Salon de FréFré: A VR + ASMR Experience

Ryan Bluth

ryan.bluth@carleton.ca

Michael Hetman

michael.hetman@carleton.ca

Sean LeBlanc

sean.leblanc@carleton.ca

Kiera Lundberg

kiera.lundberg@carleton.ca

Emma Thurlow

emma.thurlow@carleton.ca

Cartherine Wong

catherine.wong@carleton.ca

ABSTRACT

We will build a multimedia experience which combines VR with ASMR and plan to compare users' experiences with the VR system against an audio-only system. We expect to see higher levels of relaxation as a result of the increased immersion/presence offered by VR.

Author Keywords

Virtual Reality; VR; Virtual Environments; Autonomous Sensory Meridian Response; ASMR; Presence; Immersion; Head-Mounted Display; HMD; Flow State; Treatment; Therapy

ACM Classification Keywords

H.5.1 Multimedia Information Systems: Artificial, augmented, and virtual realities

INTRODUCTION

Project Overview

The topic of interest for this project is Autonomous Sensory Meridian Response, commonly known as ASMR, which is a "sensory phenomenon, in which individuals experience a tingling, static-like sensation across the scalp, back of the neck and at times further areas in response to specific triggering audio and visual stimuli" [3]. Although ASMR can occur as a result of virtually any stimulus, there is an emerging trend of ASMR content uploaded to YouTube, with one of the most popular channels garnering nearly 200 million views since their first video was uploaded four years ago [2]. These videos are meant to lull viewers into relaxed states by incorporating specific audio stimuli, including whispering, tapping, brushing, and other sounds, ideally recorded using binaural microphones for increased immersion.

We plan to explore whether the immersion, presence, and/or interactivity of a virtual reality system affects viewers' experience with media designed to evoke ASMR. This exploration will be achieved through the use of a custom-developed ASMR

Paste the appropriate copyright statement here. ACM now supports three different copyright statements:

- ACM copyright: ACM holds the copyright on the work. This is the historical approach.
- License: The author(s) retain copyright, but ACM receives an exclusive publication license.
- Open Access: The author(s) wish to pay for the work to be open access. The additional fee must be paid to ACM.

This text field is large enough to hold the appropriate release statement assuming it is single spaced.

Every submission will be assigned their own unique DOI string to be included here.

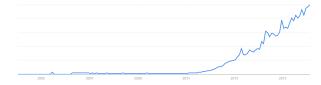


Figure 1. The popularity of ASMR searches has been rising steadily over the past four years. Data Source: Google Trends (www.google.com/trends/).

experience, an Oculus Rift¹, and a pair of high quality head-phones².

The ASMR experience that we intend to create is one wherein the participant's avatar receives a virtual salon makeover. It will consist of a makeup artist, shown in proxy as a roughly animated character silhouette, applying makeup to the participant's avatar. True to the format of ASMR videos, the artist will move around and speak as they go about their tasks. The artist's speech will be a pre-recorded mono track and positional audio will be used to place it relative to the participant.

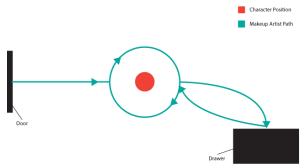


Figure 2. Mockup of the salon layout and the makeup artist's motion path.

At certain points, the artist will offer participants a selection of products. A selection can be made by through head-tracking: by maintaining eye contact with the choice for a set time (see Figure 3). Choices made will cosmetically affect the avatar displayed at the experience's conclusion.

¹DK2 headset

²Grado SR80e headphones



Figure 3. Mockup of the selection method which uses the center of the screen as a cursor position.

User Study

To evaluate the experience, a comparative study will be performed in which participants are exposed to two variations of the experience: one will be the VR experience exactly as developed, and the other will lack visual stimuli and interaction in order to isolate audio, the component most closely associated with the YouTube ASMR format³. The test will use a within-subjects design, as individual differences would be a significant source of error for something as subjective as ASMR.

