refill fountain pens	2.09	1.58	91
Watching someone touch their own hair	1.72	1.60	98
Watching others sweep	1.67	1.57	96

The mean age for earliest ASMR experience recalled by ASMR participants were 13.37 (*SD* = 4.47). Data on past ASMR experiences and usage amongst ASMR sensitive individuals were also analysed. Table 7 summarizes the frequency of ASMR usage for relaxation and how pleasant (or unpleasant) the experience may be.

Table 7

Frequency of usage for relaxation, and pleasantness of the ASMR experience amongst ASMR participants

Items	*n* (%)
"How often do you use ASMR videos or audio files to help you relax (but not sleep)?"	
Daily	6 (6)
2-3 times a week	10 (10)
2-3 times a month	17 (16)
Less than once a month	22 (21)
Once a month	9 (9)
Never	40 (38)
"On average, how pleasurable is an ASMR experience?"	
Quite Uncomfortable	7 (7)
Mildly Uncomfortable	6 (6)
Neutral	11 (11)
Mildly Pleasurable	50 (48)
Quite Pleasurable	29 (28)
"What percent of the time is an ASMR experience opposite to how it feels on average?"	
Between 1 and 10 percent of the time	30 (29)
Greater than 10 percent but less than 25 percent of the time	26 (25)
Greater than 25 percent but less than 50 percent of the time	14 (14)
50 percent of the time	15 (15)
ASMR virtually always feels the way I specified in the previous question	18 (17)

38% of the ASMR participants do not use ASMR videos to relax, and about 76% of the participants found the experience to be pleasant. However, a follow up question on the likelihood of having an affective reaction that is opposite to the usual reaction found that 83% of the participants had varying degree of such likelihood.

Total scores from the Beck Anxiety Inventory (BAI) indicates severity of anxiety in the past month. Each participant's total scores were calculated and ranked according to the cut-off points available on the scoring manual (Beck & Steer, 1993). From the sample, 130 participants had low anxiety, 54 were at moderate levels whilst 28 participants showed anxiety of concerning severity (19 of which were part of the ASMR group).

Discussion

Results showed that there was a significant interaction effect of ASMR group and ASMR videos on state anxiety, thus, hypothesis (H1) could be supported. However, the non-ASMR group showed higher state anxiety after watching the ASMR video compared to the neural video. State anxiety levels in the ASMR group was not significantly different after watching the ASMR video and neutral video. Additionally, state anxiety levels of both ASMR and non-ASMR group were not significantly different from each other after watching the ASMR and neutral

video. Thus, hypotheses H2, H3 and H4 cannot be supported.

Moreover, there was also no significant difference in tingle frequency between all conditions in our study; based on past literature, ASMR sensitive individuals would report significantly higher tingling sensations compared to non-ASMR group whilst watching ASMR videos (Barratt & Davis, 2015; Kovacevich & Huron, 2019). Given that tingles are a prominent ASMR feature, the lack of significant differences in tingle frequencies throughout conditions suggests that ASMR group were not any more likely to have had experienced ASMR compared to the non-ASMR group after going through the video manipulation.

Our results were not consistent with findings by Barratt and Davis (2015), in which found that almost all their participants (98%) used ASMR for relaxation purposes; only 62% of the participants from our study did so. Suggesting that the use of ASMR as a relaxation tool may not be the primary goal in our sample. Furthermore, the top three intense triggers found in this study was whispering, scratching sounds, and watching others cook. In comparison to the findings from Fredborg et al. (2017), whispers were also reported to be the most intense trigger, followed by haircut simulations, and tapping sounds.

Interestingly, watching someone cook was a weak trigger reported by Fredborg et al. (2017) – ranked as the least intense trigger, with a mean of 1.39 (*SD* = 1.63), compared to a mean of 3.54 (*SD* = 2.00) from the current study. It should also be noted that chewing sounds were rated quite high on our trigger list, ranked as the fourth most intense trigger. Whereas in findings by Fredborg et al. (2017), chewing sounds were the second least intense trigger. It may be hypothesised that differences in trigger intensities may be affected by the individuals' early life experiences; given that the mean age of first ASMR experiences often fall in childhood ranges (Barratt & Davis, 2015), preferences could have developed throughout earlier developmental years – similar to the reinforcements of certain phonophobias (Lucker & Doman, 2015).

