Using Embodied Learning with Hand Tracking in Virtual Reality to Disseminate Scandinavian Rock Art

Interactive Systems Design

Bachelor Project Report
MTA21637

Aalborg University
Electronics and IT

AALBORG UNIVERSITY
STUDENT REPORT

Title:

Using Embodied Learning with Hand Tracking in Virtual Reality to Disseminate Scandinavian Rock Art

Theme:

Interactive Systems Design

Project Period:

Spring Semester 2021

Project Group:

MTA21637

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Copies: 1

Page Numbers: 384

Date of Completion:

November 18, 2024

Abstract:

Virtual reality (VR) is a technology which has become more popular recently, as a way of disseminating cultural heritage. A main advantage of using VR is its potential to offer a larger degree of embodiment and immersion compared to other alternatives. In this project, the objective was to use the concept of embodied learning, in VR, to disseminate information about the process of creating Scandinavian rock art, one purpose behind its creation, and its transformativeness throughout time. Hand tracking is used as an input method, as a way of enhancing the user's agency, a cornerstone of embodied learning. The design is evaluated with a within-subject design (n=13), which gathered both quantitative and qualitative data. After analysis, it was found that the created prototype was successful in disseminating knowledge about the process of creating rock art. However, it was unclear whether it had success in disseminating the purpose behind its creation and its transformativeness.

agreement with the author.

Contents

Chapter 1

Introduction

This project is concerned with cultural heritage in both of its forms: tangible (TCH) and intangible (ICH). These are both fragile, as they can either change, as is the case with ICH, or be inaccessible to the public, in the case of TCH. As such, it is important to preserve it, and one way to do this is by digitisation. This is what this project aims to do, specifically with Scandinavian rock art as a cultural domain.

The technology chosen for disseminating the cultural domain is Virtual Reality (VR), which has become a popular way of preserving CH, and the focus is on using the concept of embodied learning in order to "teach by doing".

Research within the field specifically investigating the possibility of disseminating Scandinavian rock art in VR, appears to be absent. There are, however, examples of rock art from other cultures. The focus in most of these solutions, however, is on disseminating rock art through just observation, and thus it does not take full advantage of the potential of dissemination through VR, by using embodied learning. Additionally, in the solutions which have interactions involved, the main focus of dissemination was not the rock art itself (as a process), but a story from the local culture, represented through the art.

Additionally, hand tracking as an input technology has become accessible on mainstream VR headsets, and it could have the potential to enhance the agency and presence of the users, while interacting within a VR prototype.

With all this in consideration, this study investigates the possibility of disseminating the process and one purpose behind creating Scandinavian rock art, namely pictographs, as well as transformativeness using VR with hand tracking. We evaluated the design based on an experimental setup with a within-subjects design (n=13).

The results showed that the created prototype is able to disseminate knowledge regarding the process of creating Scandinavian rock art, but it remains inconclusive in terms of its capabilities to disseminate the intended purpose behind it, or the aspect of transformativeness throughout time.

Chapter 2

Background Research

2.1 Project Proposal

The topic that this project will be concerned with, as well as the initial proposal states:

> **Topic:** Making Intangible and Tangible Cultural Heritage DIGITAL.
>
> **Proposal:** Design and Implement a portable VR prototype where one can make digital rock art.

With this in mind, we identified three key domains, which will inform the research focus, namely *Cultural Heritage Digitisation, Rock Art* and *Virtual Reality*. To get a surface level understanding of the topics, a brief initial research was conducted, mainly focusing on the topic of rock art.

Rock art is a broad subject with materials, tools and depictions varying based on the era it was created from, as well as the culture which made it. For this reason, we decided to narrow down the topic to a specific region of the world: Scandinavia.
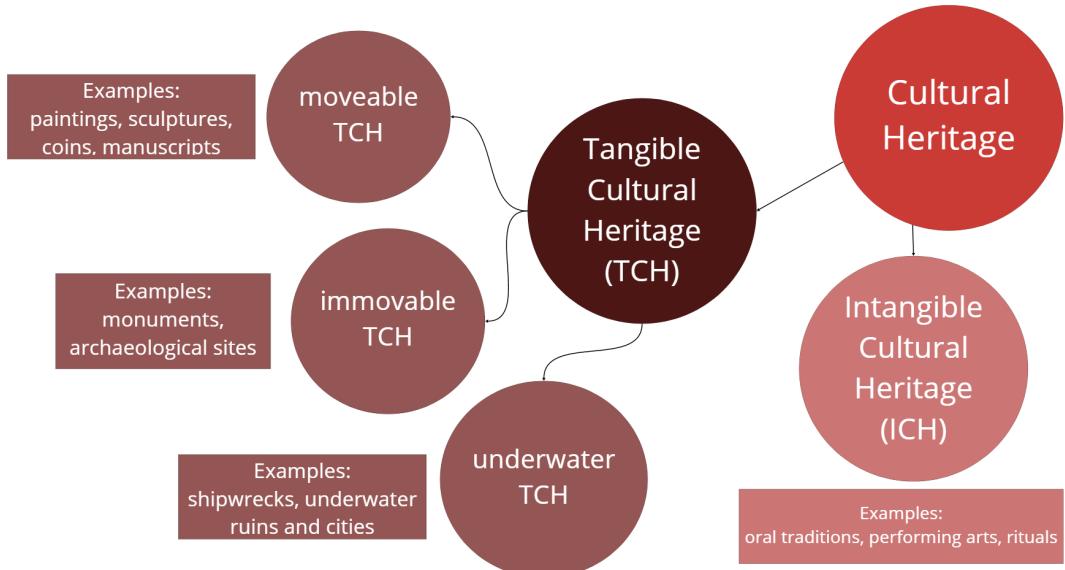
After this initial research, we refocused the search effort, focusing on Scandinavian rock art only, as well as gathering information about the other two topics; Cultural Heritage Digitisation and Virtual Reality (VR). The findings from this process will be presented within this chapter.

2.2 Cultural Heritage

In this section, we explore what Cultural Heritage (CH) is, how it can be classified, and the potential of its digitisation. Gathering knowledge about this topic will help

us understand which classification our chosen domain (Scandinavian rock art) falls under, as well as how to approach digitising it.

As a start, to define what CH is, we will use the classification provided by UN-ESCO [76]. Accordingly, a visual breakdown of CH, created by using the afore-mentioned definition, can be seen in Figure 2.1:

Figure 2.1: *A visualisation of what comprises CH, based on information from UNESCO [76].*

To understand the terms better, we explore both intangible cultural heritage (ICH) and tangible cultural heritage (TCH) in the following sections. With the purpose of classifying our own domain under these categories.

2.2.1 Tangible Cultural Heritage (TCH)

TCH consists of physical artefacts of a culture, such as the examples given on the left side of Figure 2.1. Depending on the nature of those artefacts, they can be fit under three sub categories, which are also presented in Figure 2.1.

(a) *An example of moveable TCH, depicting a music lesson on a greek vase. Image source: [40].*

(b) *An example of immovable TCH, in the form of Scandinavian rock art. White chalk has been used to highlight the engravings, Image source: [68], page 102.*

Figure 2.2: *Examples of physical artefacts that fit the definition of TCH.*

Scandinavian rock art fits in the sub category of immovable TCH, as it can be considered an archaeological site. An example of rock art, that illustrates the tangibility and immovability of the art, can be seen in Figure 2.2b.

2.2.2 Intangible Cultural Heritage (ICH)

ICH, on the other hand, encompasses all non-physical parts of a culture. These include practices, expressions, representations, traditions, songs, crafts or skills [75].

Based on this, one might think that certain physical artefacts, such as the vase depicted in Figure 2.2a, or the rock art from Figure 2.2b, can also have traces of ICH, as it depicts the practices of the cultures that created them, however, this is not exactly applicable. The reason for this is that ICH exists in the present, which is also why it is often called "living heritage". If it is not practiced in the present, it is considered to be part of cultural history instead, meaning one can think of it as historical ICH, beliefs, crafts etc. that were practiced in the past [66].

With that, we can consider Scandinavian rock art to hold historical ICH, as the culture that created those pieces of art is no longer present, or it has been changed tremendously to the point of being completely different.

Scandinavian Rock Art can be classified as:

Immovable TCH: as an archaeological site

Cultural History/Historical ICH: as a practice and craft which is no longer practiced, that also represents beliefs of past cultures.

2.2.3 Digitisation of Cultural Heritage

Now that we have an understanding of what CH is, both in its tangible and intangible forms, we need to understand what the process of digitising it is.

In terms of the potential of digitisation, Bekele et al. claims that CH can greatly benefit from technology, and that digitisation enables the spread of knowledge [4]. Ott et al. mention the usefulness of technology as well, claiming that it can lead to more accessibility and favours the "*sharing of knowledge, information and ideas*" [50]. From now on, we will refer to this process of spreading knowledge as dissemination.

On top of its theoretical usefulness, digitisation has become quite widespread when it comes to CH dissemination. Bekele et al. mentions that the applications of technology in the CH domain are quite varied, from education, to exhibition, exploration, reconstruction and virtual museums, in their extensive survey of existing technology [4]. This idea of widespread application of technology in CH, is also supported by Bercigli, who mentions that "*many tools are available for the use and enjoyment of heritage*" [5]. She then identifies some of these tools, in the form of Augmented Reality (AR) and VR applications, as well as serious games [5]. In other words, With the advancement of technology, it appears the choice of digitisation for CH has expanded. From merely documenting it in the past, technology nowadays can bring cultural heritage to life, and new systems, such as VR, can play an important role in not only preserving, but also disseminating CH.

With this, we can start explaining the process of digitisation of CH, which usually consists of multiple parts. Rodil et al., has presented a breakdown of these parts (specific to ICH) as consisting of *capture, representation and dissemination* [59]. This is called the *Tripartite Digitisation Model*. As the names implies, capture refers to the process of gathering and analysing data, with the purpose of understanding the ICH which is to be disseminated. Representation is the step where the collected data is structured as digital representations (3D models, databases etc.). Finally, the data is disseminated. This is the step where the ICH is visualised and spread to the users.
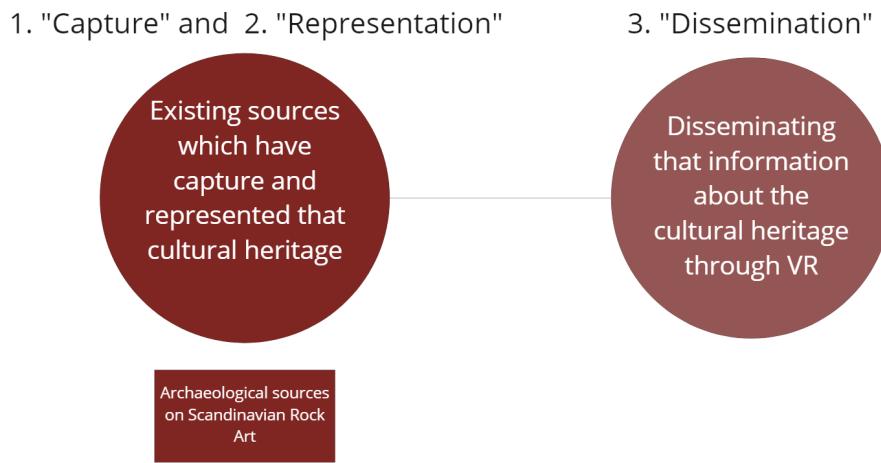
Even though this model refers specifically to ICH, a similar structure can be observed with TCH as well. We have observed that there is a tendency for the artefacts, monuments etc. to be recorded e.g. through pictures, descriptions, digital scans, and then be visualised in a digital manner for the purposes of dissemination. One key difference is the method of gaining knowledge about the cultural domain which is to be digitised. With ICH, it is possible to observe and engage in the cultural practice and with TCH you will have to rely on existing sources for

explanations, such as archaeological findings.

With this information in mind, it is apparent that technologies for digitising CH have been used in a practical context before and have proven to be effective in disseminating CH. For this project, we will adopt a similar methodology, where we use existing literature, as well as photo-documentation and descriptions, to gain a better understanding of the domain (capture + representation). We will then develop a prototype that will serve the purpose of disseminating the knowledge about the domain, through visualisation and interaction. The technology that we will use for the prototype is virtual reality (dissemination).

2.3 Scandinavian Rock Art

In this section we explore our aforementioned focus point of Scandinavian rock art by reviewing existing literature on the topic. The aim is to gain an understanding of the cultural domain, in order to be able to replicate the process of creating Scandinavian rock art, as well as understand why it was created in the first place. We will present findings focused on: the classification of rock art, tools and materials used, common motifs and possible purposes behind creating the art. Incorporating the illustration in Figure 2.3, this section will encompass the first, and second part of the digitisation process, as we will look at sources which have already captured and represented Scandinavian rock art, in some way or another.

1. "Capture" and 2. "Representation"   3. "Dissemination"

Existing sources which have capture and represented that cultural heritage

Disseminating that information about the cultural heritage through VR

Archaeological sources on Scandinavian Rock Art

Figure 2.3: *An illustration of the process we used for digitisation. This section is focused on exploring the cultural domain, so step 1 and 2, as illustrated.*

To define what rock art is, we use the definition provided by Whitley, who states: *"Rock art is landscape art. It consists of pictures, motifs, and designs placed on natural surfaces, such as cliff and boulder faces, cave walls and ceilings, and the ground surface. The defining characteristics of rock art is its placement on natural rock surfaces..."* [79]. Furthermore, we will define Scandinavian rock art as rock art geographically located in Scandinavia, from around 5000 BCE to 500 BCE, as this is when the majority of Scandinavian rock art is estimated to originate from [20, 67, 74, 26].

With that being said, rock art is commonly classified into two types, being petroglyphs and pictographs. Both classifications will be explored below in Section 2.3.1 and 2.3.2 respectively.

2.3.1   Petroglyphs

Petroglyphs are depictions on rocks created by carving into the rock. This is the most common type of rock art in Scandinavia. The petroglyphs have been created using different techniques, such as polishing (also called ground art), where the art was made by rubbing a hard stone on the rock surface; or carving, using the hammer and chisel technique [21]. An example of a petroglyph from Norway can be seen in Figure 2.4.
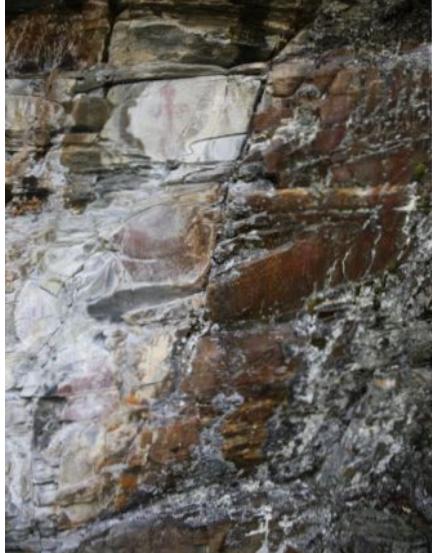
Figure 2.4: *An example of a Petroglyph from Bergbukten 4, Hjemmeluft, Alta, northern Norway. Picture from Gjerde [21, p. 15].*

2.3.2   Pictographs

Pictographs are depictions on rocks created by drawing or painting on the rock, so one could refer to them as rock paintings. What is common amongst rock art pieces in the form of pictographs all over the world, including Scandinavia, is that they appear to consist of minerals such as ochre, charcoal, chalk, and clay. These minerals could be used by themselves, for dry painting. However, more commonly, the minerals were mixed with a liquid substance in the form of water,

animal blood/fat, and urine, which classifies it as a wet paint. The appliance of the paint was done by either using a finger or a brush made of the tail of a small animal, animal hairs and bones or plant material [79, 73]. An example of a pictograph from Scandinavia can be seen in Figure 2.5. For our project, we took interest in the pictographs, more than the petroglyphs as most research we found about Scandinavia focused on petroglyphs, therefore we decided to narrow the scope to this type of rock art.

(a) *Original photo.*

(b) *Color enhanced photo.*

Figure 2.5: *An example of a pictograph from Transfarelv, Alta (Norway). A color enchanced version is provided, for easier viewing. Pictures from Gjerde [20, p. 5] (cropped).*

2.3.3   Motifs and Purpose

In order to properly represent the cultural domain, we needed to get an idea of what was commonly depicted, which is usually referred to as motifs, as well as the reasons why rock art was created in the first place. This would make it easier to accurately represent the art. Furthermore, this will give us insight into how our prototype should depict said motifs and purpose.

Following up from that, there is a great variety in what is depicted in Scandinavian rock art, as both single events and ongoing narratives were created [55, 21]. The most recurrent figures are various animals such as elks or bears (common animals in these areas), canoes and human figures. Humans are often depicted holding different tools and weapons like shields, swords, spears or fishing poles, but they are also shown with ploughs or animals [25, 67, 55]. Some of these aspects can be

seen in Figure 2.6.

Figure 2.6: *A photograph of rock art showing a hunt scene. Picture from Gjerde [22, p. 202] (cropped).*

These items are connected with different activities portrayed in the rock art, often with the purpose of retaining and passing on knowledge. This included practises such as farming, metalwork, sailing, trading, war, hunting and gathering [1, 37, 55]. The latest was also connected with geographical representations of real places and useful hunting methods. For example, some rock art was deliberately painted/carved with spaces and cracks in the rock between individual images to represent specific landmarks, such as rivers or fjords, which could point to an area with a concentration of animals or their movement patterns and trails [22].

Other than that, there are religious, mythical and cosmological motifs, where shamanism and communication with spirits is a reoccurring subject [55, 33, 22]. Furthermore, a motif of pragmamorphism [1] was found, where different body parts are depicted as objects such as swords or canoes, to infer that the portrayed person (or their specific body part) also has the qualities of the object (e.g. fast and agile as a canoe) [25].

This is, however, not the only time when peoples abilities are exaggerated. Another example is in depictions of hunting settings, in which there are often less hunters (usually one or two) portrayed than the actual number necessary for the hunt to e.g. to show their courage [55]. Another reason to portray their people in a "better light" was possibly a ritual purpose, to wish for a better hunt, successful raid or healthy and strong offsprings [21, p. 443-444].

Rock art was, additionally, important in the scope of social aspects and interactions. The sites where it is located were important meeting places for social activities like communication between the hunting groups or communities, which was

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[1]Attributing properties of inanimate objects to humans

often done through the imagery. These places would be revisited during different times of the year in accordance to the migration pattern [55, 22].

Rock art also depicted important life events, social statuses and its inequalities [37]. It is possible, that it could go as far as altering the meaning, or completely "over-writing" rock art, which was originally created by a different culture, seemingly with the purpose of overshadowing the presence of that culture with a new one (i.e. showing superiority over others) [67].

For our project, we found the last purpose described to be particularly interesting. As such, we decided to focus on it: the overshadowing of other culture/tribes, as a purpose to disseminate.

2.3.4 Transformative Rock Art

Other than purposes and motifs, there were also other aspects of rock art which we found through research. One particularly stood out as interesting for dissemination purpose: the transformativeness of rock art, over time, by different generations of people. We will describe this in more detail in this section.

As mentioned in Section 2.3.3, some rock art seems to depict ongoing narratives. As such, another aspect of Scandinavian rock art is its transformativeness over a long period of time, in the sense that additions or reworks to the rock art have been done over multiple occasions [26]. One can think of this as a collaborative, or competitive (in the case of the previously mentioned overshadowing, see Section 2.3.3) process. For the purposes of this report, we will refer to this aspect, or process, as transformative rock art.

In a sense, we could make an analogy to modern graffiti, where multiple artists would use the same wall for their paintings. In this way, it becomes a dynamic process, with the meaning of the art being subject to change, as more people work on it, with the passage of time.

An example of a transformative rock art piece from Sweden, in the form of a petroglyph, can be seen in Figure 2.7, which is said to have been transformed at least five times.
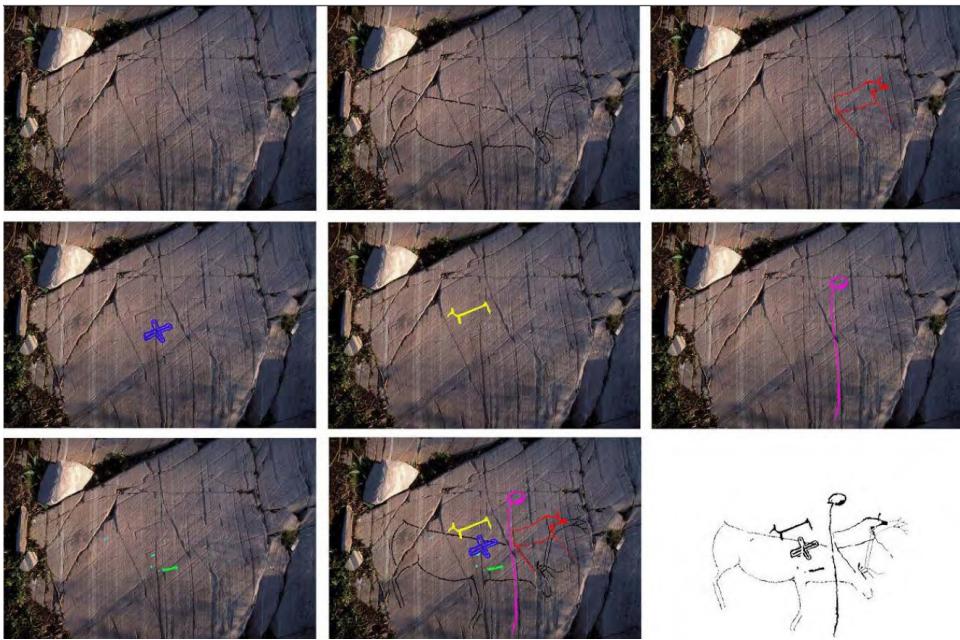
One interpretation of this aspect of rock art is set to be linked to it being a way for humans to engage with objects directly marked by their predecessors [26].

Figure 2.7: *An example of a petroglyph from Litsleby, RAÄ Tanum (Sweden), said to have been transformed at least five times. Picture from Horn [26, p. 93] (cropped).*

The way the rock art transformed, throughout time, depends on the techniques used. One such technique, found in Scandinavian rock art, is superimposition. This refers to the drawing of something, on top of what is already existing on the rock. An example of the superimposed technique can be seen in Figure 2.8, where the different motifs have been highlighted with different colors. In the bottom right, a sketch of the final composition can be seen. The superimposition is evident on both of the figures as the different motifs are laid over each other [21].

A similar technique called juxtaposition was also used in rock art. This technique is similar to superimposing, but places the images next to each other, rather than over each other [21].
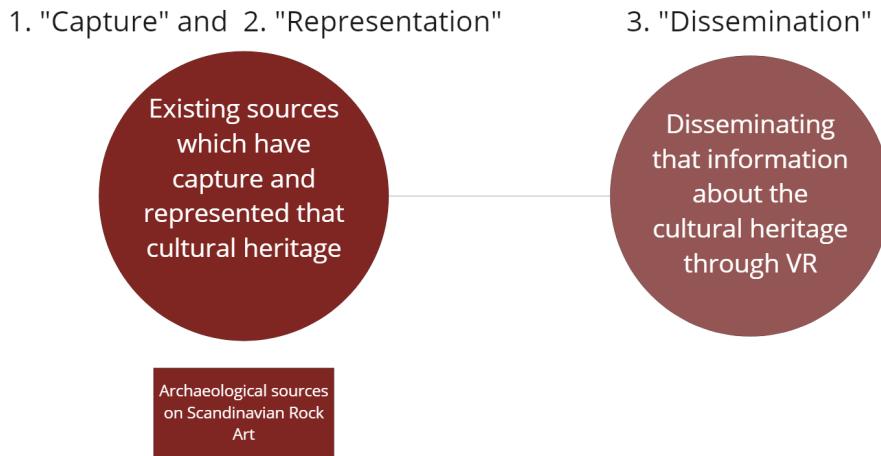
Figure 2.8: *An example of a superimposed petroglyph from Ytre Kåfjord (Norway). As can be seen different motifs have been carved on top of other carvings. Picture from Gjerde [21, p. 254].*

2.3.5 Summary of rock art knowledge to be disseminated

As we have gathered an understatement of our cultural domain in this section, we are ready to decide what aspects of Scandinavian rock art to digitise. Firstly, the process of creating pictographs, described in Section 2.3.2 will be recreated, including the materials and tools used. On top of this, we want to represent the purpose behind creating the art as well. As there are many possibilities, outlined in Section 2.3.3, we will only pick one for the purposes of our project, namely the *overshadowing*. Similarly, the aspect of the transformation of the art in time, as described in Section 2.7, will also be a part of the process which we want represented.

2.4 Virtual Reality

With the cultural domain explained, we can move on to the next aspect of the digitisation process, which has been described in Section 2.2.3, namely, the dissemination. As we mentioned, in Section 2.2.3, we will use VR as a technology to visualise the process of creating rock art. As such, it is important to gain an understanding of what virtual reality is.

1. "Capture" and 2. "Representation"   3. "Dissemination"

Existing sources which have capture and represented that cultural heritage

Disseminating that information about the cultural heritage through VR

Archaeological sources on Scandinavian Rock Art

Figure 2.9: *An illustration of the process we used for digitisation. This section is focused on exploring the way of dissemination, so step 3, as illustrated.*

When working with a new platform, such as VR, it is important to understand the underlying reasons for its creation, as well as its technical functionality and extent of it. The purpose of this section is to create a general understanding of the aforementioned areas within the scope of virtual reality, to get an idea of how it can be used to full effect, for digitising Scandinavian Rock art.
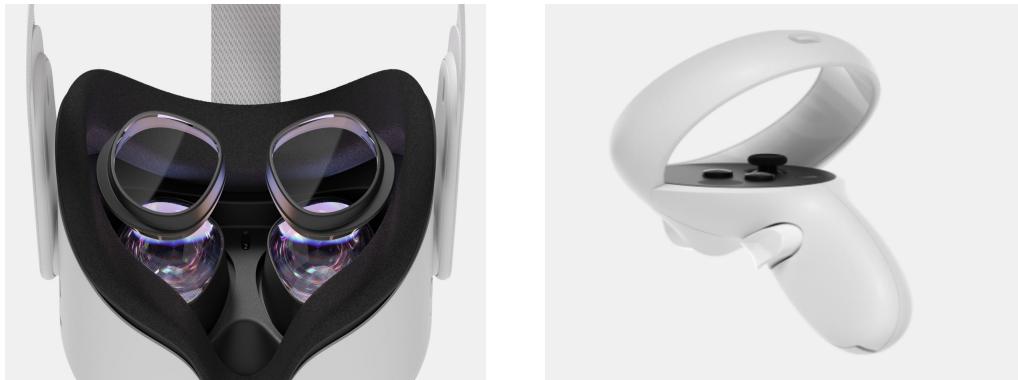
2.4.1   What is VR?

Virtual reality can be defined as "*an artificial environment which is experienced through sensory stimuli provided by a computer and in which one's actions partially determine what happens in the environment*" [10]. This means that users immerse themselves into an environment and act as if they are within it, which is further supported by Sutherland stating "*The ultimate display would [...] be a room within which the computer can control the existence of matter*" [71].

Jerald states that the communication between human and technology is an essential component and basis of VR, and if done well, should make users more focused on the experience, rather than the technology [30].

VR is an artificial environment which is experienced through sensory stimuli, and the communication between human and technology needs to be intuitive.

A virtual reality environment is experienced through HMDs. There are two lenses withing the headset (one for each eye) which serve as the window into the virtual world. An example of this can

(a) *The lenses of the Oculus Quest 2. Image source: [47].*   **(b)** *The Oculus Quest 2 controller. Image source: [48].*

Figure 2.10: *The Oculus Quest 2 headset and right hand controller.*

be seen in Figure 2.10a. The audio in these systems is usually incorporated within the headset itself, however, some offer two ear pads the user can position next to the ears. To interact with the virtual environment, the user is provided with two wireless controllers (one for each hand) which are paired with the headset providing haptic modality, meaning that the user receives sensory stimuli through kinesthetic (e.g. movement and weight) and tactile (e.g. vibration or pressure) feedback. An example of such controllers can be seen in Figure 2.10b. However, this was not always the case, as forerunners experimented with features ahead of its time, such as, hand tracking.

2.4.2   History of VR

This subsection will explore the milestones within the history of VR. Past iterations of VR provide great insight in the technology developed along the way, which is still expanded upon to this day, as well as how it has been used for different purposes in various fields.

The section includes a timeline (see Figure 2.12 and 2.13) to provide a quick overview of the progression of VR.

In 1851, David Brewster invented stereoscopic glasses where users would be able to experience depth in 2D images [7]. The stereoscopic glasses could be viewed as a forerunner to the modern Google Cardboard, where the user would put a phone into a cardboard box with lenses instead of a still image, making the design conceptually similar, which can be seen in Figure 2.12 and Figure 2.11.

Approximately one hundred years later, in the 1950s, Morton Heilig created the
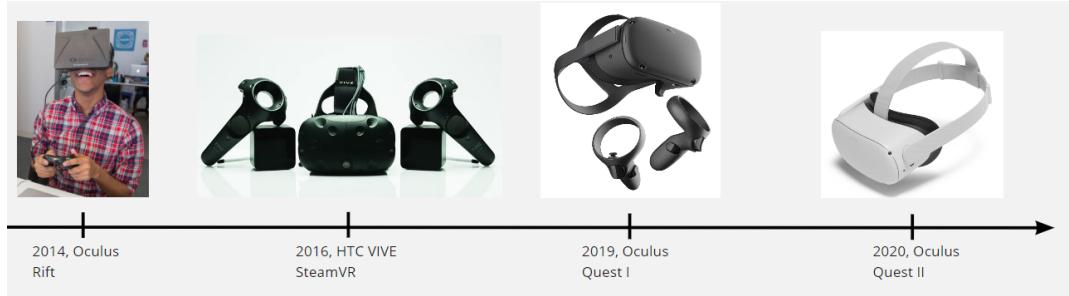
Figure 2.11: *The Google Cardboard, allowing the user to insert their phone as the lens. Image source: [23].*

Sensorama [30]. The intention was to create an immersive film viewing experience, by adapting stereoscopic color views with a large field-of-view (FOV), stereo audio, smell, wind and a tilting seat which supported vibrations [24]. Many of these ideas are applied in modern day VR headsets, such as a large FOV usually being a big selling point for an immersive experience, where stereo audio and haptic feedback is a bare minimum requirement for a modern VR experience [30]. In 1961, the first HMD with functioning head tracking was invented, where the user would move their head and a camera in another room would move correspondingly [30]. Later in 1965 the Wright-Patterson Air Force Base experimented with using HMD to train fighter pilots. During the same time, Ivan Sutherland, of the University of Harvard and Utah, created the first HMD that used head tracking and computer-generated imagery [43]. This concept was then further build upon at the University of North Carolina where they, to this day, are building VR systems to solve real problems such as; creating surgical simulations and architectural tools [71].

Figure 2.12: *Timeline showing the progression within the field of VR from 1851 to 2012. Image source(s) from left to right: [7], [64], [30, p. 23], [30, p. 25], [41], [17].*

In 1982, commercialising VR systems as consumer products was explored by an Atari Research team led by Alan Kay. Shortly after, Scott Foster and Beth Wenzel who worked on said team, created a system which provided localised 3D sounds, as employees under NASA in 1985 [80]. The VR system created could be produced for an affordable price, henceforth starting the VR industry, as companies which lacked the financial support in the likes of NASA or state universities, could start exploring the field. The same year, two other former Atari employees built a VR glove based on an early NASA design. The glove had optical flex sensors to measure finger bending and tactile vibrator feedback [80]. After the mid-nineties, VR went out of fashion as these iterations did not live up to the expectations, which resulted in many companies going out of business and research getting shut down [30].

Figure 2.13: *Timeline showing the progression within the field of VR from 2014 to 2020. Image source(s) from left to right: [49], [27], [44], [45].*

VR resurfaced in 2006 with MxR Lab and Fakespace Labs creating a 150°FOV HMD, to study the effects and user experience of FOV. Six years later, a VR headset called FOV2GO by MxR Labs made an appearance for the IEEE VR 2012 conference [28] and this headset is said to be the precursor of modern day consumer headsets [30]. Shortly after, Palmer Luckey left the lab and together with John Carmack they formed the Oculus Rift Kickstarter campaign. The Oculus Rift used 3 degrees of freedom (DOF) tracking, which means that through a gyroscope it could get rotational data on the X, Y and Z axis. This led to the user being able to look around with the headset on. To move in the virtual world, the headset relied on a connection to a computer, which was connected to sensors that were placed around a room, i.e. "outside in tracking". These sensors would gather data of the headset, thus creating the virtual reality experience as we know it today [53].

With the Oculus Rift, VR started to get media attention once again and many resources were put into the research and development, which included big companies like Facebook buying the Oculus VR for 2 billion US Dollars in 2014 [30], thus leading to the development of Oculus Quest 2.

VR has seen many iterations and purposes throughout the years and continues to grow to this day, where wireless, self-contained VR systems are the newest area of interest due to the consumer friendliness with minimal setup.

The Oculus Series uses their own inside out tracking system, Oculus Inside, which utilises IMU sensors, cameras and infrared light, supporting untethered 6 degrees of freedom.

2.4.3   How the Quest 2 Works

This section will explain the technical aspect of VR, specifically, in the context of the Oculus Quest 2 from the Oculus Quest series. This is the headset used for the purposes of this project, so it was deemed appropriate to explore its features separately.

The Oculus Quest series utilises "inside out tracking" (called Oculus Insight), as opposed to outside in tracking mentioned in Section 2.4.2, allowing the controllers to be used without any stationary external sensors. This is achieved through SLAM (simultaneous localisation and mapping) algorithms, which use 3 types of sensor data in order to map objects' position, rotation and velocity in space [77]:

- Linear acceleration and rotational velocity from inertial measurement units (IMU).

- Image data for positional tracking.

- Controller tracking through infrared (IR) constellation tracking.

Figure 2.14: *The Oculus Quest IMU's in motion, indicated by the multicolored lines. Image source: [77].*

In order to track the position and orientation of the headset and controllers in space, Oculus Quest uses IMU's to track the linear acceleration and rotational velocity, as seen in Figure 2.14.

(a) *The Oculus Quest headset gathering the contrast points from space. Image source: [77].*

(b) *The infrared light from the controllers getting tracked by the camera in the headset. Image source: [77].*
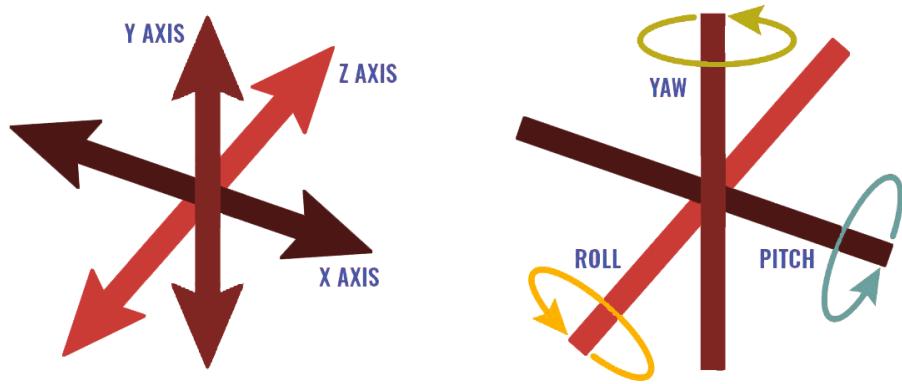
Figure 2.15: *The infrared tracking system and room tracking in the Oculus Quest.*

After getting the rotation, position and velocity from the IMU's, the position still requires a reference point to track in virtual space. This is done with cameras in the headset, as seen in Figure 2.15a. They detect pixels in an image of the real environment based on high contrast such as the patterns on a carpet or the corners of a window. These pixels are then tracked over time and updated 60 times per second. The points are then used to calculate the relative position between the environment and the headset. Thus, making the headset able to move around in a 3D environment on the X, Y and Z axis.

Lastly, the controllers are tracked through constellation tracking. This method is similar to the aforementioned virtual space position, however, the controllers are fitted with infrared light sources that functions as reference points for the headset camera, as seen in Figure 2.15b, thus making the tracking more robust as it is less reliable on outside light sources and requires less computational power. The constellation tracking is then supported by the transformation data gathered from the IMU's inside the controllers.

Degrees of Freedom

The Oculus Insight system, as opposed to the Oculus Rift mentioned in Section 2.4.2, uses untethered (wireless) 6 DOF, meaning that it calculates its own rotation and position on the X, Y and Z axes independent from a computer, hence making it standalone.

Figure 2.16: *Illustration of 6 DOF. Image source: [65] (cropped and coloured).*

6 DOF refers to the ways a user can interact with the system. Each degree translates to a transformative property, which is either positional or rotational. This can be seen in Figure 2.16, where the left illustration shows the first 3 degrees, being the positions along the axes, and the right illustration shows the other 3 degrees being the rotation around each axis.

2.4.4 How Hand Tracking works

Recently, Oculus has introduced their hand tracking system, which eradicates the traditional controller, explained in Section 2.4.1, and offers users a new way of experiencing VR. For this project, we decided to work with this new feature, to see what its potential is, when it comes to disseminating Scandinavian rock art. At the Oculus Connect 6 press conference, Oculus described the system in a 4-step process: 1. detecting the hands' position based on the image feeds' from the build-in Oculus Quest cameras, 2. generating heat maps of the hands, i.e. joints, 3. mapping the heat map into a 3D model and 4. applying the model to the application of choice.

Hand tracking, as opposed to normal tracking (see subsection 2.4.3), is more sensitive in its detection, due to the limited amount of sensors it uses compared to the controllers. It relies only on the image feed received from the monochrome cameras, meaning that if the image received from the cameras do not include a hand (beyond the field of view (FOV)), then it will not detect it. However, the FOV of the cameras is undisclosed. The in-play FOV is 89°horizontally and 90°vertically and the tracking within this field has proven to work reliably under the right conditions, indicating that the monochrome cameras' FOV would be around the same range [46].

Due to the hand tracking being based on computer vision, it comes with many constraints. One of these constraints are a clear sight of the hands. Without a direct line of sight the headset looses tracking. This is the case if hands are operated outside of the camera FOV [15] or if the hands are obscured, e.g. one hand overlapping the other. This means that these constraints will have to be addressed when a product is designed [15].
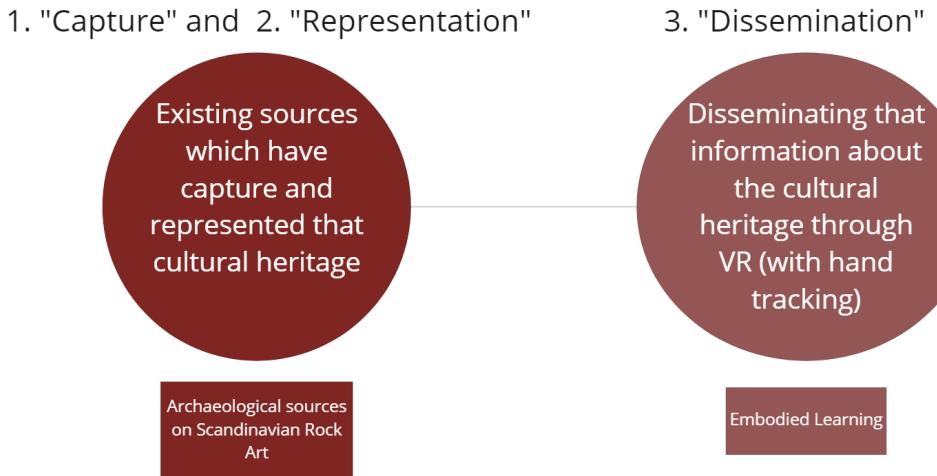
Finally, a great constraint of hand tracking is feedback and signifiers. Unlike controllers, computer vision based hand tracking cannot include traditional haptic feedback without aids, however, it includes self-inflicting haptic feedback. An example of this could be the pinching of two fingers, as when the fingers touch, the user would get haptic feedback and know that they have reached the limit of the motion. Additionally, the developers can also add more types of feedback, e.g. sound [15].

The chosen technology for dissemination in this project is:

Virtual Reality: with hand tracking as input, on the Oculus Quest 2 headset

2.5   Embodied Interaction and Learning

Finally, we have to consider how exactly can the technology (Virtual reality and hand tracking) be used to disseminate our cultural domain (Scandinavian rock art). As such, it is important to look at concepts that might help facilitate this dissemination of knowledge within VR. That being said, this section will focus on one such concept: embodied interaction. We will present how one might understand what it encompasses, and the benefits of using it within a VR environment to spread knowledge. Thinking about digitisation again, this section relates to the third step as well (see Figure 2.17).

1. "Capture" and 2. "Representation"   3. "Dissemination"

Existing sources
which have
capture and
represented that
cultural heritage

Disseminating that
information about
the cultural
heritage through
VR (with hand
tracking)

Archaeological sources
on Scandinavian Rock
Art

Embodied Learning

Figure 2.17: *An illustration of the process of digitisation. This section focuses on Embodied Learning, a concept which can be used to improve the dissemination of knowledge within VR.*

2.5.1 Embodied Interaction

Embodied interaction is physically and socially embodied and is strongly based on the environment and the items within it [11, 72]. In other words, we have a physical and socially learned understanding of how we can interact with the world and those interactions are sensitive to the environment, as the nature of the environment will affect the interactions that happen within it. An example could be an office space which can enable interactions with various office supplies.

For us, this means that the appropriate VR environment for a user creating Scandinavian rock art would be at a location resembling where it has been found with artefacts that are representative of those that have been used for creating it.

Melcer and Isbister mention that games and simulations that use embodied interaction have a tendency to place players in a physical environment, where they can physically interact with items [38].

> Embodied Interaction requires the user to be situated physically in an environment, and have the ability to interact with objects.

2.5.2 Embodied Learning

Embodied learning has been encouraged to be used within learning environments, as it provides a number of benefits. Johnson-Glenberg et al. mentions that using

gestures while learning works as a "cross-modal prime", which helps retrieve information, even if the gesturing is spontaneous or instructed by someone else [32]. They, as an example, mention an experiment where they would say simple phrases of actions to be carried out (such as "lift the hat"). One group would interact with the items of interest and another would not. In the end, the group that interacted with the item itself remembered the phrases better than the ones who did not [31].

Degrees of Embodiment

Johnson-Glenberg et al. introduces a taxonomy that describes four degrees of embodied learning, four being the highest one [32]. The **fourth degree** includes movement in the environment and high sensori-motoric engagement. Gestures are designed to be congruent to real life experience and it is perceived as very immersive.

The **third degree** includes a stationary user, however, the user's whole body is still engaged. Gestures have some form of congruence and the environment is perceived as immersive.

The **second** and **first degree** includes sitting users where there is some upper body movement. The second degree includes an interactive interface, but less congruent gestures, which can be seen with use of, for example, tablets, whereas the first level is focused on observations of video or simulation, completely removing interactive gestures. Neither of these degrees are perceived to be very immersive.

Considering our prototype, which takes place in a VR environment, we aim to use embodied learning to a fourth degree, with the user being able to move around in the environment, and realistic interactions.

Embodied Learning in VR Taxonomy

Johnson-Glenberg et al. later suggested a taxonomy that focuses specifically on embodied learning within VR [31]. Additionally, they provide reasons for why VR is a great tool for embodied learning, as it makes it possible to portray environments and interactions, that would either be *impossible, expensive, dangerous* or *counterproductive* to accomplish in real life. For VR, they describe two profound affordances for embodied learning, which includes

A sense of presence and agency is needed in order to "learn by doing", in virtual reality literature.

having a sense of presence within the VR application and the embodied affordances by gesture and manipulation in the 3rd dimension, which enables a sense of agency for the user [31]. These points are important, as they allow the user to

feel as if they are performing actions themselves, within a virtual environment, and thereby "learn by doing". The taxonomy provides a list with 18 points that describe general guidelines and gestures/hand controls. The narrow the list down to the *"Necessary Nine"*, which they especially recommend using for VR embodied learning environments. These will be used as guidelines for the design phase, in order to create an environment which is fit for disseminating cultural heritage. The list contains the points:

- Scaffold: build up complexity and introduce components one at a time.

- Guided exploration (through signifiers): use free exploration in the beginning, but as the educational content takes part, guide the user as they progress.

- Playtest often, both on newbies and experienced users. Developers do not count.

- Provide immediate, actionable and non-distracting feedback.

- Incorporate opportunities for the user to be active, e.g. through placement of objects and representational gestures.

- Incorporate opportunities for the user to reflect, as this allows the mental model to cohere (this component, however, still needs to be further researched).

- Incorporate congruency through gestures/actions that are focused on the content the user is trying to learn.

- Allow the user to feel ownership and agency, as this help negate motion sickness and provides positive emotional affects.

- Use gestures as a form of assessment during and after the learning takes place to reveal the user's mental model.

Examples of other points on the list were *minimising text reading, using low-stake errors* (i.e. learning by failing) and *collaborative interactions* (multiplayer or interacting with non-playable characters (NPCs)).

2.6   Summary of Project Direction

With all the information presented previously in the previous sections, we can summarise the direction of the project. As such, we aim to:
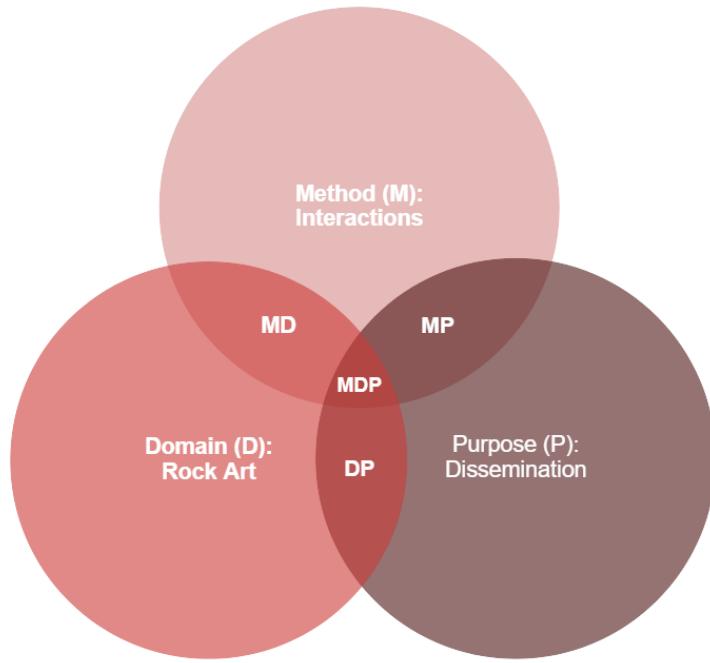
Digitise *tangible* and *historic intangible culture*, in the form of *Scandinavian rock art*,

by using a *VR application* with *hand tracking*, which incorporates concepts from *embodied learning*. The *transformative aspect* of the rock art will be illustrated, including the *materials* and *tools* used, as well as one possible *purpose* behind the creation of the art: *overshadowing*.

All things considered, before starting to create a prototype, it is important to find and analyse programs or projects which try to create a similar solution. Accordingly, through this analysis, we can gain new insights and design ideas for our own solution, as well as get an idea of what has been explored in the field so far, and possible complications.

2.7 State of the Art

This section describes our analysis of state of the art (SOTA) solutions and related work. To organise the search, we summarised our area of interest using a Venn-Diagram, which can be seen in Figure 2.18. Each circle contains an area of interest to our project, and they correlate with the points identified initially in the project proposal, described in Section 2.1. The main point was then to look for related work and solutions which are at the intersection of the three focus areas, as those would be very similar to what the project is trying to accomplish. However, such works were scarce, and, as a consequence, we also analysed solutions which only contained two areas of interest. Ideally, these overlaps can paint a better picture of what similar research and solutions already exists, as well as highlighting the unexplored fields within.

Figure 2.18: *An illustration of the diagram used to conduct the SOTA research. Each focus point is abbreviated using a letter: Method (M), Purpose (P), Domain(D). The intersections between them use a combination of these abbreviations, e.g MD are solutions which use a similar method and have the same domain as we the one we are interested in.*

That being said, we identified three types of solutions/works that are relevant to the scope of project (discriminated based on how close they are related to our own project):

1. Solutions which disseminate a different cultural domain through VR interactions.
   (Method and Purpose intersection)

2. Solutions which disseminate rock art through VR, but without interactions.
   (Domain and Purpose intersection)

3. Solutions which disseminate rock art through VR interactions.
   (Domain, Purpose and Method intersection)

These will be presented below, in their own sections.

2.7.1 Solutions which disseminate a different cultural domain through VR interactions

Within the domain of ICH, VR is thought of as a new Information Communication Technology (ICT) tool for dissemination, due to the additional types of modalities that it offers. However, a scarce amount of research exists. Rossau et al. investigated whether VR could be an alternative or additional way to disseminate ICH, specifically for traditional craftsmanship, since it offers benefits that other safeguarding methods do not offer, such as embodied interaction [61]. Through a case study they explored the merits and demerits of digitising dovetailing in VR, following the Tripartite Digitisation Model (TDM) [61]. Using TDM the captured data was acquired using four different ethnographic methods (situated interview, shadowing, in-situ acting, video viewing), each giving a different context to the domain, which facilitated the dissemination through VR. The authenticity of the simulation was evaluated on the inside actor and peer, both through watching and playing, which in terms of dissemination, received positive feedback. Afterwards, they conducted another study on nineteen students averaging in their twenties. The users were able to successfully interact with the environment, which suggests that using VR as a method for safeguarding ICH is advantageous.

Even though the domain of the paper is not fully aligning with our project's, it still infers an argument for using VR, as it proves to be a powerful medium for disseminating ICH thanks to the higher levels of interactivity it offers. It also describes aforementioned ethnographic methods that might prove useful within this project.

Similarly, Stok et al. also used VR for safeguarding. In this case, a South African folk tale called "The Jackal and The Wolf" was digitised with the use of audio recordings, with the purpose of creating a multi-sensory ICH VR experience. The results showed that "*working with captured ICH material in a very limited form requires technology designed to fill in the blanks for what the data does not offer*" [69]. This infers that when digitizing ICH, it may come with obstacles such as incomplete literature, which would in turn make the digital product lack those missing parts. In order to fix that, we as the designers might need to fill these gaps with a subjective perspective about the domain.

2.7.2 Solutions which disseminate rock art through VR, but without interactions.
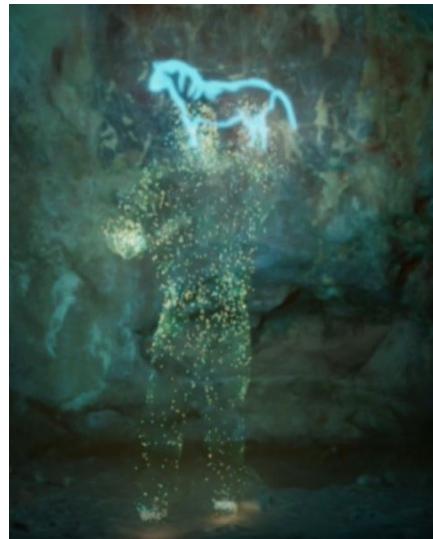
This category is where a lot of the solutions lie. It relates to works where rock art is presented, but there is no direct interaction, or embodied learning.

An example of this is what Helen et al. explored in their collaboration with the British Museum in 2018 [2]. The idea was to disseminate rock art with a 360°photograph used in conjunction with 3D models as a VE. With this prototype many challenges and design choices had to be taken in consideration, such as the viewing device. For the project they chose to go with a mobile device and Google Cardboard mainly due to accessibility. The application was then made free and all that was needed to experience it was a phone, headphones and Google Cardboard (or an equivalent of it). In spite of the benefits from a mobile application, many limitations came with it, mainly visual quality. The article argues that accessibility outweighs quality, and uses the Oculus Rift as an example of a good headset for a quality rock art application. However, the project did not want: *"cost, internet bandwidth speeds or access to the headset technology to act as a barrier"*. With this in mind, the Helen et al. project is from 2018 and since then headsets have evolved. It can be argued that all of the concerns of VR headsets has been addressed as headsets no longer requires a tethered connection, can be bought in common electronic stores, does not require an internet connection to run a locally stored application, and have a consumer friendly price tag at the same range (if not lower) as some phones.

Similarly, **Memoria: Stories of La Garma**[2] is described an *"interactive virtual reality journey"*, where a user can explore the recreated cave of La Garma (Spain). Interestingly enough, the interactions in the game itself are not related to the rock art, so we still cannot classify it as a solution which fulfils all three focus points (Domain, Purpose and Method). It is more of a narrative game, where the user is guided through the cave by narration and illusions of predecessors, made out of particles, an illustration of which can be seen in Figure 2.19. The cave contains depictions of petroglyphs and pictographs alike, and some of them are highlighted for the player. The aforementioned particles stuck as a useful way to guide a user through the environment, but other than that, it was hard to draw any additional conclusions.