We hypothesize that the addition of visual stimuli and interaction with the system will further immerse the participant in the ASMR experience. As 98% of individuals searching for ASMR videos have indicated that they do so for relaxation [3], we will be evaluating the participant's sense of relaxation. This will be measured through surveys and possible physiological indicators (e.g. heart rate, respiratory rate) during or after the experience. We expect to observe higher satisfaction with the experience as a result of these factors than with passive audio alone. We believe this will open up the ASMR video-producing community to a new form of experience unlike those found on YouTube.

Future Work

A possible extension of this experience would be to have the test administrator brush the participant's face with actual makeup brushes in-sync with the virtual brushes. As we intend to primarily evaluate the visual and interactive elements, this idea was excluded from this proposal. We hypothesize that this haptic stimuli on its own could be capable of eliciting sensations similar to ASMR (which would interfere with our study) [5], and so we leave this for future works to consider.

Experience Outline

- 1. The participant is seated and puts on the equipment
- 2. A makeup artist enters the salon and introduces herself
- The artist asks participants to select a colour for their makeup
 - VR: Participants are presented with a palette and make a selection
- The artist circles participants, brushing their face and whispering quietly about what she's doing, occasionally complimenting the participant
- 5. Participants are informed that the makeup is complete
- ³During interactive elements in which a question is posed to the participant, the audio will continue without any user input. Both versions will include some questions in this format (e.g. "How was your day?") to avoid interference with study results.

- 6. The artist instructs participants to turn and look at their reflection in a mirror she's holding
 - VR: Participants see their avatar in a mirror, re-textured based on earlier selections

RELATED WORK

Introduction to Autonomous Sensory Meridian Response

Autonomous Sensory Meridian Response, or ASMR, is the tingling sensation across the scalp and back of the neck, caused by specific audio and visual stimuli [3]. To experience ASMR, many users watch videos, often involving personal attention or grooming role-play [1, 3] with a female host [1], designed to elicit the phenomenon. Various types of stimuli can be used within a video to evoke the desired response[3]. When surveying those that experienced ASMR in order to learn which stimuli was triggering, it was found that whispering, personal attention, crisp sounds, and slow movements could cause the response. Whispering was the most common among participants, affecting 75% [3]. To increase the sensation, users may change their environment by dimming the lights or using headphones [4]. For our project, we will be recording similar audio stimuli to those listed above, and utilizing highfidelity headphones for the best experience. Since an HMD will be used, dimming the lights is unnecessary.

Apart from eliciting a tingling sensation, ASMR is able to put users into a state similar to flow state, "the state of intense focus and diminished awareness of the passage of time that is often associated with optimal performance" [3]. During their research, Barratt and Davis observed that this state of concentration was improved with more ASMR triggers [3]. ASMR is valued for its calming effects [3]. When polling users, 98% of people strongly agreed that they use ASMR videos for relaxation, and 70% use it for stress relief [3]. Some believe in its effects so much that they promote ASMR as a treatment for stress-related conditions such as anxiety[1, 4].

Unfortunately for those who use ASMR, these effects can be lost over long-time usage [1]. In this situation, users often turn to more immersive experiences that use binaural sound and 3D microphones [1]. It is believed that this adds to the experienceâĂŹs intimacy, encouraging the response [1]. For our project, we hope to determine whether the increased level of immersion of our choice of display will amplify the sensations provided by ASMR.

Virtual Reality Input Methods

There are various methods which developers can use to allow for interaction with virtual worlds. In a 2008 study, when comparing mouse and gaze pointing methods, participants perceived gaze as faster but less accurate than mouse pointing [7]. Discomfort is a drawback of gaze pointing, especially if users must keep their heads still for a long time [7]. We believe that the gaze method will work well for our project as users will not be asked to complete tasks requiring accuracy or holding a position for a long time.

The Effects of Virtual Reality

Like real life environments, virtual environments can cause emotional reactions in users. During a 2007 experiment, it was found that when placed into a relaxation or anxiety inducing environment, participants showed signs of either relaxation or anxiety [10]. It was also shown that a relaxing VR experience can increase feelings of quietness and happiness while reducing anger, sadness and anxiety [10]. This suggests that virtual environments can be designed to arouse an emotional response, and that users are directly engaged with the effects of the experience [10, 13]. It was also found that the level of presence⁴ felt by participants was greater in relaxing and anxious environments than in neutral ones, and that the greatest feeling of presence was achieved in the relaxing environment [10]. During a literature review relating to presence in virtual environments, it was found that a participant's sense of presence is influenced by the attributes of the VR platform the features of the environment itself, and the individual userâĂŹs characteristics [9].

