NRK SUCCEEDS IN COMMUNICATING THEIR CLIMATE JOURNALISM. ALMOST.

A CRITICAL ASSESSMENT

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This evaluation was written as an exam assignment at MIX202 «Design for Media Use» in the spring of 2020. The course is part of the Bachelor's program Media and Interaction Design at the Department of Information and Media Science at the University of Bergen. The course leader was Professor Lars Nyre. Subject teachers were Professor Andy Opel (Florida State University), Senior Engineer Zulfikar Fahmy, PhD Fellow Fredrik Håland Jensen, PhD Fellow Oda Elise Nordberg and Master's Student Jonathan Lindø Meling. The evaluation is translated into English by Kristin Eidsheim.

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1 Introduction

The temperature increases, the snow melts and the sea rises. Climate change will have serious consequences for both people and nature. Never before has the climate been more in focus, and those who will help to enlighten the Norwegian people about this are the broadcasting company NRK. NRK will explain, engage and take responsibility with its climate journalism, says Astrid Rommetveit, who has helped launch NRK's new climate editor (Flaarønning, 2020).

In this project, five media and interaction design students have collaborated with NRK in an attempt to provide a critical assessment of their media content. In the report we will evaluate two of NRK's videos, «Here is the Norwegian CO_2-mountain» and «Identity. I am who I am and see what I want to see». Based on a group of high school students' experiences, we will analyze the content and design of the videos. This is done in the light of selected design principles and principles for visual climate communication.

The purpose of the evaluation is to find out how young people respond to videos which communicate statistics and attitudes towards climate, and to advise on how such video productions can be improved in the future. To answer this, we have gained insight into a total of eight young people's subjective experiences of the content through the use of semi-structured interviews. In addition, we used eye tracking and stress bracelets on two of the candidates to obtain objective data. The reason we wanted to focus on young people is because they represent a large and important community group that NRK is committed to satisfying. We want to emphasize that this is not a research article, but we still believe that we have gained good insight into the target group's perception of the content.

2 Background

2.1 NRK

NRK stands for Norwegian National Broadcasting and is a state-owned Norwegian public broadcaster. The company was established in 1933 and was basically only a radio company (Enli et al., 2019). Today, NRK is Norway's largest media company, offering services on radio, TV and the internet. The company's main target group is people in the age group 20 to 49 years. In 2020, NRK established a climate department with the goal that everyone in Norway should be able to participate in the climate discussions and make good choices. Their coverage puts emphasis on how to act to adapt to or dampen global warming (Flaarønning, 2020). This is the department we partnered with in the project.

2.1.1 What NRK-content have we been evaluating?

The task was to evaluate two climate cases produced by NRK. We chose video as a stimulus because we believe it is a relevant medium for young people today and it has great potential to present heavy content in a simple and neat way. After a meeting with NRK, we agreed on the videos «Here is the Norwegian CO_2-mountain» and «Identity. I am who I am and see what I want to see». They both convey a message of climate and use visual tools to reinforce their statements.

2.1.2 Here is the Norwegian CO_2-mountain

The CO_2-Mountain is an animation video of less than two minutes in which physicist Selda Ekiz has the narrator voice. The purpose of the video is to illustrate Norway's greenhouse gas emissions. It begins with an overview of an average Norwegian's annual CO_2 emissions in various categories as a bar graph (Figure 1).
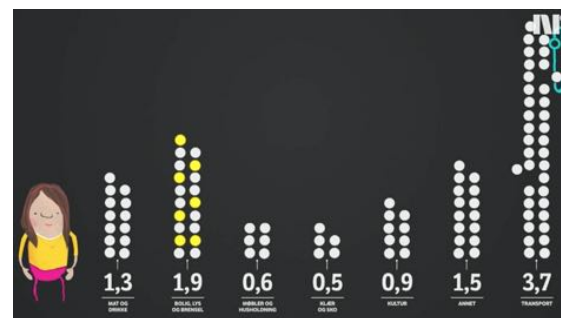

Figure 1: CO_2 emissions for an average Norwegian illustrated as pillars (screenshot: Stoknes, 2015).