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[2]Overlat, 2020

Figure 2.19: *An example of a guiding illusion made up of a particle like structure of different colours [51].*

Additionally an application made by Google called *The Dawn of art*[3] in 2020 explores the same field as Helen et al. [2]. However, this application is a PC VR headset exclusive. This allows the application to have better visual quality, though it does require a tethered connection to a PC. The Dawn of Art provides great visuals and voice acting from Hollywood actress Daisy Ridley. However, though it takes advantage of the quality and computing power gained from a PC VR headset, it does not utilise the full potential of VR where it only uses minimal interactions such as holding a torch or touching a hand stencil.

2.7.3 Solutions of Method, Purpose and Dissemination

An example which is closely aligned with our research is a paper by Rodil et al., in which they made a VR prototype for creating rock art using the Oculus Quest. The base of the art is a San[4] folktale called Thunder and Lighting. Within the virtual environment, it is possible to use a stone or a brush on interactive cave walls to create both petroglyphs and pictographs. The purpose of doing so is to disseminate intangible culture through VR technology. The user experience is evaluated through a logging system which tracks the position of a head mounted display and the two controllers. Rodil et al. argue that the logging method is chosen due to the system being tested outside of lab facilities, where the user interaction is only observable through the head mounted display (video recording is too costly for frame rates), and the inability to disturb the user, due to the user needing to hear the story progressively being told verbally [60]. Through this,

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[3]Google, 2020
[4]A group of indigenous tribes located across borders in southern Africa.

the implementation of an interactive cave wall for the creation of pictographs and petroglyphs proves to be a possible concept, therefore, it is feasible to create such a "canvas", on which a user would be free to paint.. Additionally, a similar logging system seems to be a possible solution for an evaluating the prototype.

2.8   Research Gap

Based on the reviewed literature from Section 2.7, it is evident that solutions within each of the focus points do exist. There is, however, limited research which concerns all three domains. From what was found, it seems as if most applications concerned with disseminating rock art, do it in a manner where the user ends up being a spectator, just observing the rock art, instead of taking full advantage of the possibilities of VR, and letting the user interact with it in some way. On the other hand, works which disseminate other cultural domains have proven how effective embodiment in VR can be for that purpose. Furthermore, the research we have found which situates itself at the intersection, most similar to the scope of our project, focuses on a story and not the process of rock art creation.

With all that in consideration, from what we can gather from the findings, it seems as if VR definitely has potential to disseminate rock art, and a lot of that potential could be coming from how good the platform is for embodied interaction as suggested by Rossau et. al. [61]. At the same time, hand tracking is now available on mainstream VR headsets, which might be able to enhance this embodiment even further, by adding to the agency the users feel. Therefore, our focus is:

To use embodied learning in virtual reality, with hand tracking as an input method, to disseminate the process of creating Scandinavian rock paintings, its transformative aspect, and the purpose of overshadowing that lead to the creation to some of the art.

Chapter 3
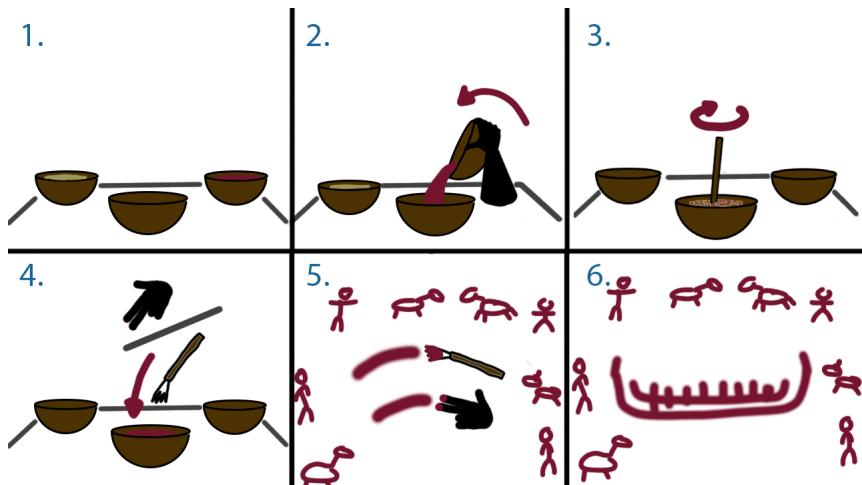
Methods

In this chapter, we will describe the process of designing and implementing the virtual reality prototype, for the purposes of disseminating rock art.

3.1 Design

Here, we will present the design steps that went into creating the prototype, from sketches to the final models, the prototype's interactions and the reasoning behind these decisions.

To start, the storyboard in Figure 3.1 describes the process that we are attempting to recreate within the prototype. Taken step-by-step, the user would first take the materials necessary for preparing the paint, and pour them into an empty mixing bowl. Following up on that, they would need to stir those materials to mix them, after which they can freely dip either their hand, or brush into the paint. Lastly, they can apply the paint to the rock wall to create their desired rock art.

Figure 3.1: *The storyboard showing the main interactions of preparing the paint and painting on the rock wall.*

In the rest of this section, we will expand on design decisions regarding each element that goes into creating this sequence of events, as well as detailing what parts of the application were created according to literature, and where liberties had to be taken.

3.1.1 Virtual Objects

As can be seen in the storyboard, in Figure 3.1, the prototype contains three bowls. These virtual objects are meant to hold the materials needed for the paint: red ochre, animal fat and one empty bowl in which the two materials will be combined. Furthermore, it contains a brush made out of an animal bone and animal hair, as well as a wooden stick needed to stir the paint materials. These models were created within Autodesk Maya and imported into Unity, which is the game engine used for this prototype. The ochre material, animal fat and brush components are used based on the research on materials presented in Section 2.3.2. However, similarly to the problems described by Stok et al., mentioned in Section 2.7.1, we could not find literature which described all aspects of the process [69]. Namely, we did not find any information as to what containers they used (if any) to keep the aforementioned materials in, as well as what they used to mix them together. For that reason, we had to make assumptions about these possible objects, so that the rest of the process could be represented. That being said, we decided to have the materials kept in the wooden bowls, and to use a simple wooden stick to stir the materials.

Another important object within the scene was the actual rock wall where the users are able to paint. We decided that this would already contain depictions of

rock art, as to suggest the aspect of transformativeness. These depictions come into two forms: as actual rock art motifs, taken from existing photo-documentations, or as paintings created by us, with similar motifs, within the application itself. The idea to include both was meant to support the idea that some depictions are older than others.
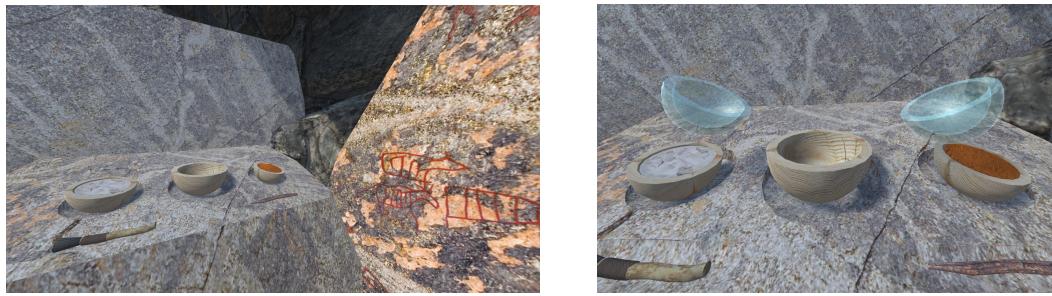
3.1.2   Interactions, Signifiers and Feedback

As stated in Section 3.1, the prototype involves numerous interactions. This section present the choices, in terms of feedback and signifiers, when it comes to these interactions, as well as the overall design approach to create them.

Considering the taxonomy described in Section 2.5.2, we strived for creating a prototype which incorporates a fourth degree of embodiment and the nine necessary points presented by Johnson-Glenberg et al. [31].

The users will be able to observe the environment and the current rock art, as they enter the program, however, they will not be able to draw any rock art before they prepare the materials needed for it, i.e. mixing the paint. This forces the user to follow the process of creating Scandinavian rock art step by step, which enforces the taxonomy point of introducing components one at a time.

The materials themselves will be placed on top of a smaller rock resembling a table, by the rock wall, as can be seen in Figure 3.2a. The table is intended as a signifier, for the user to be able to identify where the interactable items can be found, as there will be nothing similar to it in the virtual environment. Additionally, the materials presented on the table will have fitting textures suggesting what they are made of. Furthermore, the table has been made with small indents (on top which the items are placed) to further signify interactability, which can be seen on Figure 3.2a and 3.2b below. Lastly, instructions signifying how to mix the paint will be presented as transparent "ghost" replicates of the objects performing the necessary movement to complete necessary steps. This was inspired by the signifiers used in **Memoria: Stories of La Garma**, where the user is guided through a cave system by illusions of predecessors. Examples of these points can be seen in Figure 3.2b.

(a) *Illustration of the stone table which holds the materials the users can interact with. The materials are placed in small indents within the table itself.*

(b) *Illustration of the "ghost" signifiers which were incorporated to guide the user through mixing the paint.*

Figure 3.2: *Illustrations from the VE of the program in Unity.*

This process incorporates a multitude of taxonomy points, one being guided exploration, as the user is free to explore once they enter the program. The mixing of paint and the painting itself allows the user to be active through congruent gestures and all activities within the program is performed by the users, which are intended to let the user achieve a sense of agency and ownership.

For the aforementioned mixing, the process is for the user to grab either the ochre- or fat bowl first, then add it to the empty bowl, and repeat the process with the remaining bowl. When the content of both bowls are added in the empty bowl, the user will have to grab the wooden stick to stir and combine the materials. Once this has been achieved the mixing process is complete and the user is free to dip either hand, or the brush into the paint mixture to proceed to the painting.

Feedback will be provided through audio and visuals, where audible feedback will be triggered as following:

- When the ochre bowl has been poured into the empty bowl.

- When the fat bowl has been poured into the empty bowl.

- While the stick is continuously stirring the mixture.

- When a hand has been dipped into the finished mixture.

- When the brush has been dipped into the finished mixture.

An additional sound was added when an object was dropped on the floor within the scene. The object would then return to its original position on the table to avoid the user losing access to the object if it fell out of reach.

Due to the constraints with haptic feedback that comes with hand tracking, as

explained in Subsection 2.4.4, visual feedback is used, where the hand will stop moving towards and through the rock wall, when it is pushed against it, indicating that the hand is within reach and ready to paint. Without this, the hand and everything they hold (e.g. the brush), would pass through the rock wall, making it tedious for the user to paint on the surface, as they would need to keep their hand at very specific positions.

Furthermore, when the user picks up a tool, it will snap to their hand position, to indicate that they are currently grabbing the tool.

Additionally, in conjunction with the sound feedback, the texture on the hands would change to a texture with red colour on the fingertips, when the hand is dipped in the paint bowl. In similar fashion, the texture of the tip of the brush will be changed as well, to the same colour as the paint, after it has been dipped. Furthermore, when the paint has successfully been mixed, the paint mixture model will change to a finished mixture model which can be seen in Figure 3.3a and 3.3b below, so the users would have feedback indicating their actions were successful.

(a) *In-game image of the mixture model before stirring on the rock table.*

(b) *In-game image of the mixture model after it has been stirred, and has become dippable.*

Figure 3.3: *Images of the table from Unity.*

3.1.3 Virtual Environment

The virtual environment for the prototype was designed based on descriptions and examples of real rock art locations, such as in Figures 3.4a and 3.4b. However, our environment is not a replica of any specific location, as we do not intend to disseminate an exact Scandinavian rock art location. Therefore, it was designed to resemble a generic Scandinavian rock art site, while being small and simple. With this in mind, the environment will incorporate one rock art panel, situated underneath a vertical overhang. In literature, this is described as a common occurrence, since the overhang can protect the rock art from unfavourable weather [19, 42]. Additionally, the overhang will be situated close to the shoreline of a body of water, as described in existing literature [42, 74, 68]. Figures 3.5a and 3.5b show the initial design of the environment, which was created in Autodesk Maya [3], and
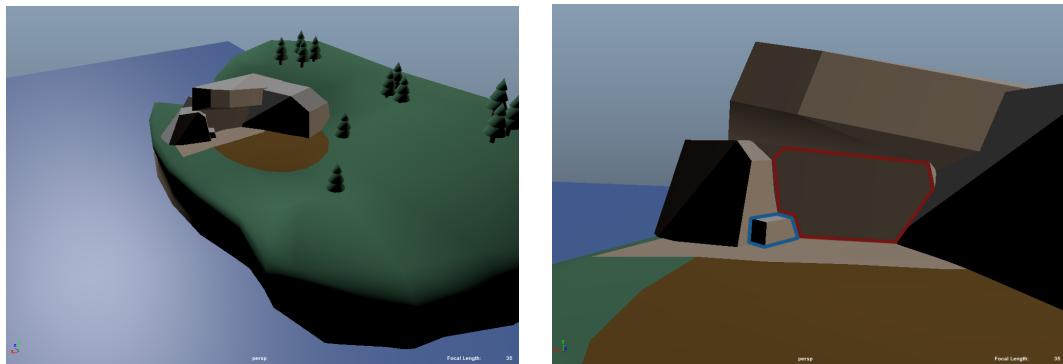
was based on multiple sketches. The latter, see Figure 3.5b also outlines three different areas: the blue outline marks a stone "table" that is used to hold necessary items; the red outline is the actual rock wall on which the user will paint, so the same virtual object mentioned in Section 3.1.1. Using this sketch, the environment was created in Unity, this final version can be seen in Figure 3.6.

(a) *The panel of Honhammar. Photo taken by George Nash/May-Tove Smiseth, from [42, p. 39].*

(b) *Another example of a rock art site. Photo taken by J.M.Gjerde, from [19].*
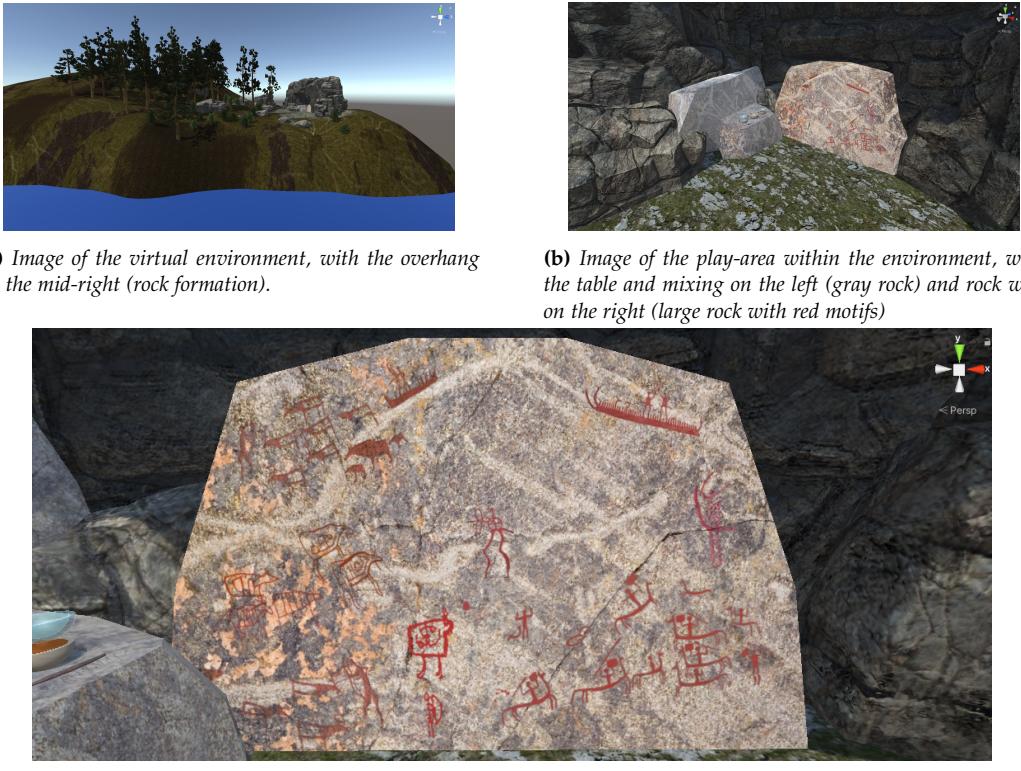
Figure 3.4: *Examples of rock art.*

(a) *A wider perspective of the environment showing the basic idea of the final prototype. The blue plane on the left side symbolises water body, the green part on the right is a land with some decorative trees. The brown texture in the middle is dirt ground. Finally, the grey models are the rocks on which the art will be made.*

(b) *This Figure shows a closer look on the main part of the rock, which will be the focus of the prototype. The coloured outlines show different parts of the rock which will have specific purposes.*

Figure 3.5: *The environment seen from birds eye perspective (left image) and a closer look of the main rock (right image).*

(a) *Image of the virtual environment, with the overhang on the mid-right (rock formation).*

(b) *Image of the play-area within the environment, with the table and mixing on the left (gray rock) and rock wall on the right (large rock with red motifs)*

(c) *The rock panel on which the user can draw.*

Figure 3.6: *In-game rendering of the program in Unity.*

3.1.4 Hand Representation

As mentioned, the prototype is controlled using the users' hands. According to Lin et al., the higher level of realism, when it comes to hand representation's, the better it is perceived, indicating that the hand models should be as realistic as possible [36]. Similarly, Schwind et al. argue that non-human avatar hands lower men's levels of presence, but also that a male hand representation can lower women's level of presence [63]. With this in mind, we chose to use the custom hands provided by Oculus Integration, the official Oculus library for Unity, which can be seen in Figure 3.7. The idea is to have the hand representation be realistic, but not to the extent where a user would have a lower level of presence based on gender or race.

Figure 3.7: *The Oculus Integration custom hands taken from Unity.*

The custom hands include sets of bones that are mapped to the image processed model of the user's hand. These are controlled based on the user's real hand rotation and position through image processing, as mentioned in Subsection 2.4.3. With this in mind, the implementation was initiated.

3.1.5 Assets

The prototype used a multitude of public assets, which facilitated the implementation. These assets include 3D objects within the environment, textures and sound effects.

Two Unity asset packages were used for creating the environment, namely, Dream Forest Tree (DFT) and Rock and Boulders 2 (RB) [12, 56]. DFT was used to model the terrain and included free tree and bush assets. For the rocks within the scene, RB was used, which included several different types and shapes of rocks.

The base textures used for the bowls, brush, stick, materials and rock panel was taken from Colourbox, which provides a library of stock photos [9]. It is worth noting that the rock art used on the rock panel are real life pictures of Scandinavian rock art [62, 58, 57, 52]. Each texture was modified before applied to the respective items.

The sound effects (stirring and applying paint) and ambient sounds were taken from Epidemic sound and Freesound.org, which provides libraries consisting of royalty free soundtracks [14, 16].

3.2 Implementation

Previously, in this chapter, we have explained the design decision that went into creating the application. In this section, we will discuss how those aforementioned features where implemented.

With that said, there are three main aspects of the application which we will presented, corresponding to parts in the process of creating rock art:

The implementation consists of four core features being; grabbing objects using the OVRBones, mixing the materials using colliders, painting onto the wall using shaders, and hand collision using two pairs of hands.

1. *Grabbing* - Allowing the user to manipulate the various tools and materials.

2. *Mixing materials* - Allowing the user to learn the process of creating paint through embodied learning.

3. *Painting* - Allowing the user to juxtapose or superimpose new motifs to learn about the transformative aspect of Scandinavian rock art, and the overshadowing purpose.

3.2.1 Grabbing

Grabbing is one of the three main aspects, and it allows the user to manipulate objects' transformation. In order to register a grab, we used information from the hands (specifically the bones within the hands) included in the OVR package (see Section 3.1.4). Here, each bone contains a transformation, relative to their parent[1], creating a hierarchical structure. We use these transforms to check for a grab. Each finger tip is compared to the palm of the hand (in terms of bone transforms), which results in vectors whose magnitudes describes the distance from the finger tip to the palm. These distances are summed together and averaged, since grabbing is a function of multiple fingers, resulting in an overall metric that can be evaluated to a custom threshold. If the averaged distance is ever below the threshold, then a grab is initialised. The implementation of this can be seen in Figure 3.8 below.

---

[1]An object which acts as an anchor point for its children, i.e. all objects transforms are respecting their parents.

```csharp
      4 references
76    public bool FingerUpdate(OVRSkeleton skeleton, OVRBone[] bones, float t, string type, ref float debugSum)
77    {
78        bones[0] = skeleton.Bones[20]; //IndexTip
79        bones[1] = skeleton.Bones[21]; //MiddleTip
80        bones[2] = skeleton.Bones[22]; //RingTip
81        bones[3] = skeleton.Bones[23]; //PinkyTip
82        bones[4] = skeleton.Bones[0]; //Wrist
83        bones[5] = skeleton.Bones[19]; //ThumbTip
84
85        if (type == "4FingerGrab")
86        {
87            float[] differences = new float[4];
88            float sum = 0;
89
90            for (int i = 0; i < differences.Length; i++)
91            {
92                differences[i] = Vector3.Distance(bones[i].Transform.position, bones[4].Transform.position);
93                sum += differences[i];
94            }
95            sum /= differences.Length;
96
97            debugSum = sum;
98            return sum <= t ? true : false;
99        }
100       if (type == "3FingerGrab")
101       {
102           float[] differences = new float[3];
103           float sum = 0;
104           differences[0] = Vector3.Distance(bones[0].Transform.position, bones[5].Transform.position);
105           differences[1] = Vector3.Distance(bones[1].Transform.position, bones[5].Transform.position);
106           differences[2] = Vector3.Distance(bones[1].Transform.position, bones[0].Transform.position);
107
108           for (int i = 0; i < differences.Length - 1; i++)
109           {
110               sum += differences[i];
111           }
112           sum /= differences.Length;
113
114           return sum <= t ? true : false;
115       }
116       return false;
117   }
```

Figure 3.8: *Function which checks for a grab by accessing the OVR bones, either returning **true** or **false**.*

If the user is within proximity to a grabbable object with their respective hand, i.e. if collision between the object and the hand occurred, and the aforementioned grab is registered, then the object is picked up. Each of these objects are snapped to their own position on the hand depending on whether it was the bowl, stick or brush and will be detached as soon as the aforementioned distance is beyond the threshold. An example of this can be seen in Figure 3.9 below.
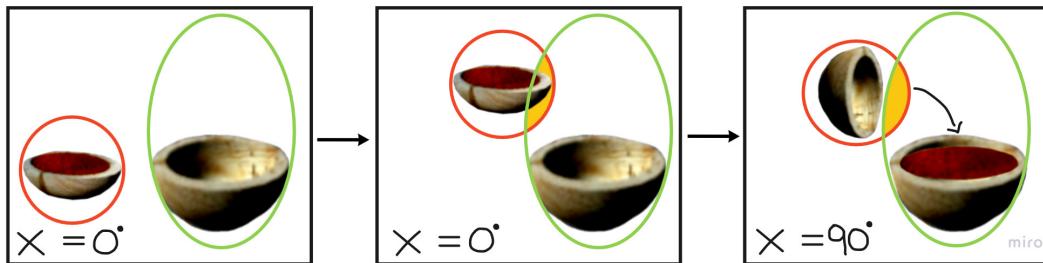
```
125         public void startGrab(int hand, string obj) // 0 - left hand,  1- right hand, obj = "Brush" for brush, obj = "Bowl" for bowl
126         {
127
128             if (hand == 0)
129             {
130                 grabbedBy[0] = true;
131
132
133                 if (obj == "Brush")
134                 {
135                     leftHand.setGrab(true,"Brush");
136                     gameObject.transform.parent.gameObject.transform.SetParent(leftBrushTransform.transform, false);
137                     gameObject.transform.parent.gameObject.transform.localPosition = Vector3.zero;
138                     gameObject.transform.parent.gameObject.transform.localRotation = rot;
139                     gameObject.transform.parent.gameObject.transform.localScale = new Vector3(4,4,4);
140                     rbody.isKinematic =true;
141                 }
```

Figure 3.9: *Function which snaps the object to the participant's hand if they have initialised the grab and collided with, in this case, the **brush** object.*

3.2.2   Mixing

As mentioned in Section 3.1.2, the user must pour the paint materials (red ochre and animal fat) into the empty center bowl. This one is locked in position so the user cannot move it by accident, and checks whether any of the said materials collide with the area above it, and if they are rotated an angle above 90°. If it is the case, then the contents of the respective material bowl will be transferred into the center bowl. Once both materials have been gathered the user can proceed to stir the materials. An illustration of the collision and orientation needed is shown in Figure 3.10.
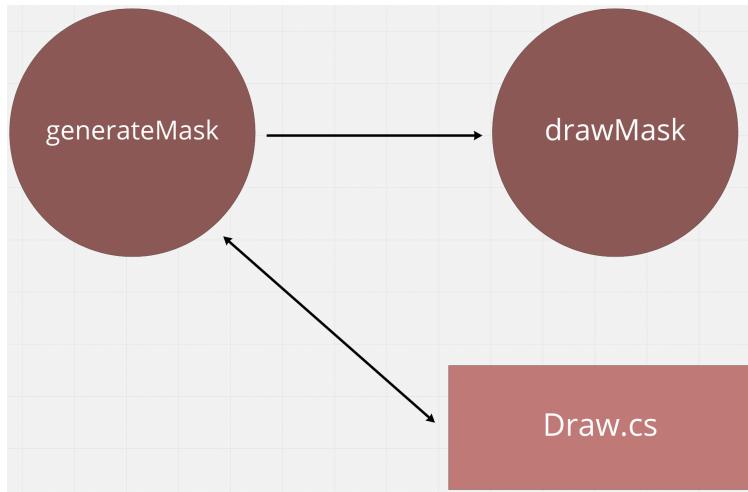
Figure 3.10: *Left box shows the bowl's initial state, center box shows a collision occurring between the two bowl colliders (red and green) and right box shows the rotated bowl while still being inside the collider, adding the material.*

Following the sequence of events, the stirring is next. In implementation terms, the user has to dip the virtual stick object into the center bowl so that it is in contact with one of the bowl's collider. The program then checks the local x coordinate of the bowl object, as well as the x coordinate of the stick. As the stick is moved back and forth on the x axis, away from and towards the center of the bowl, a counter value decreases, when that value reaches zero, the stirring is considered complete. After this, the paint material will replace the unmixed texture.

3.2.3 Painting

In order to paint, the user must first dip their hand(s) or brush into the finished paint mixture. When a collision is detected between the two, a boolean becomes true, which keeps track of whether or not that specific object (one of the hands or the brush) can paint. To achieve the ability to paint, we used shaders (two to be specific), which communicate through a script. This relationship can be seen in Figure 3.11 below.

Figure 3.11: *The relationship between the shaders (circles) and the script (rectangle).*

Draw is a script which handles the information being send to the shaders, more specifically, at which coordinates paint should appear on the texture. When the user is trying to paint within the program, a raycast is send from the same coordinates as the tips of their fingers (from both hands), and the tip of the brush, in a forward direction. Only those raycasts which have their origin point in an object that can paint (that have been dipped) will get send out, for optimisation reasons. When a hit occurs, if the object that was hit is the rock panel, the UV coordinate[2], at the position of the hit, will be send to *generateMask*, as shown in the code-snippet in Figure 3.12.

---

[2]2D representation of the 3D texture.

```
11 references
32   private void SendUV(RaycastHit ray_hit, int intensity)
33   {
34
35       generateMask.SetVector("_Coordinates", new Vector4(ray_hit.textureCoord.x, ray_hit.textureCoord.y, 0, 0));
36       generateMask.SetInt("_Intensity", intensity);
37       RenderTexture temp = RenderTexture.GetTemporary(mask.width, mask.height, 0, RenderTextureFormat.ARGBFloat);
38       Graphics.Blit(mask, temp);
39       Graphics.Blit(temp, mask, generateMask);
40       RenderTexture.ReleaseTemporary(temp);
41
42   }
```

Figure 3.12: *Function that sends the uv coordinate to the **generateMask** shader.*

This coordinate is used as a reference point within ***generateMask***, so it knows where to paint. When this shader has received its coordinate it will draw at that particular point on a *rendertexture*, which is a temporary texture created at runtime, and in our case, used as a mask. Onto this mask, ***generateMask*** will draw a circle around the received coordinate in a custom colour, whose radius can be modified within the ***draw*** script. The output and implementation of this can be seen in Figure 3.13 and 3.14.
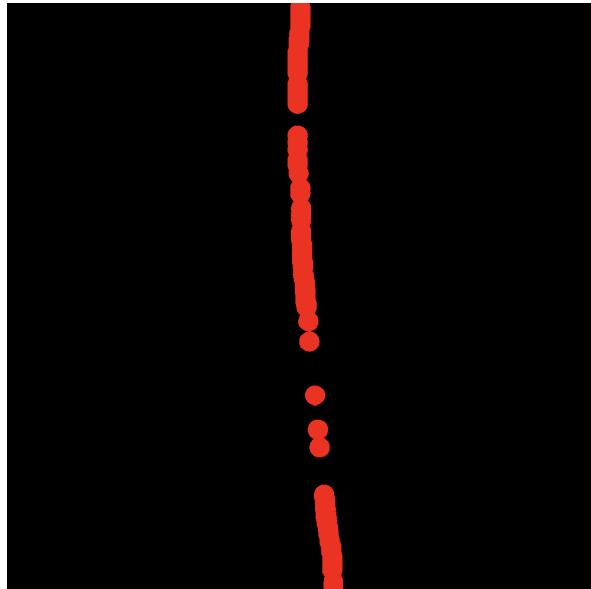
Figure 3.13: *Output of the **generateMask** shader.*
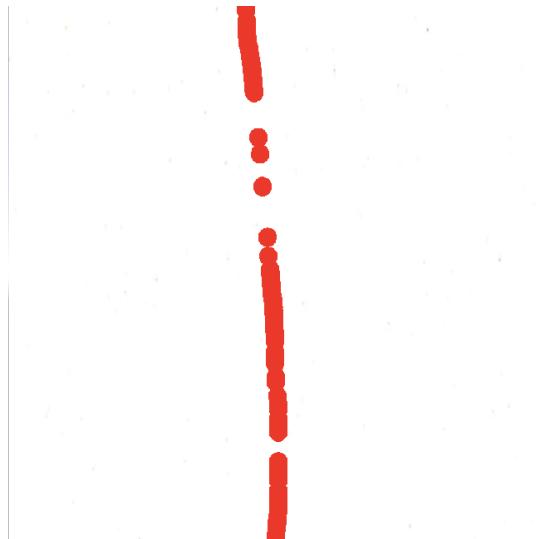
```
52          fixed4 frag (v2f i) : COLOR
53          {
54              fixed4 col = tex2D(_MainTex, i.uv);
55              float4 draw = pow(saturate(1-distance(i.uv, _Coordinates.xy)), _Intensity);
56              fixed4 drawcol = _Color * (draw * 1);
57              fixed4 temp = round(saturate(col + drawcol));
58
59              return temp;
60          }
```

Figure 3.14: *Fragment function which draws a circle onto the rendertexture at the received coordinate from draw.cs.*

This render texture, which Figure 3.13 shows an example of, is shared with ***drawMask***, which is what is used to draw on the actual wall texture. This is done by filtering the pixels based on their colour; if the pixel's colour is equal to what was drawn on the render texture it should make it the same colour on the wall texture. If not, it should make the pixel's colour equal to the wall's, i.e. it remains the same. The end result and implementation can be seen in Figure 3.15 and 3.16, having successfully painted on the surface.

Figure 3.15: *Output of the **drawMask** shader.*

```
52          fixed4 frag (v2f i) : COLOR
53          {
54              fixed4 col = tex2D(_Mask, i.uv);
55              float isColorToReplace = step(0.999, dot(col.rgb, _Color));
56
57              return isColorToReplace == 1 ? _ColorToDraw : tex2D(_MainTex, i.uv);
58          }
```

Figure 3.16: *Fragment function which filters the rendertexture for red pixels and draws it to the object's texture.*

3.2.4   Collision

As mentioned in Section 3.1.2, we designed for the virtual hand and everything it holds, not to pass through surfaces such as the rock wall, due to the distance between it and the fingers or brush being hard to maintain without any assistance. However, there is an issue where the hands, prefab from Oculus integration (see Section 3.1.4), follow the position of the user's actual hands unconditionally, making them pass through every object within the program without exception, therefore two pairs of hands had to be implemented. One pair which tracks the position and are not displayed, which we call *trackingHands*. The second pair of hands are the once meant to interact with anything within the program, which are called *outerHands*. The outerHands follow the trackedHands position unless collision occurs, which solves the issue of passing through objects.
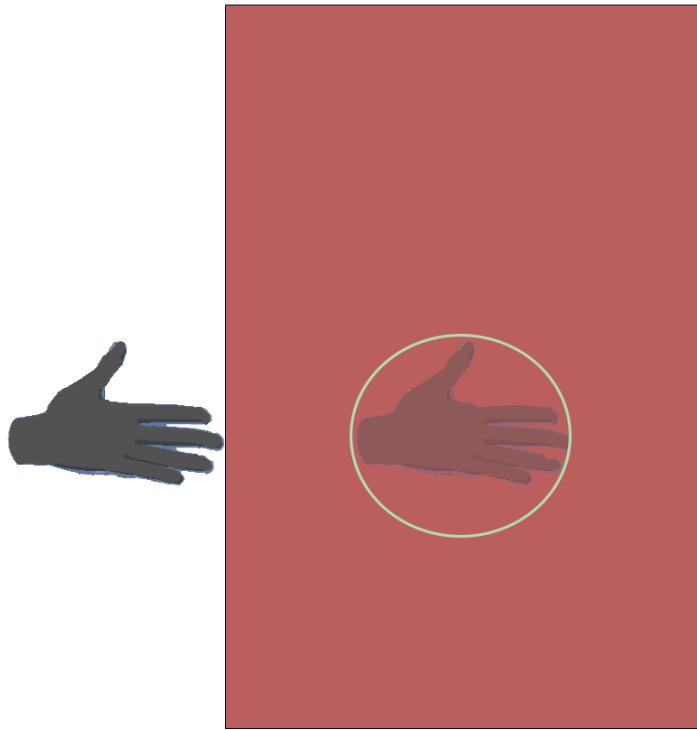
Collision was implemented through two different scripts; *handCollision* and *collisionSwitch*. The handCollision script handles the triggering of collisions between the trackingHands and one of three different colliders; tabletop, table side, and rock wall. The effect of what will happen to the hands depends on what object triggers a collision with them. The rock wall game object is oriented to face the player in the z axis, in this case we only set the outerHand to follow the x and y positions of the trackingHand, thus freezing the z axis (so that it does not move more towards the wall). This gives the illusion of hand collision on touch. When the trackingHand exits the rock wall collider, the condition is no longer met and the outerHand will continue to follow the x, y and z position of the trackingHand. This is illustrated in Figure 3.18 below the paragraph. This is the same principle used for the table top and table side colliders. However, the axis on which the outerHand is frozen is different in those two cases (since the objects themselves have a different orientation). Figure 3.17 below, illustrates the transform relation.

```
129
130        void HandsCollided ()
131        {
132            paintHand.transform.rotation = gameObject.transform.rotation;
133            paintHand.transform.position = new Vector3(paintHandX, paintHandY, paintHandZ);
134            gameObject.GetComponent<OVRMeshRenderer>().enabled = false;
135            gameObject.GetComponent<SkinnedMeshRenderer>().enabled = false;
136            gameObject.GetComponent<OVRSkeletonRenderer>().enabled = false;
137        }
```
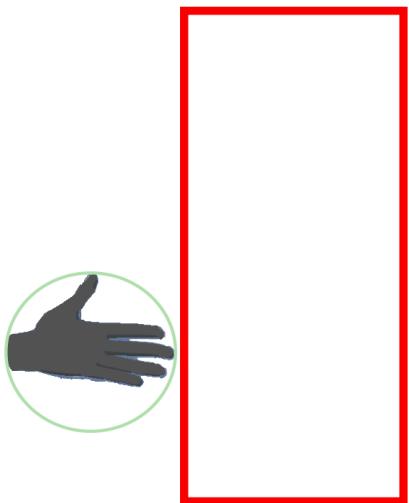
Figure 3.17: *Code snippet of the **handCollision.cs** script, where the game object is referring to the tracked-Hand, and paintHand to outerHand. The HandsCollided function freezes the aforementioned outerHand position, when called in an update loop.*
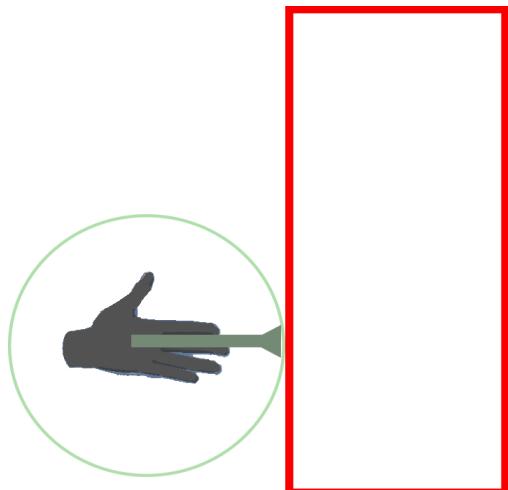
Figure 3.18: *Side view illustration of the outerHand and trackingHand relationship, with the trackingHand (faded on the right) and its sphere collider (green circle) inside of the rock wall triggering collision, stopping the outerHand (left) from going through the rock wall.*

The collisionSwitch script handles the issue of tools going through the surfaces of the rock wall and the table. The script accesses a sphere collider on the outerHands and increase the radius a certain amount depending on the tool being picked up, e.g. when the brush is being picked up by the right outerHand, the radius of the sphere collider would be increased to prevent the brush from going through the mesh of the rock wall. This is illustrated in Figure 3.19 and Figure 3.20 below.

Figure 3.19: *Illustration of the initial radius of the sphere collider (green) from the trackingHand.*

Figure 3.20: *Illustration of the increased radius of the sphere collider (green) from the trackingHand, when a brush is grabbed by the outerHand.*

Chapter 4

Experimental Design

As has been previously mentioned in Section 2.7, the project has three focus points; Interactions (as a Method), Rock art (as a Domain), Dissemination (as a Purpose). The experiment for testing the prototype was structured in such a way as to evaluate these points. For an overview, the list of methods used to accomplish this can be seen below:

1. *SSQ: Simulator Sickness Questionnaire* - Eliminate invalid data

2. IPQ: Igroup Presence Questionnaire - Evaluation of the system and embodied learning (dissemination)

3. *UMUX: Usability Metric for User Experience questionnaire* - Evaluation of the system (Interactions)

4. *Agency and Ownership questionnaire* - Evaluation of the system (interactions)

5. *Sequence questionnaire* - Evaluate learned knowledge (dissemination)

6. *Pre- and post-interviews* - Evaluate learned knowledge and usability (dissemination and interactions)

7. *Video and voice recording with the Think Aloud method [8]* - Evaluate learned knowledge and usability (dissemination and interactions)

8. *System logging* - Fail-safe and triangulation

With that being said, these chapter will explain the choices for each of these methods, the setup and procedure of the experiment, as well as a plan for analysing the data resulting from it.

4.1 Evaluating the System

Evaluating the system is important in order to find which areas could be faulty and, by extension, affect the embodied learning and overall experience. To do so, four questionnaires and a logging system was used, which focuses on their own specific area of the three formerly mentioned.

4.1.1 IPQ

As a start, the IPQ presents data regarding three presence levels of the participants: *Spatial Presence, Participant Involvement level and Experienced Realism*. Additionally, it measures a general presence level with a single question. Through this questionnaire we will be able to determine which parts of the program could be faulty in terms of presence and use it to triangulate with other data to find a source of potential problems. Furthermore, it can be used to triangulate whether it had an effect on the embodied learning, as a sense of presence is one of the two profound affordances, as mentioned, according to Johnson-Glenberg et al. [31].

4.1.2 UMUX questionnaire

The UMUX questionnaire was used to give insight into the system usability with focus on the interactions. This data will be compared to data from the Agency and Ownership questionnaire and qualitative analysis, to triangulate the assessment of the interactions.

4.1.3 Agency and Ownership

The Agency and Ownership questionnaire specifically returns a quantitative assessment of the virtual hands, which can then be compared to the results of the qualitative analysis for a more insightful result. The questionnaire is used by Lin et al., where the questions were specifically tailored to the VR system in that study, since the questionnaire is a modified version of a questionnaire by Dummer et al., which is originally not created for VR [36, 13]. To fit our own system, some questions were rephrased, which can be seen in Appendix A.1.4. Originally, this questionnaire has been used in an experiment with multiple conditions to compare them, however, we will use it to triangulate the embodied learning experience and the results that come thereof, as agency and ownership is also one of the two profound affordances in embodied learning according to Johnson-Glenberg et al. [31].

4.1.4 SSQ

The Simulator Sickness Questionnaire is used to evaluate whether the participants got sick as a result of using our prototype. In case the score from this questionnaire

is too high for a given participant, the data from their test might not be used for analysis.

4.1.5   Logging System

Finally, we use a logging system as a fail-safe, in case certain actions that participants performed in the program, would unclear by looking at just the video recordings. Additionally, it would be useful for seeing exactly when hand tracking loss occurred, and how the hands behaved while the application was not able to track them. It is important to disclaim that this logging system was not created by us, but by another study group, and we used it with their permission, in order to gather data. The output of the logger was a .csv file, which contains the position, rotation and velocity of the hands, both the tracked, and outer one. Furthermore, it contains timestamps for each recorded transformation.

4.2   Evaluation of Dissemination

In order to verify whether the process and the transformative aspect of rock art has been disseminated, we chose a multitude of assessments, more specifically, a pre- and post-semi-structured interview and a sequence questionnaire.

4.2.1   Semi-Structured Interviews

The purpose of the pre-interview is to explore the participant's current understanding and knowledge of Scandinavian rock art, as well as their familiarity with VR and hand tracking, as a different amount of experience might lead to different outcomes. The post-interview is used for comparison with the pre-interview, as a validation of what knowledge the participants have gained by using the program, as well as for any additional comments that the participants might have.

4.2.2   Sequence Questionnaire

Similarly to the interviews, the sequence questionnaire is given before and after the test, accessing whether the participant remembers the process of preparing the materials needed for creating rock art. The sequence questionnaire consists of six sets of sequences, which can be seen in Figure 4.1, with Sequence 4 being the correct one. The rest of the sequences were created to be plausible, but incorrect.
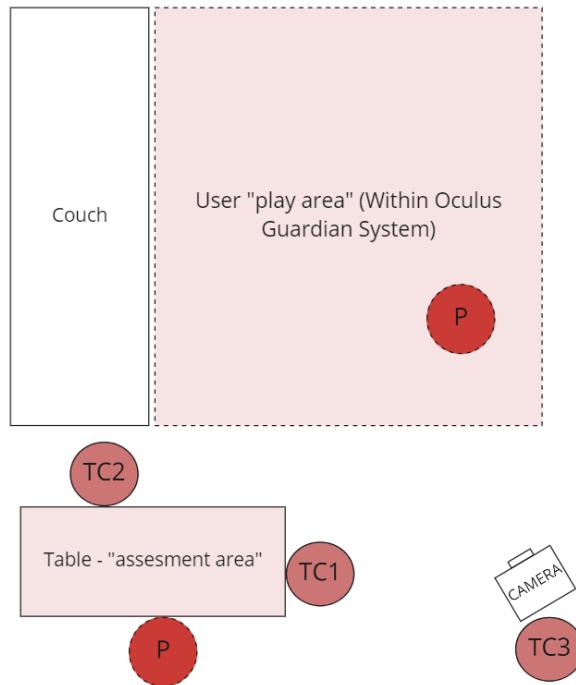
1	Pick up the materials	Heat the materials on a campfire	Stir the materials	Apply paint to finger or leaf	Paint on the rock wall
2	Pick up the materials	Shake the materials	Heat the materials on a campfire	Apply paint to finger or leaf	Paint on the rock wall
3	Pick up the materials	Heat the materials on a campfire	Stir the materials	Apply paint to finger or brush	Paint on the rock wall
4	Pick up the materials	Pour the materials into an empty bowl	Stir the materials	Apply paint to finger or brush	Paint on the rock wall
5	Pick up the materials	Pour the materials into an empty bowl	Shake the materials	Apply paint to finger or brush	Paint on the rock wall
6	Pick up the materials	Pour the materials into an empty bowl	Shake the materials	Apply paint to finger or leaf	Paint on the rock wall

Figure 4.1: *Sequence questionnaire*

4.3 Setup and Equipment

The experiment took place in the living room of a conductor's apartment. During the experiment there were three test conductors present, with only one participant at a time. The experiment room setup can be seen in Figure 4.2 below:

In Figure 4.2, it can be seen that there were two areas: gameplay and assessment. The purpose of the assessment area was to introduce the participants to the experiment and gather data through questionnaires and interviews. The gameplay station was an approximately 2x2 meter play area, where they received the headset and could roam around. The area was controlled by an Oculus Quest Guardian system, which is a digital wall within the headset that is set up prior to the experiment. The Guardian would warn the participants in the form of a blue vertical grid, in case they were close to stepping outside of the play area. The purpose of Test Conductor 2 (TC2) seen in Figure 4.2, was to prepare pre and post questionnaires, as well as a consent form for each participant. Test Conductor 1 (TC1) was the mediator who introduced the experiment and performed both interviews. Furthermore, TC1 controlled the gameplay and in-game recording. Finally, Test Conductor 3 (TC3) ensured that the participants secured the VR headset and knew their boundaries. Furthermore, TC3 recorded the video footage and sound of the participants moving in the real world during gameplay, and sanitized the equipment.

Figure 4.2: *Illustration of the experiment setup with the placement of Test Conductors (TC) and Participant (P). P is the same participant on the two locations they would switch between during the test.*

The following equipment was used:

- *Oculus Quest 2 VR headset*

- *A laptop (Asus ROG Strix GL502VS-DB71) with Windows 10, running the prototype, and OBS studio for gameplay recording [70]*

- *Another laptop running Windows 10, for setting up the questionnaires, and backup for interview audio recording*

- *iPhone 6S for interview recording*

- *Sony A6000 camera with Røde VideoMic for recording real movement during gameplay*

4.4   Procedure

With the methods mentioned in the previous section in mind, the procedure could be created, which will be explained in this section.

4.4.1 Participants

The participants for this experiment consisted of 13 university students (12 of which were peers from Medialogy), in the age group between 20 and 30 years. All participants had experience with VR, either coming from personal or study related use. Only 2 participants expressed having former experience with integrated hand tracking.

4.4.2 Pre-Test Procedure

Before conducting the experiment, the participants signed a General Data Protection Regulation (GDPR) consent form, to assure that they are informed about how their data will be handled and processed, as well as, if they agree to it. Once signed the experiment could begin.

To begin, a semi-structured interview was conducted, which was recorded both on the facilitators phone and laptop to assure that no data was lost. The interview consisted of three questions:

- *Do you have any VR experience?*

- *Do you have experience with hand tracking in VR specifically?*

- *Can you tell us what you know about Scandinavian Rock Art?*

- **Additional questions in case the facilitator wanted the participant to elaborate on something.**

Following this, they filled out the sequence questionnaire and SSQ, as explained in the previous section, and lastly the participants were given the following explanation, before testing the prototype:

Now you are going to do the actual test. Scandinavian Rock art is art that was created on various rock and boulders by tribes that lived in the area. You will be put in a virtual environment where you will act as a member of Scandinavian tribe living somewhere between 5000-500 Before Common Era (BCE). You found the rock art wall where a previous tribe used to live and your task is to mark your own existence here.

Additionally, the mediator further explained that the gameplay will be both screen and video recorded, and encouraged them to Think Aloud, which includes the participants verbally speaking their thoughts and actions as they proceed [8].

4.4.3   Gameplay Test Procedure

The test was performed in a virtual environment based on what was described in Section 3.1. The participant had a total of five minutes to paint after they have mixed the materials. Once the time was up or they requested to leave, they exited the program.

4.4.4   Post-Test Procedure

After the test, the participant answered a second SSQ, an IPQ, Agency and Ownership and UMUX questionnaire in that respective order. This was followed by another semi-structured interview consisting of two questions:

- *Can you tell us what you know now about Scandinavian Rock Art?*

- *Do you have any additional comments?*

- **Additional questions in case the facilitator wanted the participant to elaborate on something.**

Once completed, they answered a second sequence questionnaire, and was thanked for participating in the experiment.

4.4.5   Pandemic Precautions

Due to the physical circumstances under which this experiment was performed, extra precautions had to be made due to the current COVID-19 pandemic. All test conductors wore face-masks during the experiments and had gotten a negative COVID-19 result beforehand. Additionally, a silicone cover was used for the VR headset which is more hygienic than the standard Oculus Quest 2 foam cover, and easier to clean with the use of non-alcoholic wet-wipes, which was done before every participant.

4.5   Data Management

The data acquired from the experiment can be divided into two groups being, ***qualitative*** and ***quantitative.*** This section will go through how each will be processed, if needed, before presenting them in Chapter 6.

4.5.1   Qualitative Data

The audio recordings from both interviews as well as the video recording of the participants during gameplay yielded qualitative data, which we analysed using

Grounded Theory. This methodology involves observing (implicit layer) and listening (explicit layer) to participants in order to derive conceptual categories from the data which facilitates user patterns. These patterns describe possible relationships which the researchers can use to develop multiple theories. There exist different types of coding, but as there will not be any given list of categories, data-driven coding will be used. This means that the categories will be created based on the derived patterns from the data as described by Gibbs [18]. The idea behind having no given list of categories is to make the codes be as data dependent as possible.

To derive the categories, we transcribed the speech of the participants as well as test conductors for the pre- and post-interviews and gameplay. With this we could create categories as we were exploring the data. The categories involved labels such as *"Unexpected behavior"* (from the prototype, perceived by the participant), *"Excitement"* (participants verbally expressing excitement towards the prototype) or *"Rock art knowledge"* (participants expressing knowledge focused on rock art). These categories were further split into subcategories, if possible, where "Rock art knowledge", as an example, were split into *"Location"*, *"Motif/Depictions"*, *"Materials"* and more. To gather an overview we created a spreadsheet containing each category and their respective subcategories, which Figure 4.3 illustrates an example of.

Rock art knowledge								
Year	Location	Motifs/Depictions	Purpose	Materials	Process	Author	Knowledge gained outside of gameplay	New knowledge gained?
X	X	X	Collaboration focus (noticed difference between drawings)	Liquid, Dust/powder	Mixing materials, Stirring, Paint, Brush, Fingers	X	X	Yes
5000 to 500 BC	Cliffsides, Boulders	Hunting, Human Figures	Self expressions, Teritory marking, Religion, Collaboration focus	X	Ground and mix materials, Finger, Brush, Leaf	Indeginous tribes	Yes	Yes
X	Nordic environment	X	X	Red Paint, White Paint	Mixing materials	X	X	Yes
X	X	X	Depicting reality	Tools (brush), Dust/Dye, Liquid	X	X	X	Yes

Figure 4.3: *Example of the spreadsheet which contained notations of the accumulated categories and subcategories created using Grounded Theory.*

Some categories were also formed based on what we observed in the video

recordings, e.g. by looking at the participants' gestures and general movement.

4.5.2   Quantitative Data

The data from all of the questionnaires yielded quantitative data (numeric) and was analysed depending on the method the questionnaires required (namely the SSQ, IPQ, SUS and Agency and Ownership questionnaires).

Processing the SSQ

The SSQ was calculated based on a paper from Walter et al. who presents the following equations to acquire the score for each symptom, as well as, the total score [78]:

$$Symptom = weights_{Symptom} * constant_{Symptom}$$

$$Total_{Score} = Sum_{weights} * 3.74$$

Each symptoms score is calculated by summing the weights for each symptom and multiplying it with their associated constant, which are as follows, **Nausea = 9.54, Oculomotor = 7.58, Disorientation = 13.92**. The total score is calculated by taking the sum of weights and multiplying it with a constant of 3.74.

Processing the IPQ

The IPQ was analysed in accordance to the official Igroup web page, which takes the average for each sub-scale [29]. However, before doing so, the reversed items i.e., negative loaded questions, have to be reversed. This is calculated by the following equation:

$$Question_{Inversed} = -1 * Question_{Original} + 6$$

Processing the UMUX Quesionnaire

The UMUX is a System Usability Scale (SUS) questionnaire shortened to consists of four questions. Each question is represented as a Likert scale ranging from 1–7 with an associated weight being either negative or positive. These four questions are calculated by the following equation, which as a result, produces a number between 0–100 (0 worst, 100 best) [6]:

$$UMUX_{Score} = ((Q1 - 1) + (Q3 - 3) + (7 - Q2) + (7 - Q4)) * \frac{100}{24}$$

The scores for the participants are then averaged and compared to the following table presented in Figure 4.4 below, which results in a grade that describes the overall usability of the system.

