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Exploring Experiential Qualities of Relaxation in ASMR through Soma Design

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Media designed to elicit Autonomous Sensory Meridian Response (ASMR) has been used for years for relaxation and improved sleep. Recent research has shown that experiencing ASMR lowers markers for stress, and can induce a relaxed mood. In this thesis, the use of ASMR in a somaesthetic design process was used to define experiential qualities of relaxation. Somaesthetic sensitivity training, ASMR exploration, a material exploration, and a workshop produced several themes relevant to relaxation. Out of these, the themes with the most promise for this project were selected and further examined through the formation of the artifact The Rice Walker, a walking-based artifact for ASMR-inspired relaxation. Using a thematic analysis, the foundations for three experiential qualities of relaxation were identified: *Allowing for Anticipation, Softness, Gentleness, and Gradual Transitions*, and *Control Without Demands*. These qualities can be used to expand the soma design space, or could be used in the development of relaxing human-computer interactions.

SAMMANFATTNING

Media designad för att framkalla ASMR har använts i flera år för avslappning och bättre sömn. Ny forskning har visat att upplevd ASMR sänker stressmarkörer, och kan leda till ett avslappnat tillstånd. I detta examensarbete utforskades användandet av ASMR i en somaestetisk designprocess för att definiera experienciella kvalitéer av avslappning. Somaestetisk träning, utforskning av ASMR, en förstapersons material utforskning, samt en workshop resulterade i flera teman relevanta för avslappning. Av dessa valdes de teman med bäst möjlighet till utveckling ut, och dessa teman utvärderades mer utförligt i skapandet av artifakten The Rice Walker som använder gång för att ge känslan av ASMR-inspirerad avslappning. Tre kvalitéer identifierades genom en tematisk analys: *Allowing for Anticipation, Softness, Gentleness, and Gradual Transitions*, och *Control Without Demands*. Dessa kvalitéer kan utöka soma design-området, och kan användas i utvecklingen av avslappnande människo-dator interaktioner.

CCS Concepts: • **Human-centered computing** → *Haptic devices; Interaction design process and methods*.

Additional Key Words and Phrases: somaesthetics, HCI, relaxation, soma design, tangibles, physical interactions

Nyckelord: somaestetik, MDI, avslappning, soma design, tangible, fysisk interaktion

1 INTRODUCTION

Autonomous Sensory Meridian Response (ASMR) describes a phenomenon where exposure to certain stimuli elicits feelings of relaxation and a tingling sensation [8]. The tingling sensation, often referred to as “tingles”, is often perceived on the back of the head or neck, but can be felt in other parts of the body as well. ASMR can be brought on by several

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different stimuli, referred to as ASMR “triggers”. These triggers can be of different modalities, such as auditory, visual, or tactile. Sensations such as gentle touch and whispering are common ASMR triggers. The ASMR experience is highly subjective and differs a lot between individuals. Different people have different triggers, and some people do not experience ASMR at all [16]. ASMR media, such as videos and audio tracks, are often produced to be used as a means for relaxation or as an aid in falling asleep [2, 3]. This type of media can be, for example, videos of someone playing with or touching hair¹, or audio tracks of close whispering or scratching sounds². Relaxation can be used to manage stress, which can be beneficial for our health. Stress can cause imbalances in our brains affecting among others decision making and mood [34], and chronic stress can have an adverse effect on learning and memory [18]. Proper sleeping habits are also important for maintaining good health, as lack of sleep has been correlated with several diseases and health conditions: diabetes [17]; higher blood pressure [54]; and increased cardiovascular risk [14]. A single night of sleep deprivation can also negatively affect learning and memory [50]. ASMR is a cost-effective practice and does not require special training to partake in. The use of several modalities (visuals, sounds, and touch) and no requirements on mobility makes ASMR an accessible option to all. Studies indicate that ASMR can provide relaxation [43] and stress alleviation [37], which means it could have a positive effect on health when used to combat stress. Many studies have been performed on the physiological and psychological effects of auditory ASMR stimuli [7, 37, 40], and some HCI research drawn inspiration from ASMR inducing sounds [29]. Even though ASMR triggers have been reported in many modalities, these studies on ASMR generally tend to focus on auditory triggers [7, 37, 43, 52], occasionally also including visual ones [40]. Even in studies when triggers related to touch are involved, it is videos of touching activities being used instead of physical touch [15]. ASMR has, however, been noted in many real-life experiences involving touch or pure visuals, and even smells [4]. Taken together, ASMR is a worthwhile topic to investigate.

This project will utilize a holistic view of ASMR experiences, observing ASMR in all modalities and settings. Unlike the previous studies on the physiological and psychological effects of ASMR, this thesis will not use quantitative measures of stress markers, but instead focus on the first-person, individual experience of stress and relaxation. The project will focus on the feeling of relaxation when experiencing ASMR, either used for stress-relief or as an aid in falling asleep. Rather than designing artifacts for the purpose of inducing ASMR, ASMR will be used in this design process as a design material to provide insights about how it induces relaxation. This thesis aims to use insights from the experience of ASMR in a Soma design process for the exploration of experiential qualities of ASMR-inspired relaxation. This work utilizes a first-person material exploration approach, an approach that uses the designer’s first person experience in the design process. This project follows the Somaesthetic design process, an introspective practice that places focus on the bodily experience in interactions [23]. These methods are especially suitable for this research topic, as the experience of ASMR is subjective and individual, and soma design can address individual, personal experiences.

As a first-person research topic, the results will be heavily reliant on the lens through which I as the author perceive the world and my body. For this purpose, I offer here a positionality statement to give the viewpoint through which my work and results were formed. I am an able-bodied Swedish woman with an academic background in interaction design and IT. I experience ASMR, and I have engaged with ASMR media for many years and use it frequently for relaxation. This experience means that I am accustomed to stimuli which can seem strange to those who have not consumed ASMR media before. However, this also means I have a good understanding of which ASMR triggers work for me, and how ASMR affects me and my body.

¹An example of such a video is "ASMR | whisper | Relaxing hair treatment (brushing, braiding, styling, back scratching)" by itsblitzzz https://www.youtube.com/watch?v=sjHiCBMmFfo&ab_channel=itsblitzzz

²An example is the podcast audio track ASMR | Deep Ear Attention / Close Whispers;Intense Scratching Massage by Gibi ASMR <https://open.spotify.com/episode/6wUZl2YPgGiSeXSuxa8517>

1.1 Research Question

ASMR is used for relaxation and sleep-aid, and scientific projects are underway to explain the physiological causes and effects of ASMR. However, little focus has been placed on which aspects of ASMR are *perceived* to be relaxing from the perspective of the person experiencing it, or how these aspects can be applied in novel ways. The somaesthetic design process provides a way to articulate knowledge on these first-person highly individual felt experiences such as ASMR. Being able to extract these qualities of ASMR that aid in relaxation could prove beneficial in developments of HCI for relaxation, which leads to the following research question:

Which insights can be gathered from the use of ASMR in a somaesthetic design process of an artifact for ASMR-inspired relaxation?

1.2 Structure of the Thesis

Section 2 provides theoretical background on the impact of ASMR on stress-relief and relaxation, covering research on both physiological and psychological effects. Previous HCI research projects on ASMR and physical interactions for relaxation are reviewed, and the concepts of somaesthetics and Soma design are explained. In Section 3, the methodology of the project is explained, including somaesthetic sensitivity training and ASMR exploration, first-person material exploration, and workshops. Section 4 covers the results of the exploration phases, the workshop, data analysis, and the development of the artifact The Rice Walker which lead to the experiential qualities defined by this project. Section 5 contains the discussion of the findings from the project. Finally, Section 6 provides a conclusion of the work and results.

2 BACKGROUND

This section will cover the previous research on ASMR, how ASMR has been addressed within HCI, and the field of somaesthetics.

2.1 ASMR and Relaxation

Recent research suggests experiencing ASMR may be connected to sensitivity to other sensory experiences. One study suggests that individuals who experience ASMR have heightened sensory sensitivity [39]. Those who experienced ASMR were more likely to have higher levels of interoceptive awareness (the awareness of sensations from inside the body, such as heartbeat, respiration, or satiety [41]), and were more likely to be classified as a Highly Sensitive Person than control subjects who did not experience ASMR. Experiencing ASMR has also been linked to higher levels of sensory suggestibility, the ability to experience sensory events which are not there from suggestion, such as feeling the heat from a lamp when it is suggested that they should experience it, even though physically there is no heat [28].

Many accounts from individuals reflect feelings of relaxation or improved mental health when engaging with ASMR inducing media. Due to the individual nature of ASMR, these effects could be dismissed as anecdotal, however, more recent studies on the subject provide support for these claims. In 2017, Poerio et al performed two studies aiming to find empirical evidence of ASMR's impact on affect and physiology [40]. Regarding affect, the results showed consumption of ASMR media caused significant reductions in feelings of experienced stress and sadness, and increases in excitement, and calmness. These results were only present in those who reported experiencing ASMR and could not be seen in those who reported not being able to experience it. The study on physiological effects used skin conductance³ and heart rate, which were both hypothesized to be decreased as an effect of relaxation. The heart rate did indeed lower in those experiencing

³Skin conductance is a measure for the presence of hydration, in this case sweat, on the skin. This measurement is connected to a persons arousal levels[30].

ASMR when watching a video made to induce it, indicating relaxation, but the skin conductance increased. The authors argue this could indicate that the ASMR experience is a complex emotional state, in which several emotional responses can be induced simultaneously. Sakurai and colleagues on the other hand found support for the relaxing effects of ASMR even in cases where the participants did not experience tingles [43]. This study used fMRI to compare the effect of ASMR audio and classical music on brain activation. They found that even though both ASMR and classical music gave similar activation in the brain, the activation was stronger in the medial prefrontal cortex when listening to ASMR sounds. Since this area is connected to stress reduction and relaxation, these results could indicate that ASMR is more relaxing than listening to classical music even in the absence of tingles. ASMR could also be relevant in the alleviation of symptoms of depression, as shown by Smejka and Wiggs [46]. In this study participants who experienced ASMR reported significantly better mood after watching an ASMR triggering video, an effect which was not found in those who did not experience ASMR.