VR has also been seen as an alternative way to administer therapy, which could help people in overcoming anxiety and stress-related conditions. In various studies, it has been found that compared to traditional therapy, individuals enjoyed VR therapy more, leading to an increase in motivation to complete treatment [6, 8]. VR therapy also has the benefit of current equipment being affordable, allowing participants to engage in sessions in their own homes [8]. When researching the viability of VR therapy, a follow-up survey of those who suffered from anxiety found that there was no significant difference in the level of anxiety felt between participants of VR and traditional therapy [11].

VR and ASMR have the shared attribute of inducing relaxation and are both often used for therapeutic purposes. We hope that by combining these two relaxing mediums users will be able to achieve a higher level of presence, which will increase the perception of intimacy ASMR users desire, leading to an increase in its effects.

Testing Methods

To collect data on subjective topics, questionnaires are a useful tool. During Riva's experiment on the link between presence and emotions in multiple virtual environments, questionnaires were used to evaluate mood before and after the experience including Visual Analogue Scale (VAS), Positive and Negative Affect Schedule (PANAS), and State Trait Anxiety Inventory (STAI). The VAS required participants to indicate how they feel at a specific moment in time regarding their level of happiness, anger, surprise, disgust, anxiety and quietness. The PANAS uses a list of 20 adjectives that describe 10 positive and 10 negative emotions. Participants must associate a magnitude on a scale of 1-5 for each emotion at a given moment. The STAI measures the level of anxiety participants feel on a scale of 0-3. The "State" version of this questionnaire asks participants how they feel at a given moment, while the "Trait" version asks for their general feelings. These questionnaires were provided to participants before and after testing to compare their baseline emotional state against the effects of the environment. Two additional questionnaires, the UCL Presence Questionnaire, and the Independent Television Company

Sense of Presence Inventory (ITC-SOPI) were also given to participants after each stage in order to assess their presence. For the UCL Presence Questionnaire, subjects were asked to answer using a 7-point Likert scale for the following questions:

- 1. "Rate your sense of being in the virtual environment."
- 2. "To what extent were there times during the experience when the virtual environment was reality for you?."
- 3. "When you think back to the experience, do you think of the virtual environment more as images that you saw or more as somewhere that you visited?"

The ITC-SOPI was used to measure different dimensions of presence, such as sense of physical space, engagement, ecological validity, and negative effects. The questionnaire is divided into two parts. The first consists of six items used to measure a participant's experience after the test has concluded, and the second consists of 38 items used to measure the participants experience during the test. Each is scored using a 5-point Likert scale.

Riva and her team also asked participants questions rated using a 10-point scale, while they were within the virtual environment. To measure their emotional status, participants were asked to what extent they felt sad, happy, anxious, and relaxed at any given moment. To measure presence, participants were asked if they felt as if they were in the virtual environment and whether that environment was a real place they were visiting. To reduce errors as a result of their within-subjects design, every participant was required to test each environment, with the sequence of environments being randomized [10].

For objective measurements on the emotional state of participants, physiological measures, such as heart-rate, can be taken. During a 2006 study on the effects of relaxation techniques and heart rate variability, it was found that guided relaxation decreased the participant's heart rate[12]. This shows a correlation between an individual's level of relaxation, which cannot directly be measured, and their heart rate.

To gather information on "the prevalence of particular features of ASMR, when and why individuals engage in ASMR, and the relation of ASMR to other known phenomenon", Barratt and Davis collected information on a participant's viewing habits and various facets of their experience using a questionnaire [3]. Although this questionnaire is designed for use with those already familiar with ASMR, it could likely be used to assess the experiences of individuals new to the phenomenon. A version of the original questionnaire can be found in Appendix A.