Table 1. The Sauro/Lewis curved grading scale.

SUS Score Range	Grade	Percentile Range
84.1–100	A+	96–100
80.8–84.0	A	90–95
78.9–80.7	A-	85–89
77.2–78.8	B+	80–84
74.1–77.1	B	70–79
72.6–74.0	B-	65–69
71.1–72.5	C+	60–64
65.0–71.0	C	41–59
62.7–64.9	C-	35–40
51.7–62.6	D	15–34
0.0–51.6	F	0–14

Figure 4.4: *SUS curved grading scale (CGS) used for UMUX questionnaire [34].*

According to Lewis a common industrial SUS goal is 80, which facilitates an above average user experience, hence the aimed score for this prototype [35].

Processing the Agency and Ownership Questionnaire

The Agency and Ownership questionnaire is processed in accordance to the paper from Lin et. al, by taking the average across all participants for each question [36].

Chapter 5
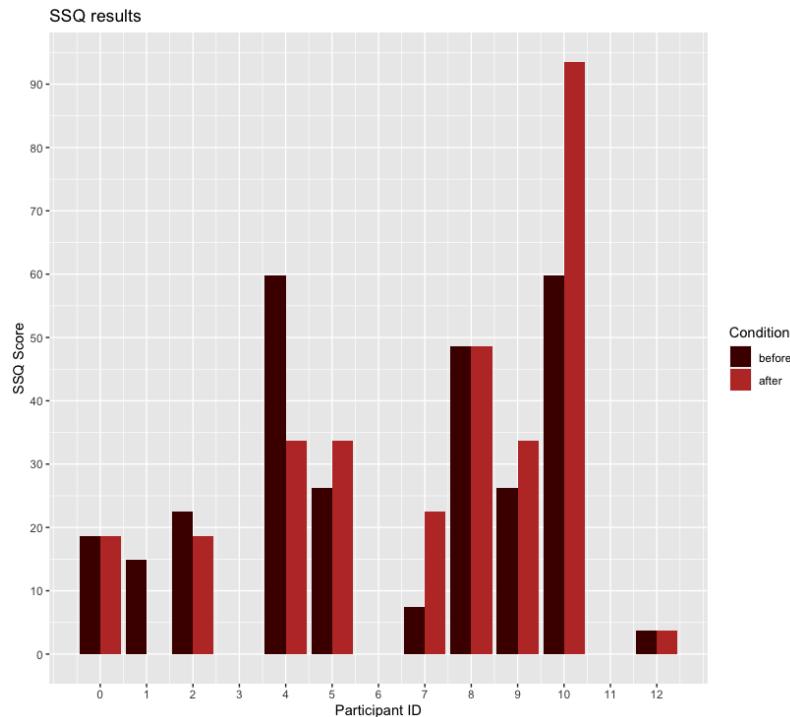
Results

5.1 Quantitative Data Findings

This section will present the findings from the questionnaires mentioned in the previous Chapter. The data was processed in either R studio [54] or Microsoft Excel [39]. The questions and raw data are available in the Appendix A.1.

5.1.1 SSQ Results
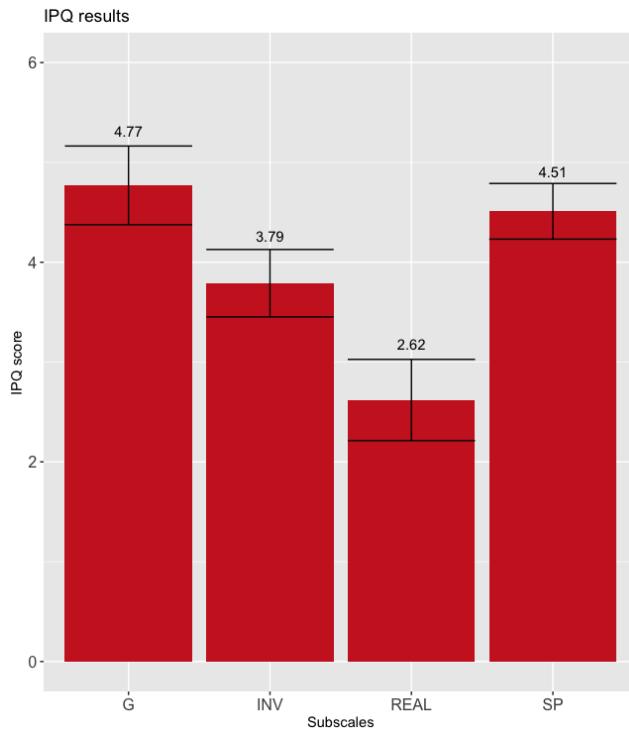
This section will present the findings from the SSQ, which can be seen in Figure 5.1. The SSQ scores yielded, in summary, both positive and negative changes, as well as neutral. Notably, four participants saw an increase in their sickness score, whereas three participant saw a decrease. Furthermore, five participant had no positive nor negative gain. Ultimately, no participants were excluded based on their sickness score, as there were no instances of participants feeling a severe level of sickness, meaning that it would not have a greater affect on the participants performance. Furthermore, we can state that the prototype is not responsible for any major changes in sickness overall.

Figure 5.1: *The SSQ score for each participant, both before and after, ranging from 0 to 100. Empty columns are participants who felt no level of sickness.*

5.1.2 IPQ Results
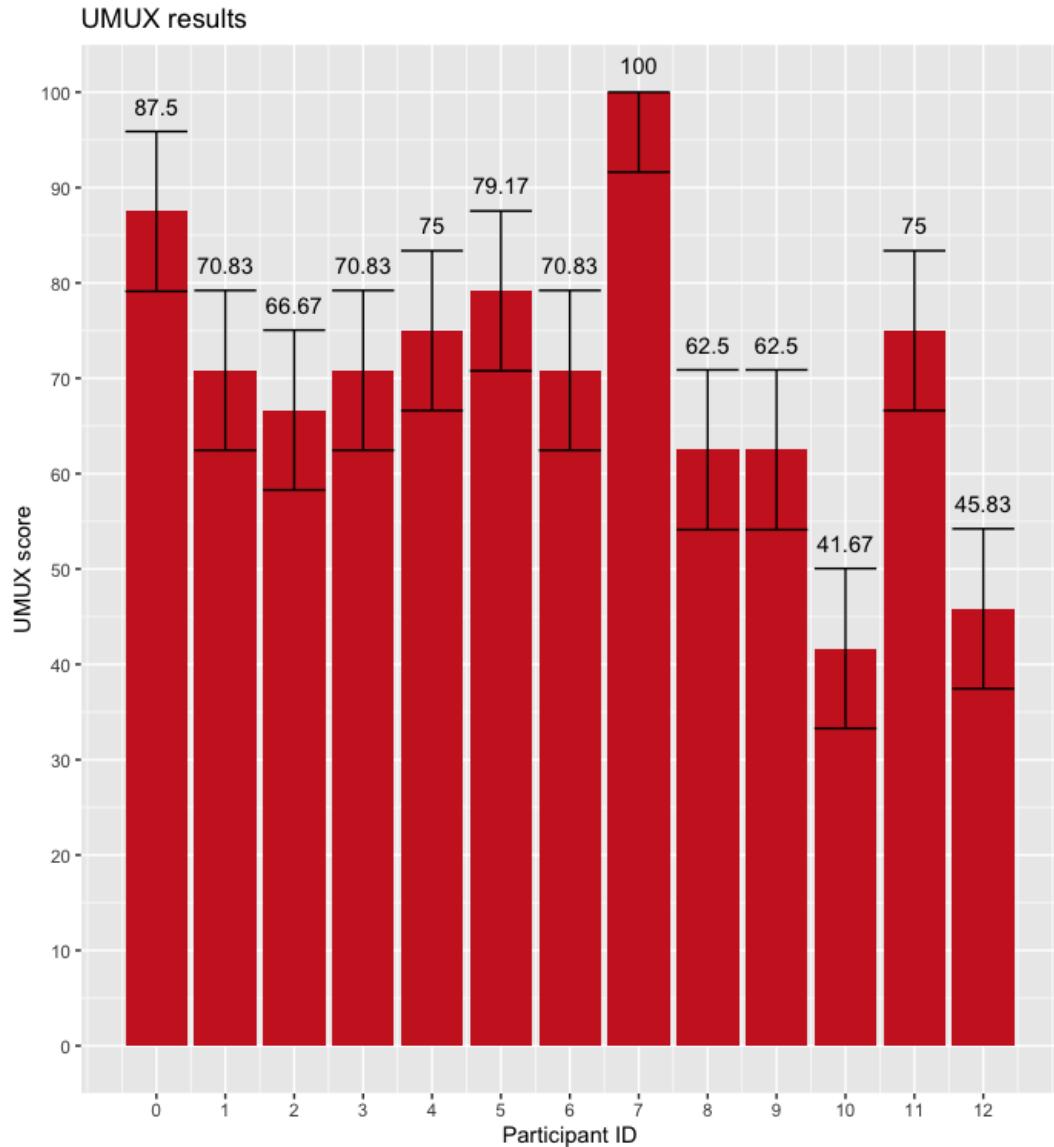
The findings from the IPQ can be seen in Figure 5.2. In summary, the Spatial Presence mean is 4.51 with an error margin of 0.279. The user Involvement has a mean of 3.79 and an error margin of 0.338. The Realism experience has a mean of 2.62 and an error margin of 0.407. Finally, the General presence mean is of 4.77 and have an error margin of 0.197.

Figure 5.2: *The means from the four subscales (General Presence, Involvement, Realism and Spatial Presence), with their respected error margin.*

5.1.3   UMUX Results

This section will present the results from the UMUX questionnaire, which are summarised in Figure 5.3 below.
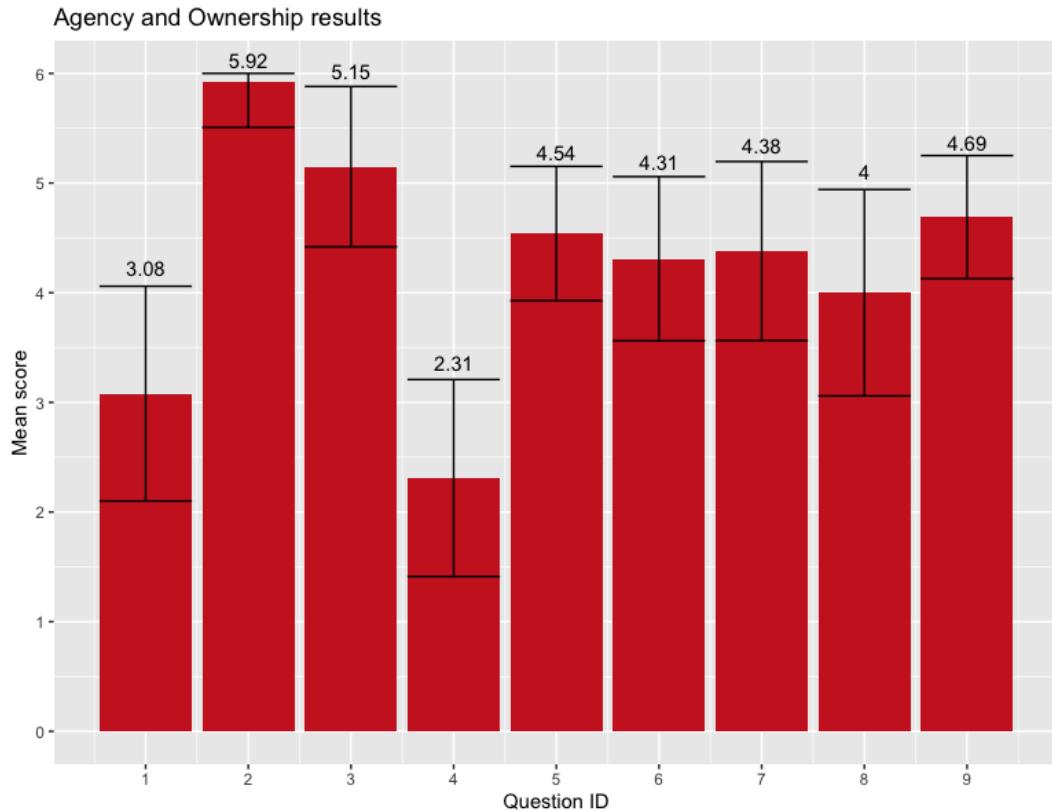
Figure 5.3: *The UMUX scores for each participant (number above each bar), with a confidence interval of 95% (margin of error).*

The interquartile ranges from: 1st Quartile = 62.50 to 3rd Quartile = 75, with a median of 70.83 and a mean of 69.87. The following participants are outside this range (lowest to highest): **Participant 10** = -20.83, **Participant 12** = -16.67, **Participant 5** = 4.17, **Participant 0** = 12.5 and **Participant 7** = 25. Looking at the table mentioned in Section 4.5.2, based on the mean, the prototype got a **C grade**.

5.1.4 Agency and Ownership Results

This section will present the findings from the Agency and Ownership questionnaire, which can be seen in Figure 5.4.
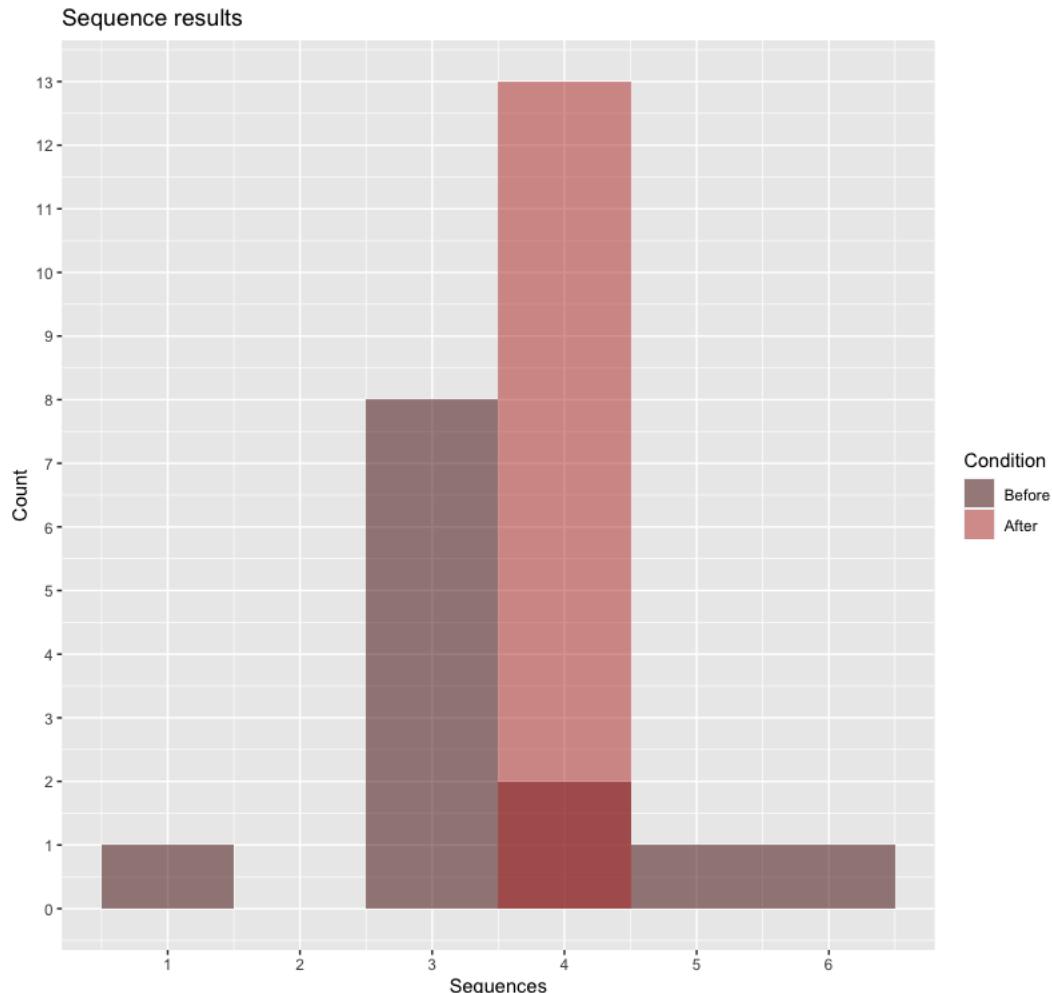
Figure 5.4: *The Agency and Ownership scores for each question (number above bar), with a confidence interval of 95% (margin of error).*

The interquartile ranges from: 1st Quartile = 4 to 3rd Quartile = 4.690, with a median of 4.380 and a mean of 4.264. The following questions are outside this range (lowest to highest): **Question 4** = -1.954, **Question 1** = 1.184, **Question 3** = 0.086 and **Question 2** = 1.656.

5.1.5 Sequence Results

As mentioned in Section 4.2 the participants within the experiment were given a set of six possible sequences, both before and after trying the gameplay, where only one would represent the process within the created prototype. In Figure 5.5 both the results from before and after the participants interacting with the prototype can be seen, where sequence 4 is the correct one. As can be seen two out of thirteen

participants picked the correct sequence before interacting with the prototype, with the majority believing sequence 3 to be the correct one. Additionally it can be seen that all participants were able to pick the correct sequence after interacting with the prototype.

Figure 5.5: *The sequence questionnaire results*

5.2 Qualitative Data Findings

5.2.1 Gained Rock Art knowledge

The findings which resulted from the analysis of the qualitative data from the interviews, and gameplay recordings, are detailed in this section.

Learning the Process of Creating Rock Art

Based on the finding, the participants had retained some knowledge behind the process of creating rock art, as well as some of the materials and tools used. Specifically regarding the *process* of creating rock art, five participants (4, 8, 9, 10, 12) implied during the post-interview that they had retained information about the process of mixing, such as Participant 12 who stated: *"well I know they mixed up something [...]"* and Participant 10 stating: *"I guess the procedure for like mixing the ((pause)) colors[...]"*. None of the participants expressed having this knowledge during the pre-interview, leading us to believe that the knowledge seems to be coming from their experience with the prototype.
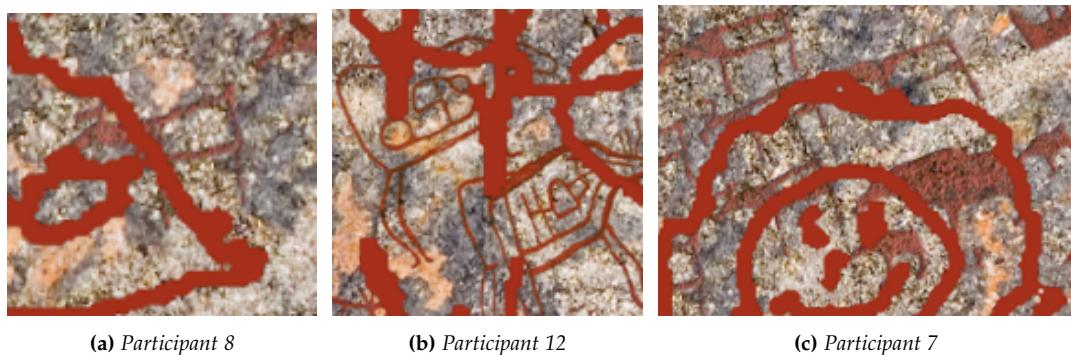
In terms of the *materials and tools used*, three participants (6, 9, 12) expressed having some knowledge regarding the topic, specifically mentioning or implying the possible use of chalk or paint, as an example, in the pre-interview. For instance Participant 12 stated: *"Whether it be if they found chalk, I would assume..."*. None of the participants mentioned tools. In the post-interview, six participants (4, 8, 9, 10, 11, 12) mentioned materials, some in more with additional details compared to the pre-interviews. An example from the post-interview is Participant 11 who stated: *"[...] dust, some dye, that are mixed together with some form of liquid"*. Some participants were, additionally, able to retain knowledge about the process of creating rock art as well as the tools used, such as Participant 8: *"I guess one of the bowls had, ehm, liquid in it and the other had... some.. dust [...] and you mixed that together and stirred it, and then you had your painting"* and Participant 9: *"they used different materials for paint.. they like.. ground materials and mixed them.. and then applied them to their fingers a brush or a leaf"*.

With the above information in mind, it appears that the prototype is able to disseminate knowledge regarding the process of creating rock art, as well as the materials and tools used to some degree. It was somewhat effective for some, but not everyone, since only six participants recalled new gained knowledge in the post interview. Additionally it also seems that the prototype is able to spread misinformation based on the cases of a participant mentioning the leaf as a used tool as well as another participant mentioning dust being a used material. We can then say, that even participants who did not mention the process as newly attained knowledge, during the interview, still retained the information about it, as they were able to correctly pick it from a collection of plausible choices.

Learning the Aspect of Overshadowing

Another aspect, which we sought out to disseminate, is the transformative aspect of rock art in the form of *overshadowing*. Throughout the gameplay, five participants (0, 1, 6, 7, 11) verbally expressed behavior of overshadowing, such as Participant 0, who said:*"I'm just drawing on top of all the other thing:::s (.) that is not important anymore"* and Participant 6, who said: *"I feel like... I'm desecrating a natural land mark or something"*. Additionally, 11 participants (excluding 5 and 9) superimposed by painting on top of the existing rock art. Examples of superimposition from Participant 7, 8, and 12 can be seen in Figure 5.6. However, the participants (7, 8, 11, 12) that were asked about the reasoning behind the superimposition in the post-interview, gave two explanations.

One explanation was doing it out of curiosity, such as stated by Participant 8: *"compared to what other stuff was, I just tried painting on top of to see... how stark the difference was"*. Secondly, they did it to make it look like their own, as stated by Participant 12: *"So I'm like: I'm just going to draw all over the...all of it [...] As to make the newest paint be on top and cover as much as possible, as to make it look like my own"*. And lastly, it also seems like they did it intentionally, as stated by Participant 7: *"I mean ((pause)) it was kinda intentional[...]"*. This indicates that overshadowing did occur during the gameplay, both expressed verbally, but also physically through superimposition. Nevertheless, it also seems that overshadowing was not the sole reasoning behind the participants' superimposing, which makes it unclear whether the participants understood that this is a possible purpose behind creating Scandinavian rock art.

(a) *Participant 8*   **(b)** *Participant 12*   **(c)** *Participant 7*
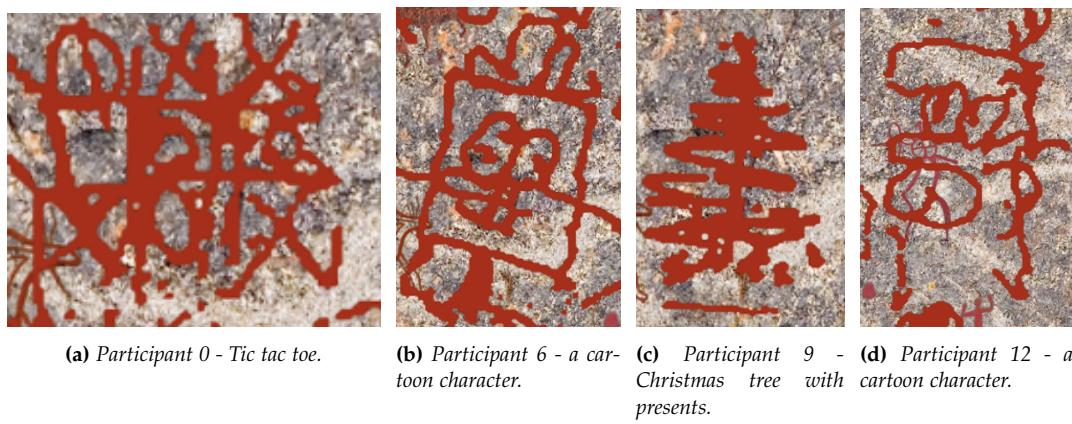
Figure 5.6: *Cases of superimposition from Participant 7, 8, and 12.*

Self-expression

Another observation that was made while the coding the data is the reoccurring theme of the participants seeming to have similar drawing behavior, which might

have lead them to think that Scandinavian rock art was a tool to document existence and self-expressions. 9 participants (excluding 3,9,10,11) used the opportunity to depict motifs of personal interest, such as cartoon characters. Figure 5.7 shows four examples of the most prominent cases of superimposition. The created motifs by themselves does not explain why there was this reoccurring theme, but comparing it with a statement made by Participant 9 during the post interview, who stated: *"[...] they painted for self expression [...]"*, it can be speculated whether the participants have gotten the impression that Scandinavian rock art was a tool to make self-expressions.

(a) *Participant 0 - Tic tac toe.*   **(b)** *Participant 6 - a cartoon character.*   **(c)** *Participant 9 - Christmas tree with presents.*   **(d)** *Participant 12 - a cartoon character.*

Figure 5.7: *Motifs created by Participant 0, 6, 9, and 12.*

5.2.2 Usability, Immersion and Agency

During the analysis, a pattern of usability issues, which repeated between participants, began to emerge. These will be presented in this section, along with any other findings related to potential issues within the prototype.

Grabbing and Releasing the Bowls

As a start, the most present issue amongst all participants was the interaction with the bowls, that were holding the materials. This interaction seemed to hold two issues, the first one having to do with grabbing these items. Ten participants (all but Participant 3, 8 and 9) expressed verbal frustration or confusion during the gameplay while they were interacting with the bowls. Examples include Participant 10: *"I can't really ((pause)) manage to pick them up [...] I'm just... pushing them around ((pause)) at this point"*, Participant 4: *"I can't grab it"* or Participant 2: *"How am I supposed to grab this?"*. This was also confirmed by some participants (1, 2, 6, 11, 12) in the post-interviews, with Participant 12 stating: *"I thought I could just put my hand to it, [...] I couldn't grab it how I taught"* and Participant 0 expressing: *"[...] I, had*

a bit of trouble getting the bowls, grabbing the (bowls), which was a bit weird or awkward."

The second issue that participants encountered with the bowls was that, on releasing the grab, the bowls would move in an unexpected manner. To put it simply, when let go, they would sometimes fly away from a participant's hands (almost as if they were ejected), and land in unexpected positions, cluttering the stone table, and making it harder to grab again. This surprised participants, e.g. leading Participant 4 to exclaim: *"They're kinda escaping me"* or Participant 5 who mentioned: *"it's like grabbing a slippery object or something"*. For context, Figure 5.8 illustrates an example of the random positions the bowls landed at, after being ejected. In similar fashion to the grabbing error, this unexpected behaviour was also mentioned by participants during the post-interview, e.g. with Participant 5 mentioning: *"there was some stuff, like the bowls flying in and out of my hands when I was trying to grab them"*, when asked about additional comments regarding the prototype.

Figure 5.8: *The aftermath of the bowls being ejected from the participants hands, image taken from Participant 4's gameplay.*

These two problems are clearly not just minor issues, since they both have been mentioned by 10 out of the 13 participants. Furthermore, they weren't just expressed during the gameplay, but also brought up during the post interview, meaning that the errors stuck with some of the participants after the test was finished as well (seven talked about the issue in the interviews, compared to the ten that encountered it in the gameplay).

It could be said, then, that these two issues could have negatively affected the usability of the program. This point could be further strengthened by looking at the results from the UMUX questionnaire, presented in Section 5.1.3. The participants with the two lowest scores (10 and 12) both mentioned the issues in their interviews, as did Participant 2, who also had a score below the total average. That being said, at the same time, there were participants who encountered the issues
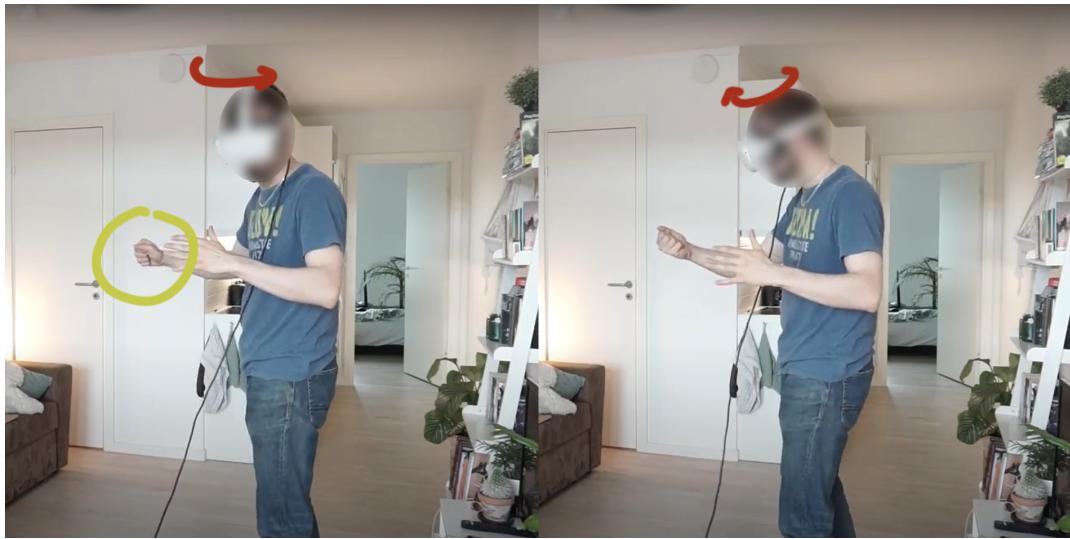
that did have a greater score in the UMUX, such as Participant 0 and Participant 7 (who scored the highest). With this in mind, it could be said that the bowl interactions were an issue which affected most people, but in a disproportionate manner. For some, it was an issue which was only brought up at gameplay, and seemingly didn't affect their perception of the programs usability. For others, it was an issue which was brought up both during the gameplay, and in the post interviews, and could have also been a cause of them scoring the prototype low on the UMUX questionnaire. In the closing remarks of this section, it is necessary to stress that the video data showing the different types of grasping performed by the participants, when interacting with the virtual objects, such as the bowls or the brush, was analysed separately for the purpose of two Ethnographically Informed Design course papers, and therefore will not be addressed.

Lost Hand Tracking Leads to Accidental Painting

It is important to disclaim that this aspect of the prototype was analysed separately, as part of the aforementioned course as well, so we will not describe it in many details, but present the overall findings. With that being said, another commonly reported issue was that of accidental painting when using the hands. This was mentioned during the gameplay by three participants (0, 5 and 10), and in the post-interviews by another three (6, 9 and 12). It seems that what happened was a result of the fingers of the participant covering each other, making it hard for the headset to track them. As a results, they would revert back to their default state, pointing forward, thus drawing on the canvas, causing Participant 10 to exclaim: *"it's a li- little bit hard to control, like.. when you're trying to draw with one finger [...] you accidentally ((pauses)) like it accidentally draws double? Like you're using two fingers"*. However, even participants who encountered this problem scored the application relatively high in the agency and ownership questionnaire, the results of which are presented in Section 5.4.

Hand Tracking Loss Leads to Accidental Dropping of Items

One usability issue that occurred with multiple participants (0, 4, 5, 8), was also caused by the loss of hand tracking. When this happened while a participant was holding an object, the object would be dropped from the hand, often resulting in it respawning to its original position on the stone table. Figure 5.9 shows the moment of the headset losing track of one of the hands, which in this case resulted in the object held in the hand being dropped. As can be seen on the Figure, the participant first looks away from his hand (to his left), which makes his right hand go out of the FOV, and then immediately looking back at it (as a result of audio feedback of respawning object) to check whether the object is still there. In fact,

Figure 5.9: *Two screenshots taken from a video recording of testing Participant 5. The red arrows indicate the movement of participants head, and the yellow circle highlights the hand which was out of the headset's FOV.*

this was usually what was happening before an object was dropped, this could be caused by the combination of the limited FOV, and the inexperience of the users.

Temporally Inconsistent Signifiers

Another reoccurring aspect that the participants mentioned during the gameplay were the visual signifiers of the items, which were guiding the user through the steps of mixing the paint. It is evident that these signifiers were clear, for the most part, and helpful with guiding the participants through the different steps, as mentioned by almost all participants (all expect 3, 8, 9) in various stages of the testing. Some examples include Participant 1: *"and now the instructions says to mix, so:"*, or Participant 2: *"Now I need to stick my hand in it hhh"*. However, there also seems to be a connection between the last signifiers in the sequence (dipping the brush/hand in the paint) and confusion expressed by the participants, mainly about their task. The reason behind this is probably the fact that this would never disappear, even after the participant dipped both a hand and the brush into the paint. This was in contrast with all the other signifiers that came before it, which would disappear as soon as the action had been completed. This led some participants to believe that their task is not complete, and they would try to repeat the last step multiple times before moving on as stated by Participant 10: *"it keeps showing to dip it, I don't know if I need to dip it like several times"*. In addition, after they would paint on the wall, the signifier would still be present, adding to their confusion as exemplified with Participant 2: *"Am I supposed to do anything else?"*.

Figure 5.10: *Participant 5 stretching his leg out to figure out how far is he from the couch.*

Another common signifier misinterpretation involved the bowls in the interaction of pouring their content into the empty bowl. The signifier showed both material bowls simultaneously pouring their materials into the empty bowl, which made some participants think that they had to do it simultaneously as well. This occurred for nine participants (0, 4, 5, 7, 8, 9, 10, 11, 12), which could make the complicated interaction of grabbing the bowls even greater. This misinterpretation was expressed both verbally and physically, e.g. by Participant 4 who stated: *"I have to do this at the same time with both hands."*.
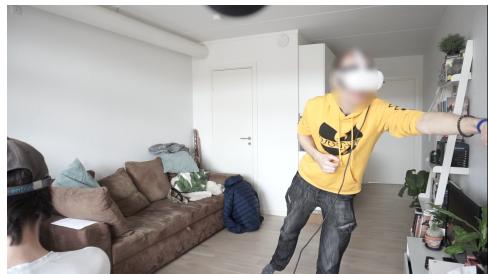
Spatial Awareness Concerns

Some participants (2, 4, 5, 7, 8, 12) expressed concern about moving around while using the prototype, as they supposedly lost track of their surroundings. While some were unsure whether they were even able to move (i.e. if their real life movement translates into the VE), others were concerned about bumping into their surroundings after testing for some time. This was, among others (2, 4, 5, 7, 12), mentioned by Participants 8: *"[...] do I have space to walk?"* and 9: *"Oh so I can move around or should I?"* despite the Guardian system being active for all the participants. Participant 5 even stretched his leg to assess the environment around him, as seen on Figure 5.10, while saying: *"I'm approaching the wall I think... and maybe also a sofa."*, to which the conductor responded: *"The Guardian will let you know."*. This is usually an issue only for a short time, but slowly disappears as they grow familiar with the Guardian and their surroundings. The aspect of physical movement during gameplay is further explored in an Ethnographically Informed Design course paper.
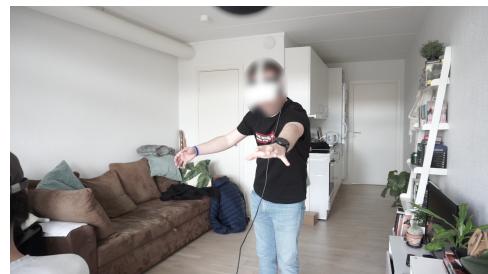
5.2.3 Overall Experience

Even as the prototype showed signs of complicated usability, leading to frustration or confusion, there were signs of the participants becoming immersed with the experience and verbal exclamations of enjoyment as well.

The immersion was prominent in the behaviour of the participants' movement within the program, but could also be noticed verbally. For movement we saw examples from 8 participants (1, 4, 6, 7, 9, 10, 11, 12) where they would lean their upper body over the virtual stone table, from the edge of it, if they managed to push the materials too far out of reach. However, nothing was hindering the participants from stepping forward through the table in order to get closer to the object out of reach. Examples of these instances can be seen on Figure 5.11, and Figure 5.12 shows an example where the participant examines their distance to the table before leaning their upper body forward.
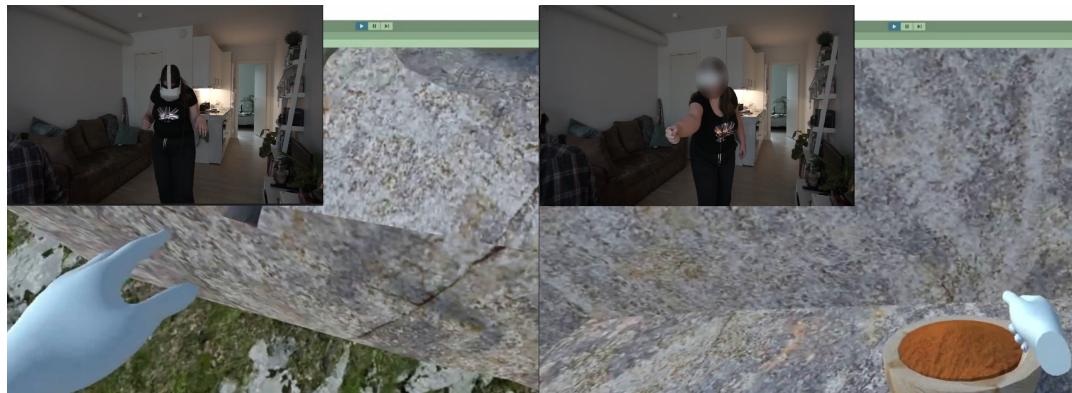
(a) *Participant 7 learning over the virtual stone table.*   **(b)** *Participant 8 learning over the virtual stone table.*

Figure 5.11: *Examples of two participants learning over the virtual table in the attempt to retrieve objects they pushed away from themselves.*

Figure 5.12: *Participant 1 examining their distance to the virtual stone table before leaning over it.*

There were, additionally, examples of 5 participants (2, 7, 10, 11, 12) neatly putting the brush back onto the table after use, even as they had observed that objects would reappear back onto the table, if they fell onto the ground. In other words, this means that they could have dropped the brush where ever they were standing, if they no longer wished to use it.

For verbal expression of immersion, we saw examples of 4 participants (1, 4, 5, 6) expressing a feeling of defacing the current rock art, which they, in reality, are not. This includes examples such as Participant 4 saying: *"I can paint over the others I suppose, that's probably a- ((pause)) bad idea, that's probably defacing art"* and Participant 6 saying: *"I feel like... I'm desecrating a natural land mark or something"*. Additionally, Participant 5 explicitly noted *"I'm kind of scared of bumping my toe into this immediately, but of course I wont"*, when facing the virtual stone table.

Moving on with the overall experience, the participants also expressed that they enjoyed the experience, e.g. by praising the experience of painting or the virtual environment itself, even as the prototype had clear flaws as described in Section 5.2.2. As a few examples, Participants 4 praised the painting interaction by stating: *"this is really cool. I like this a lot"* and *"I just- I really like this hhh it's a lot of fun"*. Participant 0, 1, 3, 7, 10, 11 and 12 expressed similar statements of the painting interaction being "cool" or enjoyable.

Chapter 6

Discussion

In this chapter, we will discuss our application of the concept of embodied learning, in the light of the results, the potential for dissemination of the application, possible solutions for identified design and implementation issues, as well as analysing the flaws in our experimental methods.

6.1   Embodied Learning and Dissemination

Considering the design choices that went into incorporating taxonomy points for embodied learning, we can use the questionnaires to help determine whether the design accomplished its purpose. Looking at the sequence questionnaire, we noticed that all participants picked the correct sequence, which was used within the prototype, after having participated in the gameplay. This could indicate that using embodied learning for preparing the materials did help the participants retain the information of the process. However, to properly know whether this is correct, it would be useful to ask the participants again, after an extended amount of time.

As mentioned in Section 2.5.2, immersion is a large part of embodied learning within VR, as well as the user's sense of agency and ownership, meaning that this could have an effect on how well the embodied learning concept is applied. Starting with the IPQ, we noticed a low score on realism, which involved questions about how real the virtual world seemed to the user and how consistent their experience seemed compared to performing in the real world. The low score could have been affected by the usability issues involved with grabbing the bowls or managing the number of fingers used for drawing with their hands. These issues are also reflected in the UMUX questionnaire results, where it is clear that some participants did not feel that the prototype responded well to their actions.

The score for involvement is also noticeably lower, which contained questions

mainly about how much the participants paid attention to the real world environment. This score likely reflects the concern that a number of participants expressed of whether they were able to move in certain directions, during their gameplay. In other words, this means they had issues forgetting their surroundings, as they were nervous about walking into anything in the real world room.

This being said, the general- and spatial presence has higher scores, indicating that the participants still felt present within the VE. This is also supported by what was found within the grounded theory analysis, where the participants expressed immersion both verbally and physically, as mentioned in Section 5.2.3. With this it is possible to argue that the immersion within the prototype would not negatively affect the embodied learning.

Moving on to the agency and ownership questionnaire, we noticed that the scores were relatively high, except two points. These points involved the user feeling as if they felt the touch of the brush on their real hand and how realistic the hand felt compared to their own, in terms of appearance. As the users were not touching anything real and we consciously chose a hand with an abstract representation, these results were to be expected. While the remaining scores could still be better, we did not see any major issues in the with the participants not feeling agency and ownership over their virtual hands. Some participants delivered low scores, which could be a direct results of the usability issues of the grabbing and painting. With this we can also argue that the agency and ownership did not negatively effect the embodied learning.

Finally, we can summarise that embodied learning seemed to help the participants understand and retain the process of preparing the materials needed to create rock art and as an extension, the prototype is able to disseminate knowledge related to Scandinavian rock art. This also means that embodied learning could be incorporated in more ways, e.g. by using a different method to better disseminate how tribes could have overshadowed each others rock art to show superiority. As the data suggests, it is unclear whether the participants understood the overshadowing aspect of rock art, which indicates that there is a need for applying a different method in order to achieve this, or further research on what knowledge the participants took away from the VR experience.

6.2   Design and Implementation Flaws

As previously mentioned in Section 5.2.2, there were several issues within the application which repeated themselves for multiple participants, which affected the usability of the application. In this section, we will provide an explanation for

the possible causes of these flaws, as well as possible solutions.

6.2.1 Fixing the Bowl Interaction

The two main issues involving the bowls, during the gameplay, have been outlined in Section 5.2.2, but will be briefly restated here, for context. The participants generally had problems grabbing the bowls, and they would occasionally eject out of the virtual hand(s) once let go. Looking into these issues, we found possible explanations for both.

For the interaction part, the issue was caused by the collider which was responsible for detecting when the hand is within proximity of the bowl, as described in Section 3.2.1. This collider was too small, resulting in the collision only getting triggered when approaching the bowl from a certain position. We saw a varied way of approaching the bowl from the participants, and the collider we made did not take this into account. As such, a way to fix this is by enlarging this collider, and thus make the area in which the grabbing can happen larger as well.

For the ejection problem, we believe the issue was caused by a collider as well, since the bowl was physically being ejected from the hand, as if a collision occurred. The highest possibility is that the collider in question was the sphere on the hand, i.e. the one which would expand or shrink to stop grabbed items from passing through other objects, as described in Section 3.2.4. That being said, this issue is not as clear to identify as the grabbing, and we would need to run some additional debugging tests to pinpoint it.

6.2.2 Fail Safes for Lost Hand Tracking

Another outlined issue, in Section 5.2.2 was the loss of hand tracking affecting parts of the program. While the detection of the hands themselves is not handled by us, the imported library provides functions for getting the confidence of the tracking. A fix that could be implemented, when a hand or finger is not being tracked anymore, would be to freeze the position of the bones within the hand, at the last recorded position before tracking is lost. This would ensure that there is no unexpected behaviour of accidental hand painting due to self-occlusion, and that the hand does not move erratically in the scene, while its position is not being tracked.

6.3   Process Analysis

In this section, we explore the possible flaws in our experimental design, and the methodology used for gathering the data.

6.3.1   Experimental Design Flaws

There are two main issues, which we will discuss in this section which relate to how we carried out our experiment. One is about the interviews, and the other about the researcher-participant communication during the gameplay.

Improper Interviewing Strategy

As a start, the semi-structured interviews were flawed, the main issue being that we were not consistent in probing participants for further information, after they answered the initial open-ended question about their rock art knowledge. This was largely due to the interviewing strategy being very loose. After the participant answered the initial question, it was mostly on the individual interviewer to come up with a relevant follow up question, and the only guideline provided was to have the participant elaborate on relevant statements. However, there was no comprehensive list of what relevant information to look out, and probe for, which could have aided the interviewer. This lead to situations where some participants were not asked any follow up questions. Creating such a list of possible discussion topics, which could be brought up in case certain keywords were present in the participant's answers, could have ensured a higher degree of consistency in the probing for each participant.

Additionally, this issue could have been fixed after the test of the first participant, which served as a pilot. However, we did not realise at the time that this could become an issue, and by the time we became more structured with our interviewing, there were already some participants who were not asked any further questions. In general, we should have payed more attention to the first test, and use it more efficiently to inform future testing.

Another problem with the interview was the presence of leading follow-up questions. These were usually about how a certain interaction affected their immersion during the test: *"during the gameplay you had a hand that was visible in the frame (0.8) eh did that affect your immersion?"* and *"You had troubles grabbing one of the bowls [...] was that something [...] That took you out of the [experience]?"* (both quotes are from Participant 1's post-interview, whose full transcript is available in Appendix A.2.2). Questions phrased in such a way can affect the participants answers, which harms the validity of the answer altogether. Our way of mitigating the effect of these was

to not include the answers to these questions in the analysis. That being said, even with them being excluded, it could have affected the other answers that followed in the interview. Reflecting upon these issues, for future similar experiments involving interviews, we should be more careful about creating a proper interviewing strategy, and not ask leading questions.

Communication During Gameplay

Furthermore, we should have made a more comprehensive plan on what assistance to offer the participants during the testing. In short, some participants received more clarification than others, such as getting immediate verbal confirmation on whether they could paint with multiple fingers, instead of letting them explore on their own. This could have created inconsistencies in how the participants experienced the gameplay and thereby have affected the reliability negatively.

Sequence Questionnaire

For the questionnaires we, as mentioned, created the sequence questionnaires ourselves, where we attempted to create sequences that all seemed viable. However, we cannot guarantee that the participants were simply able to pick the correct sequence after the test by excluding options that e.g. contained utilizing a campfire, which was not present in the environment. This harms the validity of the results, which, as mentioned, could have been negated by asking the participants again after an extended amount of time (e.g. with days or weeks between) or it could have been done by asking the participants to write down the steps themselves, with nothing to compare to.

Chapter 7

Conclusion

To conclude, this project aimed to disseminate cultural heritage, in the form of Scandinavian rock art, through the use of embodied learning, facilitated by hand tracking within virtual reality. This lead to the creation of a VR application, which contained a VE containing a rock wall, on which the user could create pictographs (rock paintings). The necessary process of mixing paint was also recreated, with two materials which were supposedly used (according to literature), and a tool in the form of a brush. Additionally, the application would disseminate the transformative aspect of Scandinavian rock art, as well as one of the purposes behind it: overshadowing. To test the potential for dissemination and usability, an experiment was set up, where thirteen participants tested the application. The test involved two semi-structured interviews (one pre- and one post- gameplay), four questionnaires (SSQ, IPQ, UMUX and Agency and Ownership) and a list of six different sequences of the process of preparing the materials needed for creating pictographs (both before, and after the gameplay). The participants were asked to think out loud during the gameplay, and the transcripts from these session, plus the interviews were coded and analysed.

The findings point toward the application having successfully disseminated information about the process of creating rock art, as well as the tools and types of materials used. That being said, it also gave way to unintended presumptions about the topic, both correct and incorrect. Furthermore, it is unclear whether the application succeeded in disseminating information about the collaboration, or overshadowing aspect. Participants displayed behaviour which would be considered overshadowing (painting over the work of the former "author" of the art) but never explicitly mentioned it as a known purpose behind the original rock art, which has been found. Similarly, they seemed to understand that there were pieces of art drawn at different times on the rock, but it is unclear if they saw that as an aspect of the process. Additionally, the prototype suffered from some usability

issues, which could have made dissemination more difficult.

With all this in mind, this project shows that, even when suffering from certain usability issues, VR can work as a platform for the dissemination of cultural heritage. However, future improvements to the usability of the program and additional experiments would need to be conducted in order to optimally explore the different aspects of this kind of dissemination.

7.1 Process Analysis Conclusion

This section is kept separate from the formal conclusion, as it focuses exclusively on our own methodology.

In short, the way the experiment was carried out could have been better planned, with our interviewing strategy being flawed, and lacking a concrete plan as to how much clarification to provide participants with, during the test. These issues could be solved by using the pilot test more efficiently, to inform future tests, as well as putting more effort into creating a proper strategy that an interviewer could follow during the testing.

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Appendix A

Appendix

In this chapter all the raw data from the experiment will be presented.

A.1 Questionnaires

A.1.1 SSQ

Participant ID and Condition	0	0	1	1	2	2	3	3	4	4	5	5	6	6	7	7	8	8	9	9	10	10	11	11	12	12
Question	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After
General discomfort	0	0	0	0	1	1	0	0	0	1	1	1	0	0	0	0	1	1	0	1	0	1	0	0	0	0
Fatigue	0	0	0	0	0	0	0	0	2	2	0	2	0	0	0	0	0	0	1	1	1	1	0	0	0	0
Headache	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0
Eye strain	0	0	0	0	0	0	2	0	1	1	0	1	0	0	1	0	1	1	1	1	1	2	0	0	0	0
Difficulty focusing	0	0	1	0	1	0	1	0	1	0	0	1	0	0	1	0	1	1	1	0	1	1	0	0	0	0
Salivation increasing	1	1	0	0	0	0	0	0	0	0	0	0	0	2	1	2	1	0	1	0	0	0	0	0	1	1
Sweating	1	1	0	0	0	1	0	1	0	1	0	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0
Nausea	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Difficulty concentrating	0	0	1	0	0	0	2	0	1	1	0	1	0	0	1	0	1	1	0	1	1	1	0	0	0	0
"Fullness of head"	1	1	0	0	0	0	1	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	0	0	0	0
Blurred vision	0	0	0	0	1	1	0	0	0	0	0	0	0	1	0	0	0	0	2	0	2	2	0	0	0	0
Dizziness with eyes open	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	0	1	2	0	0	0	0
Dizziness with eyes closed	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	1	1	2	0	0	0	0
*Vertigo	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	0	0	0	0
**Stomach awareness	1	1	0	0	0	0	2	0	0	0	0	0	0	0	2	0	2	2	0	0	1	1	1	1	0	0
Burping	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	1	0	0	0	0	0	0	0

Figure A.1: *SSQ raw scores.*

A.1.2   IPQ

Question	Participant ID												
	0	1	2	3	4	5	6	7	8	9	10	11	12
In the computer generated world I had a sense of "being there"	5	5	5	5	4	5	6	5	4	5	5	5	3
Somehow I felt that the virtual world surrounded me.	5	5	5	5	5	5	4	4	4	4	5	6	2
I felt like I was just perceiving pictures.	6	5	5	6	5	5	6	5	4	4	4	5	5
I did not feel present in the virtual space.	5	1	1	5	3	5	6	5	2	5	5	5	4
I had a sense of acting in the virtual space, rather than operating something from outside.	6	5	2	4	6	4	6	4	4	5	3	4	5
I felt present in the virtual space.	5	5	4	5	3	5	6	4	4	6	4	5	4
How aware were you of the real world surrounding while navigating in the virtual world? (i.e. sounds, room temperature, other people, etc.)?	5	4	3	6	5	4	4	2	4	3	4	5	5
I was not aware of my real environment.	5	2	1	6	4	3	4	2	4	4	4	6	4
I still paid attention to the real environment.	5	3	2	6	2	2	3	2	3	2	4	4	1
I was completely captivated by the virtual world.	4	4	4	5	4	4	4	4	4	5	4	4	5
How real did the virtual world seem to you?	4	4	5	4	2	3	1	1	3	4	2	3	1
How much did your experience in the virtual environment seem consistent with your real world experience ?	5	4	5	3	1	3	3	6	3	4	2	2	2
How real did the virtual world seem to you?	1	3	2	1	2	4	5	4	4	4	4	3	2
The virtual world seemed more realistic than the real world.	1	1	3	0	0	2	4	1	1	2	0	1	1

Figure A.2: *IPQ raw scores.*

A.1.3   UMUX

Questions	Participant ID												
	0	1	2	3	4	5	6	7	8	9	10	11	12
This system's capabilities meet my requirements.	7	6	5	5	7	6	6	7	5	5	3	5	7
Using this system is a frustrating experience.	2	2	2	6	3	3	3	1	4	3	5	3	6
This system is easy to use.	6	5	7	7	6	6	5	7	5	5	4	7	3
I have to spend too much time correcting things with this system.	2	4	6	1	4	2	3	1	3	4	4	3	5

Figure A.3: *UMUX raw scores.*

A.1.4 Agency and ownership

Question	Participant ID												
	0	1	2	3	4	5	6	7	8	9	10	11	12
I had the sensation that I felt the brush touch my hand in the same location where the virtual hand on the screen was in contact with it.	6	3	6	3	2	2	1	2	5	5	2	2	1
The movements of the virtual hand on the screen were caused by myself.	7	7	6	5	6	6	5	7	5	6	6	5	6
It sometimes seemed my own hand was located on the screen.	7	5	5	4	6	6	3	6	6	5	3	4	7
The virtual hand on the screen began to resemble my own hand in terms of shape, skin tone, freckles, or some other usual feature	5	2	3	1	2	1	1	1	2	5	1	1	1
Sometimes I felt as if the virtual hand on the screen was my own hand.	7	5	6	4	5	5	4	4	4	4	3	3	3
Sometimes it seemed as if what I was feeling was caused by what I was seeing on the screen.	5	4	5	4	7	4	2	3	5	6	3	3	5
During the experiment there were moments in which it seemed that my own hand was painting.	6	3	6	4	6	5	2	6	5	4	3	2	5
I thought the virtual hand on the screen looked realistic.	5	5	6	2	2	6	1	6	4	5	4	4	2
I was so immersed in the virtual reality, it seemed real	6	5	6	3	3	6	4	5	5	5	5	4	4

Figure A.4: *Agency and ownership raw scores.*

A.2 Transcriptions

This section will show the transcriptions from the pre interview, post interview and gameplay for each participant.