Fredborg and colleagues carried out a study on the physiological effects of ASMR using EEG to measure brain activity in people when exposed to ASMR triggers [16]. Those who reported experiencing ASMR had increased alpha brain wave activity, a brain activation pattern also reported during meditation [31], when ASMR was triggered from the stimuli. The authors point out that since the brain waves of those who are in a meditative state have similarities to the found patterns, ASMR could be putting the person in a similar state as meditation does. Similar results were seen in a study by Ohta and Inagaki focused on the stress-reducing potential of ASMR [37]. Participants in this study would solve a maze either in silence or while listening to ASMR sounds, while having their brain waves measured with EEG. The results showed a reduction in alpha wave activity during the task when performed in silence compared to the resting case, however, the introduction of ASMR during the task brought the alpha activity up to levels similar to when the participants were resting. Low alpha wave activity in the brain is connected to stress, which means this finding supports the notion that ASMR can be used to reduce mental stress.

Ahn found that the sound of stepping on fallen leaves, a sound similar to ASMR sounds with evenly distributed frequencies and a mix of strong and weak sounds, produced a decrease in blood pressure and a normalization of heart rate to a healthy level [7]. Brain waves indicating relaxation have also been connected to the similar sound of stepping on fresh snow [52]. Smith and colleagues performed a study with an fMRI to examine how different ASMR triggers affect different brain regions [48]. Participants who experienced ASMR were subjected to different stimuli with differing triggers in them and would indicate to the researchers during which triggers they experienced ASMR. The results showed a connection between which triggers people react to and which parts of their brains had higher levels of activity. This means there could be a neurobiological reason for why different people have different triggers, however, it is not possible to prove causality from this study alone.

2.2 ASMR in HCI

ASMR saw a rise in popularity far ahead of any scientific studies on the subject were released. Media pieces designed to induce ASMR have become very popular. Poerio describes the rise of ASMR in her 2016 compendium chapter “Could Insomnia Be Relieved with a YouTube Video? The Relaxation and Calm of ASMR” as a phenomenon that has been described in earlier literature, but is fairly recent on the internet [38]. The appearance of ASMR on the internet started in the late 2000s, with the first forum posts describing and naming it in 2007, and the first video uploaded on YouTube in 2009. Media caught the attention of ASMR soon after, with the first articles being released in 2012, with the first scientific exploratory studies being released in 2015. Today, many people consume ASMR videos on platforms such as YouTube regularly, where the most popular ASMR media creators have followings in the tens of millions [5, 6].

ASMR in HCI is not a highly explored research area, but a few design projects have touched on the concepts. A research project by Klefker and colleagues resulted in the development of two wearables, The Listening Jacket and The Chanting Cloak [29]. Both garments were designed to give a sense of enchantment with the sounds around them, by letting the wearer pay attention to small otherwise easily-overlooked sounds around them. Thus, the garments function as a filter between user and environment, enhancing some stimuli and diminishing others. The garments were designed using insights from ASMR, but it was found that they contributed with a meditative soundscape. The researchers also experienced a lasting effect in their attention to sounds in familiar environments even when taking the garments off. Smith and Snider explored how the embodied experience of tingles can be brought on by computer-mediated communications(CMC) [47]. They do this by testing various online spaces for ASMR, including YouTube videos and forums. Smith and Snider argue that CMC provides a safe space to express emotions, as it is anonymous and the lack of face-to-face interactions means there is no pressure for the viewer to interact with the person on the other end, even when they are seemingly paying close attention to you (see Figure 1). ASMR media also often allow for feelings of intimacy, as it heavily features sounds and visuals which require physical closeness, such as whispering or face-touching. They also defend the value of ASMR as a tool for sleep or relaxation, categorizing it as an affective experience (an experience relating to mood or feelings) that does not require empirical studies to be “legitimized”.



Fig. 1. Screenshot from a YouTube video by Jocie B ASMR titled "ASMR Friend Does Your Skincare Fast & Aggressive (Layered Sounds)" (*cropped*). This video includes many of the elements of personal attention ASMR, including face-touching, close whispering, and looking into the camera to mimic eye-contact. The video can be found through the following link: https://www.youtube.com/watch?v=xS4ag58uBos&t=452s&ab_channel=JocieBASMR.

2.3 Somaesthetics and the Body in HCI

Somaesthetics is an interdisciplinary field defined by Richard Shusterman [45]. Somaesthetics rejects the body-mind dichotomy and the critique of the senses as a source of knowledge, common in especially Western philosophy, and instead

views the body as a tool through which the world is understood. As Shusterman writes in "Somaesthetics: A Disciplinary Proposal": "knowledge of the world is improved not by denying our bodily senses but by perfecting them."^[45] In the fields of HCI and design, ideas similar to, or derived from, somaesthetics can be found in several schools of thought. Embodied interaction design relies on the belief that body movement and spatial skills play an important role in HCI, as they aid in communication and cognition. Embodiment claims that in order to gain knowledge it is necessary to use the body, therefore the idea of a disembodied mind capable of perceiving the world without the use of the body is rejected [32]. Ranten provides the same criticism of the cartesian mind-body separation in their description of bodily interactions [42]. She argues that when we touch something we are "touched back", and the things we use and their meaning are changed through our bodies when interacting with them. Because of this, the designer's body will affect the design process, and the interaction will in turn change the body. Ranten relates this to the concept of corporeal dynamics, defined by phenomenologist Hermann Schmitz, a way of viewing the bodies as expanding or contracting based on experienced emotions. Based on these insights, Ranten proposes the design method "phenomenological research through design", including four methodological aspects: prototyping with the body, touch and touchback, social interrelation, and drifting.

2.3.1 Soma Design. Soma design is a design approach based on the principle of somaesthetics [23]. Soma design aims to use a deepened understanding of our bodies' experiences from a first-person experienced perspective in order to further the design work, an approach that is suitable for the investigation of a felt experience such as relaxation. Somaesthetic design emphasizes the importance of somaesthetic sensitivity, the ability to have deeper bodily awareness. This can be achieved through several different methods, such as Feldenkrais exercises, meditation, yoga, dancing etc. By performing these activities, the designers will be better equipped for understanding the experiences derived from interactions, leading to designs better suited for our bodies. Since soma design is focused on the individual felt experience, it can be problematic to find a way to articulate the findings in a way that is understandable when shared with others. Several approaches have been used to try to achieve this articulation, including body maps, written journals [19], and soma trajectories [51]. One way to articulate the knowledge gained in a soma design project is through experiential qualities. Experiential qualities belong to a category of knowledge articulation sometimes referred to as "intermediate-level knowledge", describing scientific knowledge that is more generalized than singular instances but not as general as theories [22]. They can be used to evaluate an interaction or experience on a certain aspect. Projects on somaesthetic design tend to produce knowledge in this grey area, and previous soma design projects have thus generated many experiential qualities. For example, The Soma Mat and The Breathing Lights, Höök and colleagues attempt to hone in on the quality of Turning Inwards [23], describing the ability for an interaction to turn the user's attention in to their own body, allowing them to engage with their bodily awareness/soma. In another project Windlin and colleagues engage in bodily practices for a long period of time, and through this identify several experiential qualities, for example Feeling Connected, Feeling Embraced, and Being in Correspondence [56]. These qualities are used to design the Soma Bits, a toolkit for ideation in soma design projects. In her soma design exploration leading to The Breathing Wings, Tsaknaki also identifies several experiential qualities, in this case, all surrounding the element of touch [53]. These qualities are selected based on their exploration of the sensations of wearing wings, and how they affect their body. All these projects show how experiential qualities can be used to articulate knowledge on more abstract concepts.

Several other design projects have used principles of somaesthetics to design interactive systems. In the interactive art installation soft(n) by Schiphorst, somaesthetics is used to design a system where the user engages with *active touch*, a touch which can provide heightened interoception [44]. The installation consists of 10 soft objects, which utilize conductive fabric and wires to react to different types of touch with sounds, light, and vibrations. The Breathing Garment, a wearable artifact

developed by Jung and colleagues, is designed to support the user in gaining bodily awareness through their breathing [26]. The Breathing Garment is a vest equipped with pneumatic pads which inflate and deflate, supporting the wearer to follow certain breathing patterns through deep touch pressure. Another example of somaesthetics in HCI are the artifacts Ambient Walk and Hearing the Hidden by Chen [10]. The Ambient Walk is a mobile application, designed for meditative walking. It visualizes and sonifies walking by monitoring the user's breathing, recorded by holding the microphone to your face. Hearing the Hidden is a device that allows the user to perceive their surroundings with echolocation. It consists of a hat with sensors, that measure the distance to surrounding objects and displays a rendering of the distance to the closest object on a mobile screen, while presenting the user with echolocation queues in headphones. These artifacts were developed with the purpose of creating affective experiences in everyday activities, and heightening the user's somaesthetic experiences by allowing them to perceive the distance to objects around them with movements of their bodies.

3 METHOD

This project followed an autobiographical [36] Research through Design (RtD) process [57], guided by the somaesthetic design approach. I aimed to make use of the affective experiences of ASMR rather than pursuit empirical "evidence". I will, similarly to Klefker and colleagues[29], use ASMR as a source of insights. However, I aim to extract the more specific elements of ASMR which aid in relaxation so that they can be studied in isolation, and bring more light upon the affective, relaxing experience of ASMR.

To deepen my understanding of somaesthetics, and ensure the techniques best suitable for myself were used, an initial trial period was used to explore options in somaesthetic sensitivity training and articulations of findings. For somaesthetic sensitivity training the methods of hatha yoga, guided meditations, body scan meditations, and walking meditations were tried. Out of these methods, walking meditation was the method that was deemed to be the most efficient for me at providing the deepest understanding of my body, so it was chosen as the main method of training my somaesthetic sensitivity. In order to train my somaesthetic sensitivity to the highest degree possible in the relatively short time period of this thesis project, I also paid close attention to the bodily experiences when engaging in physical activities such as weight lifting and dance classes. Articulation of findings was done with a combination of a written journal [19] and body maps [11]. Body maps are a method to show how an activity or interaction changes the felt experience of the user's body. It consists of simplified outlines of bodies, on which the user can draw or write to articulate bodily experiences or emotions. These methods were chosen as they proved to be most efficient for me, allowing expression of bodily experiences which are difficult to articulate in words with body maps, and articulation of more complex emotions/ideas with written journal entries.