Furthermore, the emissions are produced as CO_2 bubbles, which together make up a mountain. The mountain is compared to the opera house in Oslo (Figure 2). Moreover, the annual emissions within Norway's borders are presented, and it is emphasized that oil and gas extraction accounts for the largest share of this. Then, Norway's emissions, which have increased, are compared with those of Sweden and Denmark which have decreased. It also states that the combustion of the exporting oil and gas from Norway produces ten times as much emissions as Norway's total emissions. It then ends with a new CO_2-mountain that illustrates the size of this (Rommetveit et al., 2015). Further in the report we will refer to this video as the «CO_2-mountain».

Figure 2: The CO_2-mountain compared to Oslo (screenshot: Rommetveit, 2015).

2.1.3 Identity. I am who I am and see what I want to see

The video is two and a half minutes long, and is the fifth video in a series of ten episodes. Climate psychologist Per Espen Stoknes explains which psychological mechanisms make you look for affirmations that fit who we are and want to be (Stoknes et al., 2015). The theory is known as the tendency of confirmation. The video first describes an example where the left-handed is seen as more creative than the right-hand, before it links the theory to how we humans relate to climate change. Stoknes is visible throughout the video, and additionally, several animations appear along the way (Figure 3). In this report, we will refer to this video as the «Tendency of confirmation».

Figure 3: An example of the layout of the video (screenshot: Stoknes, 2015).

2.2 Selection of informants

In a conversation with NRK, it was revealed that despite their main target group being people from 20 to 49 years, they have a goal to make themselves more relevant to younger people. Based on this, and that the informants had to be over 18 years in this project for privacy reasons, we ended up with the age group 18 to 19 years. We were interested in looking at how pupils at Amalie Skram high school related to climate, because it is the school with the highest grade average on first intake in Bergen (Mossing, 2019). The purpose was to see if there was a correlation between high school students and climate engagement. However, after conducting the interviews, we realized that the informants' background and interests were not as relevant to the findings. We therefore disregarded this to focus more on how young users generally perceive the content, regardless of their demographics.

To contact the students we had to have formal access. By formal access, it is meant to receive confirmation that one is welcome (Hagen and Skorpen, 2016, p. 32). We went to a high school and came in contact with a teacher for VG3, who gave us the opportunity to present our project to a class. We also contacted the students who showed interest, to arrange a closer appointment.

Due to the covid19-situation, only eight of ten scheduled interviews were conducted. As Figure 4 shows, three women and five men participated in the project.

Candidate	Age	Gender	Eye tracking/ stress bracelet
1	19	Female	
2	18	Male	
3	18	Male	
4	18	Female	Yes
5	18	Male	
6	18	Female	
7	18	Male	Yes
8	19	Male	

Figure 4: Overview of the candidates' age, gender and whether eye tracking and stress bracelets were used.

2.2.1 Consent form

Before the user tests could be conducted, we had to obtain permission to process the informants' personal data and feedback. Course coordinator Lars Nyre took responsibility for this by submitting an application to the Norwegian Center for Research Data, and in addition we formulated a consent form that was given to the informants before the test. We did this to ensure that both parties accepted the terms. The form described what the test was about, that data and personal data would be confidential, and emphasized who was responsible for the test.

2.3 Design principles

Former industrial designer Don Norman is known for having developed six design principles. These principles are designed to guide people to improve the usability of a product (Nordbø, 2017, p. 38). We have chosen to evaluate the videos based on two of these design principles - visibility and context. Visibility is about making features clear to the user (Nordbø, 2017, pp. 38–40). This includes color contrast, readability and graphic elements that are enriching, not disturbing. It can also be about visual structure, which is also part of the principle of coherence; there is a natural connection between elements that have to do with each other (Nordbø, 2017, pp. 40–41).

2.4 Principles for visual climate communication

In addition to the two design principles, we have focused on two principles for visual climate communication. The climate principles are based on a study, conducted to provide an understanding of how humans interpret visual images of climate change. The first principle we have chosen is show climate causes at scale. The study claims that people do not necessarily understand the link between climate change and their daily lives. Therefore, it is recommended to display this information at scale (Corner et al., 2015, p. 25). For example, a picture of a busy and congested freeway gave strong reactions. People reacted negatively both because of the environmental consequences and that people could recognize the situation and relate it to everyday life. The other principle we have chosen is the climate effects are emotionally strong. The study revealed that images that show climatic consequences attract attention and give strong emotional reactions. At the same time, it can create a feeling of hopelessness, thus it is important to not only focus on consequences (Corner et al., 2015, p. 29).

