

Article

Autonomous Sensory Meridian Response for Responding to Climate Change

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Abstract: Most climate change messages depict a picture of the devastating effects that anthropogenic activities have on the environment, expecting to mobilise human action. Built on the daunting scientific evidence, these gloomy messages can potentially emotionally harm a young audience. By contrast, this study explores the impact of Autonomous Sensory Meridian Response (ASMR) as an innovative marketing technique to communicate positive climate change messages. This study investigates whether ASMR could be used to encourage pro-environmental behaviour and create social bonding among young people. An ASMR video and two series of interviews with high school students were conducted in Sydney, Australia. The results show that the participants are divided in their opinion about the effectiveness of ASMR. Although all see ASMR as a completely new world in marketing, some are of the opinion that it can influence positive climate change behaviours while others are reluctant to accept it as a way to encourage action. Given the vastness and urgency of the climate change agenda, this novel marketing technique can find its way in promoting pro-environmental behaviours by utilising positive messaging and influencing a section of the young population.

Keywords: autonomous sensory meridian response (ASMR); climate change; positive messaging; neuromarketing, marketing techniques; Generation Z; pro-environmental behaviour

1. Introduction

Autonomous Sensory Meridian Response (ASMR) is a spontaneous, psychophysiological, sensory-related, calming and pleasurable reaction to positive sensations triggered by audio and/or visual stimuli, which provoke a unique pleasant effect on the person. Some have described it as a frisson [1], paresthesia [2], synesthesia [3] or low-grade euphoria [4], but essentially the term itself represents its meaning, namely: autonomous—happening on its own; sensory—describing sensation; meridian—linked to an imaginary peak pathway through the body; and response—a reaction to something. The ASMR describes a sense of deep relaxation frequently accompanied by a tingling, pleasant sensation in the scalp [5] and a feeling of calm and relaxation [6]. Created fortuitously as a phenomenon by the television painter Bob Ross, it developed in the 1980s and early 1990s with over 400 episodes of *The Joy of Painting*, showing his “uncanny ability to induce the ASMR response with every breath and stroke of his brush” [7] (p. 13). The term entered the research vocabulary in 2010 through the work of Jennifer Allen, the founder of asmr-research.org [8].

As a marketing technique, ASMR is a relatively new and rather unexplored concept. The scarce scientific investigations of ASMR are limited to a few peer-reviewed studies but none focuses on positive messaging in relation to communicating environmental problems. On the other hand, the gloom and doom surrounding the environment and climate emergency are dominating the global media, including the 2019–2020 fires in Australia followed by other extreme weather events, such as hailstorms and flash flooding. People feel overwhelmed and powerless to cope with the forces of

nature, prompting government agencies and non-government organisations to provide explicit directions on how to psychologically deal with climate calamities [9,10]. Native fauna and flora ablaze with species dragged to the brink of extinction are adding to the pain of losing human lives, properties and livelihoods. Is this how we need to communicate climate change or are there ways that can evoke positive feelings and empower people to act?

This paper searches for answers exploring the ASMR technique to engage young people in particular as they will inherit the planet. Furthermore, a 2019 report [11] shows that 83% of Australia's younger people (18 to 34 years old) are concerned about climate change compared to 67% of older Australians (55 and above). In Europe, 90% of young people (15 to 24 years old) see climate change as a serious problem [12]. Anger, pessimism, angst, distress, despair, fear, stress, depression, and grief represent a range of negative feelings which are increasingly associated with the current climate change situation. This is "a natural and legitimate response to ecological loss" [13] (p. 275). All these negative reactions framing the discussions about climate change leave people disempowered and overwhelmed with the scale of the challenges. Instead, psychologists are looking for ways to better engage with climate change through positivity and best practices [14]. Can ASMR as a new tool help?

The limited research available about ASMR is centred on the sensations it provokes. There is emerging evidence that ASMR creates a therapeutic effect and results in improved well-being. For example, one of the studies analysed participants' responses to whispering and personal attention displayed in YouTube videos as an antidote to relaxation, sleep improvement and dealing with stress [4]. The data show improvements in chronic pain and depression in those exposed to ASMR [4]. Another investigation of the whispering effect of YouTube videos on the viewers explains the sonic associations between private domestic space and care in the pursuit of non-standard intimacy [15]. Using the argument of the interconnectedness between ASMR and musical frisson, del Campo and Kehle [1] argue that they can be therapeutically helpful in promoting the subjective feeling of happiness. This supports earlier findings by Ahuja [16] about the therapeutic power of ASMR. An assessment of the intensity and duration of tingling sensations triggered by watching 60 ASMR videos by 807 Chinese participants confirms their effectiveness in provoking positive experiences [17].

The study by Lochte et al. [5] measures the brain activation and ASMR receptivity of 10 participants using functional magnetic resonance imaging (fMRI)-based methodology. The study reveals significant activation in the brain regions associated with reward and emotional arousal explaining the sensations of deep relaxation and pleasant head tingling. Using an anatomical MRI and resting-state fMRI, the study by Smith et al. [18] examines the neural substrates of 17 ASMR and 17 control participants. The results disclose that ASMR was linked with lowered functional connectivity, implying that the resting-state networks of those individuals are not as pronounced as in the brains of non-ASMR participants [18]. Valtakari et al. [19] investigated whether experiencing ASMR is visible from the person's eyes and the study reveals substantial pupil diameter increase due to the tingling sensations reinforcing the credibility of ASMR. Another study by the University of Sheffield shows some mental and physical health benefits of ASMR videos, including a lowering of heart rates and an increase in positive emotions and feelings of social connection [6]. The authors conclude that ASMR triggers reliable physiological changes.

Furthermore, the study of Janik McErlean and Banissy [20] shows that people who self-report ASMR experience score better in empathic concern and fantasising, which can potentially be linked to reduced anxiety. Additional research explores personality characteristics occurring in response to ASMR stimuli. The research suggests that ASMR is associated with specific personality traits [8], particularly with higher openness to experience and neuroticism and lower conscientiousness, extraversion and agreeableness, implying that such people can also behave differently. A study of psychology students reveals that proneness to absorption, that is the ability to be completely absorbed by a situation, is a crucial factor in experiencing ASMR [21]. Furthermore, Roberts et al. [22] argue for the need to disentangle ASMR from other deliberately facilitated altered states of consciousness, such as absorption, alexithymia, anxiety, flow, frisson and misophonia.

Over the past decade, the public interest in ASMR videos and podcasts has risen dramatically fuelled by their availability on the internet and popularised through social media, especially on

YouTube. The viewers and listeners seem to be looking more for the audio rather than the visual impact which explains the emergence of many ASMR podcasts. This is beyond a simple fashionable trend as millions of people are now ardent followers of ASMR videos and podcasts, forming a stable ASMR community. In 2019, ASMR videos was the top #1 query in the USA and #5 worldwide, with 8.2 and 25.7 million searches per month, respectively [23]. Creators of ASMR videos are feeding their high popularity on social media platforms, such as YouTube and Instagram. It was estimated that there were 13 million ASMR videos in 2018 [6], with 500 new ones appearing every day [24]. The numbers of millions of loyal subscribers are growing exponentially on a daily basis. Popular channels are ASMRRequests, ASMRtists, WhisperingLife, Whisperlodge and Gentle Whispering, which provide a diverse collection of ASMR experiences under numerous categories. They are based on people's needs and try to accommodate different interests, which can vary from simply meditation-oriented videos or podcasts to pretend role play and many more [25]. They respond to the expectations of different ASMR communities and the topics of interest with which they want to engage. Occurring involuntarily, triggered by external, effective audio and visual stimuli, such as soft whispering, calming talk, crisp sounds, soft hand movements, personal attention, treasured objects, reassuring speech patterns and gentle sounds, ASMR already helps people relax, relieve stress [26], fight depression, reduce anxiety [27], chronic pain [4], insomnia, elevate mood and improve overall well-being. The common feature is the triggering of positive effects within the audience [28].

While advertisers are taking advantage of ASMR as a marketing (and even neuromarketing) technique, promoting products, such as chocolate, beer, mobile digital devices, pillows and sheets, services such as haircuts or eye examination and experiences such as movies or job interviews, many call for more research to properly understand the phenomenon and its impacts on people [29]. Not everybody experiences the intended ASMR effects, particularly as most of the videos or podcasts are slow and can be perceived as repetitive and lengthy compared to the fast-moving standard advertising world [29,30]. According to estimates by Richards [28], 20% of people experience a strong ASMR reaction with another 20% having only a mild response, most likely as a result of particular functional connectivity in their neural systems [31]. There are, however, significant health benefits for those who are being impacted by ASMR, leading to decreased heart rate, activation of specific areas of the brain, relaxation, reduced stress and anxiety, help coping with sadness, insomnia, pain, grief and depression and improved concentration [30].