The project started with an exploration phase, including somaesthetic sensitivity training period, and an ASMR exploration where known triggers and media eliciting ASMR were investigated. It also included a first-person material exploration of materials and interactions designed with the ASMR investigation in mind. As the final phase of the exploration phase, a workshop was held with fellow interaction designer Anna Gustavsson to try out the interactions and ideas gathered from the previous exploration. The findings from these first stages were then analyzed, producing a set of experiential qualities relevant to relaxation in HCI. Out of these qualities, the most promising ones were selected for continued work in the development of the artifact The Rice Walker. The artifact was used and evaluated by me for a period of two weeks, after which the qualities were properly defined. A chart showing the main phases of the project can be seen in Figure 2.

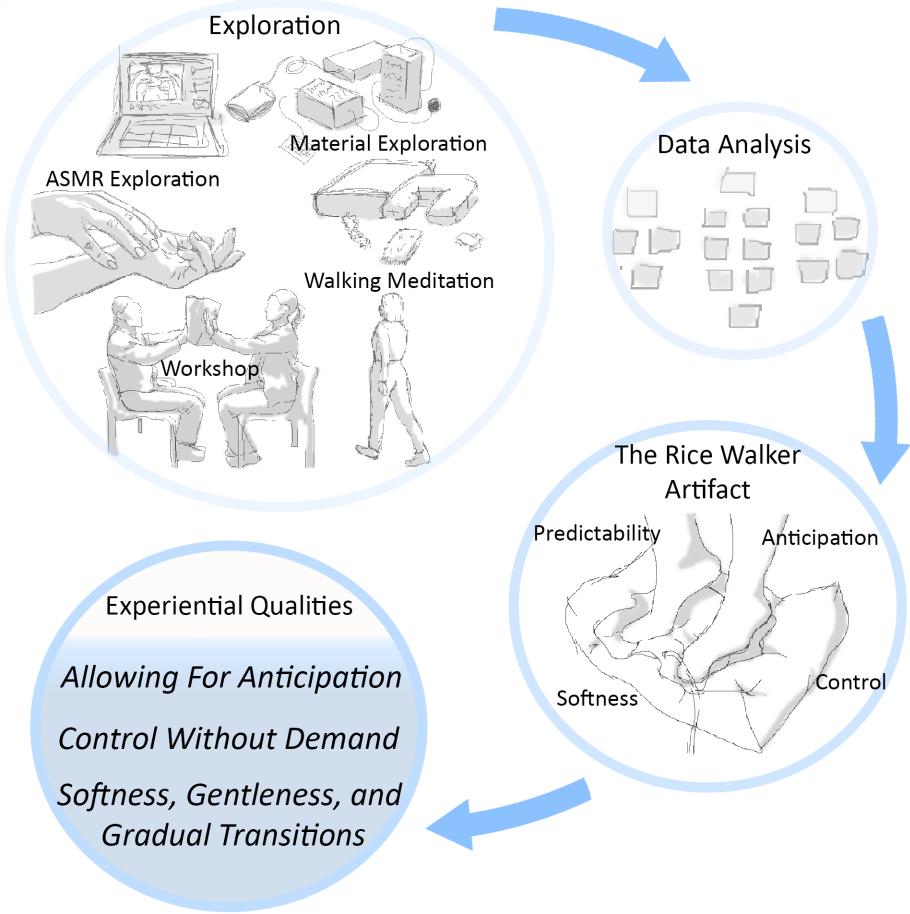


Fig. 2. The main phases of the project.

3.1 Raising Bodily Awareness and ASMR Exploration

Since I had used ASMR for many years, I already had a good understanding of which experiences trigger ASMR and/or relaxation for me. During the first week of the design process, media and triggers I already knew made me experience ASMR were investigated deeply. Therefore the sessions were focused mainly on which exact sensations were involved in these triggers. For the purpose of this project, I chose to focus only on experiences that were relaxing in nature, omitting tingle-inducing stimuli which I did not experience as being relaxing. After a session of walking meditation (on two of the five occasions exchanged for pre-recorded body scan meditations due to illness), I explored ASMR through YouTube videos and ASMR-inducing experiences such as gently touching the skin and brushing my hair. These sessions lasted approx. 90min once per day for the five workdays of the first week. I documented my findings using a written journal and body sheets. The articulation method of soma trajectories [51] was also tested during this phase, however, body sheets accompanied by a written journal were elected as methods, since I found body sheets were easier for me to work with in terms of expressing my bodily experiences. During this process I introduced estrangement, a method of disrupting a

familiar/well-known interaction or event in order to understand it better [55]. During the ASMR Exploration, I engaged in "Re-contextualization", by consuming ASMR media in different spatial or temporal settings than usual. For example, I listened to ASMR audio while: commuting; lifting weights; eating; just as I had woken up; and out in nature. I visited a grocery store and a department store and searched for elements or experiences which elicited ASMR or relaxation. This phase provided me with the insights about my experience of ASMR necessary to continue my work by engaging in materials and interactions.

3.2 First person material exploration

I started my first-person material exploration by reviewing findings from the ASMR exploration phase. Stimuli which triggered ASMR were mimicked with the available materials placed on and around the body to make it imitate the way a specific stimuli or event felt, e.g. a specific touch, or combination of a visual and sound. Other scenarios described in literature, internet forums, and discussions with others were also tried, such as the sensation of walking on soft snow or fallen leaves. I started this process using low-fi materials, such as fabrics, plastics, woods, beads, and various different items with various shapes and textures, sourced from my home and the university lab. Many different sounds, visuals, and tactile sensations could be produced with these materials alone. I engaged with the Soma Bits [56] (see left-hand image in Figure 3), a prototyping toolkit designed for soma design processes consisting of actuators for vibration, pneumatics, and heat, in the early stages of this material exploration. By combining the Soma Bits and the other materials, a wide array of sensations could be produced. The estrangement strategy of "Changing bodily sensations through artifacts" [55] was used in this phase. These artifacts were used to change bodily sensations through sensory deprivation, such as blindfolds or noise-canceling headphones, and through the application of vibrations and heat to the hands and fingers when touching something. By continuously changing the materials and the sounds, I could explore different interactions in an iterative way. When I found an interaction of interest, I wrote it down for further research during the following workshop. Some findings resulted in the production of small, simple artifacts which were later included in a workshop, described in the next section.

3.3 Workshop

In order to further deepen the understanding of how the different interactions affect relaxation, and to gain a new perspective on previously identified experiences and interactions, a workshop was held together with Anna Gustavsson, another interaction designer. This workshop lasted for approx. 2 hours.

3.3.1 Materials. During the workshop, several elements from previously discovered interactions of interest were tested. The materials used included the Soma bits, different texture elements e.g. fur and soft memory foam pillows, and items selected for their specific sounds such as pads filled with plastic and paper or wooden beads. One item, the finger puppet, was constructed from loops consisting of beads and string. By placing it around the fingers, it allows one's fingers to be controlled by someone else, introducing an element of estrangement through "Changing bodily sensations through artifacts". This artifact, and the other items included, were included in the workshop as tools for exploration. They were chosen or designed as they were versatile and could provide many different experiences or be used for many types of interactions. They were not intended to function as prototypes in isolation, but rather as puzzle pieces to be combined into novel experiences. Due to difficulty in obtaining the parts required for the pneumatics to run, they were not included in this workshop. Two of the developed pads were used without pneumatics, the crinkle pad and the wooden bead pad. These could give both physical and auditory sensations without pneumatics.

3.3.2 Procedure. Before the workshop started, the goal of the project was discussed and a consent form was filled in. The workshop was recorded with written notes, filming, and taking pictures. The workshop started with an open discussion of ASMR, including if the participating designer had ever experienced it and what it meant to her. After this, a somaesthetic sensitivity exercise in the form of a 15-minute guided body scan meditation was used to raise our bodily awareness [1]. The guided body scan meditation was done using an instructional video from YouTube which I had used once in my bodily awareness sensitivity stage, elected for its clarity and duration. Experienced body sheets were filled in before and after the meditation session, both in order to engage with our somas and for the participating designer to be able to practice their use. When this was done, the exploration of the materials began. The other designer was introduced to the materials available. As a starting point for the exploration, I had prepared a few simple interactions to try with the items, based on the findings from the ASMR exploration and first-person material exploration. These were elected as I judged them to be good starting points for wide explorations, where there were many different possible directions to go. From this, different variations of the interactions were tried based on both mine and the participant's reactions and comments to different experiences. Written notes and photographs were taken continuously throughout the workshop for the purpose of documentation. At the end of the workshop, a discussion of the workshop in general was held before filling in the last body sheet. Finally, the body sheet was discussed, which concluded the workshop.

3.4 Data Analysis

The written notes, recordings, and photographs from the ASMR exploration, first-person material exploration, and workshop were analyzed together using Affinity Diagrams. Affinity diagrams are a method of processing a large number of findings in order to discover overarching themes [20]. This method was chosen as it can be used to find connections between different findings that would otherwise be difficult to see. Findings, formulated into short sentences or taken as quotes from the notes, were written down on sticky notes and placed on the floor. The affinity diagramming used the method described by Dam and Siang of The Interaction Design Foundation [13]. If a note fit into several groups, the best fit was selected based on the correspondence to the other notes in the groups. Out of the themes identified, the themes with the most promise were selected and used to design an artifact.

3.5 Design and Evaluation of Artifact

The selected themes from the data analysis were used to design the artifact The Rice Walker. Developing an artifact provided a method for evaluating the selected themes' effect on relaxation, and exploring whether the themes could be used in an evaluative way, a requirement for an experiential quality. I interacted with this prototype for 12 days over two weeks, with a two-day break between days 7 and 8. Since I wanted to evaluate the relaxing properties, I used it during the evening just before going to sleep, when I would normally feel the most need to relax. I decided to use written notes to record my findings. I found that it was the best way for me to describe my bodily experiences in a way that was easy to decipher, and since I was the only one who needed to easily understand my own recordings, I chose to work with exclusively a written journal. I wrote down my experiences after the interaction, and I gave myself the opportunity to add to the notes in the morning after waking up. I decided to record both right after use and the day after in order to catch how the interaction made me feel when going to sleep, and if it had a lasting impact on my sense of stress or relaxation. After the two-week use period, I analyzed the data through a deductive thematic analysis [9]. I focused the analysis on the aspects of relaxation in relation to the groups selected in the previous stage, and coded the text based on points made in regards to these four groups. The findings from the use of The Rice Walker formed the experiential qualities.

4 RESULTS

This section presents the findings from the different stages of this study, and the result of the design process for the prototype.