A.2.1 Participant 0

Pre-interview

2021 May 20, Thu 13:55

Interviewer1   Are you ready interviewer 2?

TC   00:00:01.410 - 00:00:02.020

SD   (0.71)

Background Noise   hhh

TC   00:00:00.000 - 00:00:03.840

Interviewer1   Are you ready?

TC   00:00:02.730 - 00:00:03.220

SD   (0.27)

Interviewer2   Yeah

TC   00:00:03.490 - 00:00:03.870

Interviewer1   Cool   Alright

TC   00:00:03.841 - 00:00:04.170   00:00:05.040 - 00:00:05.542

SD   (0.87)   (0.16)

Interviewer1   Mhm

TC   00:00:05.710 - 00:00:06.230

SD   (0.36)

Interviewer1   Yeah, so first of all, eh, do you have any prior VR

          experience?

TC   00:00:06.593 - 00:00:09.960

SD   (0.24)

Interviewer1   quite a bit?

TC   00:00:11.510 - 00:00:12.000

SD   (0.03)

Partcipant0   Yes, quite a bit

TC   00:00:10.200 - 00:00:11.450

SD   (0.06)

Partcipant0   Yeah

TC   00:00:12.030 - 00:00:12.320

SD   (0.08)

Interviewer1   Is that eh:::m, for personal use, or is that related to some

        projects?

TC   00:00:12.400 - 00:00:17.110

SD   (0.17)

Partcipant0   Well, I play a lot of beatsaber (0.3) sometimes

TC   00:00:17.280 - 00:00:19.510

SD   (0.12)

Interviewer1   Yeah

TC   00:00:19.630 - 00:00:20.020

SD   (0.17)

Partcipant0   Eh, and then we also did a (.) project last year using, (

        .) ehm ,mixed reality (0.2) where we had like a very

        expensive VR headset

TC   00:00:20.190 - 00:00:27.900

SD   (0.11)

Interviewer1   Okay, cool

TC   00:00:28.010 - 00:00:28.990

SD   (0.05)

TC   00:00:29.040 - 00:00:30.610

Partcipant0   With a seethrough camera in it and stuff   (0.22)

Interviewer1   uh:::
TC   00:00:30.830 - 00:00:31.819
SD   (0.1)

Interviewer1   And then do you have any experience with hand tracking
          specifically (.) in VR?
TC   00:00:31.920 - 00:00:36.230
SD   (0.12)

Partcipant0   We looked a little bit into it last year (.) last semester
          (.), but we did not do anything with it (0.2) so not
          specifically
TC   00:00:36.350 - 00:00:42.430
SD   (0.05)

Interviewer1   Okay, ehm (0.3) then can you tell us a little about (0.2)
          Scandinavian rock art?
TC   00:00:42.480 - 00:00:48.300
SD   (3.72)

Interviewer1   [Okay hhh]
TC   00:00:53.810 - 00:00:55.810
Participant0   No, [hhh]
TC   00:00:52.020 - 00:00:55.200

Participant0   [Maybe] like [Jellingestenen probably with runes and shit]

        (0.2), but, but not much more than that

TC   00:00:55.340 - 00:01:01.280

Interviewer1   [hhh yeah]   [Okay]

TC   00:00:57.050 - 00:00:59.270   00:01:01.440 - 00:01:01.920

SD   (2.17)   (0.21)

Interviewer1   ehm, I'm just gonna stop the recording here

TC   00:01:02.130 - 00:01:04.150

Interviewer1   ehm

TC   00:01:04.660 - 00:01:04.970

SD   (0.6)

Partcipant0   sure

TC   00:01:03.910 - 00:01:04.390

SD   (0.27)

Interviewer1   then we have some eh   questionaires

TC   00:01:05.570 - 00:01:06.850   00:01:07.320 - 00:01:08.218

SD   (0.47)

Gameplay

2021 May 20, Thu 13:52

Interviewer3   Yeah (.) you can proceed (.) with whatever you want to do
TC   00:00:00.248 - 00:00:03.750
SD   (1.08)

Participant0   Wo::w   Okay
TC   00:00:04.830 - 00:00:05.339   00:00:08.960 - 00:00:09.541
SD   (3.62) (5.36)

Participant0   O:::h nice   hhh
TC   00:00:14.903 - 00:00:16.292   00:00:19.688 - 00:00:20.770
SD   (3.39) (1.36)

Participant0   Oh shie- (.) oh cool   Alright
TC   00:00:22.130 - 00:00:24.210   00:00:25.316 - 00:00:26.119
SD   (1.1)   (5.34)

Participant0   hhh   hhh
TC   00:00:31.465 - 00:00:34.157   00:00:47.653 - 00:00:52.268
SD   (13.49) (2.83)

Participant0   O:::h that sound is greatAlright (.) okay (.) so
TC   00:00:55.106 - 00:00:58.576   00:01:01.120 - 00:01:03.750
SD   (2.54) (0.39)

Participant0   Optional (.) oh okay cool so that's already red
TC   00:01:04.141 - 00:01:08.650
SD   (5.47)

Participant0   Nice   hhh

TC   00:01:14.123 - 00:01:14.652   00:01:17.405 - 00:01:19.013

SD   (2.75)   (1.43)

Participant0   (inaudible)   O:::h thats cool

TC   00:01:20.450 - 00:01:21.156   00:01:26.543 - 00:01:29.469

SD   (5.38)   (6.46)

Participant0   Oh shoot   hhh

TC   00:01:35.930 - 00:01:38.263   00:01:55.590 - 00:01:56.995

SD   (17.32) (4.07)

Participant0   hhh   Oh shit I missed

TC   00:02:01.067 - 00:02:03.252   00:02:05.264 - 00:02:08.151

SD   (2.01)   (0.49)

Participant0   Oh (.) oh well   There is also a brush

TC   00:02:08.648 - 00:02:10.312   00:02:12.451 - 00:02:14.210

SD   (2.13)   (13.26)

Participant0   I'm just drawing on top of all the other thing:::s (.) that is
              not important anymore

TC   00:02:27.470 - 00:02:32.800

SD   (19.85)

Participant0   This is really really cool hhh

TC   00:02:52.658 - 00:02:55.338   00:03:03.065 - 00:03:04.876

SD   (7.72)   (33.33)

Participant0   We got sharks in Denmark

TC   00:03:38.210 - 00:03:40.480

Interviewer1   hhh

TC   00:03:39.600 - 00:03:40.960

SD   (2.47)

Participant0   I need to document that they are dangerous

TC   00:03:43.434 - 00:03:47.746

SD   (1.42)

Participant0   (inaudible)   Beautiful

TC   00:03:49.170 - 00:03:52.184   00:04:04.012 - 00:04:07.370

SD   (11.82)

Interviewer1   hhh

TC   00:04:06.890 - 00:04:10.070

Interviewer3   hhh

TC   00:04:08.170 - 00:04:10.000

Participant0   Thi:::s is my masterpiece

TC   00:04:09.887 - 00:04:13.146

Interviewer1   Mhm

TC   00:04:12.863 - 00:04:13.743

SD   (0.02)

Participant0   hhh

TC   00:04:13.763 - 00:04:14.948

Interviewer3   Cool

TC   00:04:14.760 - 00:04:15.548

Post-interview

2021 May 20, Thu 14:00

Interviewer1   Now we are gonna do another interview

TC   00:00:00.505 - 00:00:01.725

SD   (0.03)

Interviewer1   [So] are you ready interviewer 2?

TC   00:00:01.981 - 00:00:02.918

SD   (0.04)

Partcipant0   [Mhm]

TC   00:00:01.762 - 00:00:02.208

Interviewer2   Mhm

TC   00:00:02.963 - 00:00:03.260

SD   (1.44)

Interviewer1   Alright (.) can you tell us (.) what you know about

          Scandinavian rock art?

TC   00:00:04.700 - 00:00:10.310

SD   (3.78)

Partcipant0   Oh I didn't look that much at the thing (0.3) eh before I

          painted on it

TC   00:00:14.098 - 00:00:18.520

SD   (0.18)

Interviewer1   [Okay]

TC   00:00:18.709 - 00:00:19.166

SD   (1.39)

Partcipant0   [Eh] still no:::t rea:::lly mu:::ch (0.3) I, I, I

TC   00:00:20.564 - 00:00:26.687

SD   (0.51)

Partcipant0   It's rock so it's just you know (.) art on rocks (.) I

          would assume

TC   00:00:27.198 - 00:00:33.753

SD   (2.04)

Partcipant0   Possibly to tell the story of (0.3) what these people went

          through during their time (0.3) putting themselves in

          history I guess (.) their way of making their mark

TC   00:00:35.802 - 00:00:46.754

SD   (0.09)

Interviewer1   Okay

TC   00:00:46.844 - 00:00:47.192

SD   (0.18)

Interviewer1   Ehm, do you then have any additional comments?

TC   00:00:47.375 - 00:00:50.389

SD   (0.24)

Interviewer1   About (0.3) this (.) this test as a whole (0.2) do you have

          any?

TC   00:00:50.635 - 00:00:55.825

SD   (0.9)

Partcipant0   Like I, had a bit of trouble getting the bowls grabbing the

          [bowls], which was a bit weird or akward (0.3) but yeah it

worked out (.) grabbing the stick

TC 00:00:56.732 - 00:01:08.219

Interviewer1 [mh]

TC 00:01:00.250 - 00:01:00.584

A.2.2 Participant 1

Pre-interview

```
Interviewer    and just remember to speak out loud so [we can] uhh...
TC             00:00:01.528 - 00:00:03.885
Participant2   [yeah]
TC             00:00:03.309 - 00:00:03.651
SD             (1.05)
Interviewer    Alright! Do you have any VR experience?
TC             00:00:04.710 - 00:00:07.443
SD             (0.13)
Participant2   Yes.
TC             00:00:07.578 - 00:00:07.964
SD             (0.54)
Interviewer    Ehhh in what way? Like have you::
TC             00:00:08.506 - 00:00:11.170
SD             (0.12)
Participant2   Video games way.
TC             00:00:11.293 - 00:00:12.396
SD             (0.02)
Interviewer    Alright! Uhh, do you have experience with hand tracking
specifically?
TC             00:00:12.418 - 00:00:17.077
SD             (0.09)
Participant2   Uhhh y:eah?  Actually, because I did the experiment for
the other group and they had
               hand tracking.
TC             00:00:17.172 - 00:00:24.131
SD             (0.09)
Interviewer    Okay.
TC             00:00:24.229 - 00:00:24.608
SD             (0.13)
Participant2   Uhh so eh, so yeah! I do that also I did the: the first...
the thing- I tried once
               (0.5) the VR headset here? when you were (0.5 ) doing the
(0.8) thing that (0.6)
               the- some other people did about rock art. (0.7) [The
whole] rock art experience
               yeah.
TC             00:00:24.740 - 00:00:39.957
Interviewer    [hm hm]
TC             00:00:38.166 - 00:00:39.222
SD             (0.12)
Interviewer    The: the Google game.
TC             00:00:39.343 - 00:00:40.607
Participant2   YEAH YEAH yeah. That one. I did that too,
TC             00:00:40.507 - 00:00:42.712
SD             (0.12)
Interviewer    Okay. Uh: can you: tell us what you know about
Scandinavian rock art?
TC             00:00:42.833 - 00:00:47.244
SD             (1.0)
Participant2   I know (0.3) that (0.2) a long long time ago (0.2) uh:
(0.3) there were some (0.7)
               poeple, uh (0.4) I don't know if it was cave people- I
don't know if it Vikings did
               it too but they went into (1.2) caves or found a rock and
then they (pointed) they
               depicted like uhm (0.4) whaht they're life was like? (0.7)
So you know all the
```

```
              things like hunting rituals, (0.8) stuff like that,
hierarchies (0.7) everything,
              everything like that
TC            00:00:48.245 - 00:01:18.735
SD            (0.7)
Interviewer   okay
TC            00:01:19.436 - 00:01:19.588
SD            (0.2)
Participant2  yeah
TC            00:01:19.791 - 00:01:20.081
SD            (0.58)
Interviewer   and then eh: I will stop the recording here? and we would
like you to fill out some
              quest-
TC            00:01:20.661 - 00:01:25.186
```

Gameplay

Wednesday, May 19, 2021, 6:25 PM

Participant1	okay!
TC	00:00:06.930 - 00:00:07.310
SD	(5.13)

Participant1	This is nice
TC	00:00:12.449 - 00:00:13.360
SD	(2.02)

Participant1	ooh!
TC	00:00:15.386 - 00:00:15.891
SD	(2.39)

Participant1	okay?
TC	00:00:18.284 - 00:00:18.798
SD	(2.2)

Participant1	stick
TC	00:00:20.999 - 00:00:21.663
SD	(1.52)

Participant1	ooh!
TC	00:00:23.185 - 00:00:23.570
SD	(4.77)

Interviewer1	we would like you to think out loud
TC	00:00:28.340 - 00:00:30.585

Participant1   okay okay okay we have a table and I see a stick! I see a brush! And I see two bowls

with things uh:

TC   00:00:30.410 - 00:00:40.080

SD   (1.45)

Participant1   powder ((pause)) for color I'm assuming a:nd uh ((pause)) something else for

texture, I'm guessing, for the paint. So I'm guessing I just have to put these into

a bowl

TC   00:00:41.530 - 00:00:54.300

SD   (1.22)

Participant1   so I start with thi-

TC   00:00:55.529 - 00:00:57.790

SD   (2.98)

Participant1   aaah

TC   00:01:00.772 - 00:01:01.482

SD   (6.17)

Participant1   *laughs*

TC   00:01:07.660 - 00:01:09.080

SD   (1.1)

Participant1   ugh!

TC   00:01:10.180 - 00:01:10.710

SD   (0.47)

Participant1   it's pretty hard to grab

TC   00:01:11.186 - 00:01:13.550

SD	(1.45)

Participant1	*laughs* alright
TC	00:01:15.005 - 00:01:16.540
SD	(3.17)

Participant1	it- AAAH!
TC	00:01:19.710 - 00:01:20.506
SD	(0.09)

Interviewer1	it should be able to snap to your hand. If you grab it (?) can't do that
TC	00:01:20.604 - 00:01:28.700
SD	(1.48)

Participant1	but it's going away
TC	00:01:30.187 - 00:01:31.051
SD	(1.05)

Participant1	ugh!
TC	00:01:32.103 - 00:01:32.703
SD	(1.43)

Interviewer1	try to make uh: ((pause)) try to make a fist before reaching the bowl
TC	00:01:34.140 - 00:01:39.956
SD	(4.47)

Participant1	uh
TC	00:01:44.430 - 00:01:44.958
SD	(0.96)

Participant1   uh *laughs* $it's gone$

TC   00:01:45.920 - 00:01:48.920

SD   (2.0)

Participant1   no it's fine, i'll try to do it with this one

TC   00:01:50.920 - 00:01:52.877

SD   (1.0)

Participant1   OH!

TC   00:01:53.879 - 00:01:54.480

SD   (2.6)

Participant1   that worked

TC   00:01:57.082 - 00:01:57.780

SD   (6.9)

Participant1   *laughs*

TC   00:02:04.683 - 00:02:05.353

SD   (0.83)

Participant1   we can start over if you want

TC   00:02:06.184 - 00:02:07.200

SD   (1.56)

Participant1   oh! I got it!

TC   00:02:08.764 - 00:02:10.273

SD   (0.88)

Participant1   ayy! yes!

TC   00:02:11.158 - 00:02:14.047

SD   (0.48)

Participant1   and now the instructions says to mix, so:

TC   00:02:14.531 - 00:02:17.875

SD   (2.68)

Participant1   oh! yes

TC   00:02:20.564 - 00:02:21.830

SD   (7.45)

Participant1   I'm guessing I should mix it until incorporated. Yeah!

TC   00:02:29.280 - 00:02:31.886

SD   (2.56)

Participant1   there?

TC   00:02:34.454 - 00:02:34.679

SD   (1.03)

Participant1   and now I'm getting the brush?

TC   00:02:35.712 - 00:02:38.220

SD   (1.19)

Participant1   and dipping it ((pause)) into the paint, there's paint on it

TC   00:02:39.411 - 00:02:44.160

SD   (0.61)

Participant1   and now we have a wall

TC	00:02:44.771 - 00:02:45.890
SD	(1.68)

Participant1	so I'm gonna go to that
TC	00:02:47.570 - 00:02:49.012
SD	(0.88)

Participant1	pick out a spot, I want this spot, and I don't know what to draw and I'm very immature so I'm gonna draw a d*ck!
TC	00:02:49.900 - 00:02:56.770
SD	(4.53)

Participant1	*laughs*
TC	00:03:01.300 - 00:03:02.320
SD	(4.7)

Participant1	*laughs*
TC	00:03:07.020 - 00:03:08.585
SD	(1.56)

Participant1	*laughs* $BEAUTIFUL!$ ((pause)) I'm very happy with that
TC	00:03:10.145 - 00:03:18.570
SD	(0.39)

Participant1	I'm gonna pick another spo- oh! I can't pick that spot, I'm picking this spot
TC	00:03:18.965 - 00:03:22.520
SD	(0.84)

Participant1	I'm gonna draw a happy face. 'Cos i feel good. This is very fun

TC	00:03:23.360 - 00:03:29.023
SD	(8.63)

Participant1	ye:s
TC	00:03:37.659 - 00:03:38.448
SD	(1.24)

Participant1	I'm going down here (?)
TC	00:03:39.696 - 00:03:42.660
SD	(1.33)

Participant1	K: ((kaaay))
TC	00:03:43.992 - 00:03:45.455
SD	(3.59)

Participant1	wa:::::s
TC	00:03:49.050 - 00:03:54.460
SD	(1.85)

Participant1	*laughs*
TC	00:03:56.313 - 00:03:57.337
SD	(1.65)

Participant1	$here$ *laughs*
TC	00:03:58.987 - 00:04:02.205
SD	(6.02)

Participant1	yeah
TC	00:04:08.230 - 00:04:08.540

SD   (0.7)

Participant1   *laughs* huh!

TC   00:04:09.249 - 00:04:11.013

SD   (0.7)

Participant1   yes, beautiful

TC   00:04:11.722 - 00:04:12.959

SD   (0.03)

Interviewer1   you have uh, three more minutes if you want (?) otherwise (?)

TC   00:04:12.990 - 00:04:18.410

SD   (0.37)

Participant1   I wanna draw stickmen

TC   00:04:18.789 - 00:04:19.741

SD   (1.44)

Participant1   stick figure

TC   00:04:21.188 - 00:04:22.020

SD   (16.27)

Participant1   ye:s, beautiful *laughs* (? - danish) *laughs* (? - danish) *laughs*

TC   00:04:38.297 - 00:04:46.510

SD   (0.77)

Participant1   I actually wondering ((pause)) if you can just stick your finger in there

TC   00:04:47.289 - 00:04:52.050

SD   (3.44)

Participant1   .hh oh my god! yes!

TC   00:04:55.490 - 00:04:59.121

SD   (8.28)

Participant1   *laughs*

TC   00:05:07.405 - 00:05:08.275

SD   (3.65)

Participant1   *laughs*

TC   00:05:11.930 - 00:05:12.700

SD   (1.38)

Participant1   ((danish))

TC   00:05:14.089 - 00:05:15.060

SD   (2.26)

Participant1   beautiful I love that

TC   00:05:17.320 - 00:05:18.600

SD   (4.19)

Participant1   yes yes! I'm good, I'm happy!

TC   00:05:22.799 - 00:05:25.780

SD   (0.23)

Interviewer1   alright! (?) how it is?

TC   00:05:26.019 - 00:05:30.894

Participant1   yes I think it's beautiful

TC   00:05:30.877 - 00:05:32.357

TC   00:05:32.330 - 00:05:34.631

Post-interview

```
Tuesday, May 18, 2021, 11:06 AM
Interviewer      uh huh (0.7) I'll start the recording?
TC               00:00:00.443 - 00:00:02.540
SD               (2.03)
Interviewer      alright! eh: so! ehm can you tell us what you know about
Scandinavian ro- *cough*
TC               00:00:04.570 - 00:00:11.760
SD               (1.18)
Participant2     *laughs*
TC               00:00:12.943 - 00:00:14.192
Interviewer      can you tell us what you know now about Scandinavian
rock art?
TC               00:00:13.232 - 00:00:16.222
SD               (0.48)
Participant2     e:::h
TC               00:00:16.702 - 00:00:17.968
SD               (2.28)
Participant2     I thin- I think the same? like
TC               00:00:20.251 - 00:00:21.749
SD               (1.22)
Participant2     well I know it wasn't like it's (0.2) I think, maybe? I
don't know? Vikings was BC?
                 No, that was after C. That was AC. Yeah. >It wasn't the
Vikings.< It was the yeah
                 [tribes, like you said] (0.2) tribes from .hh before way
before like (0.2)  the
                 beginnings of civilisation. could be said. That they
went and depicted about how
                 what their life was like. Again with like hierarchie,
huntin- hunting gathering
                 (0.2)  people (0.2)  things. (1.0)  Yeah. And they did
it like before (0.3)  BC, yeah
TC               00:00:22.970 - 00:00:58.346
Interviewer      [hmm hmm]
TC               00:00:34.770 - 00:00:35.566
SD               (17.65)
Interviewer      hmm
TC               00:00:53.225 - 00:00:53.892
SD               (4.71)
Interviewer      did that had any influence on what you drew? during the
test?
TC               00:00:58.609 - 00:01:01.560
Interviewer2     *laughs*
TC               00:01:01.560 - 00:01:02.600
Participant2     $no (0.2) haha, no I think I did a more modern
approach?$
TC               00:01:02.373 - 00:01:07.970
SD               (0.46)
Participant2     *laughs*
TC               00:01:08.430 - 00:01:10.224
Interviewer      yeah? fair? ehm:: do you have any additional comments
about the test as a whole or:
TC               00:01:09.280 - 00:01:17.789
SD               (0.15)
Participant2     I think you guys did very well
TC               00:01:17.942 - 00:01:19.218
SD               (0.67)
Interviewer      okay
```

```
TC              00:01:19.890 - 00:01:20.472
SD              (0.29)
Participant2    E- especially since I've like been following you- your
progress? $during the
                semester? without knowing anything about what you were
doing [but I I I think I
                think] you've done well
TC              00:01:20.771 - 00:01:31.475
Interviewer     [hahaha]
TC              00:01:28.477 - 00:01:30.240
SD              (1.33)
Interviewer     okay eh (0.7)  can you eh be more specific about that or
is it just -
TC              00:01:31.577 - 00:01:36.461
Participant2    eh I think I think you succeeded ehm: in the whole
immersion part? of the VR ehm
TC              00:01:35.824 - 00:01:43.650
SD              (1.53)
Participant2    and I know I know you struggled a bit with like the
environment? and the hand
                tracking stuff I think it came out really good. Like the
hand tracking was was
                really good
TC              00:01:45.186 - 00:01:54.563
SD              (0.22)
Interviewer     okay
TC              00:01:54.785 - 00:01:55.345
SD              (0.71)
Interviewer     ehm: the hand eh: during the gameplay you had a hand
that was visible in the frame
                (0.8) eh did that affect your immersion?
TC              00:01:56.063 - 00:02:03.790
Participant2    yeah
TC              00:02:01.371 - 00:02:01.730
SD              (2.31)
Participant2    uhh: (0.5) it did at the beginning? (0.5) but uh:
because I was like oh, oh shit
                what's this? (0.2)  uhm: but like after the first minute
or something I just decided
                to ignore it
TC              00:02:04.041 - 00:02:15.121
SD              (0.18)
Interviewer     okay
TC              00:02:15.301 - 00:02:15.749
SD              (0.02)
Participant2    I just like toned it out (0.8) and (0.2)  like you said
like it disappeared  when I
                put both of my hands (0.4) in front of me (0.2)  so
(0.4)  I don't think it was that
                big of an issue
TC              00:02:15.773 - 00:02:24.670
SD              (0.43)
Interviewer     okay eh: and also when you had to mix the: ingredients?
You had troubles grabbing
                one of the bowls. Eh:: was that something eh::  (3.0)
*spekas in Danish to another
                interviewer*
TC              00:02:25.101 - 00:02:40.090
```

```
Participant2      yeah
TC                00:02:29.333 - 00:02:30.262
SD                (1.44)
Participant2      yeah
TC                00:02:31.702 - 00:02:32.090
SD                (8.03)
Interviewer2      That took you out of the [experience]
TC                00:02:40.126 - 00:02:42.082
Interviewer       [yeah (0.4) that's when it] broke the immersion
TC                00:02:41.530 - 00:02:43.830
Participant2      [eh::]
TC                00:02:42.379 - 00:02:43.333
SD                (2.03)
Participant2      kind of? but eh: (0.7) we fixed it so I quickly moved on
from it
TC                00:02:45.370 - 00:02:50.762
SD                (0.8)
Interviewer       okay
TC                00:02:51.568 - 00:02:51.892
Participant2      yeah it took me out of the im- immersion (0.4) of course
because (0.8) why wouldn't
                  it? But eh:: after after we got it done and after I
figured out like how to do it
                  and you guys helped me a little bit then t was perfectly
fine $so when I first got
                  to the painting things that was like all in the past$
TC                00:02:51.830 - 00:03:11.091
Interviewer       hmm
TC                00:02:57.650 - 00:02:58.094
SD                (11.82)
Interviewer       *laughs*
TC                00:03:09.916 - 00:03:10.780
SD                (0.4)
Interviewer       okay?  ehm then (0.4) I don't have any further questions
unless you:
TC                00:03:11.181 - 00:03:16.217
Participant2      no, I'm good
TC                00:03:16.215 - 00:03:16.930
SD                (0.07)
TC                00:03:17.002 - 00:03:19.288
```

A.2.3   Participant 2

Pre-interview

Thursday, May 20, 2021, 1:38 PM

Interviewer 1   I'll press start

TC   00:00:00.648 - 00:00:01.425

SD   (1.51)

Interviewer 1   Alright

TC   00:00:02.942 - 00:00:03.417

SD   (0.04)

Interviewer 1   ((clear throat))

TC   00:00:03.458 - 00:00:03.885

SD   (0.5)

Interviewer 1   So

TC   00:00:04.394 - 00:00:04.731

SD   (0.6)

Interviewer 1   Do you have any VR experience?

TC   00:00:05.335 - 00:00:07.402

SD   (0.05)

Participant 2   Yes, I do

TC   00:00:07.460 - 00:00:08.316

SD   (0.38)

Interviewer 1   Okay, is that, ehm, something (you did) study related or have you...

TC   00:00:08.697 - 00:00:12.753

SD   (0.05)

Participant 2   Yes, study related and I also have, like, a headset myself

TC   00:00:12.810 - 00:00:16.244

SD   (0.06)

Interviewer 1   Okay

TC   00:00:16.307 - 00:00:16.609

SD   (0.11)

Interviewer 1   Cool

TC   00:00:16.728 - 00:00:17.021

SD   (0.24)

Interviewer 1   Ehm, Do you have experience with hand tracking specifically?

TC   00:00:17.269 - 00:00:20.763

SD   (0.21)

Participant 2   Hand tracking, I don't think so, like, I know how joystick work () (on)

                 playstation, but nah, no, nothing other than that

TC   00:00:20.980 - 00:00:28.680

SD   (0.09)

Interviewer 1   Okay, ehm, can you tell us what you know about Scandinavian Rock Art?

TC   00:00:28.771 - 00:00:33.395

SD   (1.22)

Participant 2   I know nothing hhh

TC   00:00:34.620 - 00:00:36.357

SD   (0.08)

Interviewer 1   Then, if you were to try to describe it with your own words, what do you think it

would be?

TC   00:00:36.438 - 00:00:41.640

SD   (0.31)

Participant 2   Scandinavian...

TC   00:00:41.950 - 00:00:42.868

SD   (0.42)

Interviewer 1   Rock Art

TC   00:00:43.289 - 00:00:43.841

Participant 2   Rock Art

TC   00:00:43.860 - 00:00:44.120

SD   (0.66)

Participant 2   I never heard about Scandinavian Rock Art, but I'm guessing that maybe something

with ((short pause)) vikings? hhh

TC   00:00:44.780 - 00:00:52.483

Interviewer 1   Okay

TC   00:00:52.480 - 00:00:52.768

SD   (0.06)

Participant 2   I don't know

TC   00:00:52.830 - 00:00:53.615

SD   (0.16)

Participant 2	Great Scandinavia hhh
TC	00:00:53.780 - 00:00:55.437

Interviewer 1	hhh
TC	00:00:55.452 - 00:00:55.772
SD	(0.17)

Interviewer 2	No, don't worry about it hhh
TC	00:00:55.950 - 00:00:57.311
SD	(0.4)

Interviewer 1	Then I'll stop the recording
TC	00:00:57.718 - 00:00:59.043
SD	(0.85)

Interviewer 1	And we have some questionnaires
TC	00:00:59.893 - 00:01:01.917

Gameplay

2021 May 20, Thu 14:01

Participant2   hhh
TC   00:00:00.880 - 00:00:02.767

Interviewer 3   Cool.. Eeeh- you can procede to do whatever you desire.
TC   00:00:01.390 - 00:00:05.483
SD   (3.94)

Participant2   Whatever I desire?
TC   00:00:09.431 - 00:00:10.922
SD   (0.88)

Interviewer 3   hhh within reason.
TC   00:00:11.810 - 00:00:13.376
SD   (0.39)

Interviewer 3   hhh
TC   00:00:13.771 - 00:00:16.260

Participant2   hhh
TC   00:00:13.987 - 00:00:16.151
SD   (1.14)

Interviewer 3   hhh
TC   00:00:17.297 - 00:00:18.333
SD   (0.59)

Participant2   Okay..
TC   00:00:18.927 - 00:00:19.400

SD   (0.98)

Participant2   Can I walk? Oh my lord.

TC   00:00:20.383 - 00:00:22.150

SD   (2.32)

Participant2   Oh no..

TC   00:00:24.477 - 00:00:25.449

SD   (1.46)

Participant2   How am I supposed to grab this?

TC   00:00:26.910 - 00:00:28.260

SD   (2.17)

Participant2   Oooh

TC   00:00:30.437 - 00:00:30.943

SD   (3.76)

Participant2   Am I supposed to say what i'm doing or what i'm feeling or everything?

TC   00:00:34.706 - 00:00:38.989

Interviewer 1   Eeh..

TC   00:00:37.100 - 00:00:37.820

SD   (1.16)

Interviewer 1   Yes.

TC   00:00:38.980 - 00:00:39.350

SD   (0.42)

Interviewer 1   All of it.

TC   00:00:39.778 - 00:00:40.320

SD   (0.2)

Participant2   All of it. Okay. So i'm trying to pick up the two bowls with some ingredients in
        it, but I...

TC   00:00:40.520 - 00:00:46.230

SD   (1.04)

Participant2   ... suck

TC   00:00:47.278 - 00:00:48.034

SD   (0.74)

Participant2   And I cannot...

TC   00:00:48.781 - 00:00:49.471

SD   (0.32)

Participant2   Oh yeah, I picked ot up- oh no. Okay, I added it to a bowl hhh

TC   00:00:49.800 - 00:00:53.460

Interviewer 1   hhh

TC   00:00:51.835 - 00:00:53.343

SD   (2.58)

Participant2   This is how physics works.

TC   00:00:55.930 - 00:00:57.274

SD   (0.23)

Interviewer 1   Yes,

TC   00:00:57.510 - 00:00:57.935

SD   (1.15)

Participant2　Okay, now I need to mix it up with- oh no what is this- oh no- a stick...

TC　　　00:00:59.094 - 00:01:04.196

SD　　　(1.9)

Participant2　Hell yeah.

TC　　　00:01:06.096 - 00:01:06.772

SD　　　(2.87)

Participant2　I'm mixing it up.

TC　　　00:01:09.648 - 00:01:10.912

SD　　　(1.72)

Participant2　Now I need to stick my hand in it hhh

TC　　　00:01:12.640 - 00:01:14.611

SD　　　(2.51)

Participant2　And now I can draw.

TC　　　00:01:17.129 - 00:01:18.777

SD　　　(0.35)

Participant2　Should I- can I approach this?

TC　　　00:01:19.136 - 00:01:20.891

SD　　　(0.23)

Interviewer 2　Yeah

TC　　　00:01:21.122 - 00:01:21.677

SD　　　(0.11)

Interviewer 3　Yeah, you can walk.

TC   00:01:21.790 - 00:01:22.810

SD   (2.59)

Participant2   I should probably draw something okay, not innapropriate.

TC   00:01:25.409 - 00:01:29.440

SD   (2.1)

Participant2   Oh no, that looks bad.

TC   00:01:31.542 - 00:01:33.449

SD   (5.7)

Participant2   I'm drawing a cat.

TC   00:01:39.157 - 00:01:40.382

SD   (1.13)

Interviewer 1   Oooh.

TC   00:01:41.520 - 00:01:42.219

SD   (10.52)

Participant2   ( ) two cats. Okay.

TC   00:01:52.745 - 00:01:54.233

SD   (3.85)

Participant2   Oooh.

TC   00:01:58.085 - 00:01:58.725

SD   (0.91)

Participant2   Wait.

TC   00:01:59.637 - 00:02:00.114

SD   (3.47)

Participant2   I can stick my hand..

TC   00:02:03.593 - 00:02:04.808

SD   (3.63)

Participant2   Ooh nice..

TC   00:02:08.440 - 00:02:09.280

SD   (0.4)

Participant2   hhh

TC   00:02:09.689 - 00:02:10.381

SD   (1.44)

Participant2   Okay.

TC   00:02:11.823 - 00:02:12.563

SD   (0.27)

Participant2   Am i supposed to do anything else?

TC   00:02:12.835 - 00:02:14.298

SD   (0.62)

Interviewer 1   Eehm..

TC   00:02:14.920 - 00:02:15.590

SD   (0.37)

Interviewer 2   I mean, we will give you about five minutes if you want to, but you can go out
    whenever you want.

TC   00:02:15.961 - 00:02:20.690

SD   (0.44)

Participant2   Okay.

TC   00:02:21.130 - 00:02:21.785

SD   (18.88)

Participant2   Still a bit hard to draw.

TC   00:02:40.665 - 00:02:42.230

SD   (0.54)

Participant2   Because it's like... very sensitive..

TC   00:02:42.771 - 00:02:45.156

SD   (1.71)

Participant2   ... in my opinion, but it's not that bad, I mean it's handtracking so..

TC   00:02:46.870 - 00:02:49.938

SD   (4.15)

Participant2   yeeeh

TC   00:02:54.091 - 00:02:54.959

SD   (2.94)

Participant2   I don't know what to draw to be honest.

TC   00:02:57.905 - 00:02:59.634

SD   (7.08)

Participant2   Nice.

TC   00:03:06.720 - 00:03:07.330

SD   (0.43)

Participant2   I'm a wizard.

TC   00:03:07.766 - 00:03:08.508

SD   (5.36)

Participant2   Uuuhm..

TC   00:03:13.872 - 00:03:14.718

SD   (0.74)

Participant2   I should write my name.

TC   00:03:15.461 - 00:03:16.548

SD   (0.42)

Participant2   Wooh.

TC   00:03:16.968 - 00:03:17.347

SD   (5.86)

Participant2   It's very calming.

TC   00:03:23.211 - 00:03:24.298

SD   (0.16)

Interviewer 1   hhh

TC   00:03:24.465 - 00:03:25.077

SD   (6.17)

Participant2   This is not art really hhh but let's say it is.

TC   00:03:31.251 - 00:03:34.974

SD   (3.72)

Participant2   I don't know what to draw, eeehm

TC   00:03:38.699 - 00:03:40.469

SD   (0.83)

Participant2   I'm just drawing multiple cats.

TC   00:03:41.301 - 00:03:43.168

SD   (1.01)

Interviewer 1   That's fine.

TC   00:03:44.181 - 00:03:45.362

SD   (1.59)

Participant2   Not very creative.

TC   00:03:46.955 - 00:03:48.499

SD   (0.32)

Participant2   If you can call it a cat, I don't know what that is- I don't know if you can see
            what i'm drawing but..

TC   00:03:48.820 - 00:03:53.277

Interviewer 3   no, we can.

TC   00:03:53.000 - 00:03:53.885

Participant2   Oh okay hhh oh no.

TC   00:03:53.867 - 00:03:56.662

SD   (0.57)

Participant2   Oh my god, my hand just..

TC   00:03:57.233 - 00:03:59.821

SD   (0.7)

Participant2   ... smashed me in the face.

TC   00:04:00.529 - 00:04:01.901

SD   (4.13)

Participant2   I don't know, i'm supposed to draw something, like, pretty like this or something.

TC   00:04:06.036 - 00:04:09.597

SD   (0.38)

Interviewer 1   That is up to you.

TC   00:04:09.983 - 00:04:10.922

Participant2   Or like this..

TC   00:04:10.607 - 00:04:11.660

SD   (1.17)

Participant2   I'm trying to draw a kayak, it's not looking good.

TC   00:04:12.833 - 00:04:15.753

SD   (3.64)

Participant2   Okay, I think i'm done.

TC   00:04:19.397 - 00:04:20.486

SD   (0.15)

Interviewer 1   Yeah.

TC   00:04:20.645 - 00:04:21.181

Participant2   If that's fine.

TC   00:04:21.064 - 00:04:22.077

Interviewer 1   I will, eeh, stop the program then.

TC   00:04:21.571 - 00:04:23.701

Post-interview

Thursday, May 20, 2021, 1:38 PM

Interviewer	Alright, ((clear throat)), can you tell us what you now know about Scandinavian Rock Art?
TC	00:00:03.260 - 00:00:09.182
SD	(1.9)

Participant 2	It was drawn by tribes in Scandinavia, in ((pauses)) ehm
TC	00:00:11.083 - 00:00:15.179
SD	(2.73)

Participant 2	five thousand five hundred
TC	00:00:17.916 - 00:00:20.610
SD	(0.88)

Participant 2	before
TC	00:00:21.490 - 00:00:22.410
SD	(0.43)

Participant 2	Christ?
TC	00:00:22.841 - 00:00:23.477
SD	(0.14)

Participant 2	hhh, I don't know
TC	00:00:23.624 - 00:00:24.640
SD	(0.66)

Interviewer	Okay
TC	00:00:25.306 - 00:00:25.753

Participant 2   I don't remember the year exactly

TC   00:00:25.751 - 00:00:27.519

SD   (0.13)

Interviewer   Okay

TC   00:00:27.650 - 00:00:28.011

SD   (0.28)

Interviewer   Ehm

TC   00:00:28.291 - 00:00:28.920

SD   (0.64)

Interviewer   Do you have any comments about the test itself

TC   00:00:29.565 - 00:00:32.811

SD   (0.46)

Interviewer   How the program behaved, how...

TC   00:00:33.272 - 00:00:35.234

SD   (0.48)

Participant 2   No, I don't think so, I only had an issue with the headset but, it was just

                ((pauses))

TC   00:00:35.716 - 00:00:39.659

SD   (0.92)

Participant 2   because of a bigger () I think, and...

TC   00:00:40.588 - 00:00:42.782

SD   (0.42)

Participant 2   other than that, I think, just, ehm, the tracking was a little more sensitive than the drawing itself, but I think that's quite normal

TC   00:00:43.205 - 00:00:53.929

SD   (0.39)

Participant 2   It would have been worse if it wasn't detecting at all so...

TC   00:00:54.328 - 00:00:56.720

SD   (0.7)

Interviewer   Okay

TC   00:00:57.425 - 00:00:57.984

SD   (0.62)

Interviewer   Yeah

TC   00:00:58.604 - 00:00:58.906

SD   (0.04)

Participant 2   And I really liked the envinronment and the bird (when you're running))

TC   00:00:58.952 - 00:01:01.867

SD   (0.87)

Participant 2   Just very calm, hhh

TC   00:01:02.737 - 00:01:04.169

SD   (0.74)

Interviewer   Ehm

TC   00:01:04.912 - 00:01:05.376

SD   (0.32)

Interviewer   I noticed you had a hard time with the grabbing?

TC   00:01:05.702 - 00:01:07.874

SD   (0.27)

Participant 2   yeah

TC   00:01:08.145 - 00:01:08.527

SD   (0.2)

Interviewer   ehm

TC   00:01:08.735 - 00:01:09.095

SD   (1.5)

Interviewer   Was that an error on our part not telling you how you should have grabbed, because

                it was more about the () hand

TC   00:01:10.603 - 00:01:16.839

SD   (0.67)

Interviewer   or was it more that the program just fucked up so it was hard to...

TC   00:01:17.517 - 00:01:21.478

Participant 2   Yeah

TC   00:01:17.892 - 00:01:18.152

SD   (3.62)

Participant 2   I think it was because I didn't approach it closer, because I was just afraid to

                walk

TC   00:01:21.779 - 00:01:26.078

SD   (0.07)

Participant 2   and...

TC   00:01:26.148 - 00:01:26.523

SD   (0.34)

Interviewer   Okay

TC   00:01:26.868 - 00:01:27.269

Participant 2   maybe normal world

TC   00:01:27.269 - 00:01:28.002

SD   (0.11)

Interviewer   Yeah

TC   00:01:28.112 - 00:01:28.419

Participant 2   and

TC   00:01:28.430 - 00:01:29.156

SD   (0.57)

Participant 2   other than that

TC   00:01:29.726 - 00:01:30.674

SD   (0.7)

Participant 2   Yeah, I was just trying to

TC   00:01:31.383 - 00:01:32.655

SD   (0.98)

Participant 2   grab it as I wouldn't grab it even in real world so...maybe that's why

TC   00:01:33.643 - 00:01:36.960

SD   (0.37)

Interviewer   mhm

TC   00:01:37.334 - 00:01:37.624

Participant 2   Because I was trying with the fingertips ()

TC   00:01:37.634 - 00:01:41.490

SD   (1.26)

Interviewer   Okay

TC   00:01:42.759 - 00:01:43.111

SD   (0.48)

Interviewer   Ehm

TC   00:01:43.597 - 00:01:44.041

SD   (0.24)

Interviewer   I don't have any more questions

TC   00:01:44.284 - 00:01:46.485

SD   (0.16)

Interviewer   Going to stop the recording here

TC   00:01:46.654 - 00:01:47.711

A.2.4 Participant 3

Pre-interview

2021 May 20, Thu 13:46

Interviewer1   Alright (.) ehem (.) do you have any VR experience?

TC   00:00:01.260 - 00:00:04.430

SD   (0.3)

Participant3   U:::h yeah

TC   00:00:04.730 - 00:00:05.650

SD   (0.41)

Interviewer1   Is it related to e:::hm school, (.) or is it personal use (.

) with games or?

TC   00:00:06.060 - 00:00:12.381

Participant3   Think with both

TC   00:00:12.400 - 00:00:13.300

SD   (0.13)

Interviewer1   Okay

TC   00:00:13.430 - 00:00:13.973

SD   (0.53)

Interviewer1   Uh, do you have any experience with hand tracking specifically?

TC   00:00:14.510 - 00:00:18.169

SD   (0.58)

Participant3   Hand tracking?

TC   00:00:18.750 - 00:00:19.660

SD   (0.09)

Interviewer1   Yes (.) in virtual reality

TC   00:00:19.750 - 00:00:21.240

SD   (0.1)

Participant3   U:::hm no I have not ever used anything like that

TC   00:00:21.340 - 00:00:23.890

SD   (0.28)

Interviewer1   Okay (0.3) e:::hm can you tell us what you know about

Scandinavian rock art?

TC   00:00:24.170 - 00:00:28.760

SD   (0.88)

Participant3   hhh [pretty] much nothing

TC   00:00:29.640 - 00:00:31.420

Interviewer2   [hhh]

TC   00:00:30.880 - 00:00:31.318

SD   (0.71)

Interviewer1   If you we:::re to define it with your own words what (.) do you

think (.) it would be?

TC   00:00:32.030 - 00:00:36.650

SD   (0.47)

Participant3   I don't I guess just like (.) any other rock art?

TC   00:00:37.120 - 00:00:40.200

SD   (0.25)

Interviewer1   Okay

TC   00:00:40.450 - 00:00:41.055

SD   (0.51)

Participant3   I mean [hhh] (0.3) I don't know anything specifically about

          scandinavian

TC   00:00:41.570 - 00:00:46.171

Interviewer1   [hhh]   Okay [ehm]

TC   00:00:42.243 - 00:00:43.529   00:00:46.570 - 00:00:47.530

SD   (3.04)   (0.14)

Interviewer3   [Can] you tell us (0.2) how much yo:::u think you know about

          rock art in general, (.) without it being Scandinavian

          specific?

TC   00:00:47.670 - 00:00:53.546

SD   (0.59)

Participant3   All I know is that it is just pictures of mammoths (.) and

          just men (.) hunting it with spears and thats all

TC   00:00:54.140 - 00:00:59.480

SD   (0.1)

Interviewer1   Okay

TC   00:00:59.960 - 00:01:00.330

SD   (0.27)

Interviewer2   Okay

TC   00:00:59.580 - 00:01:00.010

Interviewer1   I will stop the recording

TC   00:01:01.900 - 00:01:02.840

Interviewer2   That's also completely fine yeah

TC   00:01:00.600 - 00:01:01.970

Gameplay

2021 May 20, Thu 14:02

Interviewer 3   and now you can begin.
TC   00:01:15.720 - 00:01:16.690
SD   (2.63)

Participant3   And I should try to make, ehm, rock art, yeah?
TC   00:01:19.320 - 00:01:22.180
SD   (0.51)

Interviewer 3   Yeah.
TC   00:01:22.690 - 00:01:23.690
SD   (0.29)

Participant3   Okay.
TC   00:01:23.983 - 00:01:24.513
SD   (3.43)

Participant3   hhh
TC   00:01:27.950 - 00:01:29.050

Interviewer 2   hhh
TC   00:01:29.054 - 00:01:29.630
SD   (4.41)

Participant3   hhh
TC   00:01:34.043 - 00:01:35.094
SD   (4.52)

Interviewer 1   this is why we test.

TC   00:01:39.616 - 00:01:41.288

SD   (0.41)

Interviewer 2   Yes.

TC   00:01:41.704 - 00:01:42.492

SD   (17.03)

Participant3   hhh

TC   00:01:59.528 - 00:02:00.273

SD   (25.41)

Participant3   and I should just try to paint on the wall?

TC   00:02:25.691 - 00:02:27.440

SD   (0.21)

Interviewer 1   Yeah.

TC   00:02:27.654 - 00:02:28.655

SD   (0.6)

Participant3   Okay.

TC   00:02:29.263 - 00:02:29.683

SD   (7.6)

Participant3   Is there anything specific that I need to paint or?

TC   00:02:37.290 - 00:02:39.514

SD   (0.84)

Interviewer 1   Eeh, no, just whatever you want.

TC   00:02:40.361 - 00:02:42.770

SD   (0.1)

Participant3   Okay.

TC   00:02:42.870 - 00:02:43.350

SD   (7.29)

Participant3   hhh

TC   00:02:50.642 - 00:02:51.221

SD   (12.85)

Participant3   Yeah, I just.. scribbled some stuff.

TC   00:03:04.074 - 00:03:06.795

SD   (0.23)

Participant3   and now?

TC   00:03:07.033 - 00:03:07.673

SD   (0.16)

Interviewer 1   Eehm.. well, you have five minutes, eeh, to- to draw on the wall if you want,
            otherwise you can also get out.

TC   00:03:07.838 - 00:03:14.760

Participant3   Ooh okay.

TC   00:03:12.836 - 00:03:13.892

SD   (4.96)

Participant3   No idea what to draw though.

TC   00:03:18.853 - 00:03:20.075

SD   (17.74)

Participant3   hhh

TC   00:03:37.818 - 00:03:39.961

SD   (0.02)

Interviewer 1   hhh

TC   00:03:39.986 - 00:03:40.870

SD   (0.77)

Interviewer 1   hhh

TC   00:03:41.642 - 00:03:42.324

SD   (25.27)

Participant3   Try to draw Spongebob, but.. it didn't work at all.

TC   00:04:07.599 - 00:04:10.851

SD   (0.03)

Interviewer 1   Yeah, I was actually just about to ask you, because I can kind of see it.

TC   00:04:10.885 - 00:04:14.672

SD   (0.14)

Participant3   hhh it kinda look-

TC   00:04:14.816 - 00:04:16.990

Interviewer 1   yeah, unironically, like..

TC   00:04:16.182 - 00:04:18.160

SD   (0.18)

Participant3   It looks more lkke the, eeh- the Spoongebob, like, from the episode where tried to

            draw himself in the sand.

TC   00:04:18.344 - 00:04:23.590

SD   (0.37)

Interviewer 2   oh hhh

TC   00:04:23.963 - 00:04:26.969

SD   (0.99)

Participant3   yeah, I mean this is pretty cool.

TC   00:04:27.959 - 00:04:29.519

SD   (0.48)

Participant3   I also like how, eeh..

TC   00:04:30.000 - 00:04:31.445

SD   (0.44)

Participant3   .. slightly pixelated this stuff is.

TC   00:04:31.894 - 00:04:35.178

Interviewer 1   oh yeah, yeah.. you can also, eeh, draw with your hands

TC   00:04:34.734 - 00:04:38.329

SD   (0.53)

Participant3   Draw with what?

TC   00:04:38.865 - 00:04:39.696

SD   (0.13)

Interviewer 1   Your hands.

TC   00:04:39.834 - 00:04:40.405

SD   (0.14)

Participant3   Ooh.

TC   00:04:40.554 - 00:04:41.071

SD   (14.5)

Participant3   hhh

TC   00:04:55.580 - 00:04:56.207

SD   (11.07)

Participant3   hhh

TC   00:05:07.285 - 00:05:07.839

SD   (4.58)

Interviewer 1   It doesn't work on eeh...

TC   00:05:12.421 - 00:05:14.047

Participant3   hhh

TC   00:05:13.229 - 00:05:13.596

SD   (0.42)

Participant3   hhh

TC   00:05:14.020 - 00:05:15.240

SD   (7.4)

Participant3   Oh this- that's the couch hhh

TC   00:05:22.640 - 00:05:24.610

SD   (6.07)

Participant3   Yeah, that's pretty cool.

TC   00:05:30.680 - 00:05:31.740

SD   (0.27)

Interviewer 1   Allright.

TC   00:05:32.017 - 00:05:32.813

SD   (0.9)

Interviewer 1   Yeah, eeh, yeah you have two more minutes if you want or eeh

TC   00:05:33.715 - 00:05:37.500

SD   (3.16)

Interviewer 1   hhh

TC   00:05:40.660 - 00:05:41.639

SD   (6.98)

Participant3   hhh

TC   00:05:48.628 - 00:05:49.107

SD   (7.62)

Participant3   hhh

TC   00:05:56.731 - 00:05:59.386

SD   (0.49)

Interviewer 1   hhh

TC   00:05:59.884 - 00:06:00.852

SD   (6.95)

Participant3   hhh

TC   00:06:07.805 - 00:06:08.410

SD   (0.55)

Participant3   hhh

TC   00:06:08.966 - 00:06:09.832

SD   (0.25)

Interviewer 1   This is a first.

TC   00:06:10.082 - 00:06:11.311

SD   (0.06)

Interviewer 2   hhh

TC   00:06:11.376 - 00:06:12.161

SD   (1.15)

Participant3   Yeah, okay, I mean...

TC   00:06:13.317 - 00:06:14.554

SD   (0.59)

Participant3   It's pretty fun, eehm...

TC   00:06:15.145 - 00:06:16.450

SD   (0.08)

Participant3   But...

TC   00:06:16.539 - 00:06:17.032

SD   (0.36)

Participant3   I think i'm done.

TC   00:06:17.392 - 00:06:18.300

SD   (0.16)

Interviewer 1   i'll just stop the program then.

TC   00:06:18.468 - 00:06:20.130

Interviewer 2   Okay.