3 Method

To gain insight into the target group's experiences, we combined subjective and objective methods. This combination is called psychophysiology, and is based on a more holistic view of the candidates' reactions, using more than one data-collection method (Lazar et al., 2017, p. 381). The subjective method we used was qualitative interviews and the objective methods were eye tracking and stress bracelets.

3.1 Interview

Qualitative interviews are conversations between two or more people, whose purpose is to provide a rich and thorough description of a phenomenon (Dragset and Ellingsen, 2019). We chose to take advantage of a semi-structured interview, which is characterized by the fact that the topic is prepared in advance and is open to derailments (Østbye et al., 2017, p. 105). The advantage is that such conversations can provide freedom to both the interviewer and the interviewee. At the same time, it can be challenging to stick to the topic that should be discussed initially, thus it is important to plan the interview well in advance.

3.2 Eye tracking and physiological data

In this project we used Tobii Pro Glasses for eye tracking and Empatica E4 for the collection of physiological data. The equipment allowed us to observe user behavior related to stimuli objectively. Eye tracking is a process that identifies specific points the participant looks at (Kartveit, 2018). Using the tool, one can detect where the test person looks, how long they are looking at something, and what direction their eyes follow (Kartveit, 2018).

The movement of the eye is divided into fixations and saccades. A fix is the moment when the user focuses on a particular point, such as a word or an image. A saccade is the moment between two fixations (Kartveit, 2018). When two fixations occur close in time, it is called a gaze point.

The stress bracelet measures sweat, temperature, movement and heartbeat. For our part, it was most interesting to look at data from the heartbeat because it is the most immediate measurable device. Variations in heart rate can measure mental effort and stress, and emotional responses such as fear, happiness and anger (Lazar et al., 2017, p. 383).

3.3 Interview guide

In order to get an overview of how the user test would take place, we created an interview guide based on the Integration and Diversity Directorate's interview guide template (IMDi, 2010). Figure 5 shows an overview of this. The blue fields only apply to eye tracking and stress bracelet interviews.

Phase 1: Framing

Put on bracelet and start recording	
Information (5 min)	Welcome Sign the consent form
Warm-up (5 min)	Warm-up questions Getting to know the informant

Phase 2: User test

Synchronize and start recording of eye tracking-glasses, audio and screen	
CO_2-mountain (5 min)	Start video Follow-up questions
Tendency of confirmation (5 min)	Start video Follow-up questions

Phase 3: Interview

Remove glasses and bracelet, finish recording and analyze the data	
Interview (10 min)	Questions about the content and design of the videos
Questions about physiological data	

Phase 4: Evaluation

Evaluation (5-10 min)	Summary Thanking the informant for the interview

Figure 5: Overall interview guide. The blue fields only applied to those with eye tracking and stress bracelets.

During eye-tracking and stress bracelet testing, we used a large screen to see the candidates eye movements more clearly. In addition, we used an extra room where the technical manager was located. We did this to avoid factors that could affect the candidate along the way. At the end of the tests, the technician responsible came in and questioned the results from the physiological data.