4.1 Raising bodily awareness and ASMR exploration

During the first-person material exploration I initially identified stimuli that elicit ASMR for me, based on the ASMR media I typically use and events I have had in the past. The stimuli I identified in this phase can be found in Table 1. When analyzing the ASMR media I consume, I found there was a slight difference between media that felt tingly and media which felt relaxing. There was a big overlap between the two categories, but I found examples of stimuli that gave tingles without being relaxing, such as the sound of dry textures touching. For the remainder of the project, I decided to focus only on the ASMR-inducing stimuli which I found relaxing.

Walking on uneven surfaces	Pressing down on clay	Drinking warm drinks	Heat on the face and hands
Rhythmic sounds e.g. tapping and walking	Repeating sound patterns	Petting an animal	Hair brushing
Gently tracing skin with nails	Tracing on the back	Soft spoken voice	Following instructions
Being asked specific questions	Stepping on something crunchy	Liquids splashing	Handling small objects e.g. threading a bead

Table 1. ASMR inducing experiences/stimuli.

4.2 First person material exploration

As a starting point for the material exploration, I imitated the stimuli from Table 1 that I had previously identified. While mimicking these stimuli with the materials at hand, I identified many attributes of these interactions which could be of interest. Events and stimuli perceived as relaxing were isolated and combined to continue the exploration. Finally, I compiled the experiences/stimuli which were the most promising and used them to construct interaction pieces for the workshop.

4.2.1 Heat pads: I applied the Soma bit heat actuator to different parts of the body, or by performing different actions such as rolling or leaning on it. I discovered that applying the pad to the face when cold felt relaxing, and it did not feel uncomfortable until the highest setting was applied for several seconds. However, as I placed the pad in front of my face while inhaling, I felt the smell of burning plastic which completely negated the relaxation of the experience. During the experimentation with the heat pad, I also noticed a sense of discomfort whenever I placed the pad in such a way that I could not control how it touched me. For example, laying down on the pad with the heat level controller out of reach or walking on a pillow with the pad under the sole of the foot made it possible for me to somewhat control the amount of heat I felt by moving my body or lifting my foot, but it felt intrusive to not have complete control of the heat. Having the heat pad on the back was also experienced as being more intense and burning than placing it on the front of the body. Placing the pad asymmetrically in relation to the spine, such as on one side of the ribs, made the heat feel more attention-grabbing than when placed symmetrically. For example, placing the pad on the middle of the abdomen felt like a soft heat slowly radiating through the midriff, but placing it under one shoulder felt like a sharp heat, which drew the attention to sensations around that shoulder only. There was also a big difference in how heat fluctuations were interpreted based on where on the



Fig. 3. Some of the materials from the first-person exploration. Pictured is The Soma Bits (left), wooden beads, a piece of fur, wooden pieces, and a felted pot holder(right).

body they happened. Holding the heat pad in one hand and changing the temperature did not feel out of the ordinary, but doing the same thing when holding the pad to the underside of the foot felt strange. It was difficult to interpret the change in temperature on the feet, which made it feel "wet" instead of hot/cold during a fast temperature change.

4.2.2 Pneumatics: The pneumatic actuator could give many different sensations based on where it was placed. When placed under a soft pillow, it gave the sensation of something breathing. When placed under the body directly in an asymmetric position, such as under one shoulder or one hip, it gave a sensation of rolling waves. This was relatively relaxing, however, it was difficult to control the inflation and deflation for the right rhythm and level of inflation. When placed under the body in a symmetric fashion, such as under the lumbar spine or neck, it felt like a breathing motion. I found it difficult to relax with the breathing motions, especially when the pad was placed on the chest or midriff of the body, as I had a hard time focusing on my own breath when feeling it so close to my lungs.

4.2.3 Vibration actuator: Vibrations resulted in very aggressively attention-grabbing stimuli. It was difficult to feel other sensations such as heat while also having vibrations present. The sensation was less distracting when applied indirectly, such as applying the vibrating element to an inflated pillow. They were, however, not very relaxing even when indirect as the sensation was simply too strong. When applied to other areas, such as the back of the head, the sensation was more pleasant and relaxing. The use of vibration on the head and neck was deemed to be worthy of investigating further. Vibrations were also used for their sounds. When held close to the ears, they produce a droning humming sound, with a rhythm and frequency depending on the vibration pattern. They were also applied to an inflatable travel pillow, and when the pillow was held to the ear an interesting musical sound could be heard, akin to that of a loud bass drum heard from a distance. The use of the vibrating actuators on the fingers made the sensation of touch weaker. However, feeling items with the fingers after they were exposed to vibrations made everything feel more soft and velvety than before.

4.2.4 Wood pieces: In the collection of items used for the material exploration was an assortment of thin wood pieces, taken from samples of wooden blinds, pictured in Figure 3. I used these extensively in the exploration, both for the various sounds they could produce and for the different types of touch they gave. The wooden pieces had a delicate wood-grain

texture which differed between the pieces, and touching the pieces while feeling for the grain was a relaxing experience. This related to one of my relaxing experiences being that of touching small items, and the addition of the sounds of the skin on the wood made the feeling stronger. Using the blindfold while handling the wooden pieces increased the sensations both of touch and sounds. When using both a blindfold and noise canceling headphones, even more attention was brought on to the tactile sensations. Scratching the wood like this induced ASMR, but also felt like a sensation I was very unaccustomed to. It was possible to feel the vibrations in the fingertips as the nails ran over the wood grain, and not hearing the expected sound was strange. But being blindfolded and unable to hear well was an uneasy experience when done for a longer period of time.

4.2.5 Memory foam pillow: I sewed a memory foam pillow, approx 30*40*10cm, which could be used to sit, walk, or lay down on. The memory foam had a certain weight to it, making it possible to use it also on top of the body for producing light weighted sensations, or to cushion other stimuli. The foam retained its shape for several seconds, which meant walking on it felt similar to stepping on snow, as it would remain compressed even when lifting one foot. Stepping on the pillow felt relaxing, as it took pressure off from some parts of the feet, but also gave a feeling of instability, increased by lifting one foot since the texture made it difficult to balance. When the pillow was combined with the pneumatic pad by placing the pad under the pillow it produced a sensation of a breathing person or animal. This was partially relaxing but also felt uncanny, especially with the sounds of the air pump.

4.2.6 Other: Included in the materials was a potholder comprised of sewn together felted balls, pictured in the bottom right of Figure 3. When touched with the hands they feel soft, however, when stepped on or placed under the body they feel more like hard pebbles. Laying the body or stepping on the potholder provided a relaxing sensation, akin to a massage or walking on a pebble beach. A piece of fur, also pictured in Figure 3, provided relaxing sensations when stroked, both the feel and sounds were comfortable and calming. The sound when held close to the ear was similar to that of the ocean, which seems to be a common sound in relaxation audio. One interaction, in particular, of digging the fingers into the fur gently, was relaxing. When the piece of fur was placed on the thigh with the heat pad under it, the heat felt more intense/noticeable when the fur on top was stroked. When the heating pad was instead placed on the upper chest, it was possible to control the heat so it felt as if stroking the fur generated heat. This produced relaxation and was deemed interesting enough to try for the workshops. The fur was also combined with the vibrating actuator. It was expected that placing the vibrating element under the fur would mimic a purring cat, however, it was perceived more like a feared trembling. It was possible to feel the vibrations even when just lightly touching the fur, but it did not feel particularly relaxing as the fur was too soft, resulting in the uncanny sensation that the air was trembling or moving.

4.2.7 Compiling the Experiences. Engaging with the materials was a time-consuming task, and it was at time emotionally taxing. However, I felt that the moments of relaxation when finding an element/activity that felt relaxing to engage with replenished some of the energy invested. Over time, I felt that I got better at gauging how an experience would feel, and which would be the best choices to improve on a stimuli/an idea, and the iterative work-flow made the work highly productive considering the relatively short time invested.

I used the compiled experiences/stimuli from the first-person material exploration to form ideas for potential interactions and materials to try more extensively during the workshops. The interaction ideas, together with the material exploration activities which spawned them, can be seen in Table 2.

Activity/Material	Experience/stimuli inspiration
A pneumatic pillow filled with wooden beads	Laying on memory foam pillow with pneumatic underneath, holding and handling a felt ball potholder, walking on uneven surfaces
A pneumatic pillow filled with crinkly plastics and paper	Walking on leaves
Resting/moving your head on the travel neck pillow with added vibrations	Resting head on neck pillow, vibration actuator on the back of the head
A piece of fur that when stroked/touched heats up a heating pad	Fur stroking, controlled heat
The finger puppet and the arm puppet	Tapping, following instructions

Table 2. Activities and materials prepared for the workshop.

4.3 Workshop

The ASMR exploration and the first person material exploration lead to the preparation of eight activities that were tried during the workshop. The workshop started with an informal discussion about ASMR, where the other designer explained that she was unsure of whether she could experience ASMR, but that the times she has consumed ASMR media she had found it unpleasant. The videos she had watched contained very close-up microphone whispering, and she describes the sensation of a close whispering as invading her personal sphere. "It feels like they are so close to me," she says, "it is like they are inside my personal sphere, talking to me even though I do not want them to". However, she explained that watching certain visuals, such as clay being pushed through molds, made her feel very relaxed. After this, the workshop activities began, and following is a description of the results from these activities.