In this study, we explore the potential of ASMR in communicating climate change messages—an area where this technique has not been applied so far. This paper presents an exploratory study carried out with young participants in Sydney, Australia, in 2019. It is not clear whether everybody experiences ASMR or to what extent; however, those who do are capable of drawing encouraging benefits. This is indeed the area that interests us as a way to achieve positive actions about climate change. We first explain why positive communication is required to address climate change and then we outline the potential that ASMR holds. The methodology and results from the Sydney study are presented next. In conclusion, we put forward the need for an ASMR climate channel as a way to counteract the darkness and fear associated with the changing weather patterns and calamities triggered by global warming.

2. The Climate Emergency

Extraordinary situations and, in some cases, existential threats, which can have severe consequences for people's life, land or property, require urgent action on the part of governments. The response to such natural or human-made circumstances is for them to be declared "disasters", with disaster zones defined whenever possible. Depending on the seriousness of the disaster impacts, governments can further announce a state of emergency, which allows them to have special powers to take immediate measures. People around the world, based on their own experience or through the news media have begun to fully understand the scale of disasters and what a state of emergency is. The list of possible causes is long and includes military conflicts, bombings, terrorist acts, earthquakes, outbreaks of diseases (including the Covid-19 pandemic), blizzards, cyclones,

hurricanes, storms, food insecurity, floods, droughts, forest- and bushfires. Climate change has also been accepted as an emergency of a global scale and impact [32].

In the summer of 2019–2020, the Australian State of New South Wales declared a state of emergency three times for periods of approximately a week to respond to “the most devastating bushfire season in living memory” [33] (p. 2). The fire inferno left an unimaginable scale of devastation [34] and researchers are working on attributing “how much global warming is to blame for the blazes that have ravaged the [Australian] continent” [35] (p. 610). They are confident that climate change has contributed to the extreme temperatures, but hidden behind the destruction of the natural habitat is the tragedy of those affected by the trauma and distress it caused [36].

There is no doubt that our climate is changing and becoming more extreme, with life-threatening weather patterns, rising sea levels, floods inundating coastlines and lands, unprecedented heatwaves and immense drought and famine in different parts of the world [37]. We are experiencing the first consequences of a hotter climate triggered by anthropogenic activities. Even if not manifested everywhere with the same scale of severity, these extreme weather events will remain present in the near future, undermining global food, resource and water security [38]. Climate change is set to challenge the future of human civilisation, our way of life, the survival of the precious ecosystems on which we depend and the planet’s biodiversity, unless something measurable is done quickly to solve this emergency. Many governments around the world have declared environment and climate emergencies and despite some progress on the international arena around the Paris Agreement, much more needs to be done. In Australia, the majority of people, and younger people in particular, accept climate change as an issue of global significance on which the Australian government should act. A 2019 online survey in Australia shows that 60% of the young participants (7 to 25 years old) expressed concerns about the lack of adequate attention and commitment by the Australian government to tackling climate change [39].

The situation requires serious understanding, action by individual people, governments, industry and the broader community, responsible media reporting and leaders around the world uniting in their reaction to reduce greenhouse gas emissions before the extreme events continue to escalate and the tipping points become irreversible. Although the climate change challenge is existentially critical and calls for urgent measures, there are those who prefer to ignore it, deny its existence or avoid taking action. Emotions also play a part in this lack of engagement. In fact, Noorgard [40] describes people’s desire to avoid unpleasant emotions, such as guilt and fear, as a factor impeding their participation in social movements that can potentially influence the climate change policy agenda. Such emotions lead to “eco-anxiety” [41] and “eco-paralysis” [42] despite people’s willingness and desire to act [42]. In particular, people living in affluent societies can be psychologically and emotionally disturbed by the scale and the multifaceted nature of major ecological problems which are beyond their control and lead to a sense of hopelessness [41,42]. Recent worldwide climate change emergency developments associated with biodiversity loss, planetary and human health degradation as well as future consequences and prospects [43] show that people are overwhelmed and even frightened with the prevailing negativity of the messages communicated to them [44]. Climate change has accelerating impacts on human mental health and can trigger anxiety, depression, guilt, post-traumatic stress and other disorders, an issue that is often neglected [45]. Recognising and locating climate change within the discourse on mental health is particularly important because of the complexity of the interaction between mental health and other social determinants of health [45,46]. Papers outlining grim scenarios associated with climate change and depicting catastrophic events, apocalypses and tragedies (e.g., [47]) are making people, and young people in particular, anxious and depressed and causing them to seek help through counselling and therapy [48]. Youth around the globe are feeling despair, anger, powerlessness, faithlessness and helplessness. They feel that they are stuck in a no-clear-end situation, terrified, anxious and depressed about the environmental burden on their shoulders, with many fearing they will not last till their old age because of the impacts of climate change [49,50]. There seems to be no light in the spiralling tunnel of global warming.

The distress and anger among young people are also expressed with climate strikes and waves of protest demanding that the climate emergency be addressed. Many of them are ignited by the Swedish teen activist Greta Thunberg. She loudly calls for the need to panic over the present ecological state and future of our planet and to act as if our own house were on fire: “*A lot of politicians have told me that panicking does not do any good. I agree, but when your house is on fire and you want to prevent it from collapsing, it is better to panic a little*” [51] (p. 5).

This is a powerful message and there is no doubt that the psychological emotional distress due to climate change needs to be addressed. The problem is whether negative messaging is the best way to deal with the climate emergency. Do we need to stick to the doom and gloom or is there role also a role for positivity in encouraging climate change action and social bonding, especially among the young people who will bear the brunt of global warming? Decades of research demonstrate that alarming communication about climate change is not an effective way to achieve a positive shift [46,52,53]. In this article, we explore whether ASMR with positive messaging can be a better alternative.

3. Autonomous Sensory Meridian Response (ASMR) to the Help

In the 21st century, many young people around the world, and particularly in wealthy countries, such as the USA and Australia, are experiencing a mental health crisis, with high levels of stress, anxiety, depression, and suicidal behaviour [54]. Job insecurity, emerging new diseases, economic instability, and shifts in social life, with a higher reliance on digital technologies, are all contributing factors to the way young people feel. The Autonomous Sensory Meridian Response (ASMR) phenomenon attends to and contributes towards addressing this type of pandemic emergency. It is designed to relax people, to make them feel better, to bring calm, tranquility and attention to the way they feel.

Using the sensorial experience of sound and vision, the ASMR technique helps overcome these life states and survive through difficult times. The platform is rapidly growing in fame among Generation Z as an antianxiety approach, as well as being comforting, and relaxing. The ASMR technique is also increasingly appearing in marketing campaigns. Examples include the ASMR 2019 Pure Gold Beer Super Bowl advertisements [55] featuring Zoe Kravitz whispering into different microphones while tapping a beer bottle, the Oddly IKEA ASMR advertisement [56] or another Super Bowl Pepsi commercial [57] boasting with sound and no speech at all. A new dimension of sensory provoking ASMR sounds includes the LYNX advertisement, presenting a tutorial on “How to shower and shave the balls” [58]. Two Dove Chocolate ASMR-triggered sensorial experience advertisements were successfully released in China—the 2015 Li Yifeng [59] and the 2016 Sihua Dove Angelababy [60]. The marketing or neuromarketing of specific ASMR experiences is becoming border limitless, not only because of its social media status, but because of the specificity of the target markets. The ASMR approach serves a diversity of age groups and interests. Advertisements are developed specially for women and men and country-specific locations; the ASMR topic has become mainstream marketing and “inundated the internet and popular culture” [61] (p. 11). Marketers are increasingly aware of the uniquely digital phenomenon of ASMR triggers as an unexplored link to vital audiences in an innovative way that is beyond the traditional emotional connection with their consumers.

On the other hand, some have become concerned about the sensory experience and doubtful of the effect the phenomenon has on the users. China, for example, banned ASMR videos and organised their permanent removal from major video streaming sites, such as Youku, Bilibili and Douyu [62]. Research evidence, however, shows that the calming and relaxing effects ASMR has on the viewer together with the feeling of social connectivity by far exceed any “vulgar” experiences, such as sexual arousal [4–6].