REFERENCES

- 1. Joceline Andersen. 2015. Now You've Got the Shiveries Affect, Intimacy, and the ASMR Whisper Community. *Television & New Media* 16, 8 (2015), 683–700.
- 2. Anonymous. 2016. YouTube Stats, Channel Statistics. (2 February 2016).
 - http://socialblade.com/youtube/user/gentlewhispering

 $^{^4}$ " the "sense of being there" or the "feeling of being in a world that exists outside the self." "[10]

- 3. Emma L Barratt and Nick J Davis. 2015. Autonomous Sensory Meridian Response (ASMR): a flow-like mental state. *PeerJ* 3 (2015), e851.
- 4. Dave Bergmann. 2015. YouTube therapy: with ASMR, an unlikely sound-based treatment for stress and insomnia, a "brain orgasm" could be just a few clicks away. *Men's Fitness* 31, 5 (2015), 46.
- 5. G Stanley Hall and Arthur Alliń. 1897. The psychology of tickling, laughing, and the comic. *The American Journal of Psychology* 9, 1 (1897), 1–41.
- 6. Rachel Kizony, Noomi Katz, and others. 2003. Adapting an immersive virtual reality system for rehabilitation. *The Journal of Visualization and Computer Animation* 14, 5 (2003), 261–268.
- Julio C Mateo, Javier San Agustin, and John Paulin Hansen. 2008. Gaze beats mouse: hands-free selection by combining gaze and emg. In CHI'08 extended abstracts on Human factors in computing systems. ACM, 3039–3044.
- 8. M Morel, B Bideau, J Lardy, and R Kulpa. 2015. Advantages and limitations of virtual reality for balance assessment and rehabilitation. *Neurophysiologie Clinique/Clinical Neurophysiology* 45, 4 (2015), 315–326.
- 9. Eric B Nash, Gregory W Edwards, Jennifer A Thompson, and Woodrow Barfield. 2000. A review of presence and performance in virtual environments. *International Journal of human-computer Interaction* 12, 1 (2000), 1–41.
- 10. Giuseppe Riva, Fabrizia Mantovani, Claret Samantha Capideville, Alessandra Preziosa, Francesca Morganti, Daniela Villani, Andrea Gaggioli, Cristina Botella, and Mariano Alcañiz. 2007. Affective interactions using virtual reality: the link between presence and emotions. *CyberPsychology & Behavior* 10, 1 (2007), 45–56.
- 11. Marilyn P Safir, Helene S Wallach, and Margalit Bar-Zvi. 2011. Virtual reality cognitive-behavior therapy for public speaking anxiety: one-year follow-up. *Behavior Modification* (2011), 0145445511429999.
- 12. Patil Sarang and Shirley Telles. 2006. Effects of two yoga based relaxation techniques on heart rate variability (HRV). *International Journal of Stress Management* 13, 4 (2006), 460.
- 13. Brenda K Wiederhold and Mark D Wiederhold. 2006. Evaluation of virtual reality therapy in augmenting the physical and cognitive rehabilitation of war veterans. *International Journal on Disability and Human Development* 5, 3 (2006), 211–216.

APPENDIX

APPENDIX A - TEST MATERIALS

UCL Presence Questionnaire

For the UCL Presence Questionnaire, subjects were asked to answer using a 1-7 point Likert scale for the following questions:

- 1. "Rate your sense of being in the virtual environment."
- 2. "To what extent were there times during the experience when the virtual environment was reality for you?."
- 3. "When you think back to the experience, do you think of the virtual environment more as images that you saw or more as somewhere that you visited?"

Affective Interactions Using Virtual Reality - Emotional Status and Presence Questionnaire

To measure their emotional status, the following questions were asked:

- 1. "To what extent do you feel sad at this moment?"
- 2. "To what extent do you feel happy at this moment?"
- 3. "To what extent do you feel anxious at this moment?"
- 4. "To what extent do you feel relaxed at this moment?"

To measure presence, the following questions were asked:

- 1. "Do you feel you are here, in [the environment portrayed with virtual reality]?"
- 2. "Do you feel this [virtual environment] is real, is it a place you are visiting?"