4.3.1 Finger puppet: The finger puppet consists of five pieces of string, with wooden beads tied into a loop at each end. By placing the fingers in the loops, it is possible to guide someone else's fingers, or the fingers on your other hand. A picture can be seen in Figure 4. It was described as relaxing to have someone control your fingers. However, the amount of control was important, as it was still possible to resist the force or move. There was a level of uncertainty in the beginning, but when the same thing was happening repeatedly they got used to it and felt they could relax more. When a wooden piece was held under the fingertips, she described it as "not being ready for (it) but it did not feel bad or uncomfortable". She described feeling more aware of the material the fingertips were touching than when she was touching it previously, but was unsure why that was. Controlling someone else's fingers with the finger puppet took some getting used to, and initially, I hesitated to move the fingers too quickly or too much as I did not want to cause pain. It also felt quite different depending on the way the fingers were connected. When each finger connected to the other person's fingers in a mirrored way, i.e. the index finger was connected to the index finger etc., it felt much more natural and intuitive (as seen in Figure 4). Controlling the other hand like this did not require as much conscious thought. Controlling the fingers in an inverted way, so that the index finger controlled the ring finger etc. required much more concentration and conscious effort. It also gave a awareness of the movements of the fingers, that made the sound of the beads hitting the wood be perceived as more relaxing. However, the uncertainty of how much I could move the other person's fingers without causing discomfort was stressful. The finger puppet was expanded with the use of the arm puppet, a textile band tied in a loop, holding up the arm at the elbow. This was described as a hammock-like feeling. It reminded her of a rope bridge on a playground, and she felt relaxed. This feeling was described as more relaxing, but she was not sure if this was because simply the muscles in the arm were more relaxed. Afterward, she explained she hesitated to place the full weight of her arm on the loop, as she had difficulty gauging how heavy it would be for me to carry with my arm. A difference in how the finger puppet versus the arm puppet felt was described as follows: "The fingers feel like small, tapping movements, like softly walking with your

fingers. A tip-tap light feeling. The arm felt darker and slower". The hammock-like feeling described with the arm puppet lead to the idea of trying the finger puppet with the arm resting on a pillow. This was described as a weightless feeling, like what she imagines walking on the moon is like. When a wood piece was held under the fingers, it was described as a different feeling from the previous time, both in touch and sound. When the fingertips instead touched the heat pad, it was described as "lovely", and that it would be even better if the whole arm was heated. This felt more comforting than other finger puppet tries, even though she was not sure if it was because of the heat or the fact that she was getting used to having her fingers controlled.



Fig. 4. Two workshop activities. Left: Using the finger puppet with three fingers. Right: Petting the piece of fur with a heat pad attached to the stomach.

4.3.2 Heat on stomach while petting fur: The participating designer sat on a chair, with the heat pad tied to her stomach and the memory foam pillow in her lap. A piece of fur was placed on the pillow, and she was instructed to touch it while I stood behind turning the heat on and off a few times over the course of a couple of minutes. The interaction can be seen in Figure 4. It was hard to focus on the heat, she noted, the sensation of petting the fur took more attention. However, when catching a smell of the "straightening iron" (hot plastic) smell it grabbed the attention immediately to the heat pad. The fur was lovely to touch, the activity of petting the fur reminded her of sitting on the couch in a conversation with someone and finding herself stroking or playing with a pillow while focusing on the conversation.

4.3.3 Heat on stomach while kneading memory foam: As a variation from the previous activity, we replaced the fur piece with the memory foam pillow. The participant was asked to knead or squeeze down on the memory foam pillow while the heat was given in the same way. This time, more awareness was placed on the heat. It felt like she was moving her body more, like some form of exercising, which made more sense combined with the heat or getting warm. The structure of the memory foam pillow was nice (uneven pieces of memory foam of different firmness combined with pillow stuffing). She did not notice the texture earlier when it was laying on her lap. It was likened to an oversized stress ball.

4.3.4 Travel pillow and vibrating bit: An inflatable travel pillow was placed on the neck, and the vibrating bit was held to the pillow or in the air behind the head. When the vibrating bit was applied to the neck pillow, it reminded her of a massage pistol, which she found to be relaxing. However, when placing the ear on the pillow, the sound of the vibration was unpleasant. It reminded her of binaural/3D hairdresser videos⁴ (videos of e.g. cutting with a hair trimmer), and the discomfort seemed to spring from a sound too close to the head that was out of her control. The sound of the vibrating bit in the air reminded her of a fly or mosquito, "something you want to get rid of" when the sound came close.



Fig. 5. Pressing on to the memory foam pillow while being held between our hands.

4.3.5 Kneading memory foam pillow between us: We continued with the memory foam pillow, and instead of having it placed in the lap it was held between us using both of our hands and kneaded, as can be seen in Figure 5. I started to slowly move the pillow, and she followed. When the other designer was asked to knead it yet again, she noted it was difficult. When placed in the knee she knew there would be resistance when pressing down. She did not like when the hand pressing down had no resistance to press against, which happened sometimes when the pillow moved so her hand was not behind mine. She said she liked that the pillow followed her movements, which was how she interpreted it, as long as there was resistance for her to press against. With this in mind, we tried again but using my laptop held behind the pillow as support. This was better, it felt more predictable, and was more of a positive experience overall. It was likened to a floating stress ball. She was not sure if she was habituated, but this time it felt like she knew how much it was possible to press on the pillow. It was easier from my perspective when the laptop gave support, but it also meant I did not have any feedback on where the pressure was on the pillow. It made it more difficult to move the pillow in a fluid motion. It felt a bit stressful to have to think about the movements instead of just using the touch of the participant to guide it.

4.3.6 Kneading crinkle bag on memory foam pillow: We tried again to place the memory foam pillow on the lap, and placed the crinkly pad (the pneumatic pad filled with crinkly material) on it. When touching this, it felt like wearing

⁴Videos resembling hairdresser/barber visits, often including sounds of cutting or electric hair trimmers. An example of this is the audio track by Experiments with Binaural Audio titled "Hair Cut - Binaural 3D Audio - ASMR (use headphones)" https://www.youtube.com/watch?v=waYCrToYVn0&ab_channel=ExperimentswithBinauralAudio



Fig. 6. Holding the heat bit and a piece of wood behind the head.

ski pants/thermal trousers, or like wearing a thick layer of clothing outdoors when it is cold. This was a comfortable and comforting feeling.

4.3.7 Step on crinkle pad: Stepping on the crinkle pad when placed on the ground felt similar to stepping on bubble wrap while wearing shoes. It reminded the participant of stepping on egg cartons to compress them for recycling. It was nice, and felt like fun. Without shoes, it felt like walking on a rug, as it was warmer and softer than the floor. It was more relaxing and comfortable to place the foot on the pad which was soft and warm, than on the floor which was cold and hard. There was a clear preference for putting the foot on the pad.

4.3.8 Stepping on bead pad: Stepping on the wood bead pad felt like walking on rocks or pebbles. When she stepped on it first, it made a snapping sound, possibly from one of the beads cracking. This was unexpected and alarming enough for her to stop with one foot in the air staring at me with a questioning look, and she had to be reassured that it was not a problem even if the beads broke. When not wearing shoes, it felt nice to walk on the bead pad. It was described as feeling like an acupressure mat or getting acupressure treatment. It reminded the participant of getting zone therapy done on the feet when the beads would press into different places on the sole of the foot.

4.3.9 Crinkle pad behind head vs. in the lap: While seated, she was asked to hold the crinkle pad behind the head and squeeze/crinkle with it. She said it reminded her of hearing the wind from inside of a tent, like rainy windy weather outside, and it being cold in the tent. It was not a very pleasant sensation. When asked to put the pad back in the lap as earlier, it did not feel the same as it did when previously having the pad in the lap. The tent-feeling resided and she did not experience the thermal pant-feeling as much. She commented that she preferred it before she had tried it behind her back.

4.3.10 Heat and wooden piece held behind the head: She was given the heat bit pad and a wooden piece stacked beside each other to hold behind the head, so that her right hand was on the heat pad and the left was on the wooden piece, as seen in Figure 6. She said she was very aware of the asymmetry, and she could feel the heat spreading through only the

right-hand arm and side at first, eventually reaching the left side even though it did not really physically do so. When handed the pieces, one of her fingertips was reaching over the wooden piece, touching the heat pad. She instinctively moved that finger away from the heat pad, even though she was not instructed to do so or told that the left side was supposed to touch the wood only. She described it like she had an intuition or idea of how this activity "should" be/feel and acted on that without considering whether there was truly a wrong or right in that situation.

4.4 Data analysis

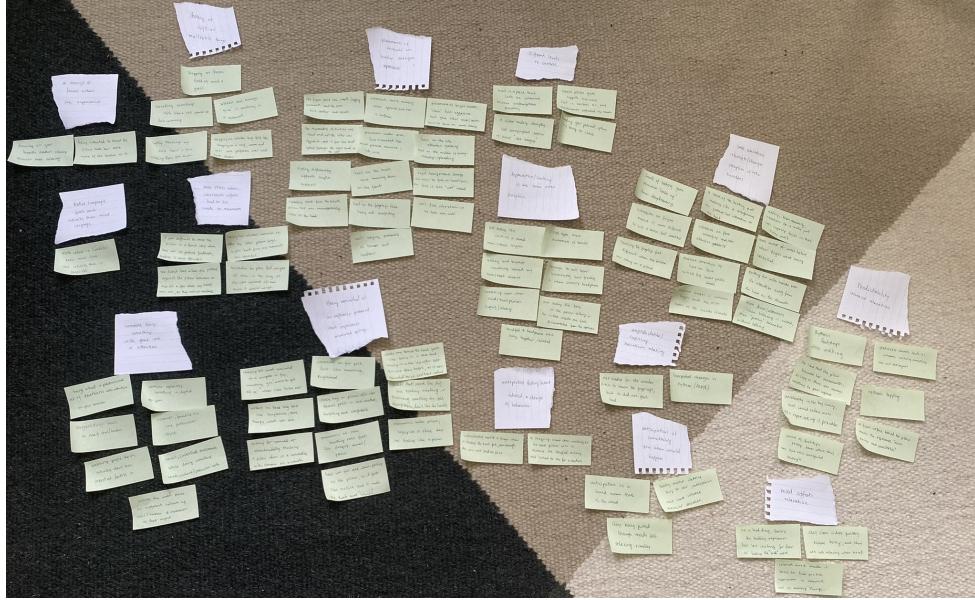


Fig. 7. The Affinity diagram after initial sorting into groups.

The affinity diagram produced in the data analysis can be seen in Figure 7. After the first sorting, 15 groups were formed. Each group was given a header, which can be found in Table 3 (partially edited for clarity). I decided to omit the groups with fewer than three notes in order to focus on the most common denominators found. Following is a short description of the 11 groups with three or more notes, and the findings they were based on. Each group was evaluated on the perceived impact on relaxation, whether further investigation was deemed necessary, and viability for examination within the scope of this project.

4.4.1 *Feelings of soft or malleable textures:* Five findings surrounded the experience of touching or being touched in either soft or malleable ways, e.g. the sensation of walking or placing your foot on something soft, having your hair touched softly, and being able to push on a surface and feeling it "give" or reshape itself. This group was chosen for continued work as an aspect of relaxation, due to the clear result being that soft and malleable were preferred, and it made a big difference to the perceived relaxation.