3.4 Thematic analysis

After collecting data, we used the thematic analysis method to map our findings. This is a widely used qualitative analysis in psychology. The method attempts to identify, analyze and report patterns in data collected (Braun and Clarke, 2006, p.78). Thematic analysis is widely used, but there is still no clear consensus on how it should be carried out. Therefore, we did not follow any clear guidelines when formulating our analysis. We chose to interpret our data using the Miro tool. There we mapped the findings in an attempt to see a pattern (see Figure 6).
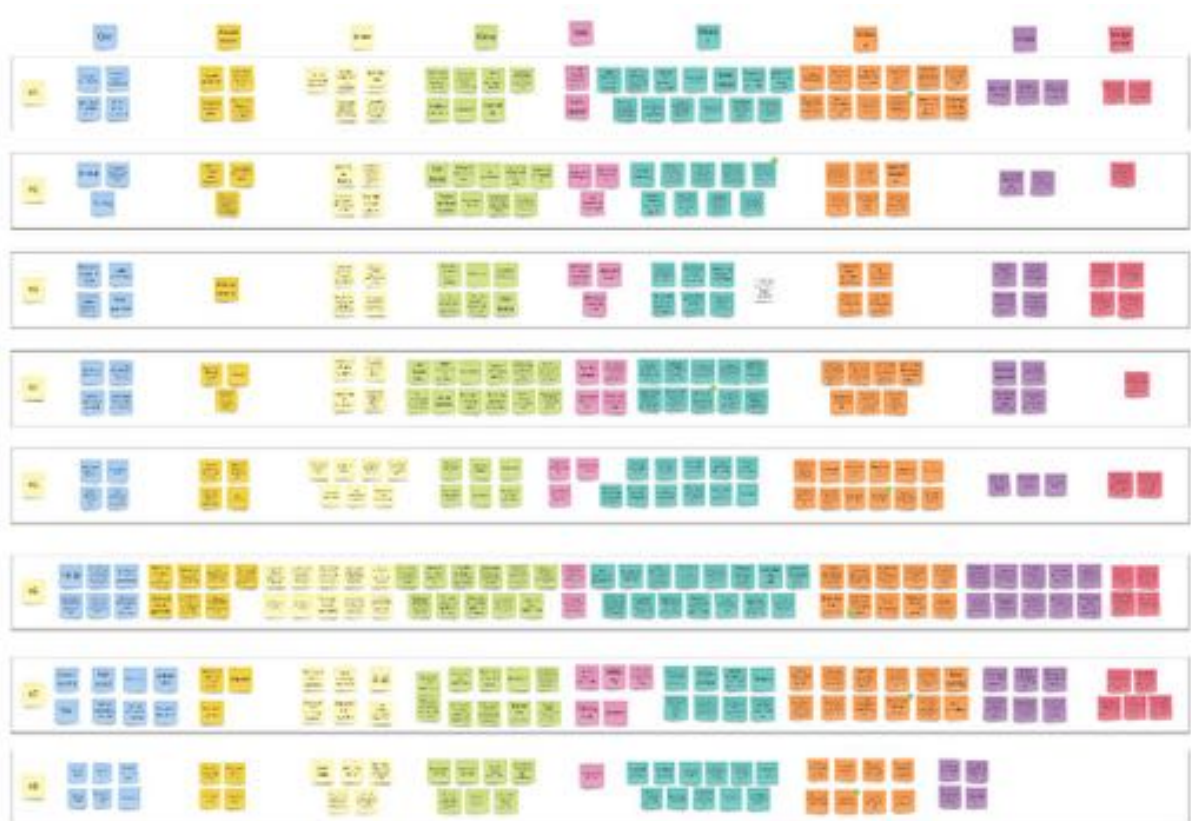

Figure 6: Comments from the candidates color-coded by theme. The analysis was done in Miro.

4 Design implications based on our findings

In this section of the report we will present our findings based on the thematic analysis. The findings will be linked to the design and climate principles, before we will further propose design implications related to the criticism.

4.1 The videos are not engaging enough

According to the head of NRK's climate editor, Astrid Rommetveit, NRK will engage with its climate journalism (Flaarønning, 2020). Based on physiological data from the tests, the videos may not necessarily succeed. The data shows that there was little that caused the pulse of candidates to rise. Variations in heart rate are often triggered by emotional responses. Therefore, low heartbeat may be an indication that the content of the videos is not engaging enough. In Figures 7 and 8 you can see that the heartbeat varies little when the candidates watch the videos (the areas marked in blue), compared to when the candidate is interviewed (the areas without marking).

Figure 7: The heartbeat of candidate 4 varies greatly when interviewed and little when the videos are played.

Figure 8: The heartbeat of candidate 7 varies greatly when interviewed and little when the videos are played.