TC   00:06:18.539 - 00:06:19.151

SD   (0.91)

Participant3   Okay.

TC   00:06:20.066 - 00:06:20.466

Post-interview

2021 May 20, Thu 13:41

Interviewer1   Can you tell us what you (.) now know about Scandinavian rock
        art?
TC   00:00:04.060 - 00:00:08.088
SD   (2.4)

Participant3   I don't know to be honest (0.3) a little bit more (.), but I
        wouldn't say that I'm an expert on it
TC   00:00:10.490 - 00:00:17.917
SD   (0.2)

Interviewer1   Okay (.) ehm is there anything within the- the program (.)
        that you have some comments on or the test itself or?
TC   00:00:18.120 - 00:00:26.110
SD   (0.56)

Participant3   H:::m no I mean nothing that is like super (.) like super
        usability breaking or [anything] that would make it super
        frustrating
TC   00:00:26.671 - 00:00:34.350

Interviewer1   [Mhm]
TC   00:00:32.200 - 00:00:32.736
SD   (2.9)

Participant3   Nothing like that (0.5) maybe I guess (.) eh the fact that you
        couldn't draw on all the [walls], but not a big requirement or
        anything like that
TC   00:00:35.636 - 00:00:45.220

Interviewer1 [Mhm]

TC 00:00:41.880 - 00:00:42.811

SD (2.77)

Interviewer1 I noticed when eh, (.) when you drew on the surface (0.3) you
did these big motions (.) ehm and you did like this (.) for
instance (.) did that break your immersion that the painting
didn't really follow your motion (.) for instance when you did
[this] it was only certain parts

TC 00:00:45.587 - 00:01:01.360

Participant3 [oh] Yeah so it was like sort of patchy

TC 00:00:58.810 - 00:00:59.706 00:01:00.360 - 00:01:02.130

SD (0.65)

Interviewer1 Yeah yeah yeah yeah

TC 00:01:02.140 - 00:01:03.195

SD (0.13)

Participant3 Yeah I mean eh (.) a little bit, but I would sort of expect
that from any sort of software or computer

TC 00:01:03.327 - 00:01:12.510

Interviewer1 Mhm

TC 00:01:10.170 - 00:01:10.730

SD (1.86)

Interviewer1 Okay, then unless you have any questions then thats it. And
thank you

TC   00:01:12.590 - 00:01:19.410

Participant3   Okay

TC   00:01:18.410 - 00:01:18.896

A.2.5 Participant 4

Pre-interview

```
Interviewer1     you ready interviewer 2?
TC               00:00:00.366 - 00:00:01.310
Interviewer2     I got it
TC               00:00:01.254 - 00:00:02.016
SD               (0.11)
Interviewer1     A:lright
TC               00:00:02.134 - 00:00:03.867
Participant      *talks in danish*
TC               00:00:03.869 - 00:00:05.340
SD               (0.04)
Interviewer1     haha
TC               00:00:05.386 - 00:00:06.573
SD               (0.22)
Interviewer1     ehm: do you have any VR experience?
TC               00:00:06.801 - 00:00:09.130
Participant      yes
TC               00:00:09.124 - 00:00:09.564
SD               (0.31)
Interviewer1     eh is it through personal use or is it through out:
                 through the study? like eh::
TC               00:00:09.876 - 00:00:14.330
SD               (0.48)
Participant      uh I've been to uh uh conventions and other places that
have it but uh I've never
                 owned uh a personal headset
TC               00:00:14.812 - 00:00:21.137
Interviewer1     okay uh: do you have any experience wth hand tracking
                 specifically in VR?
TC               00:00:21.096 - 00:00:25.840
SD               (0.31)
Participant      um just like where hand is tracked or:
TC               00:00:26.151 - 00:00:29.240
Interviewer1     yeah yeah so you don't use controllers
TC               00:00:29.230 - 00:00:31.110
Participant      yeah
TC               00:00:29.647 - 00:00:30.085
SD               (1.22)
Participant      oh no I don't have that
TC               00:00:31.311 - 00:00:32.473
SD               (0.17)
Interviewer1     okay
TC               00:00:32.646 - 00:00:33.180
SD               (0.14)
Participant      no hand tracking
TC               00:00:33.324 - 00:00:34.071
SD               (0.16)
Interviewer1     alright! uh: can you tell us what you know about
                 Scandinavian rock art?
TC               00:00:34.233 - 00:00:38.317
SD               (0.66)
Participant      Scandinavian what?
TC               00:00:38.980 - 00:00:39.731
SD               (0.14)
Interviewer1     rock art
TC               00:00:39.877 - 00:00:40.479
SD               (1.64)
```

```
Participant      the uh that's not a term I'm familiar with. I don't know
                 much about it
TC               00:00:42.125 - 00:00:46.588
Interviewer1     okay uh: then how would you describe rock art then? if
                 you can
TC               00:00:46.601 - 00:00:50.900
SD               (0.28)
Participant      oh::  (1.5) I- I mean uh it s probably a it's a style of
                 art I would assume that's
                 (?) to Scandinavia *laughs* that's- I don't really know
                 it's-  just like based on
                 the (?) is it like (0.8) what what kind of rock are we
$talking about$
TC               00:00:51.186 - 00:01:04.807
Interviewer2     it's like a prehistoric uhm:
TC               00:01:04.814 - 00:01:08.710
Participant      oh in that way
TC               00:01:08.590 - 00:01:09.490
Interviewer2     artistic (0.8) ways on rock surfaces
TC               00:01:09.481 - 00:01:13.631
Participant      okay
TC               00:01:11.960 - 00:01:12.596
SD               (1.02)
Participant      well I know that there are some examples around
                 Scandinavia. They found the ancient
                 uh (0.8) the the yeah. But I don't- I don't know much
about that no
TC               00:01:13.617 - 00:01:22.197
SD               (0.13)
Interviewer1     alright uhm: then we can stop the interview
TC               00:01:22.331 - 00:01:27.194
Interviewer2     that's okay
TC               00:01:23.251 - 00:01:24.088
SD               (3.56)
TC               00:01:27.651 - 00:01:28.376
```

Gameplay

```
Thursday, May 20, 2021, 10:42 AM

Participant      okay
TC               00:02:56.500 - 00:02:56.826
SD               (12.47)
Participant      Oh god, that is very strange, okay so th- it is like is
like I'm touching nothing.
                 So it's very weird

TC               00:03:09.304 - 00:03:16.352
SD               (2.7)
Participant      I just have to clasp these together I believe

TC               00:03:19.060 - 00:03:20.780
SD               (1.0)
Participant      I have to do this at the same time with both hands.
That's a... tall order

TC               00:03:21.786 - 00:03:25.516
SD               (2.95)
Interviewer1     You can also grab it ((pause)) if you clench hard enough

TC               00:03:28.470 - 00:03:32.274
Participant      I can't grab it

TC               00:03:29.885 - 00:03:31.102
SD               (2.15)
Participant      Oh okay, I see

TC               00:03:33.252 - 00:03:34.421
SD               (7.06)
Participant      hah I'm trying to grab these right now

TC               00:03:41.484 - 00:03:43.911
SD               (0.85)
Participant      They're kinda escaping me

TC               00:03:44.762 - 00:03:45.866
SD               (0.71)
Participant      can I use both ha- I can use both hands

TC               00:03:46.577 - 00:03:48.334
SD               (1.25)
Participant      you come he- okay I can put- okay I just poured enough
(in my heads like ? at the
                 same time) ((pause)) hh

TC               00:03:49.592 - 00:03:55.650
SD               (0.66)
Participant      .hh that wa- eh: that's where I struggeled ehm: I'm
kinda trying to pick this up,
                 this red powder. It's kinda escaping me with the right
hand I think it's working
                 better with the left hand. Yeah the left hand is working
much better

TC               00:03:56.317 - 00:04:06.908
```

```
SD              (1.28)
Participant     ..for some reason. Uhh: so I guess I have to stir that

TC              00:04:08.190 - 00:04:10.776
SD              (3.65)
Participant     my right hand's - it's kinda escaping my right hand
whenever i try to pick something
                up with that.. for some reason, so I'm gonna do that
with my left hand

TC              00:04:14.435 - 00:04:20.968
SD              (2.42)
Participant     there's a sound effect. I'm just stirring this. There's
not really changing but I
                hear the sound effect so I guess that's.. what I'm
supposed to- yup it was okay

TC              00:04:23.391 - 00:04:32.680
SD              (1.39)
Participant     uhh oh! and then you notice there's like more hehe,
there's entire background. Okay

TC              00:04:34.076 - 00:04:39.429
SD              (0.94)
Participant     Nice, oh that's really cool

TC              00:04:40.378 - 00:04:41.867
SD              (0.76)
Participant     Okay so I have a paintbrush I'm gonna try to grab it
with my left hand it's- that's
                not how I would grab a paintbrush usually but-

TC              00:04:42.636 - 00:04:47.935
SD              (1.53)
Participant     there we go, there we go okay so I can dip this

TC              00:04:49.470 - 00:04:51.806
SD              (3.41)
Participant     and ((pause)) so I can make my mark I suppose

TC              00:04:55.222 - 00:04:59.036
SD              (1.33)
Participant     OOH! okay? ((excited))

TC              00:05:00.375 - 00:05:01.920
SD              (1.28)
Participant     I should not move over there should I?

TC              00:05:03.204 - 00:05:04.944
SD              (0.17)
Interviewer3    Eh: you can move as long as you're in the guardian, it
should warn you if you get
                too close to furniture

TC              00:05:05.115 - 00:05:10.258
Interviewer2    You can, that's fine

TC              00:05:05.290 - 00:05:06.966
```

```
SD              (3.74)
Participant     Can I try to (?) Can I use my right hand- I can okay
good

TC              00:05:10.710 - 00:05:14.560
Interviewer3    hehe

TC              00:05:11.958 - 00:05:12.830
SD              (10.42)
Participant     hh $oh god, okay so that didn't.. okay$. So I can try to
like.. I see like the: the
                symbols, there's like.. .hh so I can make my own, like
man

TC              00:05:23.259 - 00:05:33.736
SD              (9.4)
Participant     He's just gonna have a bow and arrow

TC              00:05:43.140 - 00:05:44.551
SD              (5.56)
Participant     'Cos I like hunting

TC              00:05:50.119 - 00:05:50.849
SD              (2.28)
Participant     okay, there. Does this eh th- it seems like this doesn't
run out of paint ever

TC              00:05:53.130 - 00:05:58.179
SD              (1.92)
Participant     okay, it says i can dip my ha::nd so I guess i can try
th- ((pause)) and can I paint
                my ((LOUD POP)) OH GOD!

TC              00:06:00.104 - 00:06:05.776
SD              (0.17)
Interviewer2    *laughs*

TC              00:06:05.953 - 00:06:07.969
Participant     oh god! that was scary! *laughs*

TC              00:06:07.150 - 00:06:10.580
Interviewer3    *laughs*

TC              00:06:07.779 - 00:06:12.020
Participant     I'm a very like- uh I'm a   very easily anxious person
like I was like VR with horror
                elements and stuff so like all of this is slightly
terrifying to me

TC              00:06:11.539 - 00:06:19.506
Interviewer1    *laughs*

TC              00:06:18.645 - 00:06:20.086
Interviewer2    (?)

TC              00:06:19.790 - 00:06:21.180
SD              (0.36)
Participant     oh thank god
```

```
TC              00:06:21.546 - 00:06:22.487
SD              (1.74)
Participant     maybe (you) just say that now (would you know)

TC              00:06:24.235 - 00:06:25.868
Interviewer2    *laughs*

TC              00:06:25.784 - 00:06:26.856
Interviewer3    *laughs*

TC              00:06:25.972 - 00:06:27.090
SD              (0.35)
Participant     I would- I would never wanna test anything you ever do
again

TC              00:06:27.440 - 00:06:30.136
Interviewer2    *laughs*

TC              00:06:29.744 - 00:06:31.366
SD              (0.91)
Participant     I'm gonna make a little.. little guy here

TC              00:06:32.280 - 00:06:34.170
SD              (3.91)
Participant     uh

TC              00:06:38.089 - 00:06:38.433
SD              (1.01)
Participant     I can dip my other hand.. I guess

TC              00:06:39.443 - 00:06:40.946
SD              (2.51)
Participant     so I can paint with my thumb too i suppose

TC              00:06:43.459 - 00:06:45.267
SD              (1.6)
Participant     ooh! That's nice!

TC              00:06:46.870 - 00:06:48.270
SD              (2.33)
Participant     hehehe this is really cool. I like this a lot

TC              00:06:50.609 - 00:06:55.257
SD              (3.4)
Participant     That's me and my.. my buddy

TC              00:06:58.660 - 00:07:00.150
SD              (3.94)
Participant     oh! i can do two- wait I can do two at once oh my god!

TC              00:07:04.090 - 00:07:06.200
Interviewer1    you can do all at once if you want

TC              00:07:06.190 - 00:07:08.200
Participant     oh!
```

```
TC              00:07:07.642 - 00:07:08.207
SD              (3.48)
Participant     $that's my work hahaha I like that a lot$

TC              00:07:11.694 - 00:07:15.120
SD              (1.95)
Participant     This is like really cool actually, I just.. I'm.. I
kinda look like I''ve murdered
                someone right now.

TC              00:07:17.079 - 00:07:21.840
SD              (0.03)
Interviewer1    *laughs*

TC              00:07:21.878 - 00:07:23.123
Participant     haha! But this is really cool!

TC              00:07:22.589 - 00:07:25.520
SD              (1.22)
Participant     okay I can act- I can paint over the others I suppose,
that's probably a- ((pause))
                bad idea, that's probably defacing art

TC              00:07:26.740 - 00:07:32.603
SD              (1.49)
Interviewer1    uhm: you have three more minutes, do what you want

TC              00:07:34.096 - 00:07:37.562
SD              (0.1)
Participant     ahh shoot, oh I can make like a big thing over there!
There's like a big space

TC              00:07:37.662 - 00:07:42.145
SD              (1.01)
Participant     oh okay

TC              00:07:43.162 - 00:07:43.797
SD              (0.45)
Participant     probably not then

TC              00:07:44.248 - 00:07:45.180
Interviewer3    It should be good in real life right now it's just the
cable then-

TC              00:07:45.124 - 00:07:47.700
Participant     There's a wall, like an invisible wall right where the
big area starts

TC              00:07:47.700 - 00:07:51.298
Interviewer1    oh:

TC              00:07:50.621 - 00:07:51.985
Interviewer3    yeah okay I see

TC              00:07:50.890 - 00:07:52.010
Interviewer2    you even- even if you stretch your arm right now you're
not gonna touch anything
```

```
TC              00:07:51.499 - 00:07:54.580
Participant     oh okay cool. So I can just draw here okay. There's a
big area down here where
                there's not a lot- I'm gonna draw something big here

TC              00:07:54.580 - 00:07:59.990
SD              (0.71)
Participant     uh I'm gonna make like uh hh ((pause)) hh

TC              00:08:00.701 - 00:08:03.680
SD              (2.15)
Participant     I'm gonna try to extend my one finger so it's the only
thing touching?

TC              00:08:05.839 - 00:08:08.842
SD              (2.62)
Participant     I'm gonna make like a hut

TC              00:08:11.468 - 00:08:12.613
SD              (1.81)
Participant     for myself ((pause)) like a house ((pause)) this is
where I live

TC              00:08:14.432 - 00:08:18.740
SD              (1.34)
Participant     and there's a ((pause)) there's a- oh god! hh ((pause))
there's me ((pause)) I think

TC              00:08:20.089 - 00:08:26.644
SD              (1.66)
Participant     I accidentally draw- drew a bit more but uh: there's me
with my lobster claw

TC              00:08:28.310 - 00:08:31.920
SD              (1.09)
Participant     uhm: I'm gonna make a cat

TC              00:08:33.018 - 00:08:34.367
SD              (3.79)
Participant     okay that- that- okay

TC              00:08:38.165 - 00:08:39.130
SD              (1.05)
Participant     $hehe that's heh that's not very good hehe$

TC              00:08:40.180 - 00:08:43.170
SD              (0.93)
Participant     and give it tiny legs

TC              00:08:44.107 - 00:08:45.345
SD              (2.22)
Participant     that's a cat right?

TC              00:08:47.570 - 00:08:49.300
Interviewer1    yeah!

TC              00:08:48.290 - 00:08:49.014
SD              (1.36)
```

```
Participant      okay

TC               00:08:50.377 - 00:08:50.702
SD               (1.98)
Participant      okay can I use the pencil again

TC               00:08:52.690 - 00:08:53.940
SD               (3.74)
Participant      okay I think I can swap. ((pause)) (I guess what to do)
right hand

TC               00:08:57.689 - 00:09:01.700
SD               (3.7)
Participant      this might be more- eh: this might be possibly more
accurate 'cos I'm not using all
                 my fingers at once it doesn't like detect everything so
this one's probably a bit
                 more accurate

TC               00:09:05.409 - 00:09:11.893
SD               (1.56)
Participant      uh, let;s make some uh like, do they make star signs
right, they make like beep beep
                 beep ((paints a dot for every beep)) and then they like
connect them

TC               00:09:13.462 - 00:09:19.174
SD               (1.81)
Participant      like you know like star signs like they see the stars
and like.. that's.. that's a
                 star sign heh

TC               00:09:20.990 - 00:09:26.060
SD               (1.4)
Participant      up in the sky

TC               00:09:27.460 - 00:09:28.300
SD               (0.28)
Participant      uh!

TC               00:09:28.585 - 00:09:29.058
SD               (3.74)
Participant      hehehe $I just I really like this hehe it's a lot of
fun$

TC               00:09:32.799 - 00:09:36.659
SD               (1.03)
Participant      I can't reach. eh!

TC               00:09:37.690 - 00:09:39.240
SD               (1.05)
Participant      eh! okay

TC               00:09:40.291 - 00:09:42.065
SD               (2.63)
Participant      uh, ((POP SOUND)) .hh ((pause)) hh it's this p- that's
still-
```

```
TC              00:09:44.700 - 00:09:49.194
SD              (1.18)
Participant     uh that's a satisfying work of art

TC              00:09:50.380 - 00:09:52.490
SD              (0.57)
Interviewer1    yeah, I'll close the program

TC              00:09:53.060 - 00:09:54.910
SD              (0.19)

TC              00:09:55.103 - 00:10:00.554
```

Post-interview

```
Tuesday, May 18, 2021, 12:20 PM
Interviewer1    okay uhm: can you tell us what you now know (0.8) nej!
(0.8) can you tell us what
                you know now (0.8) about $Scandinavian rock art$
TC              00:00:01.002 - 00:00:10.084
Interviewer3    *laughs*

TC              00:00:07.317 - 00:00:09.238
Interviewer2    *laughs*

TC              00:00:08.353 - 00:00:14.640
Participant     *speaks in Danish*

TC              00:00:09.045 - 00:00:10.480
SD              (0.35)
Interviewer3    *laughs*

TC              00:00:10.838 - 00:00:12.570
SD              (0.61)
Interviewer1    $yeah$

TC              00:00:13.180 - 00:00:15.290
Participant     *spekas in Danish*

TC              00:00:14.577 - 00:00:16.064
Interviewer3    *laughs

TC              00:00:15.987 - 00:00:17.799
Interviewer1    eh I I I mean (0.8) can you tell us what  you know now
about Scandinavian rock art

TC              00:00:16.207 - 00:00:21.203
SD              (0.62)
Participant     uhm: so:: so as far as I know it is this ancient form
where they uh crushed up umm I
                think it was like powders they probably like crushed up
rocks and then they (0.4)
                they mixed the two together and uh that uh became uh
this sort (0.4) of marking
                that they would leave on walls to kinda show themselves
so I saw (0.2) a couple of
                figures on the wall I saw a couple of animals too so I
think it's kinda like their
                (0.5) depiction of

TC              00:00:21.827 - 00:00:47.772
SD              (2.11)
Participant     their depiction of a: of different like uhm: things in
the world because they didn't
                have you know language yet they could only just visually
so that's probably (0.8)
                that's probably what it is

TC              00:00:49.886 - 00:01:00.123
Interviewer1    mhm

TC              00:00:53.724 - 00:00:54.424
SD              (5.69)
```

```
Interviewer1      okay (0.8) cool

TC                00:01:00.119 - 00:01:01.524
SD                (0.08)
Participant       uh, I don't know what's specific about Scandinavian rock
art eh in general compared
                  to just rock art .(0.8) I don't know really what- I
don't really know what's the
                  Scandinavian part of it is (0.8) as meant to like...

TC                00:01:01.607 - 00:01:15.710
Interviewer1      mhm

TC                00:01:08.337 - 00:01:08.913
SD                (9.1)
Interviewer2      there's not (0.8) much [of a difference]? to answer your
question and and the the
                  biggest difference would just would just be the
depictions of the [animals] or
                  something like that [but] it's it's very roughly the-

TC                00:01:18.015 - 00:01:27.950
Participant       [oh okay]

TC                00:01:19.199 - 00:01:20.952
SD                (0.17)
Interviewer1      yeah

TC                00:01:21.127 - 00:01:21.789
SD                (3.49)
Participant       [okay]

TC                00:01:25.282 - 00:01:25.950
SD                (0.51)
Participant       [yes]

TC                00:01:26.466 - 00:01:27.042
SD                (1.5)
Participant       alright

TC                00:01:28.543 - 00:01:29.006
SD                (0.67)
Interviewer1      uh then do you have any additional comments? Could be
about the program or the whole
                  test

TC                00:01:29.676 - 00:01:36.299
SD                (0.09)
Participant       uhm: I think I uh if you were recording on the entire
time yeah I think I've said
                  most of it in recording kinda with the uh, the: in
regards to some of the things
                  that confused me a bit but also the things that I'm
really fascinated about the
                  program. And uhm.. but I think I don't really have much
besides that

TC                00:01:36.390 - 00:01:53.771
```

```
Interviewer1      mhm

TC                00:01:47.722 - 00:01:48.235
SD                (2.24)
Interviewer1      hmm

TC                00:01:50.484 - 00:01:50.721
SD                (3.11)
Interviewer1      okay? Then I think that's it! We have one last
questionnaire

TC                00:01:53.833 - 00:01:57.850
SD                (0.22)

TC                00:01:58.070 - 00:01:59.395
```

A.2.6 Participant 5

Pre-interview

Thursday, May 20, 2021, 1:39 PM

Interviewer 1	Alright
TC	00:00:00.420 - 00:00:00.749
SD	(1.47)

Interviewer 1	Do you have any ==VR experience==?
TC	00:00:02.224 - 00:00:04.608
SD	(0.67)

Pariticpant 5	ehm ((pauses)) well, ==mostly from testing other applications I don't own a VR headset==
TC	00:00:05.287 - 00:00:11.330
SD	(0.14)

Interviewer 1	Okay, do you have ==experience with hand tracking==, specifically, in virtual reality?
TC	00:00:11.474 - 00:00:17.473
SD	(0.44)

Pariticpant 5	==no, i never tried hand tracking==
TC	00:00:17.920 - 00:00:19.436
SD	(0.19)

Interviewer 1	Okay
TC	00:00:19.626 - 00:00:19.915
SD	(0.65)

Interviewer 1	Ehm, can you tell us what you know about Scandinavian rock art?
TC	00:00:20.565 - 00:00:24.434

SD	(1.28)

Pariticpant 5	hhh
TC	00:00:25.718 - 00:00:28.682
SD	(0.89)

Interviewer 1	hhh
TC	00:00:29.580 - 00:00:33.477

Interviewer 2	hhh
TC	00:00:29.580 - 00:00:33.477

Pariticpant 5	hhh silence () knowledge ()
TC	00:00:29.591 - 00:00:33.488

Interviewer 2	Such an intense question out of nowhere
TC	00:00:33.477 - 00:00:36.501

Pariticpant 5	yeah
TC	00:00:36.519 - 00:00:36.909
SD	(1.35)

Pariticpant 5	() hhh there you go
TC	00:00:38.262 - 00:00:43.002
SD	(0.9)

Interviewer 2	hhh
TC	00:00:43.910 - 00:00:44.450
SD	(0.13)

Pariticpant 5   I feel like...

TC   00:00:44.585 - 00:00:45.433

SD   (1.79)

Pariticpant 5   ehm, no, no that's something else

TC   00:00:47.226 - 00:00:48.865

SD   (2.53)

Pariticpant 5   no that's something different, theres like a geology museum on like, Odense

                 somewhere, I think, that's the only I've heard of, but I don't think that's related

                 to that at all, maybe?

TC   00:00:51.396 - 00:00:59.501

SD   (1.01)

Interviewer 1   okay, then we can go a little back. How would you ((pauses)) can you tell us what

                 you know about rock art in general then?

TC   00:01:00.520 - 00:01:07.508

SD   (1.0)

Pariticpant 5   like, ehm, () cave paintings and stuff right that we, we find from previous...

TC   00:01:08.509 - 00:01:14.280

SD   (1.59)

Pariticpant 5   generations of people, or something?

TC   00:01:15.877 - 00:01:17.255

SD   (1.64)

Pariticpant 5   I have...

TC	00:01:18.900 - 00:01:19.310
SD	(0.81)

Pariticpant 5	<mark>been a part of like, other tests for older semesters, where they were also doing something with rock art but I dont remember much of it</mark>, and of course I also know about the project proposal and I read a little bit about it in preparation for this one, because we were also interested in maybe doing something rock art, but decided not to
TC	00:01:20.120 - 00:01:36.686
SD	(0.32)

Interviewer 1	Okay
TC	00:01:37.014 - 00:01:37.750
SD	(0.48)

Interviewer 1	ehm
TC	00:01:38.232 - 00:01:38.770
SD	(0.24)

Interviewer 1	then...
TC	00:01:39.016 - 00:01:39.377
SD	(0.7)

Interviewer 1	That was it for the interview
TC	00:01:40.078 - 00:01:41.132
SD	(0.34)

Interviewer 1	We have two questionnaires
TC	00:01:41.475 - 00:01:42.841

Gameplay

2021 May 20, Thu 14:00

Participant5   Okay, so...

TC   00:00:00.000 - 00:00:00.568

SD   (0.95)

Participant5   is there any specific...

TC   00:00:01.523 - 00:00:02.651

SD   (0.32)

Participant5   ehm...

TC   00:00:02.975 - 00:00:03.499

SD   (0.45)

Participant5   Okay, yeah, so- so, I- I see the bowl and there's clearly some sort of, like...

TC   00:00:03.956 - 00:00:07.805

SD   (0.55)

Participant5   These need to be mixed, right?

TC   00:00:08.359 - 00:00:09.645

SD   (0.78)

Participant5   I'm kind of scared of bumping my toe into this immediately, but of course I wont.

TC   00:00:10.431 - 00:00:13.992

SD   (0.17)

Interviewer 1   There will be a guardian-

TC   00:00:14.162 - 00:00:15.982

Participant5   Oh.

TC   00:00:14.309 - 00:00:14.661

SD   (1.04)

Participant5   Can I grab this? Oh, I can- ah, wait- no, what- sto- hhh

TC   00:00:15.703 - 00:00:20.899

Interviewer 3   hhh

TC   00:00:19.323 - 00:00:20.756

SD   (0.04)

Interviewer 2   hhh

TC   00:00:20.796 - 00:00:21.220

SD   (0.11)

Participant5   hhh

TC   00:00:21.334 - 00:00:24.487

Interviewer 1   hhh no:::

TC   00:00:23.026 - 00:00:24.833

SD   (0.36)

Participant5   Okay, so- so the bowls just flew all crazy, like, into each other and- o:::h

TC   00:00:25.199 - 00:00:30.105

Interviewer 2   hhh oh no

TC   00:00:30.035 - 00:00:32.582

SD   (2.46)

Participant5   hhh so now i'm just- just- no, okay, yeah

TC   00:00:35.045 - 00:00:38.129

Interviewer 2   It just works

TC   00:00:38.036 - 00:00:39.193

SD   (0.29)

Participant5   E:::hm, i'm grabbing this other bowl and trying to pour- uh, hey, yeah

TC   00:00:39.492 - 00:00:43.802

SD   (3.19)

Participant5   Eh, I let- I did- They're- They're here- ehm, and I see, ehm..

TC   00:00:46.996 - 00:00:50.570

SD   (0.57)

Participant5   I see the middle bowl has, like, a mixing thing on it, so i'm assuming I need to
                grab the mixing stick...

TC   00:00:51.146 - 00:00:55.525

SD   (2.5)

Participant5   and mix it...

TC   00:00:58.034 - 00:00:58.797

SD   (0.38)

Participant5   so I mix it...

TC   00:00:59.181 - 00:01:00.258

SD   (0.39)

Participant5   Oh hell, that's nice.

TC   00:01:00.655 - 00:01:02.283

SD   (0.77)

Interviewer 1   That's some good pasta.

TC   00:01:03.060 - 00:01:04.232

Participant5   hhh that is...

TC   00:01:03.957 - 00:01:05.388

SD   (0.39)

Participant5   that is a very good looping pasta hhh

TC   00:01:05.782 - 00:01:08.273

SD   (1.59)

Participant5   Do I need to do- oh yeah, okay, faster.

TC   00:01:09.869 - 00:01:11.951

SD   (2.07)

Participant5   Let go of this stick a:::nd now I need to dip my pencil tool- how do I- what is

          the- oh

TC   00:01:14.028 - 00:01:20.258

SD   (0.79)

Participant5   So like a pen...

TC   00:01:21.051 - 00:01:22.108

SD   (1.01)

Participant5   but....

TC   00:01:23.122 - 00:01:23.446

SD   (0.55)

Participant5   okay...

TC   00:01:24.004 - 00:01:24.483

SD   (0.27)

Participant5   so does- oh, I dropped it in there and it's-

TC   00:01:24.755 - 00:01:26.903

SD   (0.65)

Participant5   yes.

TC   00:01:27.560 - 00:01:28.144

SD   (1.44)

Participant5   and now I need to leave my mark on- on the...

TC   00:01:29.587 - 00:01:32.519

SD   (0.3)

Participant5   the thing, right?

TC   00:01:32.827 - 00:01:33.453

SD   (0.23)

Interviewer 1   mhmm

TC   00:01:33.689 - 00:01:34.306

SD   (0.34)

Participant5   Eeh- oh- oh no

TC   00:01:34.647 - 00:01:35.633

SD   (1.5)

Participant5   Thanks

TC   00:01:37.138 - 00:01:37.590

SD   (0.56)

Participant5   E:::hm

TC   00:01:38.151 - 00:01:38.892

SD   (0.57)

Participant5   so....

TC   00:01:39.468 - 00:01:40.000

SD   (1.83)

Participant5   hhh no

TC   00:01:41.833 - 00:01:43.882

Interviewer 3   hhh

TC   00:01:42.643 - 00:01:43.299

SD   (3.78)

Participant5   ehm...

TC   00:01:47.087 - 00:01:47.734

SD   (0.27)

Participant5   I'm approaching the wall I think...

TC   00:01:48.011 - 00:01:49.453

SD   (0.19)

Participant5   and maybe also a sofa.

TC   00:01:49.643 - 00:01:50.955

SD   (1.31)

Interviewer 2   The guardian will let you know.

TC   00:01:52.272 - 00:01:53.770

Participant5   Cool.

TC   00:01:53.294 - 00:01:53.854

SD   (0.89)

Participant5   E:::h...

TC   00:01:54.750 - 00:01:55.637

SD   (2.46)

Participant5   and this is, like, permanent I- I kinda don't know what to draw.

TC   00:01:58.106 - 00:02:01.311

SD   (1.98)

Participant5   The immediate thing is...

TC   00:02:03.300 - 00:02:04.748

SD   (0.51)

Participant5   not good.

TC   00:02:05.260 - 00:02:05.840

SD   (0.78)

Participant5   hhh

TC   00:02:06.625 - 00:02:08.989

Interviewer 2   hhh

TC   00:02:06.625 - 00:02:09.122

Interviewer 3   hhh

TC   00:02:07.474 - 00:02:08.942

SD   (0.23)

Participant5   E:::h...

TC   00:02:09.178 - 00:02:10.167

SD   (0.09)

Interviewer 1   Don't let that discourage you.

TC   00:02:10.259 - 00:02:11.675

SD   (0.15)

Participant5   Yeah.

TC   00:02:11.831 - 00:02:12.328

SD   (0.06)

Interviewer 1   to ehm...

TC   00:02:12.389 - 00:02:13.202

SD   (0.16)

Participant5   No but- but then- yeah, okay, so there also, like, drawing, like, I- (Participant's Name) was

            here or whatever, right? But that's like- it doesn't really fit, I kind of want to

            fit the aesthetic

TC   00:02:13.368 - 00:02:21.229

SD   (0.46)

Participant5   Maybe if I draw myself...

TC   00:02:21.691 - 00:02:23.454

SD   (0.7)

Participant5   that looks nice

TC   00:02:24.160 - 00:02:25.072

SD   (0.84)

Participant5   so i'm like...

TC   00:02:25.915 - 00:02:26.644

SD   (0.82)

Participant5   oh no

TC   00:02:27.471 - 00:02:28.441

SD   (5.31)

Interviewer 1   what?

TC   00:02:33.760 - 00:02:34.400

SD   (3.09)

Participant5   no-

TC   00:02:37.493 - 00:02:38.021

Interviewer 1   ( ) it's pixelated

TC   00:02:38.026 - 00:02:39.282

SD   (0.5)

Participant5   yeah, it's-

TC   00:02:39.782 - 00:02:40.472

SD   (1.86)

Interviewer 1   can we restart?

TC   00:02:42.332 - 00:02:43.271

Participant5   i'm holding it all weird

TC   00:02:42.733 - 00:02:44.245

SD   (0.22)

Participant5   no

TC   00:02:44.468 - 00:02:44.728

SD   (0.97)

Participant5   hhh

TC   00:02:45.698 - 00:02:46.206

SD   (2.58)

Participant5   so i'm, like, actually squeezing my hand...

TC   00:02:48.794 - 00:02:50.759

SD   (0.39)

Participant5   tight so it's uncomfortable....

TC   00:02:51.151 - 00:02:53.336

SD   (0.36)

Participant5   because when I hold it...

TC   00:02:53.699 - 00:02:54.707

SD   (0.86)

Participant5   but i'm not- okay, yeah, e:::hm

TC   00:02:55.569 - 00:02:57.619

SD   (2.02)

Participant5   it is very pixelated, I- this is not-

TC   00:02:59.643 - 00:03:01.891

Interviewer 1   wait, no-

TC   00:03:00.366 - 00:03:01.870

SD   (0.24)

Participant5   that is not- yeah

TC   00:03:02.115 - 00:03:03.234

SD   (0.87)

Interviewer 2   yeah, it is

TC   00:03:04.105 - 00:03:05.409

SD   (1.64)

Participant5   no:::

TC   00:03:07.050 - 00:03:07.462

SD   (0.19)

Interviewer 1   can we redo this test?

TC   00:03:07.661 - 00:03:09.241

Interviewer 3   yeah, we can just redo it

TC   00:03:09.142 - 00:03:10.079

SD   (0.29)

Participant5   okay

TC   00:03:10.369 - 00:03:10.772

SD   (0.18)

Participant5   should I ehm

TC   00:03:10.956 - 00:03:11.905

Interviewer 1   I'll just put you out

TC   00:03:11.579 - 00:03:13.529

SD   (3.28)

Participant5   oh, something is-

TC   00:03:16.818 - 00:03:17.884

Interviewer 3   yeah

TC   00:03:17.708 - 00:03:18.400

Interviewer 2   there's some- there's some sounds happening, right?

TC   00:03:18.281 - 00:03:20.529

SD   (0.23)

Interviewer 2   like du du du du

TC   00:03:20.768 - 00:03:21.598

SD   (0.17)

Participant5   yeah it was, like, ongoing

TC   00:03:21.769 - 00:03:23.190

Interviewer 2   yeah, I-

TC   00:03:23.123 - 00:03:24.209

SD   (0.37)

Participant5   it's still going on

TC   00:03:24.586 - 00:03:25.373

Interviewer 2   that one

TC   00:03:24.824 - 00:03:25.664

SD   (0.02)

Interviewer 1   i'm such a poopoo

TC   00:03:25.690 - 00:03:26.713

SD   (0.41)

Interviewer 1   it's because the- the image is-

TC   00:03:27.127 - 00:03:29.181

SD   (0.98)

Interviewer 1   painting on so low res that, you know, you can only draw a pixel at a time

TC   00:03:30.166 - 00:03:34.446

SD   (0.03)

Interviewer 3   but it wasn't like that before

TC   00:03:34.478 - 00:03:35.757

Interviewer 1   no, because I made a new one, because we had six instead of 5, because- so it's-

            instead of being 1024 times 1024-

TC   00:03:35.728 - 00:03:43.168

SD   (0.07)

Interviewer 3   oh you made it 20-

TC   00:03:43.240 - 00:03:44.324

SD   (0.26)

Interviewer 1   it's 256 times 256

TC   00:03:44.591 - 00:03:46.838

Participant5   hhh

TC   00:03:46.706 - 00:03:48.834

Interviewer 3   hhh

TC   00:03:46.974 - 00:03:48.605

Interviewer 2   hhh

TC   00:03:47.976 - 00:03:48.943

Interviewer 1   okay, that's my bad, Marcus, i'm sorry

TC   00:03:48.831 - 00:03:51.202

Interviewer 3   okay, that's why

TC   00:03:49.195 - 00:03:50.791

SD   (0.32)

Participant5   nah, i'm ( )

TC   00:03:51.112 - 00:03:52.102

Interviewer 1   ehm

TC   00:03:51.956 - 00:03:52.601

SD   (0.62)

Interviewer 1   i'll make it properly. Then- ah, oh my god, just- forget what you just did

TC   00:03:53.224 - 00:03:58.154

Interviewer 3   why is that noise still there

TC   00:03:58.109 - 00:04:00.326

Interviewer 2   yeah, I don't-

TC   00:03:59.847 - 00:04:00.625

Participant5   yeah-

TC   00:04:00.572 - 00:04:01.129

Interviewer 2   I don't really get ( )

TC   00:04:00.855 - 00:04:02.229

Participant5   yeah, it's like a woodpecker

TC   00:04:01.620 - 00:04:02.868

SD   (0.44)

Interviewer 2   yeah

TC   00:04:03.314 - 00:04:04.115

SD   (0.29)

Interviewer 2   are you still in the scene?

TC   00:04:04.413 - 00:04:05.623

SD   (0.1)

Participant5   i'm in the-

TC   00:04:05.728 - 00:04:06.583

SD   (0.6)

Participant5   living room

TC   00:04:07.187 - 00:04:08.435

Interviewer 3   it's not even running the scene, the sound shouldn't be there

TC   00:04:07.782 - 00:04:10.406

Interviewer 2   what?

TC   00:04:08.439 - 00:04:09.171

SD   (1.12)

Interviewer 2   exactly

TC   00:04:10.292 - 00:04:11.384

SD   (0.41)

Interviewer 1   that's just how she goes

TC   00:04:11.798 - 00:04:13.581

SD   (0.61)

Participant5   now i'm in the-

TC   00:04:14.192 - 00:04:15.317

SD   (0.98)

Interviewer 3   in the real world

TC   00:04:16.304 - 00:04:17.934

SD   (0.27)

Participant5   hhh yes

TC   00:04:18.210 - 00:04:19.128

SD   (1.59)

Participant5   oh

TC   00:04:20.721 - 00:04:21.164

SD   (0.36)

Participant5   oh

TC   00:04:21.529 - 00:04:22.122

SD   (0.3)

Interviewer 1   i'm so sorry Marcus

TC   00:04:22.424 - 00:04:23.737

SD   (0.19)

Participant5   it's fine

TC   00:04:23.930 - 00:04:24.730

SD   (1.76)

Participant5   it's not my test

TC   00:04:26.494 - 00:04:27.327

SD   (0.11)

Participant5   hhh

TC   00:04:27.441 - 00:04:31.181

Interviewer 3   hhh

TC   00:04:27.686 - 00:04:30.043

Interviewer 2   hhh

TC   00:04:27.871 - 00:04:29.998

SD   (1.18)

Interviewer 2   you right

TC   00:04:31.180 - 00:04:32.579

SD   (5.14)

Participant5   okay, so::: i'm back in the scene and

TC   00:04:37.728 - 00:04:40.532

SD   (0.69)

Participant5   i'm going to try and mix the paints again

TC   00:04:41.228 - 00:04:42.588

SD   (0.47)

Participant5   and see if...

TC   00:04:43.065 - 00:04:43.642

SD   (1.4)

Participant5   i'll grab it one by- woah

TC   00:04:45.042 - 00:04:46.717

SD   (5.17)

Participant5   me:::h

TC   00:04:51.896 - 00:04:52.440

SD   (1.19)

Participant5   hhh okay here we go- no:::

TC   00:04:53.637 - 00:04:54.637

SD   (1.52)

Participant5   e:::hm

TC   00:04:56.166 - 00:04:57.143

SD   (1.06)

Participant5   it's like...

TC   00:04:58.203 - 00:04:58.820

SD   (0.75)

Participant5   grabbing a slippery object or something

TC   00:04:59.572 - 00:05:01.919

SD   (0.32)

Participant5   okay, here we are

TC   00:05:02.239 - 00:05:03.195

SD   (1.11)

Participant5   ehm, oh

TC   00:05:04.312 - 00:05:05.244

SD   (0.8)

Participant5   mh here and now I need to mix the two paints

TC   00:05:06.048 - 00:05:09.211

SD   (4.71)

Participant5   ( ) yeah

TC   00:05:13.928 - 00:05:16.101

SD   (2.14)

Participant5   and i'm grabbing the pencil

TC   00:05:18.250 - 00:05:19.689

SD   (0.28)

Participant5   a:::nd...

TC   00:05:19.969 - 00:05:20.521

SD   (0.38)

Participant5   I will try...

TC   00:05:20.905 - 00:05:22.073

SD   (0.45)

Participant5   drawing...

TC   00:05:22.525 - 00:05:23.184

SD   (0.45)

Participant5   my...

TC   00:05:23.641 - 00:05:24.173

SD   (0.35)

Participant5   stick figure again

TC   00:05:24.529 - 00:05:25.785

SD   (3.6)

Participant5   man

TC   00:05:29.387 - 00:05:29.840

SD   (0.39)

Participant5   it's kind of difficult to gage the distance to the wall

TC   00:05:30.239 - 00:05:33.513

SD   (0.03)

Interviewer 1   okay

TC   00:05:33.551 - 00:05:34.087

SD   (0.26)

Participant5   ehm

TC   00:05:34.349 - 00:05:34.969

SD   (0.26)

Participant5   also because like-

TC   00:05:35.233 - 00:05:36.196

SD   (0.15)

Participant5   my hand and also I think my tool stops-

TC   00:05:36.346 - 00:05:39.019

SD   (0.6)

Participant5   no I can get pretty close, okay

TC   00:05:39.620 - 00:05:41.346

SD   (0.67)

Participant5   this- yeah this- this is nicer

TC   00:05:42.017 - 00:05:43.701

SD   (0.1)

Participant5   this is a bit better

TC   00:05:43.807 - 00:05:44.985

SD   (1.71)

Participant5   i'm- i'm really clasping my hand to try and grab it

TC   00:05:46.695 - 00:05:49.732

SD   (0.4)

Participant5   'cause...

TC   00:05:50.138 - 00:05:50.562

SD   (0.22)

Participant5   i'm attempting to hold some- just holding my han- own fingers. Sort of.

TC   00:05:50.784 - 00:05:55.094

SD   (7.52)

Participant5   oh no stop hhh

TC   00:06:02.617 - 00:06:03.956

SD   (0.76)

Participant5   ehm

TC   00:06:04.723 - 00:06:05.473

SD   (7.11)

Participant5   I kind of want to treat it as, like, a- a Stylus tablet or something that-

TC   00:06:12.583 - 00:06:15.971

SD   (1.79)

Participant5   no, not even that, what-

TC   00:06:17.768 - 00:06:19.181

SD   (0.46)

Participant5   it's- it's so weird because

TC   00:06:19.647 - 00:06:20.925

SD   (0.58)

Participant5   I expect it to- to stop when I, like, release it somehow

TC   00:06:21.514 - 00:06:24.609

SD   (0.37)

Participant5   but...

TC   00:06:24.980 - 00:06:25.408

SD   (0.97)

Participant5   oh

TC   00:06:26.381 - 00:06:26.761

SD   (0.48)

Participant5   oh that's- no- that's

TC   00:06:27.241 - 00:06:28.911

SD   (0.5)

Participant5   wha- no hhh not again

TC   00:06:29.418 - 00:06:32.253

SD   (1.34)

Participant5   ehm here we are

TC   00:06:33.601 - 00:06:34.434

SD   (0.64)

Participant5   okay

TC   00:06:35.075 - 00:06:35.563

SD   (0.2)

Participant5   ehm

TC   00:06:35.771 - 00:06:36.483

SD   (2.61)

Participant5   i've got, like, the wire u:::h

TC   00:06:39.102 - 00:06:41.767

SD   (0.86)

Participant5   and, like, the laptop

TC   00:06:42.635 - 00:06:44.398

SD   (4.34)

Participant5   the laptop has a mouse

TC   00:06:48.738 - 00:06:50.566

SD   (3.09)

Participant5   people will wonder about this for ages

TC   00:06:53.661 - 00:06:55.298

SD   (0.52)

Interviewer 2   hhh

TC   00:06:55.818 - 00:06:57.582

Participant5   hhh

TC   00:06:55.939 - 00:06:57.012

Interviewer 3   hhh

TC   00:06:56.102 - 00:06:57.446

SD   (0.22)

Participant5   ehm- oh- no

TC   00:06:57.670 - 00:06:59.376

SD   (3.43)

Participant5   ehm

TC   00:07:02.806 - 00:07:03.693

SD   (0.81)

Participant5   i mean- I think i've left my mark

TC   00:07:04.507 - 00:07:06.205

SD   (0.47)

Participant5   I think, I-

TC   00:07:06.681 - 00:07:07.599

SD   (0.64)

Participant5   I don't want to sully this wall anymore

TC   00:07:08.239 - 00:07:09.979

SD   (0.93)

Interviewer 1   okay

TC   00:07:10.912 - 00:07:11.648

Interviewer 2   just- to give you the option, you can also paint with your fingers if you want to

TC   00:07:11.598 - 00:07:15.993

SD   (0.5)

Participant5   okay

TC   00:07:16.500 - 00:07:17.133

SD   (0.55)

Participant5   oh I see, it's dipping the hand in it

TC   00:07:17.685 - 00:07:19.713

SD   (0.78)

Participant5   right

TC   00:07:20.495 - 00:07:21.091

SD   (1.53)

Participant5   oh

TC   00:07:22.625 - 00:07:23.177

SD   (1.83)

Participant5   weird

TC   00:07:25.014 - 00:07:25.855

SD   (2.12)

Participant5   how far can I move over here

TC   00:07:27.978 - 00:07:30.057

SD   (0.34)

Participant5   I want to-

TC   00:07:30.399 - 00:07:31.623

SD   (2.68)

Interviewer 2   ( )

TC   00:07:34.304 - 00:07:35.393

SD   (0.78)

Participant5   yeah hhh

TC   00:07:36.181 - 00:07:38.261

Interviewer 3   hhh

TC   00:07:36.681 - 00:07:38.378

Interviewer 2   hhh

TC   00:07:37.324 - 00:07:38.324

SD   (1.03)

Participant5   okay so, if I do this...

TC   00:07:39.354 - 00:07:41.355

SD   (0.73)

Participant5   woah

TC   00:07:42.093 - 00:07:42.640

SD   (1.5)

Participant5   aha

TC   00:07:44.142 - 00:07:44.758

SD   (1.07)

Participant5   a:::::h hhh

TC   00:07:45.836 - 00:07:47.470

SD   (1.21)

Participant5   it's weird okay, okay

TC   00:07:48.685 - 00:07:50.619

SD   (0.17)

Participant5   I can't undo, so that was-

TC   00:07:50.796 - 00:07:52.392

SD   (0.86)

Interviewer 2   hhh

TC   00:07:53.260 - 00:07:54.124

Participant5   kind of bad hhh

TC   00:07:53.731 - 00:07:54.527

SD   (0.65)

Participant5   can we do something with this, e:::hm

TC   00:07:55.183 - 00:07:57.232

SD   (0.96)

Participant5   no:::

TC   00:07:58.196 - 00:07:58.616

SD   (0.35)

Participant5   not all the fingers

TC   00:07:58.971 - 00:08:00.043

SD   (0.8)

Participant5   just that one

TC   00:08:00.848 - 00:08:01.668

SD   (3.12)

Participant5   ye:::s

TC   00:08:04.791 - 00:08:05.631

SD   (4.68)

Participant5   ehm

TC   00:08:10.311 - 00:08:11.231

SD   (3.34)

Participant5   now it's like a weird Sonic OC

TC   00:08:14.576 - 00:08:16.756

SD   (2.76)

Participant5   sto:::p, not- just- woah

TC   00:08:19.524 - 00:08:21.441

SD   (0.38)

Participant5   hhh

TC   00:08:21.829 - 00:08:23.011

SD   (6.85)

Participant5   ehm
TC   00:08:29.867 - 00:08:30.515
SD   (0.31)

Interviewer 1   hhh
TC   00:08:30.827 - 00:08:31.795
SD   (0.71)

Participant5   he is also fast
TC   00:08:32.507 - 00:08:34.529
SD   (1.28)

Participant5   but not as fast as Sonic
TC   00:08:35.812 - 00:08:37.470
SD   (2.78)

Participant5   ehm
TC   00:08:40.250 - 00:08:40.974
SD   (2.47)

Participant5   yeah, sure
TC   00:08:43.446 - 00:08:44.514
SD   (1.28)

Interviewer 1   allright, yeah, ehm
TC   00:08:45.803 - 00:08:47.587
SD   (1.1)

Participant5   okay, that was weird

TC   00:08:48.690 - 00:08:50.587

Interviewer 1   i'll stop the program-

TC   00:08:50.598 - 00:08:51.774

SD   (0.21)

Participant5   if if did the- no

TC   00:08:51.993 - 00:08:52.934

SD   (0.1)

Interviewer 1   and ehm

TC   00:08:53.036 - 00:08:54.507

Post-interview

Thursday, May 20, 2021, 1:39 PM

Interviewer 1   Can you tell us what you know now about Scandinavian rock art?
TC   00:00:09.725 - 00:00:13.722
SD   (2.9)

Participant 5   ehm
TC   00:00:16.631 - 00:00:17.377
SD   (0.44)

Participant 5   its made by different tribes
TC   00:00:17.818 - 00:00:19.880
SD   (0.48)

Participant 5   from Scandinavia, or the ((pauses)) yeah
TC   00:00:20.364 - 00:00:22.932
SD   (1.37)

Participant 5   and...
TC   00:00:24.311 - 00:00:25.227
SD   (0.48)

Participant 5   like...
TC   00:00:25.711 - 00:00:26.042
SD   (0.26)

Participant 5   passed down, or no?
TC   00:00:26.303 - 00:00:27.610
SD   (0.37)

Participant 5   something like that

TC   00:00:27.980 - 00:00:28.284

SD   (0.5)

Participant 5   you mentioned that in the beggining but, ehm

TC   00:00:28.788 - 00:00:31.181

SD   (0.28)

Interviewer 1   Okay

TC   00:00:31.461 - 00:00:31.756

SD   (2.89)

Interviewer 1   Can we come up with something ((towards other interviewer))

TC   00:00:34.646 - 00:00:35.907

SD   (1.75)

Interviewer 1   Okay, then I'll ask you some additional comments

TC   00:00:37.659 - 00:00:39.359

SD   (0.33)

Participant 5   okay, yeah

TC   00:00:39.689 - 00:00:40.189

Interviewer 1   ehm

TC   00:00:40.189 - 00:00:40.695

SD   (3.37)

Interviewer 1   Do you have any additional

TC   00:00:44.066 - 00:00:44.730

Interviewer 1   hhh
TC   00:00:44.730 - 00:01:06.360

Participant 5   hhh
TC   00:00:44.740 - 00:01:06.370

Interviewer 3   hhh
TC   00:00:44.740 - 00:01:06.370
SD   (2.97)

Interviewer 2   Do you have any additional comments for the program though, ((Participant's Name))?
TC   00:01:09.340 - 00:01:11.523
SD   (1.17)

Participant 5   ()
TC   00:01:12.695 - 00:01:13.766
SD   (2.2)

Participant 5   no...
TC   00:01:15.967 - 00:01:16.521
SD   (0.15)

Interviewer 1   hhh
TC   00:01:16.680 - 00:01:18.448

Participant 5   hhh
TC   00:01:16.687 - 00:01:18.455

Interviewer 3   hhh

TC   00:01:16.690 - 00:01:18.458

SD   (0.11)

Participant 5   ehm

TC   00:01:18.575 - 00:01:19.593

SD   (0.97)

Participant 5   No, I think a lot of it was like, pretty clear () from the (view)

TC   00:01:20.564 - 00:01:24.930

SD   (1.01)

Participant 5   playing around with it, and like, it was () out at some points

TC   00:01:25.949 - 00:01:29.320

SD   (2.57)

Participant 5   it was kinda hard to accurately use the fingers, because it seemed, like, maybe

                 because of the way I was using it, when () I was painting way up here ((unknown

                 gesturing)) that it was taking all four fingers even though I was trying to do this

                 ((unknown gesturing)), so like ((I tend)) to do this, because, was this ambigous?