4.4.2 *More stress when conscious effort had to be made to movements:* The four findings leading to the formation of this group mention situations where there were less initial understanding of a movement and how your movements would affect other things/people. This could stem from a lack of feedback, which made it difficult to move without having

A change in focus alters the experience	Native language feels more intimate than second language	Feeling of soft or malleable textures
More stress when conscious effort had to be made to movements	Someone doing something with great care/attention is relaxing	Reminder of an experience produced feelings from said experience
Placement of stimuli on the body changes experience	Different levels of control	Deprivation/limitation of one sense alters perception
Unexpected feeling/event induced a change in behaviour	Anticipation of an event increases relaxation	An unpredictable/surprising sensation was relaxing
One sensation interrupts/changes perception of other sensations	Mood affects relaxation	Predictability increased relaxation

Table 3. Groups identified in the affinity diagram. Groups with three or more notes in bold.

to consciously think about the movements, hindering relaxation. Uncertainty about how a movement could negatively affect someone else also caused hesitation and lessened relaxation. This group was not elected for continued work. Even though it was deemed to have an impact on relaxation, the small number of findings in the group combined with the difficulty in further reviewing the fear of hurting someone within a project aimed at relaxing interactions for one person made me chose not to continue in this direction.

4.4.3 Someone doing something with great care/attention is relaxing: A fairly large group, consisting of 7 notes, addresses how care and attention can be relaxing. Many of these findings came from my preferences in ASMR media. These include, for example, sorting items into categories/neat rows, someone explaining or talking about a specific topic in great depth, being "asked" questions and the other party writing them down, or watching someone do an activity they are fully invested in. This group also includes notes of doing things with great care yourself, such as sorting something on a specific criterion, or doing some sort of precision work, requiring small and controlled movements. This group was not elected for continued work as this group contained very diverse findings which were somewhat loosely connected. Inclusion of great care/attention in a physical interaction was also deemed technologically challenging, and this in combination with the loose coherence of the group made it less suitable for a project with a relatively limited scope such as this one.

4.4.4 Reminder of an experience produced feelings from said experience: A large group relates to feelings about an experience coming from something the experience reminded you of. These experiences could result in either more or less relaxing interactions, or have an ambiguous effect. Relaxation could come from being reminded of wearing a comfortable article of clothing, or walking on something uneven feeling like acupressure therapy. Less relaxing experiences could come from a vibration in combination with fur feeling like a frightened animal, or the sound of the vibrating bit sounding like a mosquito. Some experiences which were more ambiguous are the feeling of pneumatics under a pillow feeling like a breathing person or animal, or the combination of heat and physical movement feeling more natural than just heat as the physical movement was more connected to the feeling of getting warm. This was not elected for continued work in this project, due to both the ambiguous effect on relaxation and the difficulty in controlling these experiences.

4.4.5 Placement of stimuli on the body changes experience: This was the largest group with 13 notes. One topic in this group is the experience of asymmetry versus symmetry for stimuli on the body, where asymmetrical stimuli were described as more attention-grabbing, and very apparent, whereas symmetry was more relaxing or natural-feeling. Heat on different body parts was also brought up, as heat on the back felt more burning than on the front of the body, and heat on the fingertips was very relaxing. It was difficult to feel changes in heat on the feet as compared to fingers or face, leading to a feeling of "wetness" both with sudden heat and sudden lack of heat on the soles of the foot. The placement of the

fingers when touching something was also apparent, with a "claw" shape to the fingers resulting in an aggressive feeling touch, but also more attention to the details picked up when scraping something with the nails. It also gave an awareness of the joints, tendons, and bones in the fingers. Having your fingers moved by the finger puppet versus the arm puppet showed a difference in experience, with the finger movements being described as "light" and "tapping", whereas the arm was "darker and slower". A possible overlap with the previous category (Reminder of an experience) was found when the pneumatic was held under the arm, pressed to the body. This specific placement lead to an experience similar to a blood pressure test, which was unpleasant and not relaxing. This was not elected for continued work, as the effect on relaxation was unclear and the subject of stimuli on specific body parts was deemed too broad for the scope of the rest of this project.

4.4.6 Different levels of control: This group addresses the aspect of control, where the lack of control was often deemed to hinder relaxation. Heat placed in such a way that it was not easy to control was uncomfortable, and an ASMR video ending abruptly or the feeling of someone being in your personal sphere without control of them were also causes of discomfort more than relaxation. One note that hints towards a possible level of lack of control being relaxing speaks of the experience of having the inflatable travel pillow around the neck. It restricts movements and does not allow you to push your head in a direction without pushing it back, however, it was a relaxing experience to have it on as there was still control about where to place or push the head. This was elected for continued work as quality since there was a clear advantage for relaxation in interactions and experiences which allowed for a high level of control for the user.

4.4.7 Deprivation/limitation of one sense alters perception: These notes relate to how an experience is changed by deprivation/limitation of one sense e.g. sight. Many notes point to the deprivation of sight leading to increased sensitivity or awareness of sounds or touch, leading to increased relaxation. The effect was even stronger on touch when both sight and hearing were removed, but it also felt uncomfortable or scary to not see or hear. I also found that not being able to see the face of the person talking in a video made me feel less connected to the content, leading to less relaxation. This group was not chosen for continued work in this project, as the increased sensitivity that is derived from deprivation was not clearly either relaxing or hindering relaxation, but rather heightened the level of whichever feeling was being experienced.

4.4.8 Anticipation of an event increases relaxation: This group contains three notes, all relating to the anticipation of something being relaxing. This was found in ASMR videos, where there was deliberate anticipation, and by slowly moving the vibrating bit towards the ear before touching it, giving some time to anticipate the touch. This group was elected for continued work despite its small size, as the notes are very clear on how relaxation can benefit from anticipation. Despite it being a common element of ASMR media, the aspect of anticipation had not been encountered in other literature on relaxation to this point, warranting further investigation.

4.4.9 One sensation interrupts/changes perception of other sensations: A large group with 11 notes relates to how one sensation can change how other sensations are experienced. In this group are notes relating to how smells can be very attention-grabbing, e.g. when a hot plastic smell of the heat pad made an interaction less relaxing or "stole" all attention. The hands and the face come up as places where touch could make a big effect on other bodily experiences. Vibrations on the face were annoying and attention-grabbing, and vibrations on the fingers made it difficult to feel textures resulting in everything touched feeling smoother. When actively touching something with the hands, it was difficult to feel stimuli on other parts of the body, and touches on the fingers felt different when the fingers were being moved by someone else. Some of these findings overlap with the group of "Placement of stimuli on the body", and an overlap with the "Control" group was found in that more attention was brought on to how much sound another person's fingers made if I controlled that person's fingers. This group was not chosen for continued work. Even though the group contained a large

number of notes, indicating this could be an important finding, many findings were overlapping with other groups and the remaining findings unique to this group do not have a clear effect on relaxation.

4.4.10 Mood affects relaxation: A small group relating to the effect mood has on relaxation. These discuss how being in a bad mood can make it difficult to engage in practices that bring attention to the body for fear of feeling the negative feelings stronger. It also includes a note on how boredom can reduce relaxation, and how an already relaxed mood made it easier to find positive experiences in otherwise not so relaxing activities or stimuli. Despite a clear link to relaxation, this group was not elected for continued work due to the difficulty in controlling one's mood. The limited scope of the project did not allow for extended studies to include the effect on relaxation that changes in mood can give.

4.4.11 Predictability increased relaxation: Seven notes bring up the importance of predictability to relaxation. Rhythmic sounds such as walking, tapping, or writing something repeatedly were all sources of relaxation. One note mentions a novel interaction causing uncertainty, but that after getting used to it it was deemed relaxing. The feeling of predictable feedback when pushing or touching something was also brought up in these notes, with the memory foam pillow pushing becoming more relaxing when there was a hard surface behind it, as it made the pushing on it more "predictable and positive". This was elected as a group for further work in this project, since the impact of predictability was deemed relaxing by both me and the other interaction designer, and a perceived lack of discussions on predictability in previous projects or literature.

4.4.12 The Four Groups Elected. From these findings, I elected four groups to continue working with. I selected the groups I felt had the most potential for the formation of novel experiential qualities for ASMR inspired relaxation. The selection was partially based on the number of notes in each group, with the groups with less than three notes being omitted, but also on the content of the notes. The following groups were selected: "Anticipation of an event increases relaxation", "Predictability increased relaxation", "Different levels of control", and "Feeling of soft or malleable textures". These topics will from this point on be referred to as "Anticipation", "Predictability", "Control", and "Softness".

Anticipation: The concept of anticipation involves the person knowing what will happen in advance. Anticipation in this context requires the event or sensation that is being anticipated to be of a positive nature, e.g. a pleasant touch or sound. Anticipation also requires an element of waiting or building tension until an event transpires.

Predictability: From the notes, it becomes apparent that a level of predictability is necessary for having the most relaxing experience. Uncertainty from initial introduction to interactions was described as inhibiting relaxation, with relaxation occurring first when the person is used to it and can predict what will happen.

Control: A complete lack of control was not deemed relaxing, and remaining in control was an important factor in many of the findings. However, in some cases being in control, especially when it involved another person, was seen as stressful. For this reason, control will be reviewed in the context of single-person participation in an interaction only. This limits the scope of a potential experiential quality, but can also provide a more precise definition.

Softness: Softness refers to the touching of soft and malleable items and textures. The application of softness or malleability is an open concept, which could include textures and surfaces of an item, but also the way in which a person touches an item or is being touched by it.

4.5 Designing an Artifact to Define Experiential Qualities

In order to further investigate the groups selected in the data analysis, I constructed an artifact for physical interactions using insights from the four groups deemed capable of eliciting relaxation: Anticipation, Predictability, Control, and

Softness. The artifact, named The Rice Walker, can be seen in Figure 8. This artefact was constructed as a way to prove the value of these groups in relaxation, and to assess the groups' suitability as experiential qualities. Therefore, I built the artifact to include all the four groups in the interaction.



Fig. 8. The second version of the artifact The Rice Walker, consisting of a pneumatic pad filled with rice.