Concerns about climate change and sustainability have been consistently high in Australia among people and also among the business community. For example, in 2018, 90% of Australian businesses and consumers were concerned about the environment, with the younger generation expressing higher levels of dissatisfaction with the lack of proactive action [63]. These concerns, however, are not reflected within the actions of the Australian government, which still does not have

an explicit climate policy and exhibits a backward position preventing global response in many international forums, such as the 2019 Madrid climate change negotiations [64]. Although young people are taking individual measures, such as driving less and paying attention to their diet [65], they are also frustrated with inaction on the part of governments, as manifested with the climate strikes. A 2019 study of Australian children and young adults aged between 7 and 25 years by Millennium Kids reports that there is a conclusive “link between climate change and young people feeling anxious, depressed and disempowered” [39] (p. 1). Additional effects on the psychosocial well-being of young people are sleeping disorders, phobias and anxiety due to climate change worries [66]. In this doom-and-gloom scenario, people, and young people in particular, need to find something that is positive and will comfort and relax them, something that will restore hope, build social bonds and preparedness to take action. This is why they need to experience messages delivered in a positive way.

Positive communication can improve the well-being and happiness of a person as well as stimulate their desire for action. According to Beck and Socha [67], positive communication plays an important role in fostering hope and resilience related to a variety of “stressors” emerging in any aspect of life, be it everyday stress, serious illness or natural disasters [67]. Positive communication can nourish strength and resilience so that people can lessen the impact of any stressful circumstances as well as bounce back and keep going, developing and thriving. People desire interactions that are “efficient, intelligible, creative, artistic, as well as ethical” and usually do not value communication that is “inefficient, garbled, boring, unethical, or worse, violent and hateful” [68] (p. 190). Communication also needs to be meaningful, respectful and tailored to the listener [46].

As studies of linguistics explain, positive communication “requires a conscious effort and is therefore not a natural mode of human behaviour” [69] (p. 123). Special skills are needed to be able to convey positive messages, particularly when the overall feeling is that of despair. Leontovich [69] describes the attributes of positive communication as being constructive, effective, supportive, encouraging and helpful, optimistic and coloured with good emotions, creating positive expectations and leading to overall happiness. Positive communication can impact awareness of the common good.

The current climate change communication is not exactly following a positive note. It is characterised by “diverging and incompatible understandings of communication as a theoretical construct” [70] (p. 329). Climate change communication often labels the issues as “wicked problems” [71], because of their pervasiveness, uncertainty, complex nature and the lack of a clear single solution. This can cause people to perceive climate change as distant, challenging to understand, overwhelming, difficult to conceptualise, relate to or act upon [40,70]. The need to transition from awareness and concern to action requires climate change communication to move to a new place, “at once more humble yet also more ambitious than ever before, befitting to the crucial role it could play in the cultural work humanity faces with climate change” [72] (p. 345).

Hopeful and positive messaging in comparison to negative, hostile, terrifying, depressing, unproductive and destructive communication has been beneficial and influential in many areas of life. It has encouraged people to successfully achieve things, such as collecting funds for a good cause [73], increasing students’ academic engagement and reducing disruptive behaviours [74,75], discouraging drunken driving [76] and even inspiring walking to improve physical and mental well-being [77]. This is also how ASMR can reframe the communication about climate change to generate a pleasant, engaged, relationally rich, and meaningful environment with important and tangible benefits for people’s health, wellness and relationships.

There are a few ASMR climate change-related ideas roaming the internet. They all take a different approach in their impact. For example, the comedian Izzy Phillips, in her Sydney TEDx Talk, poses the question whether ASMR can be the best way to communicate about climate change and its devastating impacts, and concludes: “sometimes the whisper can be the loudest sound of all” [78]. The soundless video including only pictures and captions created by Daniel Gonzalez named “Climate change exists ASMR for APES” [79] relies on the visual sensory reaction. Another example is the one hour-long ASMR video by Michael Shooting aimed at decreasing viewers’ stress levels

about the volatile climate change topic, which instead bombards viewers with whispered fact-heavy, scary and negative contexts, covering sea level rise to temperature and solar contributions to CO₂ science [80]. In a softly spoken voice, another ASMR talk explains the difference between global warming and climate change [81]. A similar approach is taken by Quiet Whispers' climate change discussion [82]. Eco-anxiety is treated through ASMR meditation by Carla Pérez [83]. Some ASMR creators are also taking the climate change problem seriously politically, reading the Green New Deal (the proposed package of United States' legislation that aims to address climate change and economic inequality [84]) in a soft voice [85]. Miss Synchronicity also uses ASMR to explain permaculture as a way to live in harmony with nature [86]. Furthermore, the supposedly joke ASMR video created by Captain Tingles named "ASMR Earth-Chan scolds you for climate change" [87] conveys in a whispering voice the response by Planet Earth to the climate change anthropogenic actions. It is also interesting to observe that the interview with the soft-spoken former farmer John Butler who offers a Christian perspective about the challenge of climate change is also reported to create a similar sensual experience, with one of the comments stating: "Such a soft, gentle voice and so much wisdom" [88].

More ASMR videos and podcasts related to climate change are being produced regularly. Even Greta Thunberg, in combination with the British journalist George Monbiot, has tapped into the opportunity to convey climate change messages through ASMR [89]. None of these videos, however, contains all the features identified by Leontovich [69] to represent a positive communication. Nevertheless, the ASMR experience brings positive feelings and a smile to the faces of the users and it opens up a new perspective in their lives. The psychologically comforting and relaxing effects of ASMR could be an important marketing platform for delivering positive communication that is attractive to people and provoking thoughts and actions. Working on the subconscious level and inspired by stimuli, such as gentle sounds, the sensation of light touch and personal attention from someone with a caring disposition, in intentionally created videos and podcasts, ASMR is not only a new way of communicating with the mainstream consumers, but perhaps it could be the needed tool for influencing pro-environmental behaviours and social bonding through delivering positive climate change messages. This exploratory study puts such ASMR to the test using a small group of Australian school children from Sydney, New South Wales.

4. Materials and Methods

The sections to follow describe the methodology and participants of this study. Because of the novelty of ASMR and the exploratory nature of this research, this study did not seek any statistical representation. It is, however, indicative of the impact ASMR can have.

4.1. Methodology

The research question addressed by this study is whether ASMR can be used to communicate positively about climate change with young people. A qualitative interview data collection method was employed to conduct an exploratory study with 20 participants, gain thorough understanding of the phenomenon and capture the young people's individual experiences, acceptability and response to positive climate change messaging through ASMR marketing techniques. Interviews are a widely used, flexible, interactive method, permitting comprehensive analysis from a relatively small sample size. They place the research focus on the participants' perspectives and opinions about what is important and why. The designed interview questions were first piloted on a subset of the participants to determine the interview length, language suitability and potential sources of bias (leading questions) as well as the sufficiency of the relevant data to the research question.

This study was conducted in June 2019 before the New South Wales' devastating summer fire period experienced later in 2019–2020, which significantly impacted Sydney and the State with heavy air pollution, loss of habitat and mass decimation of wildlife. It targeted adolescent students between the ages of 13 and 17 who were attending high school. At this age, teenagers transition from childhood to adulthood, reach cognitive maturity and are also starting to understand their own feelings and the reasons behind them [90,91].

A three-stage process was designed for this study which included:

- (1) A preliminary in-depth telephone interview—the conversation covered the participant's opinion about and experience with ASMR, their overall thoughts about climate change and their views on the appropriateness of ASMR as a marketing technique to be used for positive climate change messages.
- (2) Viewing an ASMR video purposefully made for this study—this external stimulus represented a 4'30" in duration ASMR video featuring an anonymous 16-year-old girl talking about what positive climate change actions can be taken in everyday life and how young people can make a difference in fighting climate change. The girl's performance was based on the traditional soft whispering voice used for ASMR, with some sound effects, including tapping and noises, to grab the attention of the viewers. The video used stimuli identified as effective by Barratt et al. [92], including a slow-paced, lower-pitched and detail-focussed presentation. Audio-visual elements and triggers that are atypical for ASMR, such as music and extra external stimulation, were not included. The video was designed and produced by the research team, with the participation of a volunteer girl whose identity was protected. In addition to incorporating scientific evidence related to climate change and ways to reduce carbon emissions (related to energy and water use, waste, transport and food), insights on how to produce an ASMR video were used, including insights related to the performance (voice and sounds), recording room and equipment [93,94].
- (3) A follow-up in-depth telephone interview—the interview solicited the participants' opinions about whether ASMR could be a successful marketing technique for delivering positive climate change messages and be instrumental for creating pro-environmental climate change actions and social bonding.