The unexpected increase in state anxiety felt by the non-ASMR group after watching the ASMR video may not be without theoretical basis. In a study by Kovacevich and Huron (2019), content analysis was conducted on a collection of comments and remarks about ASMR found throughout ASMR-related online platforms. Their results showed that non-fans of ASMR often left negative comments about the sensory experience, with some stating that ASMR content causes them to feel uncomfortable and anxious.

This contradictory reaction may have some theoretical relevance to an alternative sensory experience, known as misophonia – where individuals experience an uncontrollable negative reaction towards audio-visual triggers, often accompanied by an increased physiological arousal (Schröder et al., 2013). Interestingly, both ASMR and misophonic triggers tend to overlap, most notably in triggers involving whispering and chewing sounds (Fredborg et al., 2017; Janik McErlean & Banissy, 2017). The ASMR video used in this study involved whispers as a trigger, which could have elicited misophonic reactions in both groups.

In studies exploring the relationship between ASMR and misophonia, there was a prevalence of ASMR experiences within misophonic samples by 49% (Rouw & Erfanian, 2018). On the other hand, there was also a prevalence of misophonia in ASMR samples of about 43% (Barratt et al., 2017). Although the current study did not investigate misophonic tendencies within the sample, the ASMR Checklist did include items involving how pleasurable the ASMR experience may be, as well as the likelihood of experiencing a

subjective reaction that is contrary to the norm. 13% of the ASMR sample found ASMR to be an uncomfortable experience, and although 76% found ASMR to be pleasurable, 83% of the ASMR group also reported to have had contradictory reactions to it on varying degrees. Thus, a portion of the ASMR participants may also experience misophonia whilst watching the ASMR video – resulting in patterns of heightened and reduced levels of state anxieties that otherwise cancels each other out during analysis.

Given the high prevalence of misophonia within ASMR samples, as well as similarities related to physiological feedback in response to certain triggers, the two phenomena may be related to each other by existing on polar ends of a sound-sensitivity spectrum (Barratt & Davis, 2015), whereby exposure to certain triggers may bring forth a reaction characteristic of ASMR or misophona. Although the current study did not explicitly test for this, the interpretation of results is best explained by it.

Future studies may benefit from running screening tests for misophonic reactions to ASMR triggers prior to conducting experimental research. A suggestion would be by running pilot studies to establish the effectiveness of the video manipulation being used; this way; patterns and results may indicate the actual effects of ASMR experiences without being affected by external variables such as misophonia. Furthermore, the use of psychometric tools such as ASMR-15 and the recently published ASMR-Experience Questionnaire (AEQ) may allow future researchers to better recruit ASMR-sensitive participants based on their ASMR tendencies (Roberts et al., 2019; Swart et al., 2021); this could help minimize the false recruitment of participants that may experience similar, but distinguishable sensory experiences – such as misophonia, or even frisson ("chills" from certain genres of music) (Panksepp, 1995).

Additionally, although online experiments allow greater achievability for larger sample sizes, confounding variables such as environmental distractions could not be controlled for. There was no guarantee that participants followed proper instructions whilst taking part in the study, such as doing it in a quiet place, wearing earphones or headphones, or even watching the whole duration of the video – compliance could not be ensured, even with the use checkbox-compliance. Thus, laboratorial studies may be necessary to ensure standardization in data collection (Hostler, 2020).

The findings suggest that ASMR do exhibit an effect on one's level of anxiety, depending on their sensitivity on the "ASMR-Misophonia" spectrum. Thus, ASMR sensitive individuals may benefit by investing time and effort towards understanding triggers that are relaxing for them. If an ASMR video succeeds in eliciting desirable outcomes, the content and triggers present in that video should be explored; likewise, if an ASMR video induces a feeling of apprehension instead, it would be beneficial for the individual to identify aversive triggers and avoid it in times of anxiety or when relaxation is sought for.

ASMR videos available online are often labelled with primary triggers that are predominant in the video itself. Once personal triggers are identified, the search function on online platforms may help in sorting through videos that are optimal for subjective ASMR experience, especially in elevating anxiety. Thus, a more trigger-informed approach may be required in the application of ASMR for anxiety to minimize probable adverse reactions.

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