TC   00:01:31.897 - 00:01:49.330

SD   (0.91)

Participant 5   but i noticed that it was probably the fault of my interaction and the limitations

                 of the hand tracking I guess, I don't know ()

TC   00:01:50.244 - 00:01:57.201

SD   (0.19)

Participant 5   ehm

TC   00:01:57.399 - 00:01:57.997

SD   (1.39)

Participant 5   there was some stuff, like the bowls flying in and out of my hands when I was

                  trying to grab them

TC   00:01:59.389 - 00:02:04.906

SD   (0.22)

Participant 5   and also wasn't super, there, all the time

TC   00:02:05.128 - 00:02:09.669

SD   (0.09)

Participant 5   ehm, it was very fun drawing on the wall though

TC   00:02:09.759 - 00:02:12.397

SD   (1.44)

Participant 5   ehm, but I also was hit by the, you know, the () what should I draw? Because I dont

                  want to just ((pauses)) I know this was just like a temporary thing, but if this

                  was an actual situation where I would be making my mark as like a tribesman, like

                  you said, then like what would you actually draw to, like, represent yourself for

                  ((pauses)) the next coming time

TC   00:02:13.838 - 00:02:34.321

SD   (0.39)

Participant 5   that was weird

TC   00:02:34.713 - 00:02:35.086

SD   (4.56)

Interviewer 1	alright
TC	00:02:39.647 - 00:02:39.991
SD	(0.72)

Interviewer 1	then, ehm
TC	00:02:40.714 - 00:02:41.234
SD	(0.28)

Interviewer 2	I might have a question
TC	00:02:41.520 - 00:02:42.766
SD	(0.17)

TC	00:02:42.942 - 00:02:43.174
SD	(0.15)

Interviewer 2	ehm
TC	00:02:43.330 - 00:02:44.177
SD	(0.91)

Interviewer 2	so, ehm, I didn't see it myself but i think I noticed that, a couple of times, you dropped the brush while using it
TC	00:02:45.090 - 00:02:51.350
SD	(0.31)

Participant 5	yeah
TC	00:02:51.660 - 00:02:52.331
SD	(0.38)

Interviewer 2	Do you feel like you have any kind of indication of why that happened

TC   00:02:52.720 - 00:02:57.332

SD   (1.52)

Participant 5   hhh (), no yeah, Im not entirely sure, I was, very much, I dont know if it was a...

TC   00:02:58.853 - 00:03:06.545

SD   (0.94)

Participant 5   response to like constantly dropping it, but I tend to like, grab my hand real

                tight, to try and actually grab the brush, even though there was nothing to grab

                at, so like, holding the gesture real hard, ehm

TC   00:03:07.485 - 00:03:19.593

SD   (1.39)

Participant 5   Im not sure why it dropped, maybe because it was out of sight, or maybe I, I, put

                my hand too far low or like ((pauses))

TC   00:03:20.984 - 00:03:27.410

SD   (0.57)

Participant 5   I was like observing it and, like, it would teleport out, sometimes it would also

                just fall out? while I was looking at it? But then again, it could be that it

                couldn't see my fingers clasping

TC   00:03:27.980 - 00:03:37.670

SD   (0.93)

Participant 5   the, the pencil itself

TC   00:03:38.607 - 00:03:40.174

SD   (1.92)

Participant 5   I have no idea how the whole thing works, thats my best guess

TC	00:03:42.094 - 00:03:45.051
SD	(0.35)

Interviewer 2	That is a very good guess
TC	00:03:45.410 - 00:03:46.342
SD	(1.41)

Interviewer 2	That was, kinda, probably the reason anyways
TC	00:03:47.760 - 00:03:49.869
SD	(0.03)

TC	00:03:49.901 - 00:03:50.347
SD	(0.27)

Interviewer 2	But yeah, I just wanted to know, if it, if it made sense to you, why it would fall out of your hand, maybe
TC	00:03:50.620 - 00:03:57.391
SD	(0.1)

Participant 5	Right
TC	00:03:57.494 - 00:03:58.037
SD	(0.05)

Participant 5	I mean, reflecting on it, it makes sense, but in the moment, I was like: why is this happening? what did I do wrong? I'm just using my hands as I would any other time. So you get sort of, very absolved in, like, using the hands and they look like your hands, sort of, but, of course, they aren't, but they represent your hands, so you think they can do everything that your hands can do, so you assume that no matter where you put them, no matter what yo uare actually trying to do,

they will just respond, and then when you try to grab the bowl, it just does this

instead ((gesturing)) hhh. Why? Because I do this ((gesturing)), and now I cant see

my fingers, so now, I'm not grabbing anything, right?. And then, I also noticed

that, like, when I was holding my thumb up ((pauses)) but...

TC   00:03:58.093 - 00:04:34.640

SD   (0.8)

Participant 5   now I look at it, it looks exaclty like that, but when I was doing this

((gestures)), it looked weird, because it looked like my hand was like this

((gestures)) right? But when I do this ((gesturing)), it makes sense, its the same

TC   00:04:35.447 - 00:04:45.714

SD   (4.37)

Participant 5   it seems really cool like it was very weird seeing them react exactly like my

fingers were reacting

TC   00:04:50.085 - 00:04:55.532

SD   (3.28)

Interviewer 2   cool

TC   00:04:58.820 - 00:04:59.223

SD   (1.45)

Interviewer 2   then, that's probably done

TC   00:05:00.680 - 00:05:03.008

A.2.7 Participant 6

Pre-interview

2021 May 20, Thu 14:27

Interviewer1   Boom   (Inaudible)

TC   00:00:00.630 - 00:00:01.512   00:00:02.009 - 00:00:04.587

SD   (0.49)

Interviewer2   hhh

TC   00:00:03.180 - 00:00:03.730

SD   (1.81)

Interviewer1   Alright (.) do you have any ==VR experience==?

TC   00:00:05.540 - 00:00:09.270

SD   (0.13)

Participant6   ==I have some VR experience (.) I've played some games before==

TC   00:00:09.400 - 00:00:11.880

SD   (0.13)

Interviewer1   Okay is that eh:::m

TC   00:00:12.010 - 00:00:14.070

SD   (3.5)

Interviewer1   I need to (inaudible) (.) Do you have any ==experience with hand==
           ==tracking== specifically?

TC   00:00:17.570 - 00:00:22.130

SD   (0.71)

Participant6   E:::h very little I don't know if stuff like half life alyx
           counts where they (.) or do you mean like you know the
           controllers or?

TC   00:00:22.840 - 00:00:29.770

SD   (0.26)

Participant6   ==Oh not like that no no no==

TC   00:00:32.240 - 00:00:33.880

Interviewer1   No no where it tracks your hands

TC   00:00:30.031 - 00:00:32.030

SD   (0.21)

Interviewer1   (inaudible)

TC   00:00:32.854 - 00:00:33.661

SD   (0.26)

Interviewer1   Okay (0.3) can you tell ==what you know about scandinavian rock==

            art?

TC   00:00:33.921 - 00:00:39.080

SD   (0.45)

Participant6   Oh God hhh very little (.) ==no actually nothing==

TC   00:00:39.530 - 00:00:43.060

SD   (0.22)

Interviewer1   Okay what about rock art in general if you were to

TC   00:00:43.284 - 00:00:47.680

SD   (0.16)

Participant6   I mean I guess it's like reminants from like (.) the caveman

            area s:::o hhh they just found these little painting of their

            culture I suppose remained from their times like that depicted

            them living hunting and stuff

TC   00:00:47.843 - 00:01:04.370

SD   (0.4)

Interviewer1   Okay (.) then I will stop the recording here

TC   00:01:04.772 - 00:01:09.010

Gameplay

2021 May 20, Thu 14:21

Participant6   Neat   Oh s:::o

TC   00:00:01.652 - 00:00:02.757   00:00:03.267 - 00:00:04.790

SD   (0.51) (0.4)

Participant6   wo:::w

TC   00:00:05.190 - 00:00:05.769

SD   (0.34)

Participant6   Oh tíght (.) this is like a brush alright

TC   00:00:06.110 - 00:00:08.338

SD   (0.19)

Participant6   This is eh- I bet this is for (.) mixi:::ng

TC   00:00:08.530 - 00:00:11.180

SD   (4.18)

Participant6   Stabbing time hhh   Alright ehm

TC   00:00:15.368 - 00:00:17.778   00:00:17.960 - 00:00:19.020

SD   (0.18) (1.01)

Participant6   Purple eh   Well that's gone

TC   00:00:20.032 - 00:00:22.493   00:00:23.490 - 00:00:25.437

SD   (0.99) (3.02)

Participant6   Why is it escaping?

TC   00:00:28.459 - 00:00:30.501

SD   (0.89)

Participant6   Eh what the- (.) alright alright (.) can I eh

TC   00:00:31.397 - 00:00:35.590

SD   (0.62)

Participant6   God damn it   The fu-

TC   00:00:36.219 - 00:00:37.143   00:00:41.578 - 00:00:42.775

SD   (4.43)   (0.3)

Participant6   Uh I bet I should probably (.) yeah

TC   00:00:43.077 - 00:00:45.660

SD   (1.36)

Participant6   The boundaries are not really giving me a lot of confidence (.

) but

TC   00:00:47.026 - 00:00:51.645

SD   (1.31)

Participant6   Feel like I'm doing something wrong here

TC   00:00:52.955 - 00:00:56.190

SD   (0.04)

Interviewer1   Try to clench your fist (.) more (.) when you are grabbing

TC   00:00:56.235 - 00:01:01.076

Participant6   Eh   God damn it

TC   00:01:01.010 - 00:01:01.573   00:01:03.459 - 00:01:05.256

SD   (1.88)   (2.51)

Participant6   hhh   I can't

TC   00:01:07.767 - 00:01:09.151   00:01:12.350 - 00:01:13.936

SD   (3.19) (3.59)

Participant6   What the fu-   Oh (.) sweet

TC   00:01:17.530 - 00:01:19.080   00:01:21.290 - 00:01:22.447

SD   (2.21) (1.14)

Participant6   That sounded disguting (.) but Oh (.) stick

TC   00:01:23.589 - 00:01:25.692   00:01:29.617 - 00:01:30.970

SD   (3.92) (6.44)

Participant6   Other way around (.) oh stick gone

TC   00:01:37.419 - 00:01:39.920

SD   (3.94)

Participant6   I mean that looks like the stick I'm not being delusional here

TC   00:01:43.863 - 00:01:47.450

SD   (1.41)

Participant6   God damn it stick   Oh eh

TC   00:01:48.862 - 00:01:50.758   00:01:51.108 - 00:01:52.376

SD   (0.35) (0.59)

Interviewer1   Wait ehm

TC   00:01:54.750 - 00:01:55.703

SD   (0.66)

Participant6   Stick stick is gone

TC   00:01:52.967 - 00:01:54.662

SD   (0.08)

Interviewer1   Hmm isn't it behind the bowl?

TC   00:01:56.365 - 00:01:58.519

SD   (1.73)

Participant6   Oh it is under the bo-

TC   00:02:00.249 - 00:02:01.956

SD   (1.62)

Participant6   Is it (.) can I (.) I don't kno-

TC   00:02:03.578 - 00:02:05.506

SD   (1.92)

Participant6   Oh tight (.) okay (.) it's still mixing

TC   00:02:07.427 - 00:02:10.249

SD   (1.52)

Participant6   Sweet   Oh

TC   00:02:11.769 - 00:02:12.932   00:02:13.478 - 00:02:13.945

SD   (0.54)   (3.74)

Participant6   Nice   Yoink

TC   00:02:17.687 - 00:02:18.780   00:02:19.769 - 00:02:20.714

SD   (0.98)   (2.76)

Participant6   Sweet so

TC   00:02:23.478 - 00:02:25.069

SD   (5.38)

Participant6   Ehm (.) am I supposed to dip it more (.) becuase it still

            shows me to dip it more

TC   00:02:30.457 - 00:02:34.870

SD   (4.84)

Participant6   I got on my hands   Okay s:::o can I just like

TC   00:02:39.711 - 00:02:41.057   00:02:41.730 - 00:02:44.444

SD   (0.67) (0.16)

Participant6   Oh swe:::et (.) okay   Funny

TC   00:02:44.609 - 00:02:46.544   00:02:50.043 - 00:02:51.185

SD   (3.49) (6.59)

Participant6   hhh alright cool (.) I feel like (.) I'm desecrating a
                 natural land mark or something

TC   00:02:57.782 - 00:03:05.650

SD   (9.35)

Participant6   Uhuh   What's up

TC   00:03:15.009 - 00:03:15.529   00:03:18.708 - 00:03:19.949

SD   (3.17) (2.32)

Participant6   SpongeBo::::b

TC   00:03:22.275 - 00:03:23.754

SD   (0.63)

Participant6   Imagine being a scientist and just discovering SpongeBob

TC   00:03:24.384 - 00:03:28.430

SD   (1.92)

Participant6   hhh   Outstanding

TC   00:03:30.359 - 00:03:30.759   00:03:31.798 - 00:03:32.682

SD   (1.03) (1.64)

Participant6   hhh   hhh

TC   00:03:34.331 - 00:03:35.082   00:03:35.541 - 00:03:35.898

SD   (0.45)   (0.82)

Participant6   Yeah yeah yeah I bet   hhh

TC   00:03:36.721 - 00:03:37.993   00:03:42.720 - 00:03:43.178

SD   (4.72)   (0.77)

Participant6   hhh   God damn it

TC   00:03:43.952 - 00:03:44.423   00:03:44.590 - 00:03:45.240

SD   (0.16)   (4.01)

Participant6   Mmh sweet   Okay maybe I need more

TC   00:03:49.256 - 00:03:50.431   00:03:51.051 - 00:03:52.240

SD   (0.62)   (4.44)

Participant6   Oh okay so there is like a threshold were it doesn't draw?

TC   00:03:56.683 - 00:03:59.379

SD   (1.78)

Participant6   Yeah on the bottum

TC   00:04:01.165 - 00:04:02.060

SD   (0.49)

Interviewer1   Yeah it is because you need to be a certain distance from the
          wall

TC   00:04:02.556 - 00:04:05.833

Participant6   Gotcha hhh

TC   00:04:05.600 - 00:04:06.116   00:04:12.511 - 00:04:13.324

SD (6.39) (0.74)

Participant6 hhh

TC 00:04:14.065 - 00:04:14.555

SD (0.65)

Participant6 hhh yo can I paint my soundcloud link here?

TC 00:04:15.210 - 00:04:17.888

SD (4.37)

Participant6 There is actually a lot of space Here

TC 00:04:22.266 - 00:04:23.783 00:04:24.282 - 00:04:24.944

SD (0.49) (1.04)

Participant6 Oh what the hell Oh that's my hand (.) okay

TC 00:04:25.985 - 00:04:26.925 00:04:27.090 - 00:04:28.305

SD (0.16) (5.28)

Participant6 Must restrain myself from any phallics (.) oh what the hell

TC 00:04:33.588 - 00:04:36.315

SD (0.25)

Interviewer1 You can also paint with your hands

TC 00:04:36.570 - 00:04:39.033

SD (0.35)

Participant6 Oh tight (.) okay

TC 00:04:39.389 - 00:04:40.654

SD (1.72)

Participant6 Uh (fart sound)

TC   00:04:42.379 - 00:04:42.699   00:04:44.259 - 00:04:44.599

SD   (1.56)   (2.47)

Participant6   Okay

TC   00:04:47.069 - 00:04:47.469

SD   (3.47)

Participant6   It seems to be more (.) less accurate than

TC   00:04:50.943 - 00:04:52.999

SD   (0.15)

Participant6   Actually (.) oh no not that (inaudible)

TC   00:04:53.152 - 00:04:54.970

SD   (9.89)

Participant6   (chewing sound)   The brush it is

TC   00:05:04.864 - 00:05:05.184   00:05:05.914 - 00:05:06.584

SD   (0.73)   (2.4)

Participant6   Sweet   Amogus

TC   00:05:08.987 - 00:05:09.637   00:05:24.893 - 00:05:26.204

SD   (15.25)

Interviewer1   hhh

TC   00:05:26.130 - 00:05:26.670

Participant6   hhh

TC   00:05:26.670 - 00:05:27.387

SD   (0.19)

Interviewer1   Oh god it's that th-

TC   00:05:27.585 - 00:05:29.217

Participant6   hhh

TC   00:05:29.217 - 00:05:30.006

SD   (0.79)

Participant6   hhh nice

TC   00:05:30.805 - 00:05:31.834

SD   (3.2)

Interviewer1   You have two more minutes before we take you out to do whatever

          you want

TC   00:05:35.035 - 00:05:39.041

SD   (0.06)

Participant6   Your gonna unplug me?

TC   00:05:39.107 - 00:05:40.770

SD   (3.47)

Participant6   hhh oh Christ whatever this was before it's not that anymore

TC   00:05:44.240 - 00:05:48.547

SD   (1.37)

Participant6   u:::h   Oh yeah (.) I bet I should

TC   00:05:49.918 - 00:05:50.552   00:05:54.064 - 00:05:55.089

SD   (3.51) (1.67)

Participant6   I bet it would kind of be funny if you left some of the drawings

          for like the next group

TC   00:05:56.762 - 00:06:02.279

SD   (0.33)

Participant6   A little uh   Heritage of their own hhh

TC   00:06:02.610 - 00:06:03.491   00:06:03.690 - 00:06:04.746

SD   (0.19) (5.34)

Participant6   Alright   That is a fucked up R (.) oh sorry

TC   00:06:10.090 - 00:06:10.440   00:06:11.609 - 00:06:14.180

SD   (1.16) (8.92)

Participant6   I gotta get some gang things going you know (.) get some gang

          signs get some turtles

TC   00:06:23.102 - 00:06:29.082

SD   (8.93)

Participant6   (inaudible) enough to draw a turtle   Don't put pressure on me

TC   00:06:38.021 - 00:06:40.249   00:06:43.042 - 00:06:45.653

SD   (2.79) (1.68)

Participant6   Eh come on turtle   Outstanding

TC   00:06:47.336 - 00:06:48.392   00:06:53.345 - 00:06:54.307

SD   (4.95) (0.76)

Participant6   Well whatever the hell that is

TC   00:06:55.072 - 00:06:56.400

SD   (0.09)

Participant6   Cool (.) I think I've done a lot

TC   00:06:56.491 - 00:06:58.300

SD   (0.24)

Interviewer1   Yeah (0.3) I will stop the program then and you can take the

           headset off

TC   00:06:58.540 - 00:07:05.120

Participant6   Sweet

TC   00:07:02.343 - 00:07:03.183

Post-interview

2021 May 20, Thu 14:24

Interviewer2   I'm ready now interviewer 1

TC   00:00:01.040 - 00:00:02.700

SD   (0.12)

Interviewer1   I'm not though (inaudible) alright (inaudible)

TC   00:00:02.820 - 00:00:06.820

SD   (0.82)

Interviewer1   Cool

TC   00:00:07.640 - 00:00:08.330

SD   (0.65)

Interviewer1   Can you tell us what you know now about Scandinavian rock art?

TC   00:00:08.980 - 00:00:12.712

SD   (3.24)

Participant6   Ehm art from people who lived as you said e:::h 5000 to 500 BCE

              (.) and then they painted a bunch of stuff on rocks, so that's

              kind of neat

TC   00:00:15.960 - 00:00:26.400

Interviewer1   Mhm

TC   00:00:24.720 - 00:00:25.090

SD   (1.46)

Interviewer1   E:::hm do you have any comments about the test itself (.) how

              the program behaved (.) or ?

TC   00:00:26.550 - 00:00:33.420

SD   (0.06)

Participant6   So in the beginning I had some issues where it wouldn't track me

grabbing the bowl and it was like somewhat you know like

slightly annoying, (.) but it worked in the end and that was

pretty good (.) and then I had some moments where my hands

suddenly if I looked behind myself my hand would (inaudible)

even though I had my hand in front of me (0.4) so other than

that (.) yeah it had ehm a couple of things where it sort of

annoyed me with the drawing (.) if I pulled the brush back a

little, it would still keep drawing and If I moved my hand back

and to the right it would still draw to the right, so it seems

like it could use some adjustments to the threshold as it would

still draw (.) so that was a bit annoying since I could get

those precision shots on my spongebob [hhh] but other than that

it was pretty nice

TC   00:00:33.483 - 00:01:16.090

Interviewer1   [hhh]

TC   00:01:12.996 - 00:01:14.185

Interviewer3   [hhh]

TC   00:01:13.262 - 00:01:13.960

Interviewer2   [hhh]

TC   00:01:13.320 - 00:01:14.207

SD   (2.06)

Interviewer1   Okay (.) I noticed that you mainly used the brush

TC   00:01:16.270 - 00:01:19.040

SD   (0.08)

Participant6   Yeah

TC   00:01:19.120 - 00:01:19.560

SD   (0.15)

Interviewer1   And that you started using your hands after we told you

TC   00:01:19.717 - 00:01:23.180

Participant6   Mhm   Yeah

TC   00:01:22.150 - 00:01:22.480   00:01:23.350 - 00:01:23.790

SD   (0.87)   (0.86)

Interviewer1   Was that because the signifier (.) wasn't really telling you (

          .) that mu- like (.) when you saw the dipping of the hand and

          brush above the bowl

TC   00:01:24.658 - 00:01:33.680

SD   (0.08)

Participant6   Mhm

TC   00:01:33.760 - 00:01:34.420

SD   (0.22)

Interviewer1   E:::h did you then assume that it was only the brush that you

          could paint with?

TC   00:01:34.640 - 00:01:38.820

SD   (0.22)

Participant6   i:::i yeah when I saw the hand with the brush I kinda assumed

          that you hold the brush in a hand (.) so If there were a huge

          ass slash in there I would assume you could either use this or

that

TC   00:01:39.041 - 00:01:47.660

Interviewer1   M:::m   Okay

TC   00:01:43.210 - 00:01:43.710   00:01:47.920 - 00:01:48.260

SD   (4.21)   (1.13)

Interviewer1   Then eh (.) unless you guys have anything (.) then eh

TC   00:01:49.390 - 00:01:53.480

SD   (0.32)

Interviewer2   I think just for the sake of asking (.) tha- you mentioned

that you noticed there were drawings on the wall

TC   00:01:53.800 - 00:01:59.160

SD   (0.09)

Participant6   Mhm

TC   00:01:59.250 - 00:01:59.750

SD   (0.06)

Interviewer2   Did you get a sense of what they would draw on the wall

forexample?

TC   00:01:59.810 - 00:02:04.740

SD   (0.6)

Participant6   No not really (.) I actually couldn't really make out what

(inaudible) it was a bit too pixelized in th- in the game so

(0.3) if (.) it was a bit more precise like some animals or

something then yeah I would assume (inaudible) and what not

(0.3), but other than that no not really

TC   00:02:05.340 - 00:02:23.610

Interviewer1   Mhm

TC   00:02:11.440 - 00:02:11.870

SD   (11.96)

Interviewer2   Okay (0.3) that's completely fine

TC   00:02:23.830 - 00:02:25.960

Interviewer1   Okay

TC   00:02:24.290 - 00:02:24.803

SD   (1.38)

Interviewer2   That's it

TC   00:02:26.190 - 00:02:26.560

A.2.8 Participant 7

Pre-interview

Tuesday, May 18, 2021, 12:42 PM

Interviewer2   I am
TC   00:00:00.192 - 00:00:00.951
SD   (0.26)

Interviewer1   alright
TC   00:00:01.214 - 00:00:01.926
SD   (1.47)

Interviewer1   ehm do you have any VR experience?
TC   00:00:03.400 - 00:00:06.213
SD   (0.84)

Participant   uhm:: I have some but not a lot
TC   00:00:07.060 - 00:00:10.351
SD   (0.21)

Interviewer1   okay? Is that from study related wok or through personal use
TC   00:00:10.563 - 00:00:15.023
SD   (0.07)

Participant   It's: only personal use. And we we had a bit of uhm we made a project related to
VR
                but I didn't experience it that much so
TC   00:00:15.100 - 00:00:24.120
SD   (0.17)

Interviewer1   okay. Do you have experience with hand tracking specifically in VR?
TC   00:00:24.293 - 00:00:28.744
SD   (0.35)

Participant   uhm: no
TC   00:00:29.103 - 00:00:30.015
SD   (0.34)

Interviewer1   Okay. Can you tell us what you know about Scandinavian rock art
TC   00:00:30.359 - 00:00:35.208
SD   (1.35)

Participant   I don't know anything at all (0.9) about it
TC   00:00:36.565 - 00:00:39.390
SD   (0.48)

Interviewer1	uhm: and let's take a step back, what about rock art in general?
TC	00:00:39.870 - 00:00:43.731
SD	(0.66)

Participant	not much
TC	00:00:44.398 - 00:00:45.599
SD	(1.16)

Interviewer1	alright. Ehm: and if you were to try to define it with your own words what do you think it would be, Scandinavian rock art.
TC	00:00:46.768 - 00:00:55.169
SD	(1.14)

Participant	I would imagine (1.0) it's some draw- drawings on the rocks? Umm (0.9) I don't know. Maybe those symbols
TC	00:00:56.312 - 00:01:05.950

Interviewer1	hmm
TC	00:01:05.948 - 00:01:06.365
SD	(0.21)

Participant	Like north mythology or something I don't know
TC	00:01:06.580 - 00:01:09.315
SD	(0.38)

Interviewer1	okay, that's um that's fine. And I'll stop the recording
TC	00:01:09.699 - 00:01:13.250

TC	00:01:11.620 - 00:01:12.130

Gameplay

Thursday, May 20, 2021, 1:40 PM

Participant 7	((humming))
TC	00:00:09.420 - 00:00:10.130
SD	(2.03)

Participant 7	I should just...
TC	00:00:12.165 - 00:00:12.850
SD	(0.55)

Participant 7	say what I think?
TC	00:00:13.401 - 00:00:14.773
SD	(0.33)

Interviewer 1	Yeah
TC	00:00:15.106 - 00:00:15.857
SD	(1.68)

Participant 7	first of all, I have, like, no idea what's happening right now. So I should take this ((looks at bowls)) maybe, and then kinda, smash them together? by the looks of it...
TC	00:00:17.546 - 00:00:27.351
SD	(4.85)

Participant 7	Im having trouble picking this up ((referring to the fat bowl))
TC	00:00:32.204 - 00:00:34.329
SD	(2.1)

Participant 7	hhh

TC	00:00:36.433 - 00:00:38.153
SD	(2.0)

Participant 7	How do I grab something?
TC	00:00:40.161 - 00:00:41.294
SD	(0.32)

Interviewer 1	Ehm...
TC	00:00:41.619 - 00:00:42.165
SD	(0.47)

Interviewer 1	clench your hand, in front of you, there you go
TC	00:00:42.635 - 00:00:46.289
SD	(11.93)

Participant 7	Oh, okay, I need to pour them in there, that makes a lot more sense ((pours bowls into big bowl))
TC	00:00:58.226 - 00:01:02.492
SD	(2.77)

Participant 7	I made a nice mix, now I need to stir it apparently
TC	00:01:05.266 - 00:01:08.179
SD	(2.5)

Participant 7	ehm...this looks like the tool for it, maybe not ((tries to stir with brush))
TC	00:01:10.682 - 00:01:13.406
SD	(2.93)

Participant 7	maybe this stick is better, because...

TC	00:01:16.342 - 00:01:18.238
SD	(0.72)

Participant 7	its a stick not a brush, so I'd imagine that...
TC	00:01:18.958 - 00:01:21.660
SD	(4.44)

Participant 7	mhm, delicious ((stir))
TC	00:01:26.102 - 00:01:27.770
SD	(4.42)

Participant 7	I have no idea how much I should stir it for...
TC	00:01:32.199 - 00:01:35.080
SD	(1.09)

Participant 7	So I'm just going to stir it until something happens
TC	00:01:36.179 - 00:01:38.655
SD	(0.37)

Participant 7	okay ((stir finished))
TC	00:01:39.025 - 00:01:39.709
SD	(1.57)

Participant 7	Now, I need to...
TC	00:01:41.281 - 00:01:42.329
SD	(2.02)

Participant 7	do this... ((dips brush in bowl))
TC	00:01:44.353 - 00:01:45.657

SD	(0.44)

Participant 7	okay...
TC	00:01:46.097 - 00:01:46.458
SD	(1.4)

Participant 7	two times...
TC	00:01:47.858 - 00:01:48.342
SD	(2.99)

Interviewer 1	ehm..it will keep on signifying that, so you can just continue
TC	00:01:51.337 - 00:01:56.581
SD	(0.67)

Participant 7	My hand is now dirty, so I should probably go wash my hands, so I don't give the prehistoric humans corona or something
TC	00:01:57.251 - 00:02:03.445
SD	(1.52)

Participant 7	ehm...
TC	00:02:04.969 - 00:02:05.541
SD	(1.3)

Participant 7	So ((pauses)) was i supposed to draw something like that? ((points to wall))
TC	00:02:06.850 - 00:02:10.038
SD	(2.36)

Interviewer 1	That is up to you
TC	00:02:12.406 - 00:02:13.439

SD   (0.29)

Participant 7   okay, so anything

TC   00:02:13.733 - 00:02:15.662

SD   (0.62)

Participant 7   ehm...

TC   00:02:16.285 - 00:02:17.154

SD   (1.41)

Participant 7   kinda afraid to move but...

TC   00:02:18.573 - 00:02:19.885

SD   (1.53)

Interviewer 1   The guardian will appear if you are too close to anything, so don't worry

TC   00:02:21.416 - 00:02:24.991

SD   (0.41)

Participant 7   okay

TC   00:02:25.401 - 00:02:25.891

SD   (2.15)

Participant 7   oh!

TC   00:02:28.050 - 00:02:28.622

SD   (3.39)

Participant 7   I'm not sure what i should draw, and I'm really bad at drawing, so I'm just going

                to draw like...

TC   00:02:32.014 - 00:02:36.480

SD   (3.17)

Participant 7   something...
TC   00:02:39.653 - 00:02:40.198
SD   (0.65)

Participant 7   like, some markings, this is my...
TC   00:02:40.854 - 00:02:43.158
SD   (0.24)

Participant 7   my tribe's, ehm...
TC   00:02:43.401 - 00:02:45.121
SD   (0.56)

Participant 7   logo
TC   00:02:45.688 - 00:02:46.263
SD   (0.3)

Participant 7   So...
TC   00:02:46.570 - 00:02:47.070
SD   (0.41)

Participant 7   that's what i'm doing here
TC   00:02:47.486 - 00:02:48.373
SD   (2.36)

Participant 7   And now I...
TC   00:02:50.741 - 00:02:51.022
SD   (1.17)

Participant 7   I mean, I would imagine, they didn't have like, ehm...

TC   00:02:52.201 - 00:02:55.333

SD   (1.09)

Participant 7   you know, the letters that we are using, but, I will use that anyways, because

                  maybe I'm like...

TC   00:02:56.430 - 00:03:02.318

SD   (0.82)

Participant 7   time traveller or something

TC   00:03:03.139 - 00:03:04.614

SD   (1.39)

Participant 7   so...

TC   00:03:06.008 - 00:03:06.598

SD   (0.73)

Participant 7   I'm just going to write my name and...

TC   00:03:07.333 - 00:03:09.406

SD   (1.03)

Participant 7   freak out any people that might discover this later

TC   00:03:10.441 - 00:03:13.486

SD   (4.2)

Participant 7   okay

TC   00:03:17.694 - 00:03:18.167

SD   (1.62)

Participant 7   I know that...

TC   00:03:19.790 - 00:03:20.262

SD   (1.85)

Participant 7   its not nice to write your names, on, like, important landmarks but...

TC   00:03:22.118 - 00:03:26.110

SD   (3.09)

Participant 7   kinda looks like I had an aneurism or something while I was drawing it, so...

TC   00:03:29.205 - 00:03:33.644

SD   (2.54)

Participant 7   ehm...

TC   00:03:36.192 - 00:03:36.561

SD   (1.42)

Participant 7   I can say that whoever did this, was a lot better at drawing stuff than me, so...

TC   00:03:37.984 - 00:03:42.992

SD   (2.53)

Participant 7   oh!

TC   00:03:45.528 - 00:03:45.960

SD   (2.89)

Participant 7   how much should I draw like...

TC   00:03:48.859 - 00:03:49.894

SD   (0.17)

Interviewer 1	That is completely up to you
TC	00:03:50.073 - 00:03:51.742
SD	(1.1)

Participant 7	okay, but I'm kinda having fun I'm just gonna...
TC	00:03:52.846 - 00:03:55.045
SD	(2.39)

Participant 7	make a nice wave here
TC	00:03:57.442 - 00:03:58.750
SD	(2.49)

Participant 7	Okay
TC	00:04:01.249 - 00:04:02.411
SD	(6.11)

Participant 7	I will like to draw how, how I looked so...
TC	00:04:08.524 - 00:04:11.772
SD	(1.72)

Participant 7	This would be me
TC	00:04:13.501 - 00:04:14.944
SD	(2.65)

Participant 7	So people remember me, for my beautiful face
TC	00:04:17.599 - 00:04:19.908
SD	(8.7)

Participant 7	I look like...

TC   00:04:28.616 - 00:04:29.461

SD   (1.67)

Participant 7   don't look too good

TC   00:04:31.133 - 00:04:31.904

SD   (1.62)

Participant 7   Also having like very...

TC   00:04:33.533 - 00:04:34.615

SD   (0.84)

Participant 7   interesting hair

TC   00:04:35.463 - 00:04:36.439

SD   (3.39)

Participant 7   Okay, that was me

TC   00:04:39.837 - 00:04:42.019

SD   (5.89)

Participant 7   Ehm...

TC   00:04:47.917 - 00:04:48.483

SD   (1.03)

Participant 7   Now I kinda want to see what happens if I draw here ((tries to paint table))

TC   00:04:49.517 - 00:04:53.382

SD   (0.66)

Participant 7   nothing, okay

TC   00:04:54.049 - 00:04:54.669

SD   (0.84)

Participant 7   it's only this ((drops brush))
TC   00:04:55.517 - 00:04:57.136
SD   (5.75)

Interviewer 1   You can also draw with your, ehm, fingers
TC   00:05:02.894 - 00:05:04.993
SD   (0.46)

Participant 7   Oh!
TC   00:05:05.453 - 00:05:06.033
SD   (0.78)

Participant 7   I'd like to try that
TC   00:05:06.815 - 00:05:08.016
SD   (6.51)

Participant 7   Can I draw with more of them, at the same time?
TC   00:05:14.531 - 00:05:16.627

Interviewer 1   Yes, if it doesn't spaz out
TC   00:05:16.627 - 00:05:20.078
SD   (3.23)

Participant 7   oh! ((hand tracking gets weird))
TC   00:05:23.310 - 00:05:23.878
SD   (7.15)

Participant 7   This is my last breath, you know I was like ((drags fingers on wall))

TC   00:05:31.029 - 00:05:33.909

SD   (0.96)

Participant 7   grasping for air, and I just marked this wall, to remind people who I was. Can I

                 drew with both hands? ((pauses))

TC   00:05:34.877 - 00:05:41.020

SD   (5.5)

Participant 7   this point, I'm like a child

TC   00:05:46.526 - 00:05:48.726

SD   (4.94)

Participant 7   I touched something in real life, and that was kinda strange

TC   00:05:53.668 - 00:05:56.540

SD   (4.58)

Participant 7   oh!

TC   00:06:01.125 - 00:06:01.643

SD   (6.08)

Participant 7   This actually feels more authentic, like I'm actually touching something ((touching

                 the couch))

TC   00:06:07.731 - 00:06:11.570

SD   (0.89)

Participant 7   hhh

TC   00:06:12.466 - 00:06:13.018

SD   (2.4)

Participant 7	hhh, now I just imagine your coach being all red, like...
TC	00:06:15.426 - 00:06:19.626
SD	(0.44)

Participant 7	full of paint
TC	00:06:20.074 - 00:06:20.674
SD	(8.53)

Participant 7	Do we have other colors?
TC	00:06:29.204 - 00:06:30.842
SD	(1.09)

Participant 7	Is it just red?
TC	00:06:31.939 - 00:06:32.770
SD	(3.77)

Interviewer 1	It's just this color for now
TC	00:06:36.540 - 00:06:38.529
SD	(0.46)

Participant 7	okay
TC	00:06:38.990 - 00:06:39.398
SD	(4.16)

Participant 7	kinda...
TC	00:06:43.558 - 00:06:43.878
SD	(1.04)

Participant 7   I didn't like the person who did this so I'm just like...

TC   00:06:44.926 - 00:06:48.166

SD   (2.28)

Participant 7   erasing it for, from existence

TC   00:06:50.446 - 00:06:52.910

SD   (0.98)

Participant 7   Okay

TC   00:06:53.894 - 00:06:54.246

SD   (2.28)

Participant 7   yeah

TC   00:06:56.530 - 00:06:57.546

SD   (1.77)

Interviewer 1   You have one more minute

TC   00:06:59.318 - 00:07:00.570

SD   (0.71)

Interviewer 1   ehm...

TC   00:07:01.287 - 00:07:01.725

SD   (0.3)

Interviewer 2   But you can also step out now, if you would prefer that

TC   00:07:02.030 - 00:07:05.058

SD   (1.55)

Participant 7   Think I'm satisfied with my work

TC   00:07:06.609 - 00:07:08.494

SD   (1.0)

Interviewer 1   Going to stop the scene, and you can take the headset off

TC   00:07:09.502 - 00:07:11.790

Interviewer 3   You can just place it back on the couch

TC   00:07:11.790 - 00:07:14.946

Post-interview

Tuesday, May 18, 2021, 1:16 PM

Interviewer2	I am
TC	00:00:00.174 - 00:00:00.676
SD	(0.16)

Interviewer1	alright I'll press the button
TC	00:00:00.838 - 00:00:02.541
SD	(1.75)

Interviewer1	ehm! Can you tell us what you know now about Scandinavian rock art?
TC	00:00:04.291 - 00:00:09.267
SD	(0.97)

Participant	well I think ((pause)) from what you told me it's like from a while ago and ((pause)) I could see some like ((pause)) it wasn't what I thought it was like uh: nordid symbols and stuff it was just like some drawings ((pause)) ehm yeah. ((pause)) I still don't I still can't say that I know a lot about it? But I think I know more than before? So I I have a better idea of what what that actually is
TC	00:00:10.239 - 00:00:40.765
SD	(0.8)

Interviewer1	when you eh at a certain point in the testing you actually drew over eh another painting and you said oh now I'm erasing this dudes mark, right? Was that intentinal? Or was it just you know ((pause)) you had fun when you were drawing and then you..
TC	00:00:41.570 - 00:00:57.823

Participant	yeah
TC	00:00:50.391 - 00:00:51.037
SD	(6.87)

Participant	I mean ((pause)) it was kinda intentional? but I was also having fun so it's like in the middle so it-
TC	00:00:57.910 - 00:01:06.150

Interviewer1	mhm
TC	00:01:03.814 - 00:01:04.225
SD	(0.77)

Interviewer1	yeah?
TC	00:01:04.997 - 00:01:05.497
SD	(0.79)

Interviewer1   okay! Uhm do you have any addditional comments about the program itself?
ehm:

                ((pause)) maybe how it behaved or:
TC   00:01:06.295 - 00:01:14.720

Participant   hmm
TC   00:01:13.250 - 00:01:13.890
SD   (2.41)

Participant   I think it behaved quite nicely. Like I can't say i had any problems with figuring
                out... I mean at the start I had some problems with understanding what I was
                supposed to do but once I figured that out it was really easy to interact with it.
                And I think uh ((pause)) the like the drawing experience was fun and it seems like
                at some point my hands ((pause)) felt like uhm ((pause)) they were actually
                ((pause)) in game you know ((pause)) it was very nice. ((pause)) Maybe because
I

                also touched the couch and...
TC   00:01:16.302 - 00:01:49.420

Interviewer1   mhm
TC   00:01:30.767 - 00:01:31.092
SD   (17.52)

Interviewer2   hehe
TC   00:01:48.617 - 00:01:49.313
SD   (0.09)

Interviewer3   *laughs*
TC   00:01:49.410 - 00:01:50.152
SD   (0.12)

Interviewer1   *laughs*
TC   00:01:50.277 - 00:01:52.167

Interviewer3   *laughs*
TC   00:01:51.086 - 00:01:52.081
SD   (0.08)

Participant   At that point when I was actually drawing in the real world it kinda felt like I was
                doing it in the game as well so it was kinda interesting
TC   00:01:52.165 - 00:02:01.370

Interviewer1   hmm?

TC   00:01:59.568 - 00:02:00.339
SD   (1.27)

Interviewer1   so the point when the couch.. and you hit it
TC   00:02:01.610 - 00:02:04.180
SD   (0.08)

Participant   yeah, when I actually touched like the real surface and I was also drawing in the
                  game it felt like ((pause)) kind of surreal like ((pause)) it was interesting
TC   00:02:04.262 - 00:02:13.224

Interviewer1   hmm
TC   00:02:07.503 - 00:02:07.892
SD   (5.35)

Interviewer1   was it actually easier at that point, to draw, when you got the feedback from the:
                  ((pause)) couch and the real world
TC   00:02:13.242 - 00:02:22.360
SD   (0.02)

Participant   mmm: I think it was because I think if there was something that the game lacked
it
                  was: eh ((pause)) like knowing when you actually are in contact with the surface?
                  maybe?
TC   00:02:22.386 - 00:02:33.540

Interviewer1   mhm
TC   00:02:33.554 - 00:02:33.814
SD   (1.06)

Participant   yea
TC   00:02:34.880 - 00:02:35.606
SD   (0.1)

Interviewer1   okay uhm: ((pause)) I don't have any other questions uh:
TC   00:02:35.712 - 00:02:41.249

Interviewer2   yeah
TC   00:02:40.240 - 00:02:40.736
SD   (0.58)

Interviewer2   I just again- so.. so you said you had like an expectation of there being nordic
                  symbols or something like that, and then when you saw something else in the
program,

	do you feel like you have an understanding of what they wee trying to portray instead?
TC	00:02:41.321 - 00:02:55.158

Participant	yeah
TC	00:02:48.012 - 00:02:48.501
SD	(9.42)

Participant	If I were- like I'm just guessing but I think like their lives (?) like who I don't know ((pause)) I wouldn't be able to tell you to be honest
TC	00:02:57.924 - 00:03:07.342
SD	(0.28)

TC	00:03:07.625 - 00:03:10.435

A.2.9 Participant 8

Pre-interview

Thursday, May 20, 2021, 1:41 PM

Interviewer 2	Ready?
TC	00:00:00.800 - 00:00:01.253
SD	(0.04)

Interviewer 1	Yeah
TC	00:00:01.300 - 00:00:01.520
SD	(2.37)

Interviewer 1	((clears throat))
TC	00:00:03.890 - 00:00:04.260
SD	(0.16)

Interviewer 1	Do you have any VR experience?
TC	00:00:04.420 - 00:00:06.134
SD	(0.23)

Participant 8	Yes
TC	00:00:06.370 - 00:00:06.629
SD	(0.83)

Interviewer 1	Is that study related, or through personal use
TC	00:00:07.460 - 00:00:10.390
SD	(0.26)

Participant 8	Both
TC	00:00:10.650 - 00:00:10.992
SD	(0.33)

Interviewer 1   Both? Yeah

TC   00:00:11.322 - 00:00:12.167

SD   (0.71)

Interviewer 1   Do you have experience with hand tracking specifically?

TC   00:00:12.877 - 00:00:15.821

SD   (1.49)

Participant 8   Hand tracking?

TC   00:00:17.312 - 00:00:17.967

SD   (0.13)

Interviewer 1   Yes

TC   00:00:18.101 - 00:00:18.401

SD   (0.19)

Interviewer 1   So...

TC   00:00:18.591 - 00:00:19.131

SD   (0.16)

Interviewer 1   You don't use controllers

TC   00:00:19.292 - 00:00:20.645

Interviewer 2   Hand tracking

TC   00:00:19.312 - 00:00:19.765

SD   (1.42)

Participant 8   Only controllers, not free form

TC   00:00:21.185 - 00:00:23.507
SD   (0.89)

Interviewer 1   Okay, yeah
TC   00:00:24.397 - 00:00:25.137
SD   (0.69)

Interviewer 1   Can you tell us what you know about Scandinavian rock art?
TC   00:00:25.830 - 00:00:29.130
SD   (5.71)

Interviewer 1   Alright
TC   00:00:34.847 - 00:00:35.163
SD   (0.14)

Interviewer 1   Ehm...
TC   00:00:35.306 - 00:00:35.636

Participant 8   For the record, its zero
TC   00:00:35.649 - 00:00:37.399
SD   (0.15)

Interviewer 1   hhh
TC   00:00:37.554 - 00:00:39.529

Interviewer 3   hhh
TC   00:00:37.554 - 00:00:39.530

Participant 8   hhh

TC	00:00:37.564 - 00:00:39.506
SD	(0.51)

Interviewer 1	Then, what about rock art in general?
TC	00:00:40.025 - 00:00:42.564
SD	(1.01)

Participant 8	I mean, ehm
TC	00:00:43.575 - 00:00:44.594
SD	(0.28)

Participant 8	Not more than, you know. whatever you see in, like, popular media, you know. Whenever like, cartoons and stuff, I don't know anything specifically, actually, you know ((pauses))
TC	00:00:44.881 - 00:00:55.648
SD	(2.2)

Participant 8	I guess I know a bit about ((pauses)) you know
TC	00:00:57.852 - 00:01:00.181
SD	(1.49)

Participant 8	one of the ways
TC	00:01:01.677 - 00:01:02.387
SD	(0.95)

Participant 8	I mean, they found some, I know they found some, rock art about, like, mammoths and stuff and thats kinda how you know...
TC	00:01:03.339 - 00:01:10.522
SD	(0.93)

Participant 8   some

TC   00:01:11.453 - 00:01:11.794

SD   (0.34)

Participant 8   of like where they lived and so on, but...

TC   00:01:12.140 - 00:01:13.994

SD   (1.13)

Participant 8   basically, you know, rock art of ((pauses))

TC   00:01:15.125 - 00:01:16.810

SD   (3.05)

Participant 8   Ehm, animals that didn't, ehm, that don't live anymore, that lived back in the day

TC   00:01:19.864 - 00:01:25.203

Interviewer 1   mhm

TC   00:01:25.203 - 00:01:25.491

SD   (2.34)

Interviewer 1   So, if you were to try to define Scandinavian rock art with your own words, what do
                 you think it might, would be

TC   00:01:27.836 - 00:01:35.162

SD   (1.71)

Participant 8   I think it would be, like, you know, what kind of animals lived

TC   00:01:36.874 - 00:01:40.410

SD   (1.15)

Participant 8   I don't know what you exactly mean by, by define, like...

TC   00:01:41.569 - 00:01:44.976

SD   (0.02)

Interviewer 1   If I asked you what the term means, then, how would you describe it to me?

TC   00:01:45.001 - 00:01:51.290

SD   (2.43)

Participant 8   mhm

TC   00:01:53.726 - 00:01:54.683

SD   (3.35)

Participant 8   So, with my very limited knowledge, it would be...

TC   00:01:58.033 - 00:02:01.110

SD   (2.01)

Participant 8   you know, some people trying to communicate, you know, what kind of situation they
                 were living in, back in the day, and kinda trying to convey the significant aspects
                 of their life, you know, like ((pauses)) ehm

TC   00:02:03.127 - 00:02:14.699

SD   (2.95)

Participant 8   their rituals or their what animals they were huntign and that sort of thing

TC   00:02:17.658 - 00:02:22.283

SD   (0.28)

Interviewer 1   Okay, yeah, then I will stop the recording here

TC   00:02:22.564 - 00:02:25.875

Gameplay

2021 May 20, Thu 14:08

Participant8   So like   I think I did it

TC   00:00:13.657 - 00:00:14.189   00:00:15.831 - 00:00:16.351

SD   (1.64)   (7.36)

Interviewer1   Yes (.) you need to mix one more

TC   00:00:28.019 - 00:00:29.764

SD   (5.98)

Participant8   Do I still have to do this?

TC   00:00:23.720 - 00:00:24.600

SD   (3.41)

Interviewer3   hhh

TC   00:00:37.698 - 00:00:38.765

SD   (3.1)

Participant8   Morpheus I need your help

TC   00:00:35.749 - 00:00:36.882

SD   (0.81)

Participant8   Oh yes   Now we are cooking

TC   00:00:41.865 - 00:00:42.625   00:00:43.294 - 00:00:43.854

SD   (0.66)   (17.93)

Participant8   Hmm   Interesting

TC   00:01:01.793 - 00:01:02.083   00:01:04.222 - 00:01:04.442

SD   (2.13)   (7.14)

Participant8   Am I using the wrong thing maybe   Oka:::y

TC   00:01:11.591 - 00:01:12.941   00:01:13.680 - 00:01:13.970

SD   (0.73) (0.47)

Participant8   Stick   a:::a yes
TC   00:01:14.440 - 00:01:14.860   00:01:15.319 - 00:01:17.459
SD   (0.45) (0.18)

Participant8   That's good   There we go
TC   00:01:17.648 - 00:01:19.828   00:01:25.777 - 00:01:26.987
SD   (5.94) (13.84)

Participant8   Do I have to keep doing this?   Or am I
TC   00:01:40.836 - 00:01:41.896   00:01:45.875 - 00:01:46.486
SD   (3.97) (0.15)

Interviewer1   It will keep on doing that
TC   00:01:46.641 - 00:01:48.531
SD   (0.13)
Participant8   Okay (.) so I can just
TC   00:01:48.661 - 00:01:49.951
SD   (1.23)

Participant8   Is it like (.) do I have space to   Walk?
TC   00:01:51.181 - 00:01:53.371   00:01:54.450 - 00:01:54.730
SD   (1.07) (3.19)

Interviewer3   There is a guardian warning if you wander too far off (0.3) but
        otherwise you should be fine
TC   00:01:57.923 - 00:02:03.243
SD   (5.03)

Participant8   Lets seeWhat do we have here

TC   00:02:08.282 - 00:02:08.662   00:02:10.222 - 00:02:10.782

SD   (1.56)   (15.9)

Participant8   So obviously I shouldn't like eh   Write

TC   00:02:26.689 - 00:02:28.618   00:02:29.138 - 00:02:29.487

SD   (0.52)   (0.74)

Participant8   Because   You know

TC   00:02:30.236 - 00:02:30.686   00:02:31.046 - 00:02:31.426

SD   (0.36)   (2.27)

Participant8   I can't

TC   00:02:33.705 - 00:02:34.175

SD   (0.43)

Participant8   Be sure that people in a thousand years have the same-

TC   00:02:34.605 - 00:02:37.454

SD   (1.88)

Participant8   Eh (.) letters as me

TC   00:02:39.343 - 00:02:41.973

SD   (1.76)

Participant8   So I should try to communicate something

TC   00:02:43.742 - 00:02:45.282

SD   (0.93)

Participant8   Like visually   And e:::h

TC   00:02:46.221 - 00:02:47.071   00:02:50.640 - 00:02:51.440

SD   (3.56)   (3.11)

Participant8   I mean I know did kind of   Kind of do this maybe

TC   00:02:54.558 - 00:02:55.908   00:02:56.407 - 00:02:57.387

SD   (0.49)   (1.49)

Participant8   Probably gonna fuck up

TC   00:02:58.886 - 00:02:59.786

SD   (1.77)

Participant8   I think Morpheus just fucking stole my

TC   00:03:01.565 - 00:03:03.644

SD   (0.53)

Interviewer3   hhh

TC   00:03:04.660 - 00:03:05.899

SD   (0.45)

Participant8   Pencil

TC   00:03:04.174 - 00:03:04.574

SD   (0.08)

Interviewer3   hhh

TC   00:03:10.917 - 00:03:11.197

SD   (3.48)

Participant8   God damn it Morpheus man

TC   00:03:06.358 - 00:03:08.158

SD   (2.75)

Participant8   Even when you think is he not here (.) he is still (.) you

         know (.) lurking

TC   00:03:14.686 - 00:03:17.506

SD   (4.4)

Participant8   I'm gonna try to channel my inner Bob Ross for this one

TC   00:03:21.915 - 00:03:24.405

SD   (8.27)

Participant8   I think that is what we call a happy little accident (.) right

TC   00:03:32.684 - 00:03:34.773

SD   (0.63)

Interviewer1   hhh

TC   00:03:35.403 - 00:03:36.033

Interviewer3   hhh

TC   00:03:35.413 - 00:03:35.920

SD   (0.61)

Participant8   Look at that   And then the gifts hhh

TC   00:03:36.530 - 00:03:37.548   00:03:45.147 - 00:03:47.217

SD   (7.59) (4.8)

Participant8   Wonderful time of the year   Ye:::s

TC   00:03:52.026 - 00:03:53.270   00:03:56.899 - 00:03:57.259

SD   (3.62) (1.41)

Participant8   That's beautiful

TC   00:03:58.671 - 00:03:59.341

SD   (2.61)

Participant8   It's kind of sad that it doesn't look exactly like the others (

.) but

TC   00:04:01.960 - 00:04:04.690

SD   (0.61)

Participant8   Of course I have limited e:::h   Control I can't really

TC   00:04:05.309 - 00:04:07.279   00:04:09.788 - 00:04:11.068

SD   (2.5)   (0.34)

Participant8   Make stuff that eh   Crazy

TC   00:04:11.417 - 00:04:13.115   00:04:14.170 - 00:04:14.951

SD   (1.05)

Interviewer1   Mhm

TC   00:04:14.930 - 00:04:15.740

SD   (0.31)

Participant8   But this one looks kind of-

TC   00:04:16.059 - 00:04:17.398

SD   (0.56)

Participant8   A bit more like   Something someone else drew

TC   00:04:17.958 - 00:04:18.638   00:04:19.036 - 00:04:20.428

SD   (0.39)   (0.16)

Participant8   Alright

TC   00:04:20.590 - 00:04:21.121

SD   (1.6)

Participant8   <mark>I see kind of a difference between like eh</mark>

TC   00:04:22.723 - 00:04:25.803

SD   (1.29)

Participant8   This guy   And this guy (.) you know

TC   00:04:27.096 - 00:04:27.841   00:04:28.020 - 00:04:29.275

SD   (0.17)   (1.31)

Participant8   It's not really the same eh

TC   00:04:30.593 - 00:04:31.784

SD   (13.78)

Participant8   Of course (.) you know if we really want to freak people out

            we gotta do the illuminati thing

TC   00:04:45.568 - 00:04:50.232

SD   (0.2)

Interviewer1   hhh

TC   00:04:51.166 - 00:04:52.034

SD   (6.09)

Interviewer2   hhh

TC   00:04:50.440 - 00:04:51.584

Participant8   Man now I know why   It's so hard to draw

TC   00:04:58.128 - 00:04:59.208   00:04:59.978 - 00:05:00.970

SD   (0.77)   (6.32)

Participant8   Always watching   Do I have other dyes?