The interviews were conducted over the telephone as the most appropriate and easily accessible way to reach the targeted youth group of participants, and they were asked to watch the ASMR video in their own time and terms. Although preliminary information about the nature of the open-ended questions for the interviews was given to the participants, the discussion was free flowing, with additional lines of inquiry spontaneously emerging from the dialogue. The interview duration varied between 15 and 20 min each.

Being an exploratory study, there was no attempt made to claim any level of statistical validation. Therefore, we used a non-probabilistic, purposive sample size [95]. The number of participants to be interviewed was determined based on the information richness, rigour and trustworthiness necessary for this study, particularly when saturation was reached and no additional insights were obtained from consecutive interviews [95–97]. In order to effectively capture all data, the interviews were recorded and then transcribed verbatim. Handwritten notes during the interviews were also taken for the instant recording of key points made by the research participants. The participants' answers were transcribed and coded through assigning units of meaning including individual words, phrases, sentences or whole paragraphs in each transcript to find common emerging themes and as an aid for the interpretation of meaning [98].

4.2. Participants

The 20 recruited participants ranged between 13 and 17 years of age and were all attending high school in Sydney, Australia. They were randomly selected and recruited from a volunteers' pool of students from Sydney's North Shore-based schools. There were four participants from each year of age, with an equal number of girls (10) and boys (10). Additional to the criterion to attend high school, the participants needed to be familiar with ASMR experience and be environmentally aware to a different degree. These were tested at the start of the preliminary interview and when the criteria were not met, the conversation was discontinued.

Human research ethics approval was obtained from Curtin University. A written informed parental consent was received for all participants prior to conducting this study, stating that their opinions will only be used for research purposes. Participating youth were not compensated for their time and shared opinions during the two in-depth interviews nor for watching the video in order to discourage any incentive for falsely reporting ASMR sensitivity to positive climate change

messaging. Data collected from the 20 participants were used for the purposes of research analysis only. Below, all participants in this study are represented under pseudonyms to maintain their anonymity and confidentiality.

The quotes from the interviews are given verbatim and the essence of this study is qualitative, following the thematic analysis [99]. All transcripts were entered into NVivo11 software to compliment the analysis and the researchers' discretion. The participants were very outspoken and were able to competently and confidently express their thoughts. None of them felt uncomfortable with the research question and, once selected to participate in this study, they all completed the required three stages.

5. Findings

Despite eight participants initially wanting to distance themselves from any ASMR experiences, all demonstrated sufficient knowledge and understanding of the subject area. Their stated active involvement with the sensory phenomenon confirms the current popularity of ASMR among young people, particularly the 13–17 years age group. All participants had no hesitation and were able to freely express their opinion and experiences with ASMR, some in greater detail. There was unequal distribution of participants who were pro or against ASMR during the preliminary interviews, with 15 (all 10 girls and 5 boys or 75%) seeing some benefit in it, be it for themselves or others, and the remaining (5 boys) being against ASMR (see Table 1). Coincidentally, in all single-age groups, there was one person who disliked ASMR. It is interesting to note that all girls were in favour of ASMR, although one expressed frustration at not always experiencing the positive sensory effect. In fact, there are more female than male ASMR players on YouTube.

Table 1. Autonomous Sensory Meridian Response (ASMR) experience of Sydney participants.

N	Pseudonym	Age (Years)	Gender	Overall ASMR Experience	Pro or against ASMR
1	Oscar	13	Male	"ASMR is an interesting thing. There are many people watching it. Sometimes I am watching it too, mostly for fun. Sometimes it's not the only whisper of random words, but often funny noises, like chewing, smacking, munching – all sorts of noises. I am laughing at the noises these people create. I think these videos are for people that have some settling issues, restless, crazy people and for people with emotional problems. ASMR is not something I like to watch for other things than fun, to laugh at others."	Pro
2	Olivia	13	Female	"Not sure what to tell you. It's calming, relaxing experience and it's fun. I really enjoy ASMR videos. Something inside me just clicks and I am somehow in peace with myself. I can't describe the feeling. I prefer to have an ASMR video running as a background thing and I just listen to it and feel relieved from any pressure. I actually love it. It's a cool thing to watch."	Pro
3	Elizabeth	13	Female	"ASMR is giving me a completely new world. It's my world that is taking me away from my school, home tasks, away from my parents yelling, even sometimes bullying at school. I can be into my imaginary role plays and be myself. I am lucky to discover it and I love it since then."	Pro
4	Gabriel	13	Male	"You know ASMR is quite popular among young people, but personally I am not in favour of ASMR. The problem I see when I am trying to watch ASMR videos is the whispering. Whispering in any form or any other cringy noises makes me want to rip my ears off. I was	Against

					like this from a very little age. I believe it's annoying for some young people having my problems with the monotonous whisper. I think even to some extent ASMR is mind-numbing as people seek to relax and experience not much thinking. Like zombies. But everybody has a choice. If I need a relaxing time, I prefer talking to my mum instead of listening or watching an ASMR."	
5	Sam	14	Male		"I have not so much experience with ASMR. It is not so popular. Some of my classmates, especially females are mad about it. If you want to blend with them, you must watch it too. This is how I started watching these videos. I can say they are not too bad even there is some hidden reason behind all the ASMR videos. This tingling thing they claimed everybody should experience I think is not quite true. Not everyone can experience the relaxation though? I am kind of indifferent to them (ASMR)."	Pro
6	Fiona	14	Female		"I used to watch it before, but I stopped because of my parents who think it's not appropriate for me and a weird thing to do. Sometimes I am still watching it secretly... don't tell them. ASMR from my opinion is a good thing because it gives you the freedom to think about your own things, your own world to reflect on something that is important for you and no one else cares about it. I think this is why these videos are cool and popular among teens like me."	Pro
7	Sophia	14	Female		"I think ASMR is great. I love it. It gives me relaxation and stimulation from different directions and it helps me sleep. But I wouldn't tell my friends as I'll definitely look weird and get judged. I really enjoy the role plays and stuff like that. I keep it as secret."	Pro
8	Benjamin	14	Male		"Honestly ASMR pisses me off. Excuse my language. I think it's maybe because I can't stand people whispering around me. I have no idea why, maybe it's part of my physiology. I tried to watch it before, but I kind of got angry and also, I never had the tingles people experienced. It's just slowly rising anger... Maybe if it was a different context and not too much whispering. I don't know."	Against
9	Lea	15	Female		"It's kind of cringe ASMR is not listened for receiving messages, it is kind of satisfying noises for your ear drums. This is the only reason people are listening to ASMR. But I think it's not so popular anymore amongst young high school kids."	Pro
10	Lucas	15	Male		"I know a bit about ASMR. I'm not an expert. There are videos with different topics, people role play or just talk about stuff and make some different noises. Strangely I like it somehow... Sometimes I am watching it but not so often. Usually, if I had a tough day at school, exams, I tend to watch things. People are so clever to create all these videos. It's a new world of opportunities."	Pro
11	Katie	15	Female		"I am quite familiar with ASMR videos, Gibi's version to Billy Eilish is my favourite. She is kind of whispering popular and meaningful songs with her hands, clicks, scratches on her ASMRs videos and imitates the breathy horror movie vocal sound of Eilish. Gibi and	Pro