Positive and Negative Affect Schedule

ASMR Questionnaire

Autonomous Sensory Meridian Response (ASMR) questionnaire

Are you		
□ Male	□ Female	□ Non-binary/other
What is your a	age?	
[drop list of nu	mbers]	
Where are you	ı located?	
[drop list of loo	cations]	
Do you suffer	from any chi	ronic pain or illness?
□ Yes □No		
Please specify		
sense. For exa	mple, you ma ution, see her	verception in one sense triggering sensation in another, unstimulated by 'see' the letters as having colours, or sense shapes from music. For e: http://www.uksynaesthesia.com/whatis.html
□ Yes □No		
If so, please el	aborate.	
Do you take a	ny medicatio	ns?
□ Yes □No		
Please specify	which medica	ations you take.
Do you watch	ASMR video	ns?

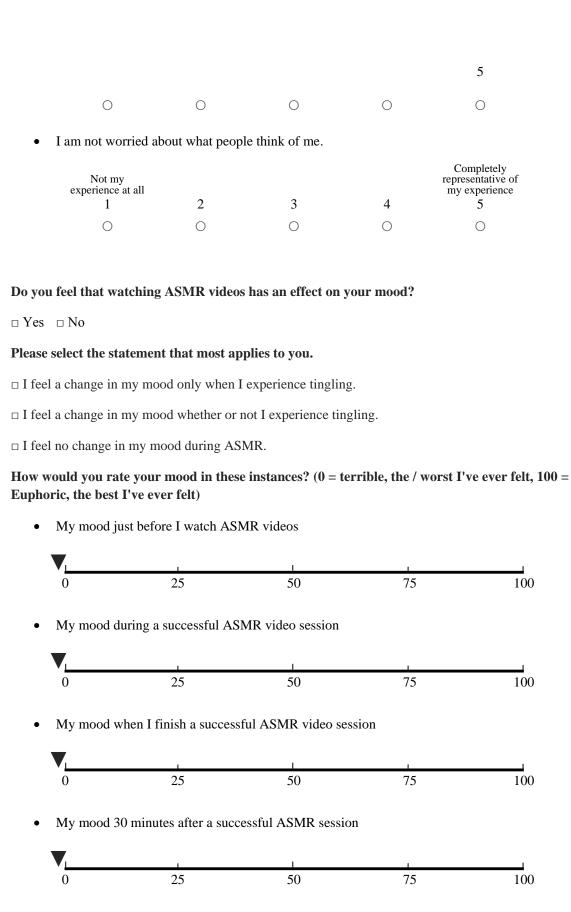
How m	any ASMR videos do you typica	ally	watch in a single session?							
[drop li	[drop list of numbers]									
What t	ime of day do you usually watch	ı AS	MR videos?							
	☐ Upon Waking									
	Mid-morning									
	Mid-day									
	Afternoon									
	Evening									
	Before sleeping									
	Whenever I have spare time									
Do you	require specific conditions to a	chie	ve ASMR?							
□ Yes	□No									
Please briefly describe the conditions you require to achieve ASMR sensations (e.g. busy room, bright lighting, etc.)										
	feel a tingling sensation when v □No	vaic	ning ASMK videos?							
Are the	ese tingling sensations triggered	by s	specific stimuli?							
□ Yes	□No									
Please	tick all the items that trigger yo	ur ti	ingling sensations while viewing	AS	MR videos.					
	Crisp sounds (e.g.		Aeroplane noise		Slow movements					
	tapping, crinkling plastic)		Laughing a lot and		A specific					
	Whispering		doing all the things that make		combination of two or more of					
	Water pouring		you happy		these options					
	Personal attention		Smiling		(please elaborate)					
	(e.g. face		Watching		Other (please elaborate)					
	touching)		repetitive tasks		ciaborate)					
	Vacuuming		(e.g. towel folding)							

options'.	e on your selection of 'A speci	ne combination of two o	r more of these
=	any 'other' triggers. Please se	eparate triggers by comr	nas (e.g. tickling,
dog walking, trainspot	ting).		
Do any stimuli stop or	prevent this tingling sensation	n from continuing?	
□ Yes □No			
What stimuli will stop words as possible.	any tingling sensation you are	e feeling? Please be brief	f and use as few
Does this tingling sens	ation always originate in one a	area of your body?	
□ Yes □No			
Where can your tingle	s originate?		
☐ Head	\Box Arms		Legs
☐ Shoulders	☐ Stomach/le abdomen	ower \Box	Feet
☐ Chest	☐ Genitals		
☐ Back	☐ Hips		
Do you feel this tinglin	ng sensation more on one side o	of your body than the ot	her?
□ Yes, left □ Yes,			
	nese tingles vary from session		eo viewing?
□ Yes □No	•		D
	nese tingles vary at different ti	mes during a session of	ASMR video