TC   00:05:07.290 - 00:05:08.050   00:05:21.019 - 00:05:22.429

SD   (12.96) (0.44)

Participant8   Or is it just this Cause I mean I can-

TC   00:05:22.870 - 00:05:23.860   00:05:26.816 - 00:05:27.696

SD   (2.95)   (0.26)

Interviewer1   Yeah ehm (.) you can also paint with your fingers

TC   00:05:27.965 - 00:05:31.096

SD   (0.08)

Participant8   O:::::h   Oh like in this?

TC   00:05:31.181 - 00:05:32.506   00:05:36.587 - 00:05:37.787

SD   (4.08)   (0.54)

Participant8   Like this   A:::a

TC   00:05:38.336 - 00:05:38.815   00:05:43.534 - 00:05:44.425

SD   (4.71)   (2.46)

Participant8   Yeah even though my   Fingers are kind of

TC   00:05:46.894 - 00:05:47.967   00:05:48.635 - 00:05:49.703

SD   (0.66)   (3.91)

Participant8   Yeah so I can do the red pill (.) but I can't do the blue pill

TC   00:05:53.614 - 00:05:56.854

SD   (0.21)

Interviewer3   hhh

TC   00:05:58.012 - 00:05:58.832

Participant8   A big problem over here

TC   00:05:57.064 - 00:05:57.964

SD   (0.04)

Interviewer1   hhh

TC   00:05:58.013 - 00:05:58.806

SD   (4.7)

Participant8   So that's just one pill

TC   00:06:03.511 - 00:06:04.421

SD   (1.54)

Interviewer3   hhh

TC   00:06:07.270 - 00:06:08.160

Participant8   The illusion of choice hhh

TC   00:06:05.970 - 00:06:08.290

Interviewer2   hhh

TC   00:06:07.290 - 00:06:08.220

SD   (2.79)

Participant8   Alright

TC   00:06:11.019 - 00:06:11.339

SD   (1.06)

Participant8   I should probably go out and you know

TC   00:06:12.403 - 00:06:14.843

SD   (0.81)

Participant8   Catch some food or whatever otherwise I will (.) you know die

TC   00:06:15.657 - 00:06:19.004

SD   (1.01)

Participant8   Can't be messing around with this all day right

TC   00:06:20.021 - 00:06:22.181

SD   (3.09)

Interviewer1   Ehm

TC   00:06:26.668 - 00:06:27.580

SD   (1.08)

Participant8   Good

TC   00:06:25.279 - 00:06:25.499

SD   (1.16)

Interviewer1   I will put you out of the scene (.) if you are done?

TC   00:06:28.662 - 00:06:31.232

SD   (0.09)

Interviewer1   Yeah

TC   00:06:31.871 - 00:06:32.141

SD   (0.73)

Participant8   Yes

TC   00:06:31.322 - 00:06:31.761

SD   (0.11)

Interviewer1   Then you can just take the headset off

TC   00:06:32.880 - 00:06:34.655

SD   (0.48)

Interviewer3   Yeah and put it back on the couch

TC   00:06:35.144 - 00:06:36.940

Post-interview

2021 May 20, Thu 22:28

Interviewer 1   ehm, can you tell us what you know now, about Scandinavian rock art?

TC   00:00:02.611 - 00:00:07.210

SD   (1.72)

Participant 8   ehm

TC   00:00:08.934 - 00:00:09.268

SD   (1.1)

Participant 8   I know

TC   00:00:10.374 - 00:00:10.825

SD   (1.37)

Participant 8   you had to...

TC   00:00:12.204 - 00:00:13.020

SD   (1.78)

Participant 8   smash the, two bowls together, somehow, even though, kinda, you know, I fell like I

            didn't do it properly, you have to clash it together somehow

TC   00:00:14.804 - 00:00:27.179

SD   (4.15)

Participant 8   and then somehow, that becomes

TC   00:00:31.329 - 00:00:33.281

SD   (2.8)

Participant 8   I guess one of the bowls had, ehm, liquid in it and the other had...

TC   00:00:36.090 - 00:00:40.673

SD   (1.0)

Participant 8   some

TC   00:00:41.680 - 00:00:42.225

SD   (4.14)

Participant 8   dust, or something, and you mixed that together and stirred it, and then you had

          your painting, and then you could

TC   00:00:46.365 - 00:00:56.230

SD   (1.17)

Participant 8   choose to do either a brush or use your fingers

TC   00:00:57.407 - 00:01:01.245

SD   (3.21)

Participant 8   and the fingers, feet like, it was the best option probably

TC   00:01:04.460 - 00:01:08.086

SD   (1.88)

Interviewer 1   Actually, yeah, about that

TC   00:01:09.971 - 00:01:12.397

SD   (0.67)

Interviewer 1   You, used the brush, namely, throughout the program

TC   00:01:13.073 - 00:01:16.340

SD   (0.2)

Participant 8   yeah

TC   00:01:16.548 - 00:01:16.844

SD   (0.41)

Interviewer 1   Ehm, wasn't it clear, the signifier, that you could also use your hand?

TC   00:01:17.259 - 00:01:22.735

SD   (1.17)

Interviewer 1   Or did you just, did you see it as you had to hold the brush and dip it down

TC   00:01:23.908 - 00:01:30.290

SD   (0.13)

Participant 8   I, I did not noticed any signifier

TC   00:01:30.420 - 00:01:35.503

SD   (0.85)

Participant 8   that showed me that I should use my hand

TC   00:01:36.361 - 00:01:38.659

SD   (0.34)

Interviewer 1   okay

TC   00:01:39.003 - 00:01:39.398

SD   (0.09)

Participant 8   ehm

TC   00:01:39.493 - 00:01:40.041

SD   (0.62)

Participant 8   but I was also preoccupied with what I had to, to ()

TC   00:01:40.667 - 00:01:44.440

SD   (0.73)

Participant 8   a lot of things going on, but, I didn't noticed until you told me that I could use

   my, my fingers

TC   00:01:45.173 - 00:01:51.886

SD   (0.07)

Interviewer 1   okay

TC   00:01:51.958 - 00:01:52.218

SD   (0.9)

Interviewer 3   If you had to, if you liked a more clear signifier, would you have any suggestion

   on how it could be done?

TC   00:01:53.120 - 00:01:59.176

SD   (2.52)

Participant 8   I mean, there's so many things you could do, you could introduce the mechanic with

   the brush, and then, after some set amount of time you could have some kind of, like

TC   00:02:01.699 - 00:02:11.128

SD   (1.62)

Participant 8   I don't know if you want a diegetic or non-diegetic thing, but you could have an

   audio, you could have a sound play and a pop up that says try using your hand, or

   you can even have someone use the hand first, and then the brush.

TC   00:02:12.753 - 00:02:26.325

SD   (3.41)

Participant 8   Ehm, but what was the signifier for using the hand?

TC   00:02:29.740 - 00:02:33.590

SD   (0.1)

Interviewer 1   There was a, kinda of a ghost shader of the pencil and the hand and it kinda dipped

TC   00:02:33.696 - 00:02:39.569

SD   (0.46)

Participant 8   Oh yeah, in the bowl, I noticed that actually, but now I don't remember if...

TC   00:02:40.034 - 00:02:45.511

SD   (0.99)

Participant 8   if the hand was holding the brush, it wasn't like...

TC   00:02:46.504 - 00:02:49.510

SD   (0.15)

Participant 8   there were like...

TC   00:02:49.660 - 00:02:50.393

Interviewer 1   it was like this ((gestures))

TC   00:02:49.670 - 00:02:51.060

SD   (0.53)

Participant 8   yeah

TC   00:02:51.599 - 00:02:51.879

SD   (1.16)

Interviewer 2   They were just right next to each other

TC   00:02:53.045 - 00:02:54.832

SD   (0.05)

Participant 8   yeah

TC   00:02:54.888 - 00:02:55.251

Interviewer 1   yeah
TC   00:02:54.910 - 00:02:55.248
SD   (0.4)

Participant 8   I did not perceive that as two different things, maybe if you wanted to stick to
                the same stuff you already have, maybe just change the color of the hand or try to
                differentiate the two shapes somehow. Because the color was the same, I perceived
                it as the same action
TC   00:02:55.656 - 00:03:12.511
SD   (0.31)

Interviewer 1   yeah
TC   00:03:12.821 - 00:03:13.157
SD   (0.02)

Participant 8   and I just kinda perceived it as dipping the brush in the thing
TC   00:03:13.181 - 00:03:17.698
SD   (0.76)

Participant 8   so
TC   00:03:18.461 - 00:03:18.663
SD   (0.39)

Participant 8   I think you could do a few tricks and make it clearer that you are signifying two
                different actions with it
TC   00:03:19.061 - 00:03:26.547
SD   (0.87)

Interviewer 3   Actually, speaking of signifiers, you said before that you believe that, correct me

        if I'm wrong, but if you had to, like, put the two bowls together to create,

        (mixing) the paint

TC   00:03:27.423 - 00:03:38.511

SD   (0.26)

Participant 8   yeah

TC   00:03:38.774 - 00:03:38.949

SD   (0.53)

Interviewer 3   ehm

TC   00:03:39.481 - 00:03:40.153

SD   (1.15)

Interviewer 3   The way it was intended to be used, its like, the signifiers where there to tell

        you that you had to put the contents of each bowl into the bigger bowl

TC   00:03:41.307 - 00:03:48.100

SD   (0.02)

Participant 8   Oh, so they would activate, not at the same time

TC   00:03:48.126 - 00:03:50.740

SD   (0.45)

Interviewer 3   not necessarily

TC   00:03:51.193 - 00:03:52.025

SD   (0.3)

Participant 8   okay

TC   00:03:52.325 - 00:03:52.607

Interviewer 3   but, its not supposed to be clashed together, do you fell like the signifier was
                confusing in that sense
TC   00:03:52.607 - 00:03:57.884
SD   (0.18)

Participant 8   I feel like it was definetly signifying to me that I had to clank, to smash them
                together, because I had the sound that kinda sounded like somethign was smashing
                together, so when you saw that stuff kinda going like this ((gesture)) and you
                heard the sound of two bowl hitting each other, I taught you had to do something,
                but it didn't really make...
TC   00:03:58.068 - 00:04:21.374
SD   (1.41)

Participant 8   a lot of sense, and I think
TC   00:04:22.790 - 00:04:24.887
SD   (0.78)

Participant 8   a bit later I realised that you could, that one them was actually fluid, or like
                liquid, I think it is, and one of them was the powder, and that way, it doesn't
                really make sense, like, why would you smash that together, right?
TC   00:04:25.667 - 00:04:41.012
SD   (1.6)

Participant 8   yeah
TC   00:04:42.621 - 00:04:42.994
SD   (0.69)

Participant 8   okay, so it was not meant to go at the same time is what you're saying?

TC   00:04:43.688 - 00:04:48.234

SD   (0.59)

Interviewer 1   ehm

TC   00:04:48.827 - 00:04:49.068

SD   (0.4)

Interviewer 2   not neccesarily

TC   00:04:49.468 - 00:04:50.473

Interviewer 3   not specifically

TC   00:04:50.473 - 00:04:51.522

Participant 8   okay

TC   00:04:51.522 - 00:04:51.820

SD   (1.26)

Interviewer 1   you can do so, but it was, the intention was just one after another

TC   00:04:53.083 - 00:04:57.530

SD   (0.14)

Interviewer 1   kinda

TC   00:04:57.672 - 00:04:57.896

SD   (0.09)

Participant 8   its just that the signifier was going at the same time

TC   00:04:57.986 - 00:05:01.745

Interviewer 1   yeah, yeah

TC   00:04:59.719 - 00:05:00.291

SD   (2.73)

Interviewer 1   Then, while you were drawing, there was one point, you were drawing on top of an

              already existing figure on the wall

TC   00:05:03.030 - 00:05:09.322

Participant 8   yeah, hhh

TC   00:05:08.976 - 00:05:09.829

SD   (0.19)

Interviewer 1   what was your toughts, like, what was your tought procces when you did that?

TC   00:05:10.021 - 00:05:14.610

SD   (2.27)

Participant 8   well, you know, I mean, its ehm...

TC   00:05:16.880 - 00:05:19.447

SD   (3.01)

Participant 8   mhm

TC   00:05:22.464 - 00:05:23.064

SD   (3.48)

Participant 8   it was just to kinda, ehm, give an idea, because I noticed that

TC   00:05:26.544 - 00:05:31.474

SD   (0.65)

Participant 8   there was kinda different drawings on the wall, and it might just be a texture

thing, but I noticed some of the drawings were, looking a bit differently, a bit

older maybe, than some of the other ones that looked a bit more like my own, ehm,

and I noticed my own had, it was, its the way you did it technically, it has,

its pixelated, right? Compared to what other stuff was, so I just tried painting on

top of, to see...

TC   00:05:32.125 - 00:06:00.040

SD   (0.8)

Participant 8   how stark the difference was, to get a better idea of the...

TC   00:06:00.844 - 00:06:04.695

SD   (3.41)

Participant 8   yeah

TC   00:06:08.109 - 00:06:08.308

SD   (0.62)

Participant 8   and...

TC   00:06:08.932 - 00:06:09.244

SD   (2.13)

Participant 8   I guess you could, ehm...

TC   00:06:11.376 - 00:06:12.533

SD   (2.99)

Participant 8   see if there was some kind of response in that, but I didn't really expect that to

be, but it was, to be curious right?

TC   00:06:15.530 - 00:06:23.034

SD   (1.12)

Participant 8   yeah

TC   00:06:24.155 - 00:06:24.563

SD   (0.3)

Interviewer 1   okay

TC   00:06:24.868 - 00:06:25.214

SD   (1.04)

Interviewer 1   mhm

TC   00:06:26.254 - 00:06:26.511

SD   (0.22)

Interviewer 1   I don't know if you have any () ((to the other interviewers))

TC   00:06:26.737 - 00:06:28.725

SD   (0.64)

Interviewer 1   Then, do you have any additional comments, maybe for the program, for the test
       itself, just, whatever you feel liek you could add?

TC   00:06:29.367 - 00:06:37.810

SD   (5.67)

Participant 8   I mean, again, you could do so much, right? emh.. It depends on what kind, you have
       to, it depends on what kind of constraints you imposed on yourself, ehm... because,
       really, you could do so much, and I remember we also tried to ehm... We also
       wanted to do this, so... ehm... we were thinking about it as well, ehm...

TC   00:06:43.483 - 00:07:06.184

SD   (4.41)

Participant 8   ehm, yeah, again, I don't know what your, you guys' angle is on this, but, I mean,

presumably, you could like, ehm...

TC   00:07:10.601 - 00:07:18.732

SD   (3.68)

Participant 8   right, to augment the experience somehow because obviously, it might not be

               necessarely be that the peope who did the rock art, you know, they might just,

               they might not necessarily think of it as you drawing a picture of a cow on a rock

               right? You could also...

TC   00:07:22.421 - 00:07:37.149

SD   (5.2)

Participant 8   try to convey it more like as an experience, maybe you could ehm...

TC   00:07:42.356 - 00:07:46.765

SD   (0.95)

Participant 8   have the drawings kinda come to life at some point, or just kinda, maybe the rock

               would like, fade away, and the, the cow drawings would start to move or something

               like, so that it gives you more of like a...

TC   00:07:47.720 - 00:08:02.685

SD   (3.26)

Participant 8   you know, because, if you're just looking at a painting, it can be quite stale,

               right, so if the goal with the project is to get people to be really intrigued in

               this stuff, you could maybe...

TC   00:08:05.947 - 00:08:16.864

SD   (1.12)

Participant 8   ehm...get, use the medium of this like a video game, right? where you can do stuff

               like that, to kinda like...

TC   00:08:17.985 - 00:08:25.350

SD   (1.65)

Participant 8   make it a bit more, you know, alive, because presumably, that's what they are

                trying to communicate right, you know, animals that are alive, and stuff is

                happening, and they were probably on a bunch of drugs as well, and much ()

TC   00:08:27.001 - 00:08:40.367

Interviewer 2   hhh

TC   00:08:40.380 - 00:08:41.350

Interviewer 3   hhh

TC   00:08:40.390 - 00:08:41.254

SD   (0.18)

Participant 8   you could like, you could like model a psychedelic experience almost like ehm...

TC   00:08:41.440 - 00:08:47.029

SD   (1.57)

Participant 8   ehm, that was my, this is just because, it was the orginal idea I had when we

                wanted to do this, so you could start drawing and at some point stuff would just

                kinda ((puff)) come alive, right? and you could really...

TC   00:08:48.604 - 00:09:03.568

SD   (2.33)

Participant 8   get an idea of what people might mean ((pauses)) by that, you know, if that makes

                any sense, I don't know

TC   00:09:05.898 - 00:09:13.000

Interviewer 2   yeah, it does

TC   00:09:12.214 - 00:09:12.969

SD   (3.42)

Interviewer 2   okay

TC   00:09:16.394 - 00:09:16.706

SD   (0.15)

Participant 8   and of course Morpheus

TC   00:09:16.859 - 00:09:17.880

SD   (0.51)

Participant 8   ((Morpheus conversation))

TC   00:09:18.390 - 00:09:46.380

A.2.10 Participant 9

Pre-interview

2021 May 20, Thu 14:19

Interviewer1   Alright (.) do you have any VR experience?

TC   00:00:03.810 - 00:00:07.754

SD   (1.01)

Participant9   Yes (.) a bit

TC   00:00:08.770 - 00:00:09.370

SD   (0.1)

Interviewer1   Yeah (.) is that study related or for personal use?

TC   00:00:09.476 - 00:00:13.980

SD   (0.1)

Participant9   Eh study related not personal use

TC   00:00:14.080 - 00:00:17.229

SD   (0.21)

Interviewer1   Eh do you have experience with hand tracking specifically?

TC   00:00:17.440 - 00:00:21.088

SD   (1.53)

Participant9   Hand tracking as in through image processing?

TC   00:00:22.620 - 00:00:26.140

SD   (0.09)

Interviewer1   Yeah yeah so you are not using controllers

TC   00:00:26.231 - 00:00:29.130

SD   (0.09)

Participant9   Ye:::s

TC   00:00:29.220 - 00:00:29.720

SD   (0.19)

Interviewer1   You have yeah

TC   00:00:29.910 - 00:00:30.790

SD   (0.06)

Participant9   No (.) not within VR

TC   00:00:32.860 - 00:00:34.450

SD   (0.1)

Interviewer3   Within VR or in general?

TC   00:00:30.854 - 00:00:33.757

Interviewer3   Okay

TC   00:00:34.550 - 00:00:34.780

SD   (0.11)

Interviewer1   Alright (.) can you tell us what you know about Scandinavian

                 rock art?

TC   00:00:34.890 - 00:00:39.613

SD   (6.62)

Participant9   Music?

TC   00:00:46.233 - 00:00:47.240

SD   (0.51)

Interviewer2   No hhh

TC   00:00:47.750 - 00:00:48.240

Participant9   Okay

TC   00:00:48.826 - 00:00:49.470

SD   (0.69)

Interviewer1   No:::

TC   00:00:48.241 - 00:00:48.630

SD   (0.19)

Participant9   [Nature] (.) as in nature?

TC   00:00:50.790 - 00:00:51.370

Interviewer1   Ehm as [i-]

TC   00:00:50.169 - 00:00:50.790

Interviewer1   Yeah yeah yeah

TC   00:00:51.370 - 00:00:52.173

SD   (0.54)

Interviewer3   Art on rocks

TC   00:00:52.715 - 00:00:53.995

SD   (1.87)

Participant9   Eh (.) is (3) by rock art do you mean in caves (.) do you

            mean in ancient times (.) or in recent times (.)?

TC   00:00:55.870 - 00:01:09.940

SD   (0.84)

Interviewer1   Eh (.) it's before BC

TC   00:01:10.787 - 00:01:13.220

SD   (0.55)

Participant9   Oh okay, so the (inaudible) stones doesn't count?

TC   00:01:13.770 - 00:01:16.638

SD   (3.68)

Interviewer1   Actually it's-

TC   00:01:20.322 - 00:01:21.602

Interviewer2   It's in the area, s:::o (.) so rock art as in (.) an

          artistic means to express yourself

TC   00:01:21.251 - 00:01:33.090

Interviewer1   It is (.) it is BCE so it is before

TC   00:01:22.570 - 00:01:26.248

SD   (7.07)

Participant9   Oh (.) no then I don't

TC   00:01:33.322 - 00:01:35.100

SD   (0.17)

Interviewer1   Alright

TC   00:01:35.270 - 00:01:36.280

Participant9   Something to do with runes, but that's about it

TC   00:01:36.103 - 00:01:39.483

SD   (0.15)

Interviewer1   Then lets take a step back (0.3) what about rock art in general?

TC   00:01:39.638 - 00:01:44.243

SD   (0.56)

Participant9   e:::h as in cave paintings I (0.7) I know a little bit about

          that (0.5) I looked it up a little bit for a game, but

          afterwards I kind of mostly forgot

TC   00:01:44.806 - 00:02:02.370

SD   (0.24)

Interviewer1   Alright

TC   00:02:02.610 - 00:02:03.170

Participant9   I know that they often painted animals in a ritual form before

          hunting (0.5) like painting the successful hunting scene

TC   00:02:03.180 - 00:02:12.780

SD   (0.71)

Participant9   To succeed at it (.) or t:::o or as a form of worship

TC   00:02:13.490 - 00:02:19.820

Interviewer1   Mhm

TC   00:02:15.079 - 00:02:15.591

SD   (8.45)

Interviewer1   Okay so (.) if you were t:::o (.) define Scandinavian rock

          art with your own words (.) for instance if I asked you (.)

          then how would you describe it?

TC   00:02:24.050 - 00:02:33.820

SD   (1.16)

Participant9   Uh (.) I feel like I earn this (inaudible) on how much I do

          not know [hhh]

TC   00:02:34.980 - 00:02:40.439

Interviewer1   Yeah s:::o [hhh]

TC   00:02:38.701 - 00:02:40.080

Interviewer2   [hhh]

TC   00:02:38.698 - 00:02:40.070

Interviewer1   It is just (.) you know to be sure

TC   00:02:40.208 - 00:02:42.200

Interviewer3   [hhh]

TC   00:02:38.788 - 00:02:40.130

SD   (0.07)

Participant9   Yea:::h well it's a-

TC   00:02:41.847 - 00:02:45.480

SD   (5.28)

Participant9   Made onto large boulders (.) likely in Denmark (0.7) or in
                caves in this area of Scandinavia (2) with the purpose of self
                expression and before christ (2) so likely (.) with the aim of
                hunting gathering worship purposes or something (.) expression
                purposes

TC   00:02:50.765 - 00:03:24.020

SD   (0.22)

Interviewer1   Okay (.) then I will stop the recording here

TC   00:03:24.241 - 00:03:27.870

Gameplay

2021 May 20, Thu 14:12

Interviewer3   There we go
TC   00:00:00.040 - 00:00:00.690
SD   (1.68)

Interviewer3   And you can proceed to move around (.) and do whatever you
         want to
TC   00:00:02.370 - 00:00:05.200
SD   (0.11)

Participant9   Oh so can I move around or should I?
TC   00:00:05.317 - 00:00:06.836
Interviewer3   Yes you can move around
TC   00:00:06.836 - 00:00:08.191

Participant9   Okay
TC   00:00:08.221 - 00:00:08.750
SD   (0.25)
Interviewer1   If you want
TC   00:00:07.882 - 00:00:08.136
SD   (0.08)

Interviewer3   There is a guardian thing set up (0.3) so if you do walk too far
         it should warn you
TC   00:00:09.007 - 00:00:13.081
SD   (56.83)

Participant9   Oh I see   Woah
TC   00:01:09.911 - 00:01:11.280   00:01:50.110 - 00:01:51.551

SD   (38.83) (12.16)

Participant9   Woah   Where did?

TC   00:02:03.714 - 00:02:04.573   00:02:05.484 - 00:02:06.468

SD   (0.91) (0.29)

Participant9   hhh   Oh (.) God damn it

TC   00:02:06.763 - 00:02:07.583   00:02:32.400 - 00:02:34.980

SD   (24.81) (25.5)

Participant9   Now will I just say when I'm ready?

TC   00:03:00.489 - 00:03:01.769

SD   (1.53)

Interviewer1   What?

TC   00:03:03.308 - 00:03:03.618

SD   (0.66)

Participant9   Say when I'm ready?

TC   00:03:04.287 - 00:03:05.087

SD   (0.43)

Interviewer1   Uh:::h (.) you have five minutes (.) in total within the

               (0.5) simulation (.) so whenever you wanna get out just say so

TC   00:03:05.519 - 00:03:12.840

SD   (0.06)

Participant9   Oh okay   Mm:::m

TC   00:03:12.909 - 00:03:13.988   00:03:16.227 - 00:03:16.938

SD   (2.23) (53.11)

Participant9   Okay I think I'm ready

TC   00:04:10.056 - 00:04:11.106

SD   (0.37)

Interviewer1   Yeah (.) I will put you out then

TC   00:04:11.480 - 00:04:13.210

Participant9   Okay

TC   00:04:13.114 - 00:04:13.558

Post-interview

2021 May 20, Thu 14:14

Interviewer1   Can you tell us what you know now about Scandinavian rock art?
TC   00:00:05.002 - 00:00:09.790
SD   (3.38)

Participant9   Well ehm (.) everything that you told me (.) that like rock
        art was made by indegineouss tribes within 5000 BC to 500 BC
TC   00:00:13.170 - 00:00:23.360
SD   (1.41)

Participant9   And that they painted for self expression or territory marking (
        .) or hunting or religious purposes, might be good adding that
TC   00:00:24.770 - 00:00:35.750

Interviewer1   Mhm
TC   00:00:35.440 - 00:00:35.830
SD   (1.95)

Participant9   Yeah and they (.) painted on various caves, cliff sides and
        boulders
TC   00:00:37.788 - 00:00:44.670
SD   (2.19)

Participant9   They used different materials for paint (.) they like
TC   00:00:46.863 - 00:00:51.083
SD   (1.08)

Participant9   Ground materials and mixed them (.) and applied them to their
        fingers a brush or a leaf

TC   00:00:52.166 - 00:01:03.720

SD   (0.37)

Interviewer1   Okay   Do you have something?

TC   00:01:04.090 - 00:01:04.880   00:01:05.343 - 00:01:06.345

SD   (0.46)   (0.73)

Participant9   Like that

TC   00:01:07.080 - 00:01:08.320

SD   (0.61)

Interviewer1   While you were in the game (.) I noticed that the placed that

           you drew on the walls it was mostly empty spaces (.) can you

           tell me (.) no actually (.) can you explain the thought

           process behind that?

TC   00:01:08.933 - 00:01:24.916

SD   (0.54)

Participant9   Can you repeat that?

TC   00:01:25.462 - 00:01:26.730

SD   (0.3)

Interviewer1   When you drew on the wall (.) whether it be with the finger or

           the brush and you only drew on the empty spaces (.) was this

           intentional (.) can you explain the thought process behind it?

TC   00:01:27.032 - 00:01:37.771

SD   (0.33)

Participant9   Yeah I felt like the other thing (.) what are they called (.

) like the goal was to mark my own presence (0.3) so especially

if I'm (.) some sort of ambassador then I feel like it's very

rude to paint over somebody elses paint (.) especially if you

weren't there or not a part of it

TC 00:01:38.110 - 00:01:56.063

SD (0.63)

Participant9 Especially since it is just supposed to mark presence s:::o

(0.7) what is that called (.) yeah so I (.) there were

mostly animals there and other people (.) and I have no

relation to those animals

TC 00:01:56.693 - 00:02:12.067

SD (0.49)

Participant9 I did look around if they were there, but they weren't there

TC 00:02:12.560 - 00:02:15.370

SD (1.08)

Participant9 So I didn't think much about them (.) and then there were (.

) what are they called (.) other people and I haven't directly

met them yet (.) so I just wanted to mark that I am also a

people who is here

TC 00:02:16.457 - 00:02:29.020

SD (0.68)

Interviewer1 Okay

TC 00:02:29.707 - 00:02:30.428

SD (0.4)

Interviewer1 Then can you explain to me (.) what you specifically drew

TC 00:02:30.837 - 00:02:36.551

SD   (1.3)

Interviewer1   And if what was already on the wall had any influence on what

                  figure you actually painted?

TC   00:02:37.860 - 00:02:43.030

SD   (0.1)

Participant9   ehm ye:::ah (.) I saw that it was kind of (.) ehm (.) what

                  do call that (.) (inaudible) other figures there were there

                  and that they kind of drew outlines of their body (.) but from

                  my own experience I just drew stick figures (.) then I kind of

                  immediatly assumed that it's a stick figure and that's all that

                  I can really draw so I drew a somewhat similar stick figure

TC   00:02:43.135 - 00:03:13.625

SD   (0.19)

Interviewer1   Mhm

TC   00:03:13.820 - 00:03:14.499

SD   (0.54)

Participant9   Only after I noticed there were like a cross (inaudible) in the

                  center of their head and it was empty (.) I mean I could do

                  that cause I already filled in my head and I didn't know how to

                  remove paint

TC   00:03:15.040 - 00:03:26.570

SD   (0.88)

Participant9   So I decided to see that there were a line above their head (.

) so I decided to make some hair

TC   00:03:27.451 - 00:03:36.784

SD   (0.49)

Participant9   Otherwise just trying to be simplistic about things as most

                 things seemed on it seemed to be (.) so I drew the stone (.)

                 as fast as I could me drawing on the stone (0.5) then below

                 that I come from over the river from the shiny mountains

TC   00:03:37.282 - 00:03:56.364

SD   (0.12)

Interviewer1   hhh

TC   00:03:56.490 - 00:03:57.233

SD   (0.47)

Interviewer2   hhh

TC   00:03:57.710 - 00:03:58.293

SD   (0.32)

Interviewer1   Interestingly I also noticed that you used both the brush and

                 your finger but you actually used them differently (.) I

                 noticed that you for instance drew the top like the hair with

                 your hand and then for the actual figurer you used the brush (.

) can you tell me (.) was that intentional or?

TC   00:03:58.620 - 00:04:20.850

Participant9   Yeah I I (.) first I just wanted to try the brush (.) I

                 think I tried my fingers like (.) what are they called (.) I

                 tried painting with it, but I just drew a dubble line

TC   00:04:20.554 - 00:04:33.920

SD   (1.52)

Participant9   Because when I pointed away from me I couldn't close this finger

so two fingers being there I just drew with two fingers and then

at one point I was like okay I'm gonna try with the brush

instead I already have it in my hand

TC   00:04:35.441 - 00:04:48.321

SD   (1.18)

Participant9   So I drew with that that se:::emed good but ehm (.) then

afterwards when I tried letting go it wasn't your like how to

stop painting

TC   00:04:49.502 - 00:05:03.807

Interviewer1   Mhm

TC   00:05:02.450 - 00:05:03.624

SD   (0.38)

Participant9   I actually haven't thought about putting the paint brush away (

.) so I instead went with the classic like if I stop doing it

then it will just stop painting (.) so I just let go of the

brush

TC   00:05:04.013 - 00:05:15.668

Interviewer1   hhh   Mhm

TC   00:05:11.118 - 00:05:12.375   00:05:12.901 - 00:05:13.407

SD   (0.52)   (2.73)

Participant9   And then I immediately regretted it

TC   00:05:16.140 - 00:05:19.322

Interviewer3   hhh

TC   00:05:18.188 - 00:05:19.699

Interviewer2   hhh

TC   00:05:18.319 - 00:05:19.665

SD   (0.99)

Participant9   Thankfully it reappeared in my other hand (.) but then I let

            go of it again when I (inaudible) so it fell down and reappeared

            at the table (.) I think I picked it up again once after that

            but let go of it like a fool so

TC   00:05:20.663 - 00:05:34.959

Interviewer2   hhh   hhh

TC   00:05:25.658 - 00:05:26.472   00:05:34.591 - 00:05:35.181

SD   (8.11)   (0.43)

Participant9   Yeah I decided to just go with my fingers instead and then that

            was about the point when I thought (.) oh the other person has

            like this (.) stick thing coming out of them so their hair or

            something so I will just draw hair for myself like

TC   00:05:35.611 - 00:05:49.260

Interviewer1   Mhm

TC   00:05:46.780 - 00:05:47.705

SD   (2.14)

Participant9   Oh I could do that one by one but I already have all these

            fingers that already have paint on them so I might as well go

            wild

TC   00:05:49.849 - 00:05:57.239

SD   (0.14)

Interviewer1   Alright (.) then do you have any additional comments (.)

              whether it being the program or

TC   00:05:57.388 - 00:06:05.937

Participant9   Yeah it was (.) it was pretty nic- very nicely (.) at first

              I was kind of struggeling with the bowls like one of them were

              in my hand at a very odd angle and I needed it to like tilt

TC   00:06:05.674 - 00:06:17.740

SD   (0.17)

Interviewer2   hhh

TC   00:06:17.910 - 00:06:20.210

Interviewer3   hhh

TC   00:06:18.790 - 00:06:19.973

SD   (1.01)

Participant9   It's not usually how I make my dinner

TC   00:06:20.989 - 00:06:23.454

Participant9   hhh

TC   00:06:24.170 - 00:06:25.320

Interviewer1   N:::o

TC   00:06:22.938 - 00:06:24.408

Interviewer2   hhh

TC   00:06:25.973 - 00:06:27.497

SD   (0.07)

Interviewer3   hhh

TC   00:06:24.884 - 00:06:26.584

Participant9   hhh

TC   00:06:27.569 - 00:06:28.548

SD   (0.71)

Participant9   Otherwise those grids seemed a bit a::: confusing (.) it give

me this like matrix or assasins creed feel that I was in some

sort of

TC   00:06:29.262 - 00:06:40.340

SD   (0.69)

Participant9   (inaudible)

TC   00:06:41.033 - 00:06:42.362

Interviewer1   Oh (.) the guardians or?

TC   00:06:41.743 - 00:06:45.202

Interviewer3   (Inaudible)

TC   00:06:43.180 - 00:06:43.910

SD   (1.01)

Participant9   No no no the actual grid like when I was trying to pick up the

bowls (.) there was like a grid in the wall and some circles (

.) and at some point it turned red when I think it was when I

was grabbing

TC   00:06:44.920 - 00:06:54.810

Interviewer1   Oh

TC   00:06:48.761 - 00:06:49.581

SD   (4.34)

Interviewer3   So the guardian thingy approached too far

TC   00:06:53.925 - 00:06:58.251

Participant9   Oh like that s:::ooo that makes sense

TC   00:06:57.550 - 00:07:01.675

SD   (0.57)

Interviewer1   Actually now that you mentioned the the grabbing (.) do you

                 feel like there is a need for some signifiers since you had some

                 trouble in the beginning getting the bowl in your hand?

TC   00:07:02.245 - 00:07:19.537

SD   (0.11)

Participant9   Ehm ma:::ybe if it would have showed how far towards the bowl

                 do I need to reach (.) like do I need to reach in the center

                 of the bowl and then grab (.) or is it fine if I just grab

                 somewhere on the outside of it (.) it would just kind of

TC   00:07:19.648 - 00:07:33.388

SD   (1.56)

Participant9   Jump into my hand a little bit

TC   00:07:34.950 - 00:07:37.133

SD   (0.5)

Participant9   I wasn't sure about that (.) like is there a certain angle

                 that I need to take

TC   00:07:37.641 - 00:07:42.597

Interviewer1   Mhm mhm mhm

TC   00:07:41.707 - 00:07:43.349

Participant9   Like just grab it through the top and that is how it will stick

to my hand from now on

TC   00:07:42.970 - 00:07:47.310

Interviewer2   Mhm

TC   00:07:46.335 - 00:07:47.473

SD   (0.69)

Interviewer1   I also noticed that eh (.) besides the grabbing (.) you were

very quick at actually doing the process (.) ehm (.) would

you say that (.) it was very clear with the signifiers what to

do?

TC   00:07:48.164 - 00:08:01.888

Participant9   Eh yeah yeah (.) it was pretty clear (.) ehm it was a bit

confusing first like why do I need to do my hand like this (.)

at first I thought it was some kind of error (.) it was

supposed to be some kind of grabbing (inaudible) holding (.)

like what do you call it (.) donking the paint brush (.) I

just tried (inaudible) oh I can also get it on my fingers, which

is nice

TC   00:08:01.623 - 00:08:23.895

Interviewer1   Mhm   Yeah yeah yeah

TC   00:08:07.470 - 00:08:08.390   00:08:15.199 - 00:08:16.408

SD   (6.8)   (6.69)

Interviewer1   Yeah

TC   00:08:23.098 - 00:08:23.541

SD   (0.88)

Interviewer1   Okay then (.) I don't know if you guys have (.) any other

        questions?

TC   00:08:24.427 - 00:08:30.774

Interviewer2   No that would just b:::e any additional comments that you have

        about the program or the test

TC   00:08:30.057 - 00:08:37.592

Participant9   Eh:::m it:::s it felt very nice (.) it was very fun (.) you

        guys did a great job with it

TC   00:08:35.436 - 00:08:44.905

SD   (1.59)

Interviewer1   I will stop the recording now

TC   00:08:48.361 - 00:08:50.725

Interviewer2   Thank you

TC   00:08:46.500 - 00:08:47.840

SD   (0.52)

A.2.11 Participant 10

Pre-interview

```
Tuesday, May 18, 2021, 2:27 PM

Interviewer2     there is
TC               00:00:00.379 - 00:00:01.055
SD               (0.1)

Interviewer1     alright, I'll record as well
TC               00:00:01.164 - 00:00:02.890
SD               (0.58)

Interviewer1     okay! ehm. Do you have any VR experience?
TC               00:00:03.477 - 00:00:07.569
SD               (0.86)

Participant      Uhm, I've done a bit uhm, I mean we did a project on it
                 last semester. Uhm,
                 otherwise not really. Uhm:, I've tried it a few times
                 and I know I sometimes get
                 really dizzy from it so I: haven't don't try it, haven't
                 tried it too much.
TC               00:00:08.431 - 00:00:25.672

Interviewer1     hmm
TC               00:00:13.045 - 00:00:13.653
SD               (8.11)

Interviewer1     hmm
TC               00:00:21.764 - 00:00:22.588
SD               (3.06)

Interviewer1     okay, then do you have experience with hand tracking
                 specifically? So in VR..
TC               00:00:25.654 - 00:00:32.360
SD               (0.79)

Participant      uhm:: ((pause)) like without the controllers or
                 anything? uhm: (no)
TC               00:00:33.154 - 00:00:41.820
SD               (0.57)

Interviewer1     okay. Uh, can you tell us what you know about
                 Scandinavian rock art?
TC               00:00:42.393 - 00:00:47.832
SD               (0.73)

Participant      <uhh Scandinavian rock art?>
TC               00:00:48.567 - 00:00:50.105
SD               (0.07)

Interviewer1     yes
TC               00:00:50.180 - 00:00:50.641
SD               (0.24)

Participant      I didn't know it was (?) other than like ((pause)) I
                 don't know ((pause)) street art
                 or something? (?) if you want
TC               00:00:50.884 - 00:00:58.450
SD               (0.06)
```

```
Interviewer1    hm. Then if we take a step back then what about rock art
                in general?
TC              00:00:58.518 - 00:01:05.879
SD              (0.05)

Participant     I mean the only thing that comes in mind when I think
                about rock art is a: ((pause))
                yeah like cave paintings and stuff? Like uh: very old
                stuff.. yea
TC              00:01:05.935 - 00:01:17.750
SD              (0.85)

Interviewer1    eh: if I asked you what is Scandinavian rock art, how
                would you describe it with
                your own words?If you have to...
TC              00:01:18.607 - 00:01:27.060
SD              (0.94)

Participant     Uhm:: is it- ((pause)) I don't know ((pause)) if it's
                like a: very old stuff from
                like back in the: middle ages or like the Viking age or
                whatever. Uhm so honestly I
                don't know ((pause)) uhm: ((pause)) the only other thing
                I can think about is like
                uh: ((pause)) graffiti and stuff in like uh newer times
TC              00:01:28.005 - 00:01:53.465
SD              (0.14)

TC              00:01:53.606 - 00:01:56.250
```

Gameplay

```
Thursday, May 20, 2021, 11:48 AM

Participant10    hehe
TC               00:00:01.799 - 00:00:02.688

Interviewer3     just move around as::
TC               00:00:02.650 - 00:00:05.100

Participant10    okay
TC               00:00:04.100 - 00:00:04.602
SD               (31.23)

Interviewer1     remember to think out loud
TC               00:00:35.839 - 00:00:37.421
SD               (0.66)

Participant10    yeah uh: oh sorry I think i I'm trying like.. to pick up
                 the bowls ((pause)) but uh
                 they're just I'm just kinda slapping them around
TC               00:00:38.089 - 00:00:46.810
SD               (0.1)

Interviewer3     *laughs*
TC               00:00:46.912 - 00:00:47.448
SD               (0.11)

Participant10    hehe and uh:, yeah
TC               00:00:47.560 - 00:00:50.790
SD               (0.29)

Participant10    I can't really ((pause)) manage to pick them up, like
                 they move ((pause)) but
                 ((pause)) I'm just.. pushing them around ((pause)) at
this point
TC               00:00:51.087 - 00:01:00.690
SD               (1.17)

Participant10    I'm I'm guessing that's what I need to do since there's
                 like two ((pause)) bowls,
                 uhm: ((pause)) ghostly bowls or whatever moving here
TC               00:01:01.862 - 00:01:12.313
SD               (0.26)

Participant10    uhm and now I pushed them so far away
TC               00:01:12.576 - 00:01:15.167
SD               (0.26)

Interviewer1     try to uhm: make a firm hand grip
TC               00:01:15.434 - 00:01:19.450
SD               (1.26)

Participant10    I think I pushed them like out of the zone because
                 ((pause)) there's some red and
                 blue uhm like markers showing up
TC               00:01:20.719 - 00:01:28.211
SD               (0.03)
```

```
Interviewer2      uhm: it's the guardian for the headset but you're not in
                  front of anything so you
                  can step forward if you want
TC                00:01:28.246 - 00:01:34.340

Interviewer3      no you should be fine
TC                00:01:32.333 - 00:01:33.606
SD                (0.13)

Participant10     oh okay
TC                00:01:33.741 - 00:01:34.789
SD                (0.48)

Interviewer3      try to make a fist when you grab them?
TC                00:01:35.277 - 00:01:38.001
SD                (1.72)

Participant10     ohh okay I see
TC                00:01:39.726 - 00:01:41.241
SD                (2.58)

Participant10     yeah so I got the white one.. poured the white one into
                  it and now I'm trying to
                  grab the $other one .hh and I kinda pushed it through
                  the wall haha I still like
                  slightly see it? wait! oh I got it heh!$
TC                00:01:43.829 - 00:01:58.310

Interviewer3      *laughs*
TC                00:01:57.468 - 00:01:58.355
SD                (0.79)

Participant10     *laughs*  and I uh poured the orange one into the bowl
as well
TC                00:01:59.147 - 00:02:04.050
SD                (0.79)

Participant10     so it shows some kind of mixing uh so I'm  guessing I
                  take the stick
TC                00:02:04.848 - 00:02:08.563
SD                (2.19)

Participant10     and mix it around
TC                00:02:10.760 - 00:02:11.836
SD                (2.48)

Participant10     and there is some noise.. I guess I just keep going
TC                00:02:14.325 - 00:02:19.160
SD                (1.57)

Participant10     yeah, now it ((pause)) turned into.. paint?
TC                00:02:20.733 - 00:02:25.340
SD                (1.43)

Participant10     there's like a hand ((pause)) sticking into it and a
                  ((pause)) pencil? Or like uh-
TC                00:02:26.779 - 00:02:33.390
SD                (1.97)
```

```
Participant10     and uh, the paintbrush fell down but it returned so I
                  guess I'm taking this and
                  ((pause)) dipping it
TC                00:02:35.362 - 00:02:43.566
SD                (3.25)


Participant10     and then I.. guess I paint something? i don't know
TC                00:02:46.820 - 00:02:50.851
SD                (1.98)


Participant10     it keeps showing to dip it, I don't know if I need to
                  dip it like several times
TC                00:02:52.840 - 00:02:56.818
SD                (1.0)


Interviewer1      (?)
TC                00:02:57.820 - 00:02:59.400


Participant10     oh okay
TC                00:02:59.333 - 00:03:00.083
SD                (1.25)


Participant10     so I guess I go to this conveniently placed wall over
here
TC                00:03:01.336 - 00:03:05.878
SD                (3.01)


Participant10     draw something?
TC                00:03:08.890 - 00:03:10.100
SD                (10.21)


Participant10     I'm attempting to draw a.. turtle
TC                00:03:20.315 - 00:03:24.350
SD                (1.67)


Participant10     I might be uh.. a bit too close becuase it's like very
                  ((pause)) uhm: ((pause))
                  it's kinda hard to stop drawing? you have to like go
pretty far away to ((pause))
                  make it stop
TC                00:03:26.029 - 00:03:43.067
SD                (5.92)


Participant10     $a little bit hard$
TC                00:03:48.987 - 00:03:50.660
SD                (3.11)


Participant10     .hh
TC                00:03:53.777 - 00:03:56.349
SD                (2.95)


Participant10     yes
TC                00:03:59.306 - 00:03:59.899
SD                (2.31)


Participant10     uhm: ((pause)) I'm guessing that the paint will just
                  like keep ((pause)) being on
```

```
                    the ((pause)) paintbrush, like you don't have to redip
                    it or something?
TC                  00:04:02.210 - 00:04:13.430
SD                  (3.15)


Participant10       but it looked like, because, there's also the... the
                    hands here so I guess you can
                    always dip hh dip your entire hand in there
TC                  00:04:16.585 - 00:04:24.890
SD                  (2.28)


Participant10       yeah there is some paint on the.. on the hand now
TC                  00:04:27.170 - 00:04:30.090
SD                  (3.56)


Participant10       oh that's pretty cool. Yeah.
TC                  00:04:33.657 - 00:04:35.560
SD                  (5.62)


Participant10       yeah so it's only drawing with the.. ((pause)) the
                         fingertips. I'm guessing you
                    can't just...
TC                  00:04:41.189 - 00:04:48.000
SD                  (3.94)


Participant10       oh okay it only gets on the fingertips
TC                  00:04:51.940 - 00:04:54.660
SD                  (5.41)


Participant10       but yeah that's cool.
TC                  00:05:00.077 - 00:05:01.153
SD                  (16.44)


Participant10       it's a li- little bit hard to control, like.. when
                    you're trying to draw with one
                    finger but you accidently ((pause)) like it accidently
                    like draws double? Like
                    you're using two fingers
TC                  00:05:17.598 - 00:05:29.674
SD                  (4.57)


Participant10       but it's pretty cool
TC                  00:05:34.250 - 00:05:35.190
SD                  (2.11)


Participant10       I'm not really sure what else.. to do
TC                  00:05:37.300 - 00:05:40.150
SD                  (0.82)


Interviewer1        uh you have two more minutes.. in the simulation so you
                    can just... if you wanna
                    get out now ((pause)) just say if you want
TC                  00:05:40.975 - 00:05:48.230
SD                  (0.58)


Participant10       it's a pretty cool environment. Oh there's just a hand
                    floating over there
TC                  00:05:48.812 - 00:05:53.058
```

```
SD              (0.05)

Interviewer2    *laughs*
TC              00:05:53.114 - 00:05:54.382

Interviewer3    *laughs*
TC              00:05:53.355 - 00:05:54.213
SD              (0.94)

Participant10   heh.. hh ((pause)) hahaha
TC              00:05:55.160 - 00:05:58.210
SD              (0.53)

Participant10   glitching out of- oh it's gone haha
TC              00:05:58.742 - 00:06:02.347
SD              (1.13)

Participant10   I really like the environment though I didn't actually
                turn around until now so
                it's very nice with the trees and the water and stuff...
                I- it looks like water at
                least
TC              00:06:03.479 - 00:06:12.417
SD              (4.79)

Participant10   but yeah, otherwise I think ((pause)) if if that's okay
                with you guys?
TC              00:06:17.207 - 00:06:21.438
SD              (0.15)

Interviewer1    I'll stop it and you can take the headset off
TC              00:06:21.592 - 00:06:23.839

Interviewer2    yeah!
TC              00:06:21.891 - 00:06:22.284
SD              (1.65)

Participant10   yeah
TC              00:06:23.939 - 00:06:25.195
```

Post-interview

```
Tuesday, May 18, 2021, 3:19 PM

Interviewer1      yeah, um, can you tell us what you now know about
                  Scandinavian rock art?
TC                00:00:01.805 - 00:00:07.491
SD                (3.39)

Participant       uhm:: ((pause)) honestly I didn't really think about
                  that it was specifically
                  Scandinavian, when looking at it. Like that's when I
                  looked behind me like at the
                  trees and stuff that they did look like a nordic
                  environment. Uhm: ((pause)) I
                  didn't really pay that much attention to: the paintings
                  that were alreay on the rock
                  I was painting on? ((pause)) uhm: so I felt like I can..
                  like I couldn't  really ..
                  I can't really distin- distinguish them in my head from
                  like ((pause)) any other
                  rock art, I guess Scandinavian rock art might be just
                  like ((pause)) any other cave
                  paintings or whatever you see in uhm: ((pause)) in
                  cartoons and stuff. I don't know
                  right now the only thing I can think about is uh Brother
                  bear *laughs* yeah. Uhm:
TC                00:00:10.883 - 00:01:03.690

Interviewer1      [hmm]
TC                00:01:00.288 - 00:01:00.811

Interviewer2      [okay]
TC                00:01:00.402 - 00:01:01.039
SD                (2.88)

Interviewer1      So it was mostly just the environment itself that you
                  know ((pause)) [that you
                  associated with] the.. yeah!
TC                00:01:03.927 - 00:01:10.489

Participant       [yeah that you made it..]
TC                00:01:07.679 - 00:01:09.120
SD                (0.91)

Participant       yeah, yeah
TC                00:01:10.031 - 00:01:11.390
SD                (0.33)

Interviewer3      can I ask if you kinda learned anything new from: the
                  experience in this environemt?
TC                00:01:11.727 - 00:01:17.850
SD                (0.98)

Participant       uhm:: like about rock art? I guess uhm: ((pause)) I
                  guess the procedure for like
                  mixing the ((pause)) colors and stuff was interesting?
                  Uhm: ((pause)) but maybe
                  don't really think about that.. I wasn't sure what the
                  different things were if it
```

```
                    was just like red paint and white paint or any specific
                    uh: material I guess it
                    might. ((pause)) But then uhm: ((pause)) Otherwise I
                    don't (?) Scandinavian rock..
                    rock art it's just, any rock art *laughs* I don't know
TC                  00:01:18.838 - 00:02:00.250
SD                  (0.7)


Interviewer1        uhm: when you painted on the wall I saw you ((pause))
                    mostly picked out a spot that
                    was  like empty, there wasn't already something there
                    it's like an empty spot on the
                    wall. Was that intentional?
TC                  00:02:00.951 - 00:02:17.439
SD                  (0.21)


Participant         uh I didn't think about it. I guess it's  just uhm: like
                    a reflex kinda thing that
                    like ((pause)) oh this is empty I'll put something there
TC                  00:02:17.655 - 00:02:27.678
SD                  (0.11)


Interviewer1        hmm, okay, so you didn't want to occlude what's  already
                    there?
TC                  00:02:27.790 - 00:02:32.050


Participant         yeah, I honestly didn't really think about it until you
                    just uh mentoned it now but
                    ((pause)) I guess it's like it's subconscious thing..
                    thing you just automatically do
TC                  00:02:31.328 - 00:02:41.809
SD                  (0.11)


Interviewer1        hmm
TC                  00:02:41.920 - 00:02:42.300
SD                  (1.3)


Interviewer1        uhm: initially when you had to grab the bowls, you had
                    troubles actually hehe
                    $grabbing them, ehhm:$ would you say that you needed
                    something ehm to guide you in
                    the pogram on how you should hrab it?
TC                  00:02:43.608 - 00:03:00.534
SD                  (0.48)


Participant         yeah that might've been nice. I mean, I guess if you've
                    actually tried something
                    like this before with the ((pause)) hand detection and
                    stuff then you would that you
                    need to like close your fist. But I've never tried it
                    before uhm so I just kinda
                    tied doing what comes naturally to me in the real world
                    which is like scooping them
                    up with my hands. Uhm.. that didn't work. *laughs* so
                    yeah I guess it would be nice
                    uhh: like a guidance is like (?)
TC                  00:03:01.021 - 00:03:31.080
```

```
Interviewer1     hm?
TC               00:03:21.378 - 00:03:21.908
SD               (2.15)

Interviewer3     *laughs*
TC               00:03:24.062 - 00:03:25.537
SD               (5.57)

Interviewer1     yeah? Uhm, then while you were painting you mentioned
                 that it was kinda hard to stop?
TC               00:03:31.113 - 00:03:37.750

Participant      uhm: yeah, yeah kind of like.. it felt like it is too
                 fluid maybe? And like in that
                 way if you have a standard paintbrush like you have more
                 control over? Here.. I felt
                 like it was just kinda moving on its own a little bit or
                 like a little like the
                 temp- sensitivity was kinda high? Uh so that took a bit
                 of a getting used to uhm
TC               00:03:37.750 - 00:04:01.540

Interviewer1     mhm?
TC               00:03:43.732 - 00:03:44.347
SD               (13.64)

Interviewer1     yeah?
TC               00:03:57.991 - 00:03:58.565
SD               (4.2)

Interviewer1     okay, uhm: do you have any additional comments uhh:
                 ((pause)) could be the program
                 or the test itself or..
TC               00:04:02.767 - 00:04:10.763
SD               (0.81)

Participant      uhm: ((pause)) no I don't really think so? It was a very
                 nice environment but I
                 think I said that already. And it was actually very fun,
                 very calming [$experience$]
TC               00:04:11.575 - 00:04:26.148

Interviewer1     *laughs*
TC               00:04:24.098 - 00:04:25.312
SD               (0.05)

Interviewer3     *laughs*
TC               00:04:25.368 - 00:04:26.138
SD               (0.29)

Interviewer1     alright! then I'll just stop the recording
TC               00:04:26.437 - 00:04:29.436
SD               (0.08)

TC               00:04:29.523 - 00:04:29.998
```

A.2.12   participant 11

Pre-interview

Thursday, May 20, 2021, 1:44 PM

Interviewer 1   Do you have any Vr experience?