				Eilish are viral, icons for us the YouTubers. It feels so nice you can feel a tingle in your head. I think it's cute. I am obsessed with ASMRs."	
12	Alan	15	Male	"ASMR is a stupid thing, a bunch of nonsense words strung together to make you relaxed. I relax in front of the computer playing video games. I don't think I need ASMRs to feel good. I can only laugh at it."	Against
13	Natalie	16	Female	"I'm addicted to ASMRs. I've been watching it for two years, I think, and still can't get out of it. It's my thing I enjoy and feel safe to do. I even have introduced my best friend to it and sometimes we both watch it together. I love the feeling you know you watch till you experience tingles around your neck and back of your head. It's kind of cool. I think it's better than taking substances, or drugs or other things. I really think it's safe to do."	Pro
14	Misha	16	Female	"I love it, I love it, truly love it. I am watching them every day. I like the different roles they play. It's my own new world. I am listening to what they say but at the same time, I don't. I also like some videos where they whisper popular singers' songs. It's cool to listen to the lyrics as they make more sense said slowly and with kind of personal attention put into it rather than when accompanied by music, if you know what I mean."	Pro
15	Peter	16	Male	"ASMR I see it as a tool that exists if you need to use it and if it will work for you. Personally, I'm not a fan of how ASMR is being twisted these days as some special thing. It helps people to relax, comfort them when they need especially for their insomnia, anxiety, stress, all sorts of things. I think it is helpful and I am watching ASMR videos when I feel like I need to watch them. It's a good thing to have available out there in case you need it."	Pro
16	Bobby	16	Male	"My friends love it... (laughing) I absolutely can't stand ASMR. Honestly, I can't stand it. Having someone whisper in my ear or pat, or crinkle paper or do whatever they usually do to create noises and effects is just making me really uncomfortable and annoying. It's totally not my thing."	Against
17	Markus	17	Male	"It gives me mixed feelings. I want to be part of the experience and enjoy it as other people do, but with study for HSC [high school certificate] I don't have much time to relax and I feel I am missing out. I don't know how other people do it with study and watching ASMRs. I know a couple of my friends do. I think ASMRs are cool."	Pro
18	Emmanuela	17	Female	"I know [I am] a bit based on my own experience with ASMR. I watch only some of the videos of certain people, ASMR makers if you want to name them. ASMR is good but it frustrates me so much when I can't get tingles. I feel like I'm missing out on something so interesting and intriguing. It's not nice to be missing out especially when you are a teenager like me (laughing). Otherwise, there is something else above the tingles that I can't still figure out. It's something that makes you want to watch more and	Pro

				more, addiction, obsession...habit... not sure about it. I like watching ASMRs for those strange reasons."	
19	Martina	17	Female	<p>"I read about it a few years ago and I thought it was one of the most bizarre things I'd ever heard of. When I tried last year, I felt relaxed and calm. It wasn't weird, and I didn't feel I am doing something wrong. It was just peaceful and meaningful. I am still watching ASMR videos when I feel I need it. It's helpful with upcoming exams for stress relieving."</p>	Pro
20	Bruce	17	Male	<p>"It's big nonsense. It's created by a bunch of people that think they produce some form of satisfying themselves or others that are watching the content. Mad people are whispering into microphones, taping and scratching surfaces, eating crunchy chips, pickles who knows what to make more noise. They believe they are doing all the things that will help to give you a tingly feeling on your head. Personally, I think it's revolting. Definitely, a weird thing to do."</p>	Against

Table 1 displays excerpts from all first in-depth interviews conducted with the participants regarding their personal ASMR opinion and experiences. Several of the participants claimed ASMR as being a platform for creating a "*completely new world*" for them. This opinion was shared by Elizabeth, Fiona, Lucas, Misha, Natalie and Olivia. Elizabeth believes it helps her to create a space to escape parents' yelling and school bullying. Olivia claims that it provides a continuum where she can be "*in peace*" with herself and feel "*relieved from any pressure*". Lucas viewed the potential in ASMR and the cleverness in its existence as a "*new world of opportunities*". Fiona noted that ASMR gives her "*the freedom to think about your own things, your own world, to reflect on something that is important for you and no one else cares about it*". Natalie recommended ASMR experience as "*better than taking substances, or drugs*", while Misha proclaimed it as her "*own new world*". Two of the interviewed teens described ASMR as something they perceived as entertaining, providing funny experiences and making them laugh although they were not taking it too seriously.

The five participants who shared a negative or undesirable predisposition towards ASMR experiences were only representatives of the male gender. Three of them expressed their inability to listen to whispering due to personal reasons. The other two were completely stigmatising the Autonomous Sensory Meridian Response as a weird thing.

During the preliminary interviews, the participants were also asked about their attitude towards climate change (see Table 2). Climate change is a significant issue of concern for the majority (16 or 80%) of the interviewed participants. Mass unawareness, misleading information, a lack of understanding of the issue amongst parents, teachers and government authorities, absence of active measures to address and solve the issue are of serious concern for almost all participants. Although Lucas talks about it being "*a political thing and falsehood intended to cause panic*", he still admits that he feels scared as he does not know whom to trust. Elizabeth, Misha and Olivia prefer not to show any concern due to the absence of immediate evidence in people's everyday life. By coincidence, all participants who are against ASMR are concerned about climate change and all of those who are not concerned about climate change are pro ASMR.

Table 2. Participants opinions about climate change.

N	Pseudonym	Age (Years)	Gender	Climate Change Knowledge and Opinion	Of Concern
1	Oscar	13	Male	"I think everybody if they don't know they should know about climate change. Unfortunately, not many people are aware it exists especially in Australia as we live in abundance. We enjoy plenty of resources, some of them are regularly exported around the world, we use electricity whenever we want, an ample amount of water and food while other people are starving and thirsty. We basically have everything we need to live a good life. People need to know more about climate change and how our way of life is contributing to it."	Yes
2	Olivia	13	Female	"I'm not sure how people are engaged in solving global warming. People prefer to think about narrow things about my friends, school, family and things like that. I don't like the feeling that we are vulnerable and almost apocalyptically and the humanity's at the end of its survival."	No
3	Elizabeth	13	Female	"Climate change is a hoax created by scientists. It's far away from the reality we live in, from our life. All the information presented to us at school, in the media is exaggerated. My parents and my grandparents said there is an intentional scary messaging in place to serve someone's interests. I think they are absolutely right. It can't be otherwise as nothing is evident for us right now."	No
4	Gabriel	13	Male	"Often, I have mixed feeling about climate change thing, sometimes I am feeling detached, another time I am feeling confused. We think we know about it, but actually, we are not so informed."	Yes
5	Sam	14	Male	"All I read recently says that climate change is imminent, and we really need decarbonisation and better choices. Lately, this is also what people around me are talking about. Many also don't believe climate change is a big thing we all have to acknowledge, which is not right. People need to be informed, not only scientifically, but also the media and the government need to play a part in this."	Yes
6	Fiona	14	Female	"Climate change issue is part of my future. It's part of all kids' future like me around the world. I feel like I should be protesting for it and I did go out of school to be part of the protests in Sydney. I disagree with our politicians about the place, I mean school, we should be instead of on the streets and also, I don't think the time teachers prepared for us to study was wasted as anyway we are not studying anything meaningful we can use to save our environment. They are the people that educate us, the future generations and if they need to do something better for us, teachers can join us too."	Yes
7	Sophia	14	Female	"I think climate change is happening and it's closer to the mass extinction extent. I believe there are still lots of things that can be done to stop it. School climate change strikes are one of the things but politicians in Australia are not taking it seriously, so it's kind of useless thing to do."	Yes

8	Benjamin	14	Male	<p>"The world's climate has changed a lot through the years and has affected many living and non-living things and also humans. Many places that used to be warmer are now getting colder and colder, and also many colder places and regions are getting much colder and, in some cases, even warmer. Global warming is real and is going to play a big part in our life."</p>	Yes
9	Lea	15	Female	<p>"Some of the problems like climate change are part of global-scale problems. We underestimate the importance of global warming. Many things are going on: flooding, drought, people running away from their places of living to find a better climate, a better place to raise their kids. Why politicians are doing nothing about it? Sometimes I am ashamed not to be able to do something to help solve the climate change problem. Don't understand me wrong. It's my thing I am really passionate about."</p>	Yes
10	Lucas	15	Male	<p>"We talk a lot about climate change at school. My classmates know about it, my friends know. Some of them are taking it seriously, others don't. It's normal nowadays. Some of them don't believe that climate change is caused by human activities. I think that it is all a political thing and falsehood intended to cause panic. It's scary sometimes, especially if you don't know whom to trust. You ask me what I think. Not sure."</p>	No
11	Katie	15	Female	<p>"Climate change is more than real. I've been watching lately hips of YouTube videos on issues caused by climate change. The problem is not only climate change is present. The biggest problem is with our parents and especially the majority of conservative parents who don't believe climate change exists. They think I am wasting my time watching stupid videos instead of studying maths, chemistry, English to succeed in my future. They can't understand that there are more important things than the school results for my future, ...for our future... They are the ones that need to be convinced to make a shift and believe climate change is real."</p>	Yes
12	Alan	15	Male	<p>"We had a project at school about climate change and we had to choose a problem related to climate change and present it in front of the class. The majority of us have chosen air pollution from fossil fuels, industrial burning or water pollution at the Great Barrier Reef. This was an only one-off thing and even the project didn't cover all the issues related to climate change, the teachers wrapped it up and went on the next topic. I believe in most schools is a similar situation. There is not much awareness of climate change. At least more projects about it we can deep into probably help. Sometimes I think that all the climate change thing is just for propaganda, to make people believe and be scared. I am not sure what to think and when you read about it is kind of one-sided."</p>	Yes
13	Natalie	16	Female	<p>"We all know about climate change may be not everything we should know, but a fair bit. At school, we talk a lot with some of the enthusiastic, youngish</p>	Yes