The figures also show that the video about the tendency of confirmation produced more impact than the video about the CO_2 mountain, especially in candidate 4 (see figure 7). The reason for this may be that the video conveys something the candidates felt struck by. Another candidate said: When I saw the video, I thought: *Oh, that's cool. I did not know that.* According to the climate principle - show climate causes on a scale, climate content gives greater impact if the user manages to relate the content to their daily life.

Therefore, we can assume that the video about the tendency of confirmation gave the most impact in the physiological data because the content is relatable, which may further trigger some emotional responses in the candidates.

It is said in the climate principle - the climate effects are emotionally strong, that people are more affected by consequences than by causes or solutions. The video about the CO_2 - mountain shows where the country's emissions come from, but says little about the effects this has on the climate. To solve this, the video could show concrete examples of the consequences of oil and gas extraction on the earth's climate. To satisfy the principle, it should also suggest solutions to this climate challenge, so that the viewer will not experience hopelessness.

This implication could also have been made in the video about the tendency of confirmation, despite the fact that this one has some more impact in the heartbeat. The psychologist could have presented the consequences of having such an attitude towards climate change. For example, one could use Donald Trump, who has on several occasions expressed that he does not believe that climate change is man-made (Environmental Agents, 2017). The fact that he only wants to absorb information that supports his own beliefs can have major consequences for the rest of the world. If these examples had been presented in the videos, we might have seen a greater impact in the physiological data.

4.2 CO_2-mountain

Most of the informants said that the video was about Norwegian greenhouse gas emissions. Several informants also stated that oil and gas extraction, as well as oil exportation, were two areas the video focused on. There were also several informants who remembered the comparison between Norway and neighboring countries' emission trends. Only a few informants remembered all of this, but everyone remembered some parts. Our data suggests that the video does a good job of communica ting its main message, but few remember all of the information.

4.2.1 Students get stressed out by statistics

The video is mainly focused on statistics. When asked if they could repeat any of the numbers they had just seen, no one could provide the correct numbers. From the physiological data, we observed that one candidate looked at all the numbers presented (Figure 9). Despite this, she was unable to recount any of the numbers when asked afterwards. Another candidate also experienced this. In Figure 10 we can see an increase in heart rate, where the bottom point is 57.31 and the apex is 91.42, which gives an increase of 34.11. It may be related to the candidate feeling uncertain when asked to recount some of the numbers. This was also implied when the candidate said the following: *In the beginning I was a little unsure where to look because there were so many numbers presented at the same time.*

Figure 9: The candidate's gaze visited all the numbers. However, the candidate did not remember any of them.

Figure 10: Increase in heart rate. One possible reason could be that the candidate became uncertain when asked to recount the numbers.
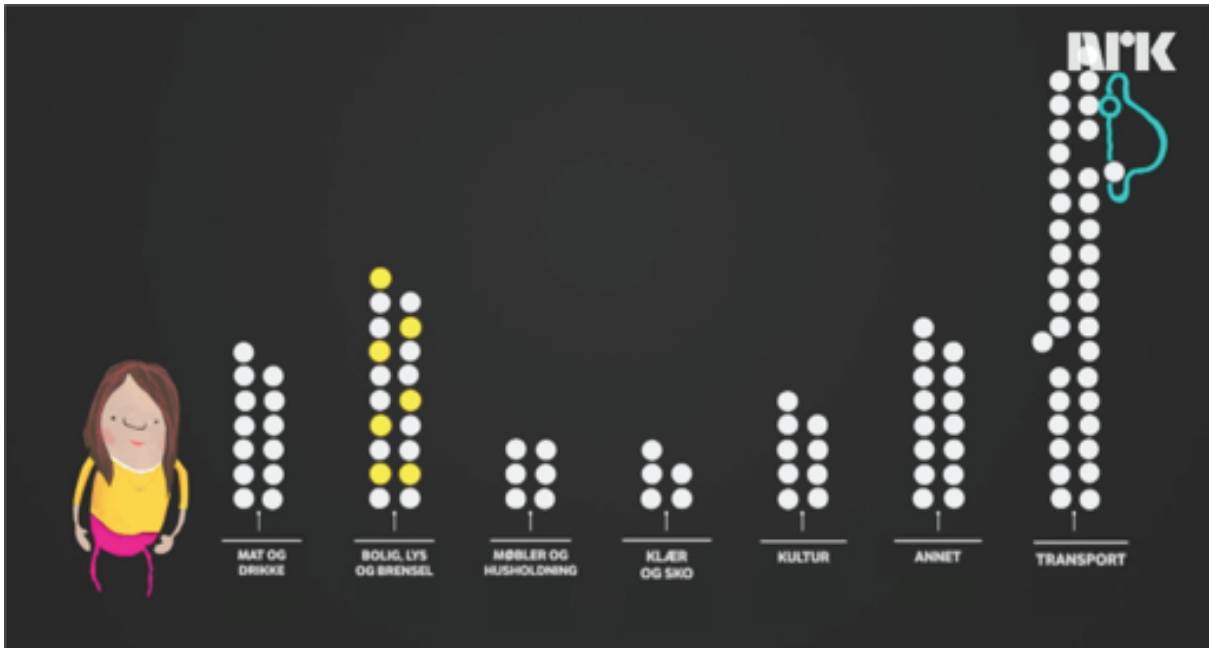
When we were in talks with NRK regarding our findings, they expressed that the purpose of the video was to show the relationship between the different causes of emissions, and that the figures were only there to emphasize these. Nevertheless, based on our data, we believe that too much numbers and statistics can be overwhelming for the viewer and that one does not need to use numbers to compare conditions. We therefore believe that it would be more favorable to present the emissions as a bar graph without numbers, as we have done in figure 11 on the next page.