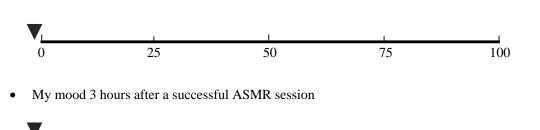
□ Yes	□No				
What i	ncreases the intensity of the ting	gling	g sensation?		
	Sounds that I like Visuals that I like Visuals I don't like		Visuals I don't expect Sounds I don't like		Sounds I don't expect Other
Does m	ore intense tingling result in th	e se	nsation moving to other areas	of yo	our body?
□ Yes	□No				
Please	tick the body areas that experie	ence	tingles when the sensation is n	ıost	intense.
	Head Shoulders Chest Back ng does the tingling sensation n		Arms Stomach/lower abdomen Genitals Hips nally last?		Legs
	ingling sensation triggered morny left ear.				other?
Does yo	our medication affect your expe	rier	nce of tingling at all?		
□ Yes	□No				
At wha	t age did you first experience tl	nis t	ingling sensation?		
Do you	have any family members that	exp	perience ASMR?		
□ Yes	□ No □ Unsure/I've never ask	ed			
Are you	ur tingling sensations/ASMR tr	igge	ered by anything other than on	line	videos?
□ Yes	□ No				
What o	ther stimuli trigger your tingli	ng so	ensations/ASMR? Please descr	ibe l	briefly.

Please rate the following statements in terms of how true they are for you while experiencing tingles.

•	My attention is focu	sed entirely of	n what I am watch	ing.	
	Not my experience at all 1	2	3	4	Completely representative of my experience
	0	0	0	0	0
•	My attention is focu	sed entirely or	n what I am feelin	g.	
	Not my experience at all				Completely representative of my experience
	1	2	3	4	5
	0	0	0	0	0
•	Time seems to alter	(slow down or	r speed up).		
	Not my experience at all				Completely representative of my experience
	1	2	3	4	5
	0	\circ	0	\circ	0
•	Things seem to happ	oen automatica	ally.		Completely
	Not my experience at all 1	2	3	4	Completely representative of my experience 5
			_	_	
	O	0	0	0	O
•	It is no effort to keep	o my mind on	what is happening	5.	
	Not my experience at all	2	2	4	Completely representative of my experience
	1	2	3	4	5
	0	0	0	0	0
•	I feel totally in contr	ol.			
	Not my experience at all				Completely representative of my experience
	1	2	3	4	5
	0	0	0	0	0
•	Time seems to stop.				
	Not my experience at all	2	3	4	Completely representative of my experience

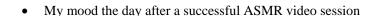


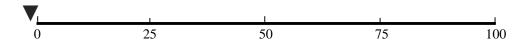
• My mood an hour after a successful ASMR video session



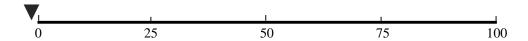
100

75





• My mood generally during day to day life



Do you feel that watching ASMR videos had an effect on your symptoms of chronic illness or pain?

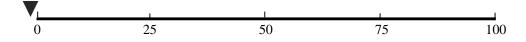
□ Yes □ No

Please select the statement that most applies to you.

- □ I feel a change in my symptoms only when I experience tingling.
- □ I feel a change in my symptoms whether or not I experience tingling.
- □ I feel no change in my symptoms during ASMR.