				teachers and sometimes we touch things that are out of normal comprehension like why humans around the world are constantly burning fossil fuels, exploiting resources, clearing lands if all of these are bad for the environment. But the conversations finish there."	
14	Misha	16	Female	"I know about climate change, but I can't believe it exists and it's too serious. We wake up every day and enjoy life, good weather, nice sun and you can't say something is going on from what you see around. For most people, I know my age is something that is staying at the background, nothing we should consider seriously."	No
15	Peter	16	Male	"Not sure how to explain climate change. It's obviously a hot topic. It feels for me impossible to put into words how ice caps are melting, species around the world almost disappearing and ...to talk about the really big issues like climate change."	Yes
16	Bobby	16	Male	"I think only kids are interested in climate change. For my parents, it's a far away issue. I am not saying they don't sympathise for what is going on with our environment, but they are kind of busy working and looking after us, the family, securing meals, everything that you need to be focussed in as parents."	Yes
17	Markus	17	Male	"Climate change is a serious, real thing we are going to deal with to the rest of our lives and the rest of the world is not even half-convinced that this is a serious issue we should address immediately and without hesitation. I was at all of the protests for climate change in Sydney and I am passionately involved with the existing climate change problem."	Yes
18	Emmanuela	17	Female	"I know a fair bit. Climate change refers to general changes occurring in climate patterns. These could include the temperature, raining, winds, other factors. Also, the excessive use of fossil fuels is one of the contributing factors to a greenhouse effect. There is lots of propaganda mostly misleading about denial of human-induced climate change. I think politicians don't want us to know the truth."	Yes
19	Martina	17	Female	"Climate change is one of the issues our politicians and the rest of the world talk about but there are no actions coming out from all these talks. They sign agreements after agreements and nobody is following these agreements. It's frustrating."	Yes
20	Bruce	17	Male	"The curriculum at school barely touches climate change looking at the whole picture. Often, we talk about racism, violence, homeliness, drugs, obesity, malnutrition... other issues. I have the feeling that even they mentioned it here and there in class this doesn't mean we are researching and talking about it in depth as we talk about the other issues our society is facing."	Yes

After the preliminary interviews, the participants were asked to watch the specially recorded ASMR video as a marketing strategy for delivering positive climate change messaging and provoking pro-environmental behaviours, actions and social bonding. In the video, a soft whispering voice of a 16-year-old girl whose face the viewer could not see talks about climate change:

"Look around yourself and you'll see it: ice cap melting (sound effects used – imitating melting "ss-s-s-s"), smell in the drought forced bushfires (sound effect imitating sniffing)... Sustainable lifestyle choices

are emitting less carbon and do make a difference. Little things that add up, like: saving energy and resources, eating less meat (sound effects chewing), eating more plant-based food, biking to school, work, everywhere, taking shorter showers, buying local organic vegetables, taking your own bags to the store, using a reusable coffee cup, buying recycled paper and many more. We have plenty of power to change things and solve the climate change for us and for the future generations. We are the youth climate activists."

The follow-up interviews were aimed at understanding what the influence of the climate change ASMR video was on the teens. Their responses are presented in Table 3. Thirteen of the participants found the video suitable to communicate positively about climate change, be it for other people or themselves personally, while seven were of opinion that such a marketing technique will not work. Of those who found the video not suitable, one participant, namely Alan, confirmed his dislike of ASMR; another, namely Olivia, who has no climate change concerns, did not like that the video made her think about these issues; and the remaining five were categorically of the opinion that such videos cannot be used for positive climate change communication.

Table 3. Post-ASMR video experience.

N	Pseudonym	Age (Years)	Gender	Post-Climate Change ASMR Video Reactions	Suitability of ASMR
1	Oscar	13	Male	"It was a really spot on. Positive and calming with a beautiful girl helping to feel positive about it, reassured you can do something to change things. Climate change, sustainability and biodiversity crises are things that many people don't want to even know or talk about and she presented it kind of cool. I think this ASMR could influence people only if it will make them listen and think about climate change."	Suitable: pro ASMR, climate change concerns
2	Olivia	13	Female	"No. I don't think it will work for me. The ASMR video you've sent me wasn't like the rest of the videos I used to watch. Climate change is a thing we all must be aware of and to try to minimise it, but as the girl in the video said it, the effect will be not in our lifetime. She said 100 years before seeing the effect of it or something like this. No, I don't think this ASMR was appropriate. I didn't enjoy it. It was not relaxing, but more ... it was making you think. I don't like to think when watching ASMRs, I just want to relax and have fun."	Not suitable as it makes her think: pro ASMR, no climate change concerns
3	Elizabeth	13	Female	"I watched the video. All the things the girl said were true. I didn't like the fact I couldn't see her face. I found this as message limitation. Otherwise, I think it was really positive and many of my mates will watch it."	Suitable: pro ASMR, no climate change concerns
4	Gabriel	13	Male	"You know, I felt guilty after watching your ASMR.... particularly for the many things I was doing wrong before.... I even didn't think they are wrong, but just normal to me and other people. You know ...it deeply incited me. I was listening to every word that the girl said, it was like a TED talk but whispered.... You know....and another odd thing I felt when watching it, and... it was quite intriguing ... As I couldn't see her eyes I kind of kept guessing"	Suitable: against ASMR, climate change concerns

					at all the time how she looks like. Very strange. But she really made me think. You know, I walked to school the next morning and didn't want to have a shower not to waste water. Something strange happened to me I can't explain. I am totally speechless. I was thinking ASMR can't be used for climate change, but I am starting to think that they can be used for anything."	
5	Sam	14	Male		"I agree people need to be aware of what we do to the environment and how we can help to improve it. Majority of people don't have a clue about how serious the climate situation is. The girl though has done a good job I can admit she wasn't so annoying like the others in the majority of ASMR videos I've seen before. And whatever she said made hips of sense and she made it sound positive and reassuring the climate crises we are right now could be fought. I can admit it was an interesting way to ask for action."	Suitable: pro ASMR, climate change concerns
6	Fiona	14	Female		"For the girl's credit I think she did a good job particularly because she was positive but at the same time kept the topic serious. It's more likely to have a positive effect than otherwise."	Suitable: pro ASMR, climate change concerns
7	Sophia	14	Female		"I am not used to this kind of ASMR. I found it a bit like...not the right platform for this type of messages, I mean climate change messages. It was a bit depressing even the girl seemed nice. The topic wasn't ASMRs appropriate I think. It can't win me."	Not suitable for climate change messages: pro ASMR, climate change concerns
8	Benjamin	14	Male		"The girl's whispering and other sound effects she was doing made you relaxed and with climate change messages you don't need to be relaxed. I think though if published officially on YouTube or Instagram the video could become viral. People are crazy about these things, especially right now."	Suitable: against ASMR, climate change concerns
9	Lea	15	Female		"The only thing I still remember is the words of this girl at the ASMR video saying we can stop climate change and create a better world. I really want to be part of it. I was on the streets protesting here in Sydney and was angry with the prime minister saying we better stay at school and study than going out to protest. If we listen to what politicians say, we will be doing the same thing that our grandparents did and parents do right now, consume the resources of the planet without making any difference. All the scientific evidence is known but we still don't act. This girl from the video reminded me of the school for climate change protests. She was quietly whispering scientifically proven ideas that will work and it was effective. For me it was effective. I can't believe it can be done with ASMR. It actually worked."	Suitable: pro ASMR, climate change concerns