Figure 11: The numbers are removed from the illustration.

4.2.2 Too much information in a short period of time

Several candidates said that the video's pace was too fast, making it difficult to remember everything that was being told. One candidate said: *The pace was a little fast, so it was a little difficult to keep up.* In addition, as mentioned, a few people remembered all the information produced. Therefore, we believe the video can get its message through, more clearly, by reducing the amount of information. One way to do this is to split the video into two parts. The CO_2-mountain as a concept could have one video aimed at the individual's emissions and one about Norway's emissions. That way, the pace of the videos could have been lower and the amount of information could have been limited.

Additionally, one of the candidates thought that much of the information in the video was irrelevant to him: *The video is very much about what Norway should do as a society, and I feel like those with a little more power than me, maybe Stortinget, should act.* By dividing the video into two videos, the individual's emissions will be better. This will probably also satisfy the climate principle - show climate reasons on a scale, because the content can be seen in the context of people's daily lives.

13

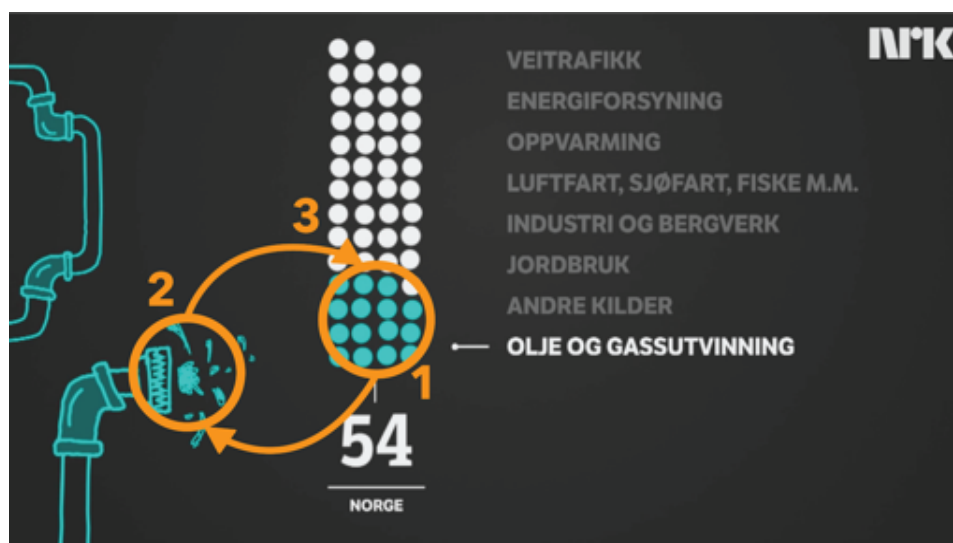### 4.2.3 The animations are distracting

Figure 12: The candidate's gaze moved from the statistics, to the animation and back (screenshot: Rommetveit, 2015).