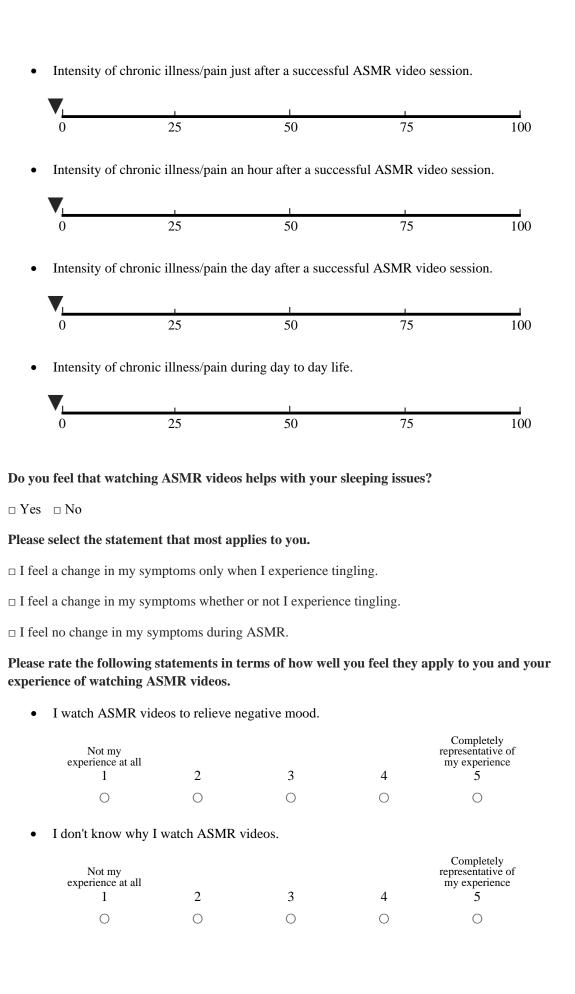
PLEASE ANSWER ONLY IF YOU SUFFER FROM SYMPTOMS OF CHRONIC ILLNESS OR PAIN. How would you rate the intensity of your symptoms of chronic illness or pain at these times? 0 = No pain, I wouldn't know I had a condition, 100 = The worst I have ever felt my symptoms.

• Intensity of chronic illness/pain just before I watch ASMR videos.



• Intensity of chronic illness/pain during an ASMR video session.





•	I enjoy ASMR video	S.			
	Not my experience at all				Completely representative of my experience
	1	2	3	4	5
	0	0	0	0	0
•	I know what triggers	my ASMR.			
	Not my				Completely representative of
	experience at all				my experience
	1	2	3	4	5
	0	0	0	0	0
•	I enjoy the content of	f ASMR video	os even without ti	ngles.	
	Not my experience at all				Completely representative of my experience
	experience at an	2	3	4	filly experience 5
	0	\circ	0	\circ	0
•	I watch ASMR video	os to relax.			
	Network				Completely
	Not my experience at all				representative of my experience
	1	2	3	4	5
	0	0	0	0	0
•	I watch ASMR video	s to deal with	anxiety.		
					Completely
	Not my experience at all				representative of my experience
	1	2	3	4	5
	0	0	0	0	0
•	I watch ASMR video	s to deal with	stress.		
	Not my				Completely representative of
	experience at all	_			my experience
	1	2	3	4	5
	0	0	0	0	0
•	I watch ASMR video	s to help me s	leep.		
	Not my experience at all				Completely representative of my experience
	1	2	3	4	5
	0	0	0	0	0
•	I watch ASMR video	os as a hobby.			

	Not my experience at all				representative of my experience	
	1	2	3	4	5	
	0	0	0	0	0	
•	I watch ASMR video	os to help me	focus.			
	Not my experience at all				Completely representative of my experience	
	1	2	3	4	5	
	0	0	0	0	0	
•	I watch ASMR video	os to ease chro	onic physical pain.			
	Not my experience at all				Completely representative of my experience	
	1	2	3	4	5	
	0	0	0	0	0	
•	I watch ASMR video	os for sexual s	stimulation.			
	Not my experience at all				Completely representative of my experience	
	1	2	3	4	5	
	0	0	0	0	0	
•	I watch ASMR video	os to help with	n a mental health i	ssue other thar	n depression or anxiety.	
	Not my experience at all				Completely representative of my experience	
	1	2	3	4	5	
	0	0	0	0	0	
•	I watch ASMR video	os to help with	n depression.			
	Not my experience at all				Completely representative of my experience	
	1	2	3	4	5	
	0	0	0	0	0	