10	Lucas	15	Male	"I wasn't quite positive about it... when you asked me about the ASMR climate change video, but after I saw it I think it perfectly completed its purpose. I felt confident, kind of encouraged I can do things to change things around. I didn't know eating meat is part of the climate change thing. I found it weird. But the rest made sense and it's achievable. We all can use fewer resources and walk more instead of being driven everywhere. Makes sense and the girl was pretty good to pass this message across. I was surprised."	Suitable: pro ASMR, no climate change concerns	
11	Katie	15	Female	"Honestly, I had the urge to be that girl and instead of whispering her climate change message to sing it like Billie Eilish style. It was cool, and I loved it."	Suitable: pro ASMR, climate change concerns	
12	Alan	15	Male	"If you listen to the girl's words they all made sense, but they are similar to the stuff everybody repeats about climate change... it is a thing we have to do something about. People don't want to live in discomfort, they want to use their cars, to fly, to have light showers, to eat whatever they want and nobody to tell them the opposite and make them uncomfortable for their actions. Apart from this I still don't think that the usual nonsense of ASMR videos will be helpful at all for promoting climate change messages."	Not suitable as he dislikes ASMR: against ASMR, climate change concerns	
13	Natalie	16	Female	"I believe climate change messages in a similar style I've heard in the video you've sent me will make you think and react. I have already started questioning my actions and especially what I eat, and I eat mostly meat. Maybe it will get not so huge response at the beginning, but it will be another type of ASMR that will grow exponentially with time."	Suitable: pro ASMR, climate change concerns	
14	Misha	16	Female	"I watched it and I didn't like it at all. I am not saying that the girl wasn't trying to create a positive atmosphere when delivering climate change messaging, but it just didn't work for me. I am in love with ASMR and can see which one is worth seeing... I was pretty sure it will not be a good idea to use ASMR for climate change messaging."	Not suitable for climate change messages: pro ASMR, no climate change concerns	
15	Peter	16	Male	"Definitely, as I said before. ASMR has the potential to conquer the youth world. It will be faddy, cool and successful. With climate change messaging on board I predict it will definitely create awareness and why not an action."	Suitable: pro ASMR, climate change concerns	
16	Bobby	16	Male	"Definitely, it was an interesting experience watching your ASMR. I watched it several times and I discovered new things every time I watched it. Not sure if it has the intended effect to make me act, but it definitely was something. ... I like the purity of it as it's kind of matching the climate change topic."	Suitable: against ASMR, climate change concerns	

					"It was unusual. I still think ASMRs are for achieving peaceful, quiet and calming anti-stress relieving effect. But it kind of provoked my thoughts... I was magnetised from the girl's mouth. It's kind a very strange, but I was, and I was listening every word she said. Very strange, unusual. I am not sure about taking positive action but definitely I'll remember what the girl said especially the fact that it takes more than a life time to feel the effects of climate change and we have to do something to change it... I don't know. It was a strange feeling, but positive, totally positive."	Suitable: pro ASMR, climate change concerns
17	Markus	17	Male		"The ASMR video was calming and imitated the way real ASMR videos are made. I wasn't hypnotised enough as usually, I am, but I tried to finish it all. After half of it, I was thinking it's too thoughtful and I didn't like this feeling. I think that ASMR videos are not made for serious stuff. Sorry that I am skeptical but I think it wasn't convincing enough for me..."	Not suitable for climate change messages: pro ASMR, climate change concerns
18	Emmanuela	17	Female		"I watched it a couple of times. Can't say it was bad, but at the same time, I can't be enraptured with it. It was pretty ordinary for my ASMR taste. I expected tingling, etc. sensations. Unfortunately, I haven't received it which frustrated me a bit. Sorry I have no other opinion to share."	Not suitable for climate change messages: pro ASMR, climate change concerns
19	Martina	17	Female		"After I watched your ASMR video I agreed with all the fact mentioned during it but the whispering I found it too much and too weak as a technique to convince anyone about climate change."	Not suitable for climate change messages: pro ASMR, climate change concerns
20	Bruce	17	Male			Not suitable for climate change messages: against ASMR, climate change concerns

All thirteen participants who found the ASMR video suitable expressed a lot of enthusiasm using expressions such as "spot on", "it was really positive", "I felt guilty after watching...", "it was an interesting way to ask for action", "she was positive but at the same time kept the topic serious", "people are crazy about these things", "it was effective", "it perfectly completed its purpose", "it was cool, and I loved it", "it will be another type of ASMR that will grow exponentially", "it will definitely create awareness", "not sure if it has the intended effect to make me act, but it definitely was something" and "it was a strange feeling, but positive, totally positive". They all saw the potential of ASMR as a social marketing technique for behaviour change.

Of particular interest are the participants whose opinion changed after watching the ASMR video, be it in relation to the use of such a marketing technique or about the seriousness of the climate change agenda. Three of the five participants who were generally against ASMR saw benefits in using it for communicating climate change actions. Gabriel shared: "*she really made me think. You know, I walked to school the next morning and didn't want to have a shower not to waste water. Something strange happened to me I can't explain*". Benjamin commented: "*I think though if published officially on YouTube or Instagram the video could become viral*". Bobby said: "*I watched it several times and I discovered new things every time*".

Out of the four people who are not concerned about climate change, two found potential in using ASMR. Elizabeth was categorical: "*All the things the girl said were true... I think it was really positive and many of my mates will watch it*". Lucas was similarly quite supportive of the video: "*I wasn't quite positive about it... when you asked me about the ASMR climate change video, but after I saw it I think it perfectly completed its purpose. I felt confident, kind of encouraged I can do things to change things around. I*

didn't know eating meat is part of the climate change thing... Makes sense and the girl was pretty good to pass this message across". The remaining two also admitted some influence by the ASMR video. Olivia explained that peer pressure is very important to her and although she did not like the video personally, it is likely that her friends may watch it: "*I didn't enjoy it. It was not relaxing, but more ... it was making you think. I don't like to think when watching ASMRs, I just want to relax and have fun... Maybe if other friends of mine like it, I'll think about it...*". Misha also clarified: "*I am not saying that the girl wasn't trying to create a positive atmosphere when delivering climate change messaging*".

Similarly, other participants who found the ASMR video not suitable commented on its ability to communicate climate change. According to Alan: "*If you listen to the girl's words they all made sense, but they are similar to the stuff everybody repeats about climate change... That it is a thing we have to do something about*". Bruce, who continued to dislike the whispering, revealed: "*After I watched your ASMR video I agreed with all the fact mentioned during it*".

Six people with different attitudes towards ASMR and climate change (Oscar, Olivia, Gabriel, Emmanuela, Natalie and Markus) stressed that the video made them think—not just experience a positive feeling. Five participants (Gabriel, Lucas, Natalie, Bobby and Marcus) also explained that the ASMR video made them act. These reactions are indicative of the effects of this way of communicating positive messages about climate change.

Some commented that the restricted visibility of the girl's face was considered by them as limitation or as an intriguing thing. The findings suggest that effective positive communication depends, in part, on the effectiveness of the message communicator, referring to Billie Eilish's songs and possibly Gibi's ASMR version.

Another effect after watching our special ASMR reported by two participants was the influence of immediate voluntary action to adopt some of the proposed positive solutions for creating a difference and reversing the effect of human generated impacts on climate change, such as short showers and walking to school. Interestingly two of the participants shared new awareness about meat consumption as a contributor to climate change, with one of them stating looking into making changes as an effect of the ASMR video. Overall, there was a sense that the video had an effect on the participants in creating hope and willingness to take action and forming social bonding. Although some of the interviewed research participants shared that they took action shortening their showers, starting walking to school and reconsidering their food choices, a further investigation will be needed to test the long-term effects and the development of new habits. This will give a better understanding of the power of the ASMR video as a social marketing technique for creating positive climate change messages.

6. Discussion

Most of the ASMR research is about its psychological and physiological effects [8,15,17,18,22]. It indicates that ASMR advertising has potential impacts in the way many people feel and think about an issue. Previous research shows that approximately 40% of the people are impacted by ASMR videos [28]. In this exploratory study (which by its nature is not statistically representative but only indicative), we actually observed a higher impact. Thirteen of the 20 participants (or 65%) categorically supported this way of communicating climate change. The Generation Z demographic group which participated in this study showed that they are willing to be experimental, experience-focussed and socially active in responding to climate change challenges. We used a single-group design with before-and-after comparisons [100]. Although the majority of the participants were pro ASMR, nobody from the group had ever been exposed to a climate change ASMR video. This made the comparison of before and after the ASMR intervention meaningful, as we were able to observe and analyse the participants' responses. Including people who like and do not like ASMR similarly allowed for richer comparisons, as there was no guarantee that if you liked ASMR, you would also like the climate change ASMR and vice-versa.