TC   00:00:02.009 - 00:00:03.495

SD   (0.76)

Participant 11   Yes

TC   00:00:04.259 - 00:00:04.612

SD   (2.05)

Interviewer 1   yeah

TC   00:00:06.669 - 00:00:06.901

SD   (0.33)

Interviewer 1   Is that related to the study, or is that through personal use?

TC   00:00:07.234 - 00:00:10.686

SD   (0.96)

Participant 11   a bit of both

TC   00:00:11.646 - 00:00:12.120

SD   (0.42)

Interviewer 1   yeah

TC   00:00:12.548 - 00:00:12.853

SD   (0.31)

Interviewer 1   ehm, do you have experience with hand tracking specifically

TC   00:00:13.171 - 00:00:16.088

SD   (1.15)

Participant 11   ehm, yes

TC   00:00:17.247 - 00:00:18.140

SD   (0.41)

Interviewer 1   yeah

TC   00:00:18.555 - 00:00:18.928

SD   (1.01)

Interviewer 1   Ehm, can you tell us what you know about Scandinavian rock art?

TC   00:00:19.947 - 00:00:23.803

SD   (3.83)

Participant 11   I don't think I know that

TC   00:00:27.635 - 00:00:30.040

SD   (2.96)

Participant 11   yeah, (have to say) I know pretty much next to nothing

TC   00:00:33.005 - 00:00:35.376

SD   (0.27)

Interviewer 1   okay

TC   00:00:35.655 - 00:00:35.999

SD   (0.35)

Interviewer 1   ehm, then what about rock art in general?

TC   00:00:36.352 - 00:00:39.340

SD   (1.57)

Participant 11   I mean, I know that it exits and I know that it is a very old artform

TC   00:00:40.912 - 00:00:45.982

SD   (0.54)

Interviewer 1   yeah

TC   00:00:46.522 - 00:00:46.738

SD   (0.93)

Interviewer 1   ehm, then if you were to define Scandinavian rock art in your own words, how would you describe it

TC   00:00:47.674 - 00:00:54.146

SD   (3.11)

Participant 11   I don't even know how to describe that, I don't even really think I've ever...

TC   00:00:57.259 - 00:01:01.924

SD   (1.29)

Participant 11   seen any...

TC   00:01:03.221 - 00:01:04.355

SD   (0.92)

Participant 11   specifically Scandinavian rock art, if anything, maybe a ()

TC   00:01:05.283 - 00:01:11.422

SD   (1.48)

Participant 11   you know, the typical...

TC   00:01:12.902 - 00:01:14.970

SD   (1.54)

Participant 11   samples of rock art

TC   00:01:16.513 - 00:01:17.434

SD   (0.1)

Interviewer 1   yeah, yeah

TC   00:01:17.540 - 00:01:18.096

SD   (0.05)

Participant 11   sort of stick figure guys

TC   00:01:18.152 - 00:01:20.212

SD   (0.28)

Interviewer 1   alright, then I'll stop the interview

TC   00:01:20.501 - 00:01:22.599

SD   (1.15)

Interviewer 2   okay

TC   00:01:23.752 - 00:01:24.089

SD   (0.45)

Interviewer 2   just, do you have a question? ((towards interviewer 3))

TC   00:01:24.545 - 00:01:25.879

SD   (0.25)

Interviewer 3   yeah, I have a question if its fine

TC   00:01:26.134 - 00:01:27.469

SD   (0.07)

Interviewer 1   oh, no, I'll...

TC   00:01:27.542 - 00:01:28.452

SD   (0.2)

Interviewer 2   It's fine ((name of interviewer 1))

TC   00:01:28.660 - 00:01:29.652

SD   (0.46)

Interviewer 3   ehm

TC   00:01:30.115 - 00:01:30.451

SD   (0.22)

Interviewer 3   So you said you had like a little bit of understanding of what kinda rock art is,

                and said somehting about stick figures, are you able to tell us a little bit more

                about it?

TC   00:01:30.672 - 00:01:41.402

SD   (0.2)

Participant 11   I mean, you know...

TC   00:01:41.610 - 00:01:42.925

SD   (1.15)

Participant 11   occasionally, in like, history books or on the internet you'll see, like, a

                picture of, like, a very crudely drawn person in () spear or something, hunting,

                like, an animal or something

TC   00:01:44.076 - 00:01:56.945

SD   (0.54)

Interviewer 3   yeah

TC   00:01:57.492 - 00:01:58.076

SD   (0.94)

Interviewer 2   yeah, cool

TC   00:01:59.024 - 00:02:00.294

Gameplay

Thursday, May 20, 2021, 1:40 PM

Participant 11   oh shit...
TC   00:00:06.580 - 00:00:07.150
SD   (12.57)

Participant 11   Oh, it's already in
TC   00:00:19.721 - 00:00:20.527
SD   (1.04)

Participant 11   Okay, picking this one up
TC   00:00:21.575 - 00:00:24.280
SD   (14.14)

Participant 11   mhm, this one is not really...
TC   00:00:38.427 - 00:00:41.737
SD   (1.9)

Participant 11   okay
TC   00:00:43.645 - 00:00:44.918
SD   (3.44)

Participant 11   I guess I'll...
TC   00:00:48.361 - 00:00:49.665
SD   (0.75)

Participant 11   take this stick and stir it
TC   00:00:50.416 - 00:00:52.061
SD   (9.75)

Participant 11   Hah

TC   00:01:01.816 - 00:01:02.628

SD   (1.65)

Participant 11   And then...

TC   00:01:04.278 - 00:01:05.094

SD   (1.14)

Participant 11   the brush I guess...

TC   00:01:06.240 - 00:01:07.527

SD   (15.29)

Participant 11   Im guessing...

TC   00:01:22.825 - 00:01:23.881

SD   (2.48)

Participant 11   Oh, yeah!

TC   00:01:26.361 - 00:01:28.441

SD   (7.47)

Participant 11   Yeah, that's really neat

TC   00:01:35.920 - 00:01:38.112

SD   (24.38)

Participant 11   So I can also use my hand for this...

TC   00:02:02.497 - 00:02:05.121

SD   (15.64)

Participant 11   Yo, this is really cool

TC   00:02:20.768 - 00:02:22.592

SD   (7.94)

Participant 11   Just, defacing a bunch of, other people's art

TC   00:02:30.538 - 00:02:36.730

SD   (9.6)

Participant 11   I don't really know, is there like any specific task you want me to do, or?

TC   00:02:46.338 - 00:02:49.799

SD   (0.65)

Interviewer 1   Ehm, you have five minutes within the environment

TC   00:02:50.451 - 00:02:54.398

SD   (1.04)

Interviewer 2   I mean, the idea is just for you to mark your own () that says you are the new

                tribe in this area

TC   00:02:55.442 - 00:03:01.450

SD   (0.24)

Participant 11   ehm...

TC   00:03:01.694 - 00:03:02.357

SD   (57.08)

Participant 11   I think I like the brush more if I'm being honest

TC   00:03:59.439 - 00:04:03.236

SD   (114.76)

Participant 11   Yeah, I...

TC   00:05:58.002 - 00:05:58.810

SD   (1.21)

Participant 11   tracking is definitely a bit off I feel but...

TC   00:06:00.029 - 00:06:04.618

SD   (0.77)

Participant 11   I mean, overall, this is like really really neat

TC   00:06:05.390 - 00:06:08.427

SD   (3.09)

Participant 11   I think like, you can definitely do, like, still do, some pretty accurate

TC   00:06:11.520 - 00:06:16.990

SD   (8.01)

Participant 11   okay

TC   00:06:25.000 - 00:06:25.650

Post-interview

Thursday, May 20, 2021, 1:43 PM

Interviewer 1	Ehm, can you tell us what you know now about Scandinavian rock art?
TC	00:00:01.507 - 00:00:05.492
SD	(1.06)

Participant 11	Well, I...
TC	00:00:06.559 - 00:00:08.550
SD	(1.82)

Participant 11	I know that it is...
TC	00:00:10.376 - 00:00:11.160
SD	(1.01)

Participant 11	sort of very similar to what I expected it to look like
TC	00:00:12.171 - 00:00:15.848
SD	(2.15)

Participant 11	it, ehm...
TC	00:00:18.005 - 00:00:18.631
SD	(1.0)

Participant 11	seems, maybe, a bit more of a complex...
TC	00:00:19.638 - 00:00:22.852
SD	(1.67)

Participant 11	artform than I taught and there was a bit more in the process of making it than I taught
TC	00:00:24.529 - 00:00:31.443

SD   (1.54)

Interviewer 1   okay, can you, oh, I'm sorry
TC   00:00:32.992 - 00:00:34.210

Participant 11 ()
TC   00:00:33.692 - 00:00:34.193
SD   (1.7)

Participant 11 they were using brushes and stuff, which I did not expect
TC   00:00:35.899 - 00:00:40.301
SD   (0.46)

Interviewer 1   mhm
TC   00:00:40.764 - 00:00:41.192
SD   (1.98)

Interviewer 1   you, ehm, now that you mention process, can you try to explain, like, ehm...
TC   00:00:43.180 - 00:00:48.243
SD   (3.38)

Interviewer 1   I lost my trail of taught
TC   00:00:51.629 - 00:00:52.844
SD   (0.37)

Interviewer 1   I, ehm...
TC   00:00:53.223 - 00:00:53.639
SD   (0.31)

Interviewer 2   It's okay

TC   00:00:53.952 - 00:00:54.342

SD   (0.43)

Interviewer 2   Just ehm, maybe try to elaborate on what you think goes into it

TC   00:00:54.774 - 00:00:58.228

SD   (0.04)

Interviewer 1   Thank you

TC   00:00:58.271 - 00:00:58.679

SD   (1.06)

Participant 11   Well, it definetly seems like it wasn't just like...

TC   00:00:59.743 - 00:01:02.393

SD   (1.9)

Participant 11   take, i don't know, dirt or something and just, like, rub it on the wall, there

                 was, like, some

TC   00:01:04.298 - 00:01:11.390

SD   (2.48)

Participant 11   dust, some dye, that are mixed together with...

TC   00:01:13.873 - 00:01:18.053

SD   (1.6)

Participant 11   some form of liquid

TC   00:01:19.659 - 00:01:21.304

SD   (1.43)

Participant 11   Then had to like stir it, and like, in order to make the thing

TC   00:01:22.742 - 00:01:26.430

SD   (3.1)

Interviewer 1   When you painted on the wall, there was a certain point when you actually drew on

                 top of what was already there, can you explain to me what your tought process was

                 there?

TC   00:01:29.533 - 00:01:41.432

SD   (2.17)

Participant 11   I mean, it was hardly...

TC   00:01:43.602 - 00:01:45.269

SD   (1.71)

Participant 11   maybe just me testing the system, seeing how accurately I could recreate what was

                 already on the wall, and...

TC   00:01:46.980 - 00:01:54.882

SD   (1.31)

Participant 11   sort of testing the limits of it

TC   00:01:56.194 - 00:01:57.418

SD   (0.27)

Interviewer 1   mhm

TC   00:01:57.691 - 00:01:58.082

SD   (1.01)

Interviewer 1   Ehm, iterating upon that, you mentioned that the hand tracking was kinda...

TC   00:01:59.098 - 00:02:04.162

SD	(0.79)
Interviewer 1	I don't remember explicitly what you said, but it was something that it was kinda off, in a sense
TC	00:02:04.953 - 00:02:09.594
SD	(0.13)
Participant 11	yeah, the hand tracking was a bit off
TC	00:02:09.729 - 00:02:13.353
SD	(1.01)
Participant 11	well, of course, when I wasn't directly looking at the hand, it wasn't really following along and...
TC	00:02:14.369 - 00:02:20.996
SD	(1.29)
Participant 11	most of the time, if the orientation was a bit off, it would sometimes start jittering a bit
TC	00:02:22.292 - 00:02:27.689
SD	(2.25)
Participant 11	But, ehm, overall, I think I am pretty impressed with the tracking and what it was capable of doing
TC	00:02:29.940 - 00:02:36.621
SD	(1.37)
Interviewer 1	Then, when you run the mixing process, and there was a little trouble grabbing the bowls...
TC	00:02:37.994 - 00:02:43.328

SD   (1.15)

Interviewer 1   Do you feel like there should have been something in the program that would've

                kinda instructed you how to grab it or...

TC   00:02:44.481 - 00:02:51.544

SD   (1.11)

Interviewer 1   some signifiers or...

TC   00:02:52.654 - 00:02:54.345

SD   (0.58)

Participant 11 That would maybe have helped, I am not sure that would maybe like...

TC   00:02:54.931 - 00:03:00.025

SD   (1.05)

Participant 11 take you a bit of the experience, but it could also be a bit beneficial because I

                wasn't really sure how I was supposed to grab the bowl, in order for it to

                actually attach to my hand

TC   00:03:01.080 - 00:03:13.040

SD   (0.34)

Interviewer 1   yeah

TC   00:03:13.387 - 00:03:13.676

SD   (0.57)

Interviewer 1   okay

TC   00:03:14.251 - 00:03:14.650

SD   (0.41)

Interviewer 1	ehm...
TC	00:03:15.064 - 00:03:15.574
SD	(0.34)

Interviewer 1	Do you have any additional comments?
TC	00:03:15.917 - 00:03:17.522
SD	(1.05)

Interviewer 1	for the program, or the test itself?
TC	00:03:18.578 - 00:03:21.131
SD	(2.75)

Participant 11	Not really, I think its an impressive program and it was pretty fun to mess around with
TC	00:03:23.887 - 00:03:30.678
SD	(0.4)

Interviewer 1	Okay, do you guys have? ((towards the other interviewers))
TC	00:03:31.079 - 00:03:33.582
SD	(1.72)

Interviewer 2	yeah
TC	00:03:35.311 - 00:03:35.566
SD	(0.47)

Interviewer 2	I have a question, you talk little a bit about, that you taught that ehm...
TC	00:03:36.040 - 00:03:39.794
SD	(1.67)

Interviewer 2   the art itself was a little bit more elaborate than you taught, I think you said

                 that at least...

TC   00:03:41.465 - 00:03:48.191

SD   (1.0)

Interviewer 2   can you then elaborate, on what you think that they are trying to depict

TC   00:03:49.199 - 00:03:55.190

SD   (1.55)

Participant 11   I mean, I still think, like, they were mostly trying to depict

TC   00:03:56.743 - 00:04:00.931

SD   (2.73)

Participant 11   their reality, like what their day to day life was...

TC   00:04:03.662 - 00:04:08.532

SD   (2.38)

Participant 11   what they went about doing...

TC   00:04:10.918 - 00:04:12.246

SD   (1.58)

Participant 11   it was definitely like...

TC   00:04:13.829 - 00:04:14.725

SD   (1.31)

Participant 11   a bit more than just, like, stick figures on a wall

TC   00:04:16.037 - 00:04:19.690

SD   (1.91)

Participant 11   so, yeah...

TC   00:04:21.607 - 00:04:22.544

SD   (1.03)

Interviewer 2   okay

TC   00:04:23.576 - 00:04:23.998

A.2.13   Participant 12

Pre-interview

Thursday, May 20, 2021, 1:43 PM

Interviewer 1	Ehm, do you have any VR experience?
TC	00:00:03.950 - 00:00:06.578
SD	(0.89)

Participant 12	Ehm, very little
TC	00:00:07.474 - 00:00:09.148
SD	(0.33)

Interviewer 1	Is it study related, or is it through personal use?
TC	00:00:09.479 - 00:00:12.475
SD	(0.41)

Participant 12	Ehm, I've tried other people's VR
TC	00:00:12.886 - 00:00:15.134
SD	(0.18)

Interviewer 1	alright
TC	00:00:15.314 - 00:00:15.593

Participant 12	That's about it
TC	00:00:15.593 - 00:00:16.533
SD	(0.99)

Interviewer 3	a bit of beat saber...
TC	00:00:17.527 - 00:00:18.533
SD	(0.64)

Participant 12   Yeah, pretty much

TC   00:00:19.177 - 00:00:20.240

SD   (0.87)

Interviewer 1   Ehm, do you have experience with hand tracking specifically?

TC   00:00:21.115 - 00:00:24.118

SD   (1.0)

Participant 12   Ehm, I have some from when I was setting up our, our ((pauses)) experiment

                 actually, so I do have a little bit of experience with that too, but its again...

TC   00:00:25.123 - 00:00:35.635

SD   (1.4)

Participant 12   fifteen, twenty minutes of using ((pauses)) a VR headset, that's about it

TC   00:00:37.035 - 00:00:41.303

SD   (0.21)

Interviewer 1   Alright, can you tell us what you know about Scandinavian rock art?

TC   00:00:41.520 - 00:00:46.514

SD   (3.57)

Participant 12   Ehm...

TC   00:00:50.090 - 00:00:50.780

SD   (1.21)

Participant 12   Ehm...

TC   00:00:51.997 - 00:00:52.460

SD   (1.22)

Participant 12   I don't know anything at all, don't think, maybe that they painted in caves, that's probably it...

TC   00:00:53.687 - 00:00:59.541

SD   (0.27)

Interviewer 1   Mhm, ehm...

TC   00:00:59.814 - 00:01:00.927

SD   (0.74)

Interviewer 1   What if we take a step back and ((pauses)) about rock art in general?

TC   00:01:01.675 - 00:01:06.178

SD   (0.79)

Participant 12   Yeah, that's kinda what it ties into, I have a vague idea that they proably painted in caves, with whatever they could get their hands on

TC   00:01:06.968 - 00:01:15.370

SD   (0.46)

Interviewer 1   Mhm, mhm

TC   00:01:15.834 - 00:01:16.489

SD   (0.17)

Participant 12   Whether it be if they found chalk, I would assume...

TC   00:01:16.666 - 00:01:19.329

SD   (1.28)

Participant 12   ehm...

TC   00:01:20.611 - 00:01:21.195

SD   (0.75)

Participant 12   or whatever

TC   00:01:21.945 - 00:01:22.569

SD   (0.28)

Interviewer 1   Yeah, so, if I were to ask you what Scandinavian rock art is, how would you define

                 it with your own words

TC   00:01:22.849 - 00:01:29.357

SD   (4.16)

Participant 12   yes...

TC   00:01:33.523 - 00:01:33.827

SD   (0.5)

Interviewer 3   hhh

TC   00:01:34.328 - 00:01:35.058

SD   (0.23)

Participant 12   I ((pauses)) genuinly don't know, painting in caves!

TC   00:01:35.297 - 00:01:39.501

SD   (0.32)

Interviewer 1   Alright, then I'll stop...

TC   00:01:39.829 - 00:01:41.145

SD   (0.15)

Interviewer 3   Can I have another question, before you stop? ((towards interviewer 1))

TC   00:01:41.298 - 00:01:42.767

SD   (0.33)

Interviewer 3 You mentioned painting in caves, can you elaborate on that?

TC 00:01:43.102 - 00:01:47.377

SD (0.17)

Participant 12 Ehm...

TC 00:01:47.552 - 00:01:48.529

SD (1.3)

Participant 12 that, they just went up to a wall and then they drew whatever, I don't really know

anythign about it so...

TC 00:01:49.829 - 00:01:56.614

SD (0.94)

Interviewer 3 Yeah, okay, that's fair

TC 00:01:57.558 - 00:01:58.468

Participant 12 That's as far as I can elaborate

TC 00:01:58.468 - 00:01:59.747

SD (0.38)

Interviewer 3 Yeah, that's cool

TC 00:02:00.129 - 00:02:00.991

Gameplay

Thursday, May 20, 2021, 1:41 PM

Participant 12   And then i can just walk around, I assume?
TC   00:00:02.360 - 00:00:04.116
SD   (0.29)

Interviewer 1   yes
TC   00:00:04.410 - 00:00:04.950
SD   (0.39)

Interviewer 3   The guardian is set up, so you shouldn't stumble into any furniture without a
                 warning
TC   00:00:05.340 - 00:00:10.513
SD   (26.14)

Interviewer 3   We would encourage you to think out loud
TC   00:00:36.657 - 00:00:38.773
SD   (0.24)

Participant 12   Okay, right, right
TC   00:00:39.013 - 00:00:39.948
SD   (0.45)

Participant 12   Ehm, I'm just right now, trying to...
TC   00:00:40.407 - 00:00:42.913
SD   (1.16)

Participant 12   get a hold of that, and somehow, hhh, it worked, I'm not sure how
TC   00:00:44.075 - 00:00:50.533

SD	(1.07)

Participant 12	Then I'll stir it up
TC	00:00:51.605 - 00:00:53.156
SD	(0.52)

Participant 12	Oh, this sounds are loud
TC	00:00:53.677 - 00:00:55.044
SD	(0.78)

Interviewer 3	hhh, is it too loud?
TC	00:00:55.831 - 00:00:56.947
SD	(0.18)

Participant 12	ehm...
TC	00:00:57.130 - 00:00:57.798
SD	(0.42)

Participant 12	They are a bit loud
TC	00:00:58.227 - 00:00:59.339
SD	(0.06)

Interviewer 3	I can turn it a bit down for you if its a problem
TC	00:00:59.399 - 00:01:01.886
SD	(0.03)

Participant 12	I think it's fine, but they are a bit loud
TC	00:01:01.916 - 00:01:05.136
SD	(0.69)

Participant 12   alright

TC   00:01:05.835 - 00:01:06.127

SD   (0.28)

Participant 12   So, I stirred it up here

TC   00:01:06.407 - 00:01:08.570

SD   (0.66)

Participant 12   I think

TC   00:01:09.231 - 00:01:10.063

SD   (0.48)

Participant 12   It's what is telling me

TC   00:01:10.552 - 00:01:11.439

SD   (0.68)

Participant 12   So, like

TC   00:01:12.120 - 00:01:12.450

SD   (0.59)

Participant 12   dip the brush, because...

TC   00:01:13.047 - 00:01:14.351

SD   (0.3)

Participant 12   apparently...

TC   00:01:14.653 - 00:01:15.071

SD   (0.48)

Participant 12   they painted with brush then

TC   00:01:15.551 - 00:01:17.003

SD   (0.76)

Participant 12   I was not aware of that

TC   00:01:17.767 - 00:01:19.183

SD   (2.43)

Participant 12   I guess I'll have to keep going

TC   00:01:21.616 - 00:01:22.848

SD   (0.58)

Participant 12   question mark?

TC   00:01:23.429 - 00:01:23.837

SD   (0.62)

Participant 12   hhh

TC   00:01:24.462 - 00:01:25.061

SD   (1.42)

Participant 12   ehm...

TC   00:01:26.485 - 00:01:27.106

SD   (0.86)

Participant 12   I'll just try painting something here

TC   00:01:27.968 - 00:01:29.645

SD   (7.55)

Participant 12   And, as a...

TC   00:01:37.197 - 00:01:38.077

SD   (0.36)

Participant 12   programmer, you know it, Hello...

TC   00:01:38.445 - 00:01:42.130

SD   (3.78)

Participant 12   world.

TC   00:01:45.913 - 00:01:46.625

SD   (1.36)

Participant 12   Ehm...

TC   00:01:47.993 - 00:01:48.768

SD   (0.26)

Participant 12   I think it ran out

TC   00:01:49.028 - 00:01:49.801

SD   (0.35)

Participant 12   Unless I did, I didn't get close enough, I'm not sure

TC   00:01:50.153 - 00:01:53.097

SD   (5.61)

Participant 12   Ehm...and actually this is also the story of how programmers got used to writing

                hello world, because they saw this

TC   00:01:58.712 - 00:02:05.016

SD   (0.53)

Participant 12   Ehm...

TC   00:02:05.552 - 00:02:06.354

SD   (1.01)

Participant 12   And again, I'll do another ((pauses)) how far can i go this way?

TC   00:02:07.370 - 00:02:10.522

SD   (0.32)

Interviewer 3   ehm, you can still go a few meters, 2 meters

TC   00:02:10.845 - 00:02:13.275

SD   (0.49)

Participant 12   So, like here?

TC   00:02:13.765 - 00:02:14.835

SD   (0.23)

Interviewer 3   Mhm, that should, yeah that's good

TC   00:02:15.074 - 00:02:17.264

SD   (0.99)

Participant 12   Ehm...and another classical drawing of me

TC   00:02:18.261 - 00:02:21.241

SD   (0.5)

Participant 12   Ehm...

TC   00:02:21.745 - 00:02:22.537

SD   (0.35)

Participant 12   A good old Homer Simpson

TC   00:02:22.896 - 00:02:24.529

SD   (1.12)

Participant 12   hhh

TC   00:02:25.649 - 00:02:27.596

SD   (3.02)

Participant 12   Ehm...its ehm...

TC   00:02:30.622 - 00:02:32.478

SD   (0.35)

Participant 12   a bit interesting, because I'm not really, oh

TC   00:02:32.837 - 00:02:36.354

SD   (0.32)

Participant 12   hhh

TC   00:02:36.674 - 00:02:38.568

SD   (0.59)

Participant 12   I'm not really sure how this paint bursh works

TC   00:02:39.158 - 00:02:41.896

SD   (1.15)

Participant 12   Ehm...so he's having a weird face, with some interesting hair

TC   00:02:43.053 - 00:02:48.197

SD   (0.79)

Participant 12   ehm...

TC   00:02:48.993 - 00:02:49.785

SD   (0.73)

Participant 12   And then his ear

TC   00:02:50.522 - 00:02:51.346

SD   (0.88)

Participant 12   sounds about right

TC   00:02:52.231 - 00:02:53.452

SD   (1.27)

Participant 12   How much more do I need to paint?

TC   00:02:54.722 - 00:02:56.090

SD   (0.45)

Participant 12   Because I think this, can this keep going forever ((regarding the brush))

TC   00:02:56.545 - 00:02:59.168

SD   (0.21)

Interviewer 3   You have like a time, when you can just paint whatever you like

TC   00:02:59.380 - 00:03:03.486

Participant 12   I'm just trying to see if you can use this paint brush up right now ((if the brush
                 runs out of paint))

TC   00:03:03.471 - 00:03:07.254

SD   (1.36)

Participant 12   Because I don't know, I dipped it a few times and I can just keep going

TC   00:03:08.614 - 00:03:12.762

SD   (1.52)

Participant 12   That's kinda what I'm just trying to do here

TC   00:03:14.286 - 00:03:16.273

SD   (3.64)

Participant 12   Ehm.. I think I can

TC   00:03:19.919 - 00:03:21.175

SD   (0.95)

Participant 12   Can I hold this in a different way, because it feels...

TC   00:03:22.127 - 00:03:24.908

SD   (0.81)

Participant 12   very...

TC   00:03:25.721 - 00:03:26.215

SD   (1.4)

Participant 12   Actually, this seems better, I dunno

TC   00:03:27.619 - 00:03:29.822

SD   (9.01)

Participant 12   I mean, this is sort of like a cave, so I'm not completely wrong on that, I guess

TC   00:03:38.838 - 00:03:44.956

SD   (1.71)

Interviewer 1   You can also use your hands

TC   00:03:46.670 - 00:03:49.559

SD   (0.7)

Participant 12   Oh

TC	00:03:50.266 - 00:03:50.938
SD	(3.3)

Participant 12	I can...((dips hand in))
TC	00:03:54.241 - 00:03:55.405
SD	(4.35)

Participant 12	Ehm...I'm not allowed to dip the whole hand apparently
TC	00:03:59.764 - 00:04:03.389
SD	(8.68)

Participant 12	That seems, a bit off
TC	00:04:12.072 - 00:04:15.012
SD	(1.4)

Participant 12	from...
TC	00:04:16.421 - 00:04:16.991
SD	(0.63)

Participant 12	I don't know if you can see this.
TC	00:04:17.627 - 00:04:19.110
SD	(1.05)

Participant 12	But, if I do this here, and then draw, its like...
TC	00:04:20.165 - 00:04:23.253
SD	(0.96)

Participant 12	some of it doesn't get in there, I feel like I'm pushing but its...
TC	00:04:24.220 - 00:04:28.220

SD   (1.5)

Participant 12   sort of attaching to it

TC   00:04:29.724 - 00:04:31.325

SD   (0.52)

Participant 12   And then its like, the thumb is further off than the rest of the fingers seem like

TC   00:04:31.853 - 00:04:36.461

SD   (1.91)

Participant 12   But at least that's how I feel it

TC   00:04:38.379 - 00:04:39.941

SD   (4.18)

Participant 12   Ehm...

TC   00:04:44.126 - 00:04:44.808

SD   (3.37)

Participant 12   Yeah, hhh

TC   00:04:48.181 - 00:04:50.417

SD   (1.26)

Participant 12   hhh

TC   00:04:51.683 - 00:04:52.211

SD   (0.44)

Participant 12   hhh, I, ehm...

TC   00:04:52.656 - 00:04:53.782

SD   (0.28)

Interviewer 1	You have one minute left
TC	00:04:54.062 - 00:04:55.810
SD	(0.25)

Participant 12	One minute left of painting...
TC	00:04:56.060 - 00:04:57.767
SD	(0.85)

Participant 12	Right, I have a good idea then, if I can find space
TC	00:04:58.619 - 00:05:01.482
SD	(5.01)

Participant 12	Ehm...
TC	00:05:06.498 - 00:05:07.078
SD	(0.95)

Participant 12	That's, ehm, interesting
TC	00:05:08.035 - 00:05:09.340
SD	(1.61)

Participant 12	A good old Peter Griffin if I can manage
TC	00:05:10.956 - 00:05:13.330
SD	(3.13)

Participant 12	People would know its me, so...that's what you told me to, no?
TC	00:05:16.469 - 00:05:20.106
SD	(0.94)

Participant 12   hhh

TC   00:05:21.052 - 00:05:21.734

SD   (1.52)

Participant 12   ehm...

TC   00:05:23.263 - 00:05:23.919

SD   (0.91)

Participant 12   hhh, this is so hhh

TC   00:05:24.830 - 00:05:28.214

SD   (1.21)

Participant 12   This is so weird but so fun at the same time

TC   00:05:29.431 - 00:05:32.894

SD   (7.13)

Participant 12   there we go

TC   00:05:40.032 - 00:05:40.777

SD   (0.7)

Interviewer 1   I'll stop the program and you can take your headset off

TC   00:05:41.477 - 00:05:45.304

Post-interview

Thursday, May 20, 2021, 1:42 PM

Interviewer 1	Alright, can you tell us what you know now about Scandinavian rock art?
TC	00:00:05.884 - 00:00:10.958
SD	(0.92)

Participant 12	Ehm, well I know they mixed up something, but I wasn't really sure what was in the bowls, because I was focusing too much on picking up the bowls rather than looking at what it was, so it just looked like...
TC	00:00:11.881 - 00:00:25.077
SD	(2.33)

Participant 12	I dunno
TC	00:00:27.415 - 00:00:27.901
SD	(0.32)

Participant 12	Fat?
TC	00:00:28.226 - 00:00:28.547
SD	(0.19)

Participant 12	maybe?
TC	00:00:28.744 - 00:00:29.269
SD	(2.43)

Participant 12	It was something white and something red, which, I mean...
TC	00:00:31.705 - 00:00:34.460
SD	(0.82)

Participant 12	considering I didn't have to do anything with it, I guess it was fat and blood

	from an animal, that would be my guess, but i've no clue
TC	00:00:35.285 - 00:00:42.743
SD	(0.89)

Interviewer 1	okay
TC	00:00:43.634 - 00:00:43.882
SD	(0.22)

Participant 12	ehm...
TC	00:00:44.108 - 00:00:44.685
SD	(0.28)

Participant 12	because I just had to mix it or stir it for not too long, and then I could just paint with it, also, apparently, they had brushes and I had no clue about that
TC	00:00:44.968 - 00:00:53.829
SD	(1.6)

Interviewer 1	Ehm...for when you have to...
TC	00:00:55.431 - 00:00:57.994
SD	(0.63)

Interviewer 1	mix...
TC	00:00:58.628 - 00:00:59.061
SD	(0.94)

Interviewer 1	the materials...
TC	00:01:00.007 - 00:01:00.530
SD	(0.51)

Interviewer 1   ehm... you had to grab the bowl...

TC   00:01:01.046 - 00:01:02.719

SD   (0.72)

Participant 12   mhm

TC   00:01:03.439 - 00:01:03.759

Interviewer 1   ehm, throughout the test you actually had a hard time grabbing them

TC   00:01:03.775 - 00:01:07.077

SD   (0.94)

Interviewer 1   ehm... would you say that

TC   00:01:08.018 - 00:01:09.443

SD   (0.69)

Interviewer 1   you needed some instructions, in order to know how you should probably grab them?

TC   00:01:10.137 - 00:01:14.167

SD   (0.39)

Participant 12   Yeah, because I thought, I could just put my hand to it, and it would latch on, if I

                 put it from the back side, that there was some kind of handle that, that, it

                 would make, like, make it easier to me so I didn't really know that I I just had

                 to do this ((gesturing))

TC   00:01:14.560 - 00:01:26.693

SD   (0.89)

Participant 12   or what it was I did, I actually don't know what I ended up doing

TC   00:01:27.592 - 00:01:29.941

SD   (0.42)

Interviewer 1   You actually had to do it like this ((gesturing))

TC   00:01:30.366 - 00:01:31.566

SD   (0.71)

Participant 12   mhm

TC   00:01:32.285 - 00:01:32.493

SD   (1.39)

Participant 12   ehm...because I...

TC   00:01:33.891 - 00:01:35.184

SD   (1.28)

Participant 12   at some point the bowl just tipped over, over the rock, and then it, then poured

                 into the thing, which confused me a lot, I was like, wait this is empty, oh! it's

                 there! I ((pauses)) I was incredibly confused by that, and I was still struggling

                 to try to pick it up and I couldn't put two hands around it, it just pushed it

                 further away ((pauses)) I couldn't grab it how I taught and then, all of a sudden,

                 I just had it in my hand, and I didn't know, and it was empty as well, and I'm

                 like...

TC   00:01:36.464 - 00:02:01.257

SD   (2.01)

Participant 12   okay...

TC   00:02:03.269 - 00:02:03.725

SD   (1.1)

Participant 12   ehm...

TC   00:02:04.834 - 00:02:05.587

SD   (0.21)

Participant 12   and then, with the second one it went a bit faster, I don't know why, but it just

                 ((pauses)) faster I could do it and then I just had to stir it for a while

TC   00:02:05.798 - 00:02:16.082

SD   (1.48)

Interviewer 1   okay

TC   00:02:17.563 - 00:02:17.898

SD   (0.27)

Interviewer 1   and then, when you had to dip...

TC   00:02:18.172 - 00:02:19.699

SD   (0.61)

Interviewer 1   either the...

TC   00:02:20.309 - 00:02:21.038

SD   (0.54)

Interviewer 1   brush

TC   00:02:21.583 - 00:02:21.838

SD   (0.15)

Interviewer 1   actually, in the start, you had to dip the brush...

TC   00:02:21.988 - 00:02:24.111

SD   (0.25)

Participant 12   mhm

TC   00:02:24.367 - 00:02:24.641

SD   (0.05)

Interviewer 1   Ehm...you were unsure whether you should do that continously until the...

TC   00:02:24.691 - 00:02:29.887

SD   (0.25)

Participant 12   I didn't know if there was like a limit of how much paint could get on it, or if

                       it would run dry, so I was just...

TC   00:02:30.144 - 00:02:37.021

SD   (0.59)

Participant 12   keeping on dipping it, because the other animations told me that I didn't need to

                       do this anymore, so I could continue, but this one kept showing the paint brush

                       and the hand dipping. So I was like, oh!, I guess I just continue doing this until

                       () you can paint now, and then after, I dunno how long, proably fifteen, twenty

                       seconds, I realised that I could...

TC   00:02:37.619 - 00:02:57.848

SD   (0.74)

Participant 12   probably just go paint...

TC   00:02:58.591 - 00:02:59.604

SD   (1.09)

Participant 12   ehm...

TC   00:03:00.694 - 00:03:01.108

SD   (0.96)

Participant 12   and then, if you didn't say the thing about the hand I wouldn't have realised, I

                       just taught it was some weird animation of the hand holding the brush

TC   00:03:02.070 - 00:03:09.450

SD   (0.49)

Interviewer 1   okay

TC   00:03:09.945 - 00:03:10.400

SD   (1.31)

Participant 12   I dunno why

TC   00:03:11.713 - 00:03:12.690

SD   (1.27)

Participant 12   but that's what i assumed when I was in there...

TC   00:03:13.968 - 00:03:15.922

SD   (0.56)

Interviewer 1   okay

TC   00:03:16.482 - 00:03:16.778

SD   (0.55)

Interviewer 1   Ehm...and when you proceeded to painting on the wall...

TC   00:03:17.333 - 00:03:21.860

SD   (2.27)

Interviewer 1   Did you just...

TC   00:03:24.138 - 00:03:24.701

SD   (0.88)

Interviewer 1   how do I phrase that...I noticed that you didn't really go for spots where there

                 wasn't anything on, you just start ed painting on the whole thing

TC	00:03:25.587 - 00:03:33.357
SD	(0.48)

Participant 12	mhm
TC	00:03:33.846 - 00:03:34.278
SD	(0.67)

Interviewer 1	Can you tell me, like, the taught process of that?
TC	00:03:34.956 - 00:03:37.271
SD	(0.23)

Participant 12	Ehm...I mean you told me that someone left and that I needed to make sure it was my own
TC	00:03:37.504 - 00:03:42.222
SD	(0.35)

Participant 12	So I'm like: I'm just going to draw all over the...all of it...
TC	00:03:42.577 - 00:03:45.549
SD	(1.25)

Participant 12	As to make the newest paint be on top and cover as much as possible, as to make it look like my own
TC	00:03:46.803 - 00:03:53.795
SD	(0.35)

Interviewer 1	mhm
TC	00:03:54.151 - 00:03:54.350
SD	(0.4)

Participant 12   And then I put in a couple of personal hand prints

TC   00:03:54.755 - 00:03:57.190

SD   (0.94)

Interviewer 1   yeah

TC   00:03:58.134 - 00:03:58.445

SD   (0.41)

Participant 12   here and there...

TC   00:03:58.862 - 00:03:59.448

SD   (1.26)

Participant 12   hhh

TC   00:04:00.710 - 00:04:02.055

SD   (0.2)

Interviewer 1   That, that's another thing, did you...

TC   00:04:02.256 - 00:04:05.102

SD   (0.41)

Interviewer 1   take what was already there for inspiration when you had to paint your own stuff?

TC   00:04:05.518 - 00:04:10.367

SD   (0.83)

Participant 12   I didn't look at it, I'm going to be honest, I didn't look at it at all

TC   00:04:11.202 - 00:04:15.283

SD   (0.63)

Interviewer 1   Okay, then a more technical question, when you used your hand, you mentioned that

	it was kinda off...
TC	00:04:15.919 - 00:04:21.604
SD	(0.11)

Participant 12	ehm...
TC	00:04:21.714 - 00:04:22.456
SD	(0.28)

Participant 12	yeah, it seemd like the fingers was a bit off, and at some point, I wanted to just put my hand in there...
TC	00:04:22.739 - 00:04:28.137
SD	(0.32)

Participant 12	and paint with the whole hand...
TC	00:04:28.465 - 00:04:29.972
SD	(0.26)

Participant 12	like when I was trying to dip it in paint, and I couldn't
TC	00:04:30.239 - 00:04:32.540
SD	(0.51)

Participant 12	and then I tried to just, over there, just draw with five fingers, but it only...
TC	00:04:33.056 - 00:04:37.546
SD	(0.29)

Participant 12	took four of them...
TC	00:04:37.842 - 00:04:38.915
SD	(0.39)

Participant 12   And then I had to stand like this wierd wait to get the thumb in there too...

TC   00:04:39.307 - 00:04:43.458

SD   (0.58)

Participant 12   and...ehm..it seemed like it was more distant than what the hand showed, as well

as how I felt...

TC   00:04:44.044 - 00:04:49.594

SD   (0.67)

Participant 12   And it was also there that i realised that it was

TC   00:04:50.266 - 00:04:52.458

SD   (0.55)

Participant 12   I don't know if it was magnetic, or what it was...

TC   00:04:53.016 - 00:04:55.316

SD   (0.4)

Participant 12   but that the hand would kinda latch onto it, so if I kept pushing forwards...

TC   00:04:55.722 - 00:04:59.682

SD   (0.37)

Participant 12   it would still, the hand would still be there, unless...

TC   00:05:00.052 - 00:05:02.508

SD   (0.71)

Participant 12   I dunno, invisible wall, although it looked like it was a bit distant from the

wall too

TC   00:05:03.220 - 00:05:07.896

SD   (0.71)

Participant 12   So that confused me, that i couldn't get the thumb to touch, and when I tried even

more, my hand just went through, but the other one stayed there, soo...

TC   00:05:08.613 - 00:05:17.501

SD   (1.09)

Participant 12   yeah

TC   00:05:18.594 - 00:05:18.930

SD   (1.32)

Interviewer 1   So, do you think you ((pauses)) in that specific interaction would've needed some

feedback in some sense?

TC   00:05:20.254 - 00:05:25.652

SD   (0.61)

Participant 12   Ehm...I think more feedback...

TC   00:05:26.270 - 00:05:28.504

SD   (0.47)

Participant 12   of some sort would have helped, because it looked like I could have moved the hand

closer to than wall than I could

TC   00:05:28.983 - 00:05:33.917

SD   (1.16)

Participant 12   ehm, and also something else, I tried painting just with my...ehm

TC   00:05:35.077 - 00:05:38.845

SD   (0.9)

Participant 12   pointy finger, I guess its called

TC	00:05:39.751 - 00:05:41.936
SD	(0.39)

Participant 12	And it drew two lines
TC	00:05:42.326 - 00:05:44.381
SD	(0.55)

Participant 12	Which confused me since, I mean, it showed me that it was only my...
TC	00:05:44.936 - 00:05:49.215
SD	(0.98)

Participant 12	one finger...
TC	00:05:50.204 - 00:05:50.929
SD	(0.45)

Participant 12	and then, it drew two lines next to each other, and I was a bit confused about that too...
TC	00:05:51.385 - 00:05:56.446
SD	(0.95)

Interviewer 1	ehm...
TC	00:05:57.405 - 00:05:57.962
SD	(0.55)

Interviewer 1	Also, I, ehm...
TC	00:05:58.515 - 00:05:59.633
SD	(1.05)

Interviewer 1	Did you ever consider using two tools at the same time, like both hand and brush?

TC   00:06:00.688 - 00:06:06.763

SD   (0.65)

Participant 12   I actually did not

TC   00:06:07.414 - 00:06:08.735

SD   (0.09)

Interviewer 1   okay

TC   00:06:08.826 - 00:06:09.178

SD   (0.53)

Participant 12   Not at any point

TC   00:06:09.708 - 00:06:10.474

SD   (0.79)

Participant 12   I was like, I can do either one or the other, that's what I assumed

TC   00:06:11.265 - 00:06:14.174

SD   (0.58)

Participant 12   then in the end, when you told me I could draw with the hand, I had pretty much

              filled up the whole space hhh. I mean, I have pretty much filled up the whole

              space so I didn't really get to that thought, because you were like, there is one

              minute left, and I'm like, wait, where's the space so I can...guess I can go down

              here and draw...

TC   00:06:14.762 - 00:06:34.056

SD   (0.49)

Participant 12   a bit more...

TC   00:06:34.555 - 00:06:35.236

SD   (0.32)

Participant 12   but I didn't really consider that i could throw two things in, since...

TC   00:06:35.556 - 00:06:38.239

SD   (0.99)

Participant 12   I guess spatial

TC   00:06:39.231 - 00:06:40.050

SD   (1.5)

Participant 12   I didn't have enough space to draw more

TC   00:06:41.558 - 00:06:43.047

SD   (1.66)

Interviewer 1   You also mentioned at one point, when you were holding the brush it was kinda

              awkward, you mentioned something that you wanted to hold it in a different way but

              then it was actually fine?

TC   00:06:44.713 - 00:06:54.790

SD   (0.32)

Participant 12   It was because, I don't know if with my hand, but I felt like I was holding it

              like this here ((gesturing)), and then painting like that ((gesturing)), that's

              how it felt like

TC   00:06:55.116 - 00:07:03.695

SD   (0.33)

Interviewer 1   kinda like the stick?

TC   00:07:04.031 - 00:07:04.909

SD   (1.21)

Participant 12   yeah

TC   00:07:06.126 - 00:07:06.583

SD   (0.17)

Participant 12   kinda like with the stick, when I was holding it and stirring

TC   00:07:06.755 - 00:07:09.499

SD   (0.48)

Participant 12   Ehm, but then I somehow managed to get it like this here ((gesturing)), which
                 still felt a bit awkward, but felt better, it was just...

TC   00:07:09.986 - 00:07:16.453

SD   (1.41)

Participant 12   ehm, if I try to explain it, its with three fingers gripped, and then...

TC   00:07:17.867 - 00:07:21.853

SD   (0.71)

Participant 12   the end of it in my palm, ehm...

TC   00:07:22.564 - 00:07:25.012

SD   (0.97)

Participant 12   It was still a bit awkward...

TC   00:07:25.985 - 00:07:27.503

SD   (0.4)

Participant 12   ehm, but less awkward than just having a full grip on it

TC   00:07:27.904 - 00:07:31.208

SD   (3.03)

Interviewer 1	Do you have any? ((towards other interviewer))
TC	00:07:34.242 - 00:07:35.073
SD	(2.16)

Interviewer 2	I actually have one question
TC	00:07:37.233 - 00:07:39.246
SD	(0.61)

Interviewer 2	You, at some point, asked us if had the opportunity to move more in another direction...
TC	00:07:39.860 - 00:07:45.856
SD	(0.36)

Participant 12	mhm
TC	00:07:46.217 - 00:07:46.641
SD	(0.35)

Interviewer 2	And I just wanted to ask, ehm, the nature of you asking if you could do that?
TC	00:07:46.993 - 00:07:51.622
SD	(0.1)

Participant 12	Ehm, I mean I could see the whole rock, how far, or big it was, but I wasn't sure where I was in the room
TC	00:07:51.728 - 00:07:58.058
SD	(0.79)

Participant 12	ehm, so that's why
TC	00:07:58.848 - 00:08:00.071

SD   (0.57)

Participant 12   I was a bit uncertain on that, so I just slowly moved over when you said I had
                more space
TC   00:08:00.642 - 00:08:06.560
SD   (0.96)

Participant 12   But that's the thing with VR, I don't really know where I am, once I go in there
TC   00:08:07.527 - 00:08:11.639
SD   (0.5)

Participant 12   So, I'm just kinda in a room, getting stuck, it feels like I can't go further, yet
                I have two meters or whatever you said so it was more...
TC   00:08:12.142 - 00:08:20.540
SD   (0.51)

Participant 12   awareness of not knocking anything over, or smashing into a wall or something,
                ehm...because it looked like I could go further but I wasn't sure
TC   00:08:21.055 - 00:08:28.767
SD   (3.6)

Interviewer 1   Would you say that...
TC   00:08:32.370 - 00:08:34.025
SD   (0.54)

Interviewer 1   because of that, that there was some things in the scene you wanted to explore,
                that you didn't?
TC   00:08:34.566 - 00:08:38.880
SD   (1.52)

Participant 12	I mean, I could ssee that i still had more space over there, but I met this...
TC	00:08:40.405 - 00:08:45.779
SD	(1.07)

Participant 12	what is that wall called? that's telling me that I can't go further that way?
TC	00:08:46.855 - 00:08:51.344
SD	(0.04)

Interviewer 1	the guardian
TC	00:08:51.387 - 00:08:51.697

Interviewer 3	the guardian
TC	00:08:51.697 - 00:08:52.226
SD	(0.4)

Participant 12	yeah, I met that so I ehm...
TC	00:08:52.629 - 00:08:54.883
SD	(0.42)

Participant 12	I didn't even consider those before i asked the other question
TC	00:08:55.303 - 00:08:59.776
SD	(0.88)

Participant 12	Ehm, so I actually taught I could go further and wanted to go further that way too, but I couldn't
TC	00:09:00.657 - 00:09:05.602
SD	(4.63)

Interviewer 1   Ehm, then, do you have any additional comments?

TC   00:09:10.238 - 00:09:13.260

SD   (0.51)

Interviewer 1   Could be on...

TC   00:09:13.776 - 00:09:14.323

SD   (0.68)

Participant 12   It was an incredible fun and janky thing to experience...

TC   00:09:15.012 - 00:09:18.388

SD   (0.15)

Participant 12   and I loved it

TC   00:09:18.540 - 00:09:19.661

SD   (0.3)

Participant 12   hhh

TC   00:09:19.970 - 00:09:22.752

SD   (0.17)

Interviewer 1   It's good to hear

TC   00:09:22.927 - 00:09:23.856

SD   (1.33)

Interviewer 1   Then, I'll stop the recording

TC   00:09:25.192 - 00:09:26.855