4.5.1 Design Process. I decided to work with an interaction based on walking. This decision was made based on both the findings in the previous stages surrounding walking, e.g. on a semi-frozen field or the soothing effects of the rhythmic beat of walking, and the previous research on the sounds of walking [7, 52]. I also wanted to explore the relaxation I felt after the walking meditation. To adhere to the aspects of Anticipation and Predictability, I needed the interaction to follow a pattern that could easily be understood. This could either be done by using a clear rhythm, to make it possible to predict stimuli, or by making the interaction reactive so that a reaction could be predicted from an action. Control meant it had to feel like I was in control of the interaction, which could be achieved by e.g. letting me choose how or where my body is touched by the artifact, or by letting me be in control over the way the artifact reacts. Softness could be achieved through soft surfaces, materials, patterns of engagement, or communication with soft touch. Textures that are malleable or can be manipulated and sculpted can also provide the sensation I was looking for from this group.

During the first-person material exploration, I had used a rice-filled pneumatic pad given to me as a part of the pneumatic actuator kit. When inflated, the pad is soft and flexible, with a sand-like texture and behavior. When deflated, the vacuum turns the pad hard and rigid, with a distinct grain pattern and texture. By experimenting with different types of rice and different fill levels, I could make a pad that retained its shape when deflated, but that was still flexible enough to be shaped. Round grain rice gave a texture that was always softened and pleasant to touch. This gave a good texture when handled with the hands, but placed on a surface and felt with the feet it lacked in textural difference between inflation/deflation. To make the difference more apparent, I placed the pad on top of various soft objects, such as a folded blanket, a memory foam pillow, a carpet, and a couch cushion. I found that memory foam gave the best texture for standing and walking on, as it was soft enough to show the texture of the pad at different inflation levels, but also provided enough support to not feel unstable to stand on. The air pump for the pneumatics is controlled by a WiFi-connected Arduino, which made it possible

to control the inflation and deflation in real-time through either an application, or by running a pre-written program. The pressure in the pad is measured continuously and can be used as an input to change the pressure. However, it was discovered that the pressure did not significantly change when the pad was compressed if it was deflated fully. This meant it was not possible to have a reactive interaction from walking motions based on pressure in the pad alone. This would have instead demanded an additional pressure sensor, and I chose not to pursue this path due to time constraints. Another options would be to "record" the walking speed at a higher inflation level, then replay it with the preferred inflation and deflation levels. However, this would change the interaction to a way of exploring your walking pace. This could have been a possibility, but I chose not to go in this direction as I wanted to avoid the risk of turning it to a game, or a critique of my movements from several seconds or minutes ago. Since this solution would not be instantly reactive, I felt it was better to trial this artifact with a set pace. Because of this, I measured my walking pace in seconds, and chose inflation pattern lengths based on these measurements.

4.5.2 Use and Data Collection. I engaged with the artifact for a prolonged time period to properly evaluate the four aspects it was built on. This made it possible for me to omit or add to the groups in order to transform them into usable experiential qualities. It also gave me the opportunity to reflect on whether all the groups were important to relaxation, or how they affected the way I experienced relaxation. It also worked as an evaluative method for the groups as experiential qualities: Is it possible to use these groups as experiential qualities in a design process and have the resulting interaction actually portray the desired traits? I engaged with the artifact for 12 days over a two-week period. The use time varied from approx. 10 to 25 minutes, as I adapted the use time depending on how I felt during the use. Several patterns were applied both to the walking pace and deflation cycle. The walking pace tried included walking at a, for me, normal pace, walking slowly, or placing one foot on the ground and walking with only one foot on the pad. For the inflation patterns, I tried controlling it based on my breathing rate, choosing the rate independently but rhythmically, and in a more "randomized" pattern. I also tried a program that inflates and deflates the pad in a rhythmic pattern. For the first half of the use period (day 1 through 7), I used a small rice pad, approximately 20 cm in diameter. This pad was too small to place both feet on it completely, and therefore I constructed a new one. The new pad fit both feet, but still have the smallest volume possible, as this made the texture change require less change in air volume. This was achieved by cutting the pad into a rounded V-shape, designed to fit my feet when standing in a natural position, with the feet slightly narrower than shoulder-width.

4.5.3 Results and Evaluation. Following is a summary of the result of the thematic analysis of the notes from using the prototype. The notes were coded, focusing on everything addressing aspects of relaxation in relation to the four groups of Anticipation, Predictability, Control, and Softness. The codes included all findings relating to the different aspects. The themes were then formed based on the contents of the codes. These themes are used to construct the experiential qualities.

Some quotes from the journal are edited for clarity.

Theme: Anticipation enhances relaxation Anticipation was overall a positive addition that enhanced relaxation. "I could anticipate the changes as they came which was more relaxing" and "the moments before a change in texture were interesting [...] knowing that the texture would change brought attention to my feet" show that the ability to understand the future actions of the artifact had a positive impact on relaxation. I also noted that knowing the texture would change made me "plan and sort of look forward to how I would be able to shape the pad". Anticipation was deeply connected to predictability: "stepped off the pad while it was running, then stepped back on it and I actually got tingles [...] maybe a break in the middle was good as I knew exactly what I would feel when stepping back after?", and "Using a rhythmic pattern made it feel better in the body when a texture change happened as I knew when it would happen". It was found that predictability only affected the relaxation through providing means for anticipation, and not in isolation. This lead to the

merging of predictability into the theme of anticipation. Predictability and anticipation could be expressed through rhythm by controlling the inflation rate from the application, which can be seen in quotes like "non-rhythmic patterns made it more surprising when a texture change happened [...] was more alerting than calming", and "walking without a clear rhythm made it less relaxing". Cues from the sounds and touch about the state of the prototype also aided in relaxation: "the sound [of the air pump] was annoying, but it did give another layer of info about when the pad would change texture", and "after using the device a couple of times, I started to learn which sounds and touch comes from the different inflation levels, and that made it more pleasant to use the device". When I instead used the program which inflates and deflates the pad independently, it took some getting used to but eventually was more relaxing than the other case: "it not as relaxing in the beginning, took some time to get into the rhythm", but I also found a rhythm of walking with the program "quite quickly". All in all, the programmed rhythm was better for relaxation, as "the walking was more soothing [when programmed speed], and even the sound from the pump felt less annoying [...] I was able to relax more". The sensation of anticipation depended heavily on predictability, to the point where the lack of predictability even when engaging with the same artifact for several days had a negative effect on relaxation. However, predictability without anticipation seemed to have less of an effect, such as when I engaged with the artifact for a longer time without changing the inflation level: "relaxing, but after a while it got boring. I started thinking about the change in texture and I kind of missed it". This all speaks for anticipation as being a clear theme in these findings, and something which greatly affected relaxation in a positive way. The theme *Anticipation enhances relaxation* is therefore used to form the first experiential quality.

Theme: Softness and gentleness aids relaxation Through the use of the prototype, this aspect of ASMR-inspired relaxation was found to include a wider array of elements than just softness. This theme included softness, but also the gentleness needed for relaxation. Softness was favored in texture "I preferred the softer feel of the inflated pillows [they] felt more comforting", "when it was soft it felt like walking on the ocean, floating [...] very peaceful", but the appearance of a firm texture was also appreciated when it allowed the feet to mold the pad: "feels good to feel the shapes I make with my feet form and harden, soften, and disappear, like modelling clay". A similar aspect of gentleness was also found in the temporal patterns. Slow inflation rates were "more relaxing, and more gentle and soft on the body", and slower switches between states "felt more like I was in control and could let my guard down". I also liked when the pad was set to very slowly inflate from the firm state as I thought it was "nice to feel the texture change slowly". There was a feeling of uneasiness from fast changes in texture: sudden changes in inflation were "not as relaxing", and "[made it feel like] the pad was living its own life [...] even though I was controlling it". When trying to change the way I walked on the pad so that I lifted my feet high at each step, it felt less relaxing and instead described as "aggressive" and "less relaxed, but like I have more vigor/power in my legs". I believe all these findings show a much broader collection of sensations of softness, gentleness, and the importance of gradual changes in texture, temporal patterns, movements, and more. The conclusion is that softness and gentleness aided in relaxation, which was used to form the second experiential quality.

Theme: Control without demands gives relaxation Control was slightly more complex. It was a different experience to control the inflation rate yourself and have the program control it for you: "not controlling the inflation felt distinctly different from controlling it [...] I could focus more on my breathing and posture and my insides". Controlling the pace "felt more like an exploration of the way it feels to walk on different textures", there was "a possibility to analyze more", and I was able to "stop and appreciate [how] the different levels of inflation felt". However, it took a lot of "mental effort to control" the device, and it "got easier to relax when I didn't have to control the rate". When controlling the inflation myself, I used other measures such as breathing rate, but it was not perfect. "[matching] breathing provided some flow [...] but the feeling was broken quickly", and "matching with breathing was not perfect as the breathing rate can only be changed so much". Counting steps and adjusting the inflation rate to this had a better effect for relaxation purposes:

"counting steps [...] felt more relaxing, like I could focus more on my feet and lower legs and releasing tension in my body". However, not having to control the inflation rate was preferable. It felt "more meditative [...] like not thinking about anything, just experiencing" and "more peaceful and relaxing", especially when the timing of inflation was chosen as a slower pace. In other words, control had a negative influence on relaxation when it demanded too much engagement or decision-making. When engaging with this artifact I had an innate level of control stemming from how the artifact was designed, since I could always control my pace of walking and all other parts of my body apart from the feet. However, when "forcing" myself to adhere to a certain walking speed, the relaxation suffered. To sum up, control aided relaxation when it allowed me to move and use my body as I wanted to, as long as I did not have to spend too much focus on issuing the control. This was used to form the third and final experiential quality.

4.6 Formation of Experiential Qualities for Relaxation

I reviewed the themes that appeared in previous the thematic analysis of the use of The Rice Walker. Using the themes, I could form three experiential qualities of relaxation.

4.6.1 Allowing for Anticipation. The first experiential quality derived from this work is *Allowing for Anticipation*. Interactions with this quality let the user experience anticipation by providing them with predictable sensations. They also give the user the time and space (physical and emotional) to experience and relish in the anticipation before an event occurs. *Allowing for Anticipation* aids relaxation in designs by deepening the positive sensations provided to the user.

4.6.2 Softness, Gentleness, and Gradual Transitions. The experiential quality *Softness, Gentleness, and Gradual Transitions* describes a broad area of experiences that give a feeling of softness and gentleness. This can refer to the experience of soft support of the body, touching soft textures and surfaces, the feeling of slow and gentle temporal patterns, seamless gradual shifts of states in an interaction, and through the use of your body in a soft/gentle way to interact with a system. The experienced softness and gentleness provides sensations of comfort, and the gradual changes enhance the relaxing experience of new events/stimuli. The interactions should invite the user to feel, use, and embrace the softness and gentleness that they can feel and create, inside and outside of their bodies and minds. It should also ease the user into new sensations to heighten the experienced relaxation from them.