A larger-scale survey may be able to deliver findings with a degree of validity for a bigger cohort or population, but in the absence of such research and faced with the imperatives of global warming and its consequences, we have reasons to believe that positive messaging can be more effective than

the threat of negative, be it probable, scenarios. Being a “wicked” problem, climate change does not fit into the standard ways of communication and requires a more constitutive approach [70], where ASMR can contribute towards changing the ways young people are engaged. Furthermore, neuromarketing techniques can help better understand the impacts that ASMR has on people.

With the ASMR climate change video offering a combination between audio and visual impacts, it is difficult to judge what had a bigger influence on the Generation Z participants. However, the emphasis was on the audio representation of the messages and many participants commented that they wanted to further visually relate to the anonymous girl who was talking to them about what they can do for climate change. It seems to us that ASMR requires a balance between the two main ways of impacting the listener while continuing to pay the highest attention on the voice and sound effects used to communicate the positive messages. Further, a major part in this communication is played by imagination, the ASMR video in fact was calling for young people to imagine a better world [101] and this could also have contributed to the positive reactions of the participants.

Communicating hope [67] in a way that generates positive feelings better serves the emotional and psychological needs of the younger generation. Therefore, they are not only willing to explore new things [102] but to respond to messages from real people with real data (the ASMR video was based on the latest research) and to trust their own authentic experience, not pictures of celebrities and perfect lives [103]. As they are not burdened and oppressed with other things in life considered important by adults, such as looking after family, finding and maintaining employment, they are open to face and consider reality directly as it is as well as imagine a better world.

Although there were several participants who cast some doubt as to whether this method is appropriate for them personally, they saw potential benefits for other people. Several shared an important characteristic of this young generation, stating that the opinion of friends and peers is more treasured, followed and would have greater impact on their final decision making. Contributing factors for the higher rate of impact are the nature of the messages being communicated, namely climate change, which is increasingly becoming a hot topic, and the age of the participants who are very much attuned to the ASMR communication ways. This allows them to watch such longer commercials. Although psychology and neuroscience are yet to disentangle what exactly impacts on people, whether it is the content of the ad or the experience of listening/watching the ad, it is clear that such a marketing technique generates positive responses.

The research results clearly also revealed that the participating Generation Z representatives are not hesitant to support the issues that matter the most to teenagers today—their future and the future of the planet. It is clear that young people who are sustainability oriented are desperately looking for something positive to lean on, a positive solution to climate change and positive agents of change. This is their way to escape the alternatives bringing distress, angst and depression. Becoming a prominent part of many people’s lives, ASMR content can be successfully used for climate emergency awareness/action purposes. The snowballing and fast increasing popularity of ASMR experience through word of mouth and social media platforms, such as YouTube and Instagram, can be a formula for success in creating constructive and positive climate change messages. This could be an effective way of communicating with young people who enjoy watching videos or listening to sounds that many describe as not being only entertaining, but also soothing and relaxing for them [25]. The research findings affirm this and recommend further studies in this direction, including whether similar responses would be experienced by young people in other countries.

Recent research shows that young people are more willing to change their environmental attitude towards better pro-environmental behaviours and willing to save the planet [104]. Young viewers are searching for ways to find solace in their everyday life and the many ASMR videos available are helping them to discover comfort in time of loneliness or distress. Climate change also causes loneliness and distress because of widespread aversion to taking it seriously by parents, friends and the government. Youth climate change environmentalists are already ignited and engaged in global protests and climate strikes and they are similarly familiar with and the main users of ASMR experiences and this was clearly demonstrated during the in-depth interviews. Psychology research advises that how the big picture about climate change is being framed is important,

particularly in terms of what can be achieved rather than what is being lost [14]. Using positive messaging and the potential created through human motivation is further valuable psychological advice [14]. This is how the ASMR video shown to the Sydney Generation Z group was designed. Such an approach explains to a certain degree the positive responses that we obtained, including the desire for action to counteract climate change.

It is difficult to predict whether the results from our exploratory Sydney study can be extrapolated to other places in Australia or across the globe. There are, however, signs that younger people are likely to respond to similar climate change videos. First, ASMR videos are popular in places, such as the USA, Europe, Canada, South Korea and even China (where they are officially banned [47]), with some of the channels having millions of subscribers. Second, many of the recent global environmental movements, such as Extinction Rebellion and the followers of Greta Thunberg, are already using ASMR. People want the messages they are given to be relevant, tailored and personally addressed to them and ASMR seems to be able to achieve this.

Irrespective as to whether they found the video suitable or not for positively communicating climate change, all Sydney participants felt influenced and stimulated by it. In some cases, this was against their expectations for shear relaxation and enjoyment. However, in the majority of cases, the video made the participants think and even take action. The positive influence of the climate change ASMR video categorically indicates a need for similar digital platforms. A climate change ASMR channel should be able to communicate positive environmental messages, reach a wider audience and contribute towards improving the mental health and well-being of the younger generations in Australia and across the globe. Practical messages, such as those related to waste reduction, dietary shifts to more plant-based options, power efficiency, water conservation and reduced automobile dependence, communicated in a calming and encouraging way are a novel, engaging and positive way to impact Generation Z. Such an approach is more suited to the way this generation lives [105], their sustainability expectations [106,107] and the effects of digital marketing communications on these young people, including on YouTube [108]. If ASMR is more widely used, researchers should be able to assess its effects on actual behavioural changes.

7. Conclusions

The largest generation of youth in history [109] are the new drivers of social progress and the new forces inspiring behaviour and political change. They are also the most connected with each other virtually and the highest users of digital content, including ASMR.

All 20 participants in this exploratory study were influenced by the ASMR video dedicated to climate change. Although some expected ASMR to only be relaxing, the majority of participants felt stimulated to think about climate change and take action. Producing an ASMR channel tailored toward positive climate change messaging could help young people deal with the challenges of their generation while remaining true to their digital nature and social connectivity. Who is going to take the initiative to establish, maintain and manage such an ASMR channel is an issue which requires further consideration. Most current ASMR channels depend on the initiative of particular individuals who may (or may not) benefit from the marketing of certain products. Climate change, however, is a complex issue and public good, and it is usually expected that the government plays a role in protecting common resources. Yet, we are not experiencing such government engagement in Australia. With the social media space available to be used by anybody, it is more likely that we will witness interest from universities, civil society, health practitioners and non-government organisations, individually or in partnership, to create and manage such a compelling, useful, relevant and engaging ASMR channel. Further, it will not be surprising if young people take the initiative themselves, in the way they are doing with climate strikes and demonstrations. In such situations, it will be important for the government to understand the need and the gap such an ASMR channel is filling, as the young generation needs support, hope and optimism for the future.

Being a qualitative study, this research has its limitations in not providing quantitative measures of the possible impact of ASMR on the different emotions and states of consciousness experienced by young people. Another limitation is the time when this study was conducted, namely in June 2019,

prior to the Australian devastating summer fire period of 2019–2020, which significantly affected Sydney and the State of New South Wales with heavy air pollution. Hence, concerns about climate change amongst younger people would have been different after such an experience. Similarly, Covid-19 would have also influenced Generation Z and this might have increased the popularity of ASMR as a safe space to deal with the built-up anxiety and stress. Further limitations relate to the fact that we do not know what the reaction of people who have never used ASMR or belong to different age groups would be. Even more interesting would be to investigate the responses of people with relatively low levels of education or environmental concerns. The list is quite long... What is, however, clear is that the influence ASMR videos have on this young generation can empower them to fight the negativity, enormity and challenges of the current environmental and climate emergency by stimulating social bonding and a desire to act, by replacing fear, depression and angst with hope and positivity.

As a marketing technique, ASMR is still at an early stage and showing a lot of potential. Some may argue that its effects may disappear as its novelty wears off. However, when it comes to climate change, such concerns are not so relevant as the planet needs people to act right now. In the time after we completed our exploratory study, we are already witnessing the spread of ASMR in climate change campaigns. As a behaviour change technique, ASMR's biggest advantages are the persuasiveness and positivity of the messages it sends.

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