4.6.3 Control Without Demands. The final experiential quality defined in this project is the quality of *Control Without Demands*. For an interaction to be relaxing, the user needs to feel as if they are in control of their experience and body. However, burdening the user with too much responsibility inhibits relaxation by adding the stress of obligation. A system that provides *Control Without Demands* can therefore support relaxation by giving the user the autonomy required to relax and feel safe, without forcing them to stay in a constant state of considering which actions they need to take.

5 DISCUSSION

This section discusses the experiential qualities for relaxation discovered in this project. Their relation to previous research and the field of soma design are discussed, and their use and value are explained.

5.1 Identified Experiential Qualities: Use and Prevalence in Previous Works

5.1.1 Allowing for Anticipation. Through my study, I found that anticipation was important to the experience of relaxation. When using the artifact, I found that being able to feel anticipation vastly increased the levels of relaxation possible. I define "anticipation" in this quality as the expectation of a positive event or sensation before it transpires, and

"allow" as giving the time and space for the user to experience anticipation. We have some examples of anticipation being mentioned in previous literature on HCI. During a workshop held by Nicolás et al. [25] with the purpose of designing for a small set of emotions, the design of items for anticipation was included. The workshop was held to evaluate the effectiveness of two proposed design tools, however, what is interesting for my study is the descriptions of designs for anticipation the participating designers gave. One designer noted that "Anticipation is very strongly tied with time" in the sense that it is necessary to be able to expect something to happen in the future to experience anticipation. In my experiential quality, I include this thinking in "allowing" for anticipation, by providing the time for the user to experience anticipation before something happens. Another description from the authors stated "Anticipation is experienced when a person is certain that they will gain pleasure from a product, an activity, or an event. [...] possibly because they have experienced them before". This emphasizes the importance of an event or stimuli being predictable, or known in advance, for anticipation to occur. In my study this was also the case, as I experienced the device became more relaxing as a new inflation pattern became more known. When engaging with the The Rice Walker, I felt that in the moments before a texture change I achieved a more heightened awareness of my feet and legs. I believe this could be used to guide attention to certain body parts in a gentle way by giving the user the knowledge of where the next stimuli will be placed on their body. In the context of relaxation, this could make the effect of a stimulus stronger, something which can be seen in ASMR media where anticipatory triggers are sometimes included to amplify the effect of e.g. close whispering. There are many different theories in the field of psychology on the effect of predictability on the perception of stressful or negative events, such as physical pain [35]. Many of them state that predictability can reduce stress from a negative experience, as it gives the person a possibility to prepare physically or emotionally for the coming event. I would argue that this, even though it addresses negative experiences such as pain and not relaxation, coincides with my findings. Predictability, in turn allowing for anticipation, makes it possible to prepare the body and mind for a sensation, in the case of relaxation a positive one, thereby experiencing a pleasant sensation to the fullest. In the description of anticipation made with the tools, Nicolás et al. note among others that "the power to influence or direct the situation" is a prerequisite for the emotion. This ties into my defined quality of control, however, it is not included in my quality of anticipation. In my definition of anticipation, it is not necessary to be able to affect something to experience anticipation from it. This shows that the definition of anticipation differs, something which is important to keep in mind if applying this experiential quality for evaluative purposes.

5.1.2 Softness, Gentleness, and Gradual Transitions. This quality addresses the important aspects of softness, gentleness, and gradual changes for ASMR-inspired relaxation. Softness is discussed in the development of the soft(n) art installation, where touching soft things is argued to bring stillness and "creating a space to be held, to bolster, to cushion, to dream" [44]. Even though relaxation is not directly addressed in this work, the softness in soft(n) instead can be seen as introducing a level of comfort. I believe from my experience during this project that comfort is essential for the experience of relaxation, and that the inclusion of softness is an accessible way of achieving that. Cooke et al. showed that softness is one factor that children associate with relaxation [12]. This could indicate that softness is something that is inherently connected with relaxation. Softness can be expressed in many ways, in the artifact used in this project, softness is incorporated through the texture. The Rice Walker also uses gentleness and gradual transitions in its changes of textures and slow pace. Softness and gentleness could also be used as an input method, by allowing users to interact with the system using soft touch. Softness can also be introduced through shapes, and findings indicate that softened, rounded shapes can work to improve well-being when used in architecture [49]. It is possible that the same effect could be achieved in designs for HCI. Softness has also been addressed in the field of soft robotics. Softness is often used as a tool for practical reasons, such as interactions with humans where soft materials can reduce the risk of harm. However, there is a push to include the

aesthetics of softness as a broader concept in soft robotics. Jørgensen writes in his position paper on the aesthetics of soft robotics about the impact of fourth wave HCI on the appreciation of softness in soft robotics [24]. He argues that the aesthetic qualities of soft robotics should be viewed not just through a "functionalistic lens" to increase robots' use or acceptance, but as a holistic view of all steps between design and use. This aesthetic view of the softness in soft robotics connects to my experiential quality, both serving as testaments of a deeper, more visceral experience of softness than of texture alone.

5.1.3 Control Without Demand. The findings in this project suggest that remaining in control is imperative to relaxation, but that the control must be issued in such a way that the user is not forced to invest attention into driving the interaction forward. Control is not a completely novel concept for an experiential quality, "Control/Autonomy" is mentioned as early as 2004 in Löwgren and Stoltermans book Thoughtful Interaction Design [33]. They define this quality as the "distribution of initiative and responsibility", and even though this quality is discussed in the context of digital artifacts, it is similar to the definition of control I use in this experiential quality. The difference in their quality of control versus autonomy and *Control Without Demand* is in the dualism of control and autonomy. The "Control" in *Control Without Demand* is viewed in regards to the control the person using the system perceives themselves to have over how they are being affected by the interaction. This does not mean that the system being interacted with can not act as an autonomous agent, taking decisions and acting without the user's input, but rather that the user should feel as if they have the final say in the situation.

In the design of the breathing interaction device The Soma Corset [27], control took the form of either letting the user lead the rhythm of inflation with their breath or the device imposing a rhythm on the user. When the user-controlled the interaction it could be perceived as their own breath, but it could also be seen as an alien version of themselves, and it could even be hard to tell they were the ones controlling it. It was important for the user to be able to recognize their breath for the experience to feel less alien. This work shows a necessary point to make in regards to the experiential quality of *Control Without Demands*: "control" in this quality tackles the perception of being in control, rather than the physical act of controlling something. The development of the Breathing Garment also mentions control as the user either "leading" or "following" [26]. Jung describes feelings of the device providing safety and listening to her when she was in control of the breathing rate. However, when a function to increase the pressure if the breathing rate was too fast was introduced it became stressful instead, as effort had to be spent trying to not trigger the extra pressure. This highlights the importance of keeping the interaction uncomplicated for the user to engage with so that it does not require too much mental effort. Using The Rice Walker, there was always a sense of control as I could move my feet however I wished. I believe introducing control in this sense, where the movements and placement of the body are completely controlled by the user, can be an appropriate way of introducing the feeling of control. I experienced the movements of my body while performing an activity such as walking or standing on my toes as more intuitive than e.g. controlling something through a slider in an application, which means there was a lesser cognitive load while still feeling as if I was in control. This could be connected to the quality of "Intimate correspondence", proposed by Höök et al. as a part of the strong concepts Somaesthetic Appreciation Design [21]. In the definition of this quality, the authors write about the importance of implicit interactions, rather than explicit dialogues with the system. My findings on control can be related to this quality, as they both point towards a decrease in relaxation when the interaction is based on actively controlling the feedback by the user. The common denominator in the findings of control seems to be that for relaxation to happen, some level of control for the user is necessary, as long as it is done in such a way that it does not require too much active participation from the user.

6 CONCLUSION

In this project, I set out to determine what experiential qualities of relaxation could be identified using ASMR as a design source. I investigated ASMR triggers and their effects on my relaxation, conducted a material exploration to explore stimuli in different modalities, and a workshop with another designer. This extensive and varied process gave me plenty of rich data, which could be analyzed and compiled into a set of themes relevant to relaxation. These findings were used to design an artifact, The Rice Walker, a walking-based interaction piece for ASMR-inspired relaxation. This artifact was deemed to be apt at providing relaxation, and showed a potential use for walking-based interactions to be used for somaesthetic design. Through the use of The Rice Walker, I could verify my findings and define three experiential qualities of ASMR-inspired relaxation. *Allowing for Anticipation* tells of the need to give users the time and space to anticipate coming events and stimuli; *Softness, Gentleness, and Gradual Transitions* describes the relaxation stemming from feeling softness and gentleness, e.g. in texture, temporality, or interaction method; and *Control Without Demands* highlights the importance of feeling like you are in control, but not feeling the stress from the demand of attention. The experiential qualities can be useful both as an expansion to the soma design space through the inclusion of the emotional state of relaxation, but also in the design process in the development of HCI systems where relaxation can be a factor in user acceptance. Due to the experiential qualities' evaluative nature, they can be used in a design process to assess how the design might affect a person's ability to relax. Aspects for the enhancement of relaxation in interactions can be relevant in the development or research in many different areas, such as wearables and ubiquitous computing. Being able to design interactions for a full range of human emotions and states of mind will be essential as more technology is included in our living environments and close to our bodies. These qualities can provide insights on HCI for the purpose of relaxation, but also show promise for the development of experiential qualities aimed at other subjective and personal experiences using Soma design. My work contributes to the body of works surrounding both ASMR and somaesthetics, and provides another instance of research through design for more intimate/subjective experiences, such as that of ASMR. The use of ASMR in a pragmatic way to design for relaxation covers a gap in knowledge between the previous studies on physiological and psychological effects of ASMR, and the projects developing artifacts and interactions based on an attempt to elicit ASMR.

This work compiled many factors crucial for ASMR-inspired relaxation, and while some of them evolved into the experiential qualities coming from this project, many were not elected for the final phases of this project. Some of these findings were ambiguous or fell outside of the scope of this project, however, some showed potential for affecting how an interaction was perceived. For future work, there could be great value in a deeper investigation of these points and their potential in HCI. With more and more interactions between humans and computers being introduced with each passing day, designing for the full spectrum of human emotions will contribute to a path to more fulfilling and rewarding human-computer interactions and relationships.

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