Several candidates believed that most of the animations in the CO_2-mountain amplified the video's message, but in some cases they were disruptive. The eye tracking showed that the candidate got distracted when the illustration of some pipes appeared. His gaze was automatically drawn towards the animation instead of keeping his eyes at the information provided by text (Figure 12). The intention of the animation was probably to emphasize the information and make it easier to remember, but here the animation can have the opposite effect. On the other hand, we have no data from the interviews that support this theory, thus it is only an assumption based on the general feedback on the animations.
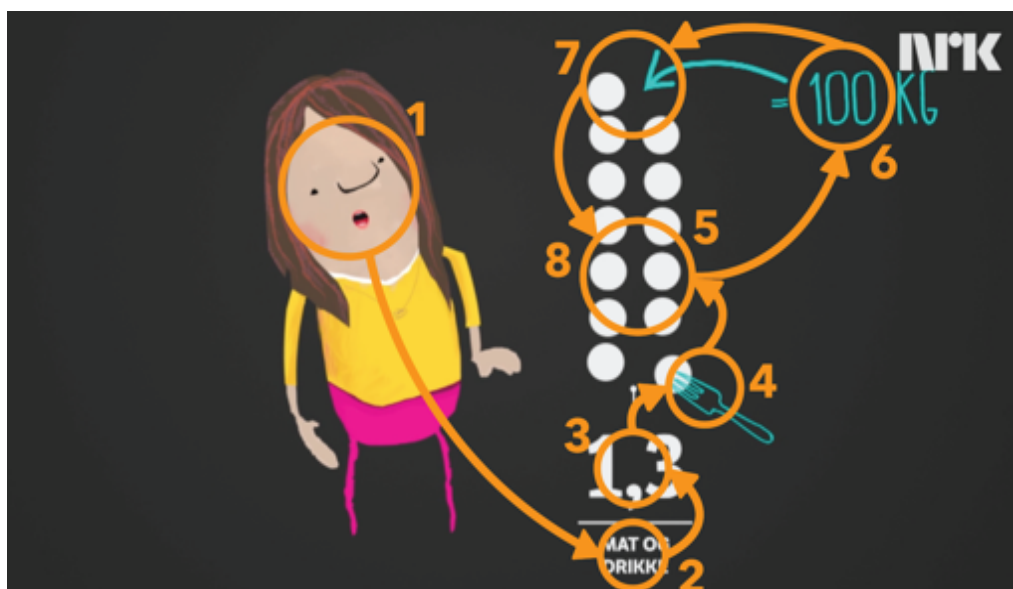

Figure 13: Gaze plot showing a gaze pattern. The eyes move between eight points in three seconds.

At another point in the video, we observed that one candidate looked at eight different places in less than three seconds (Figure 13). In this case, there is a lot going on at once, and none of the candidates could recount anything from this part of the video. We therefore believe that less important animations become distracting rather than enriching, in this case as well.

Figure 14: Here the pipe-illustration is removed so that it does not distract the viewer.
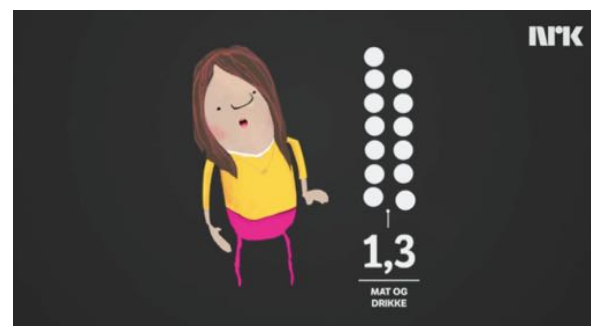
Figure 15: Here the fork and «= 100 kg» have been removed in order to have fewer elements for the viewer to concentrate on.

In the light of these findings, we would use the design principle on visibility and remove elements that may be disturbing to the viewer. Our suggestion is to remove the pipe, as Figure 14 illustrates. In Figure 15 we show that both the fork and the «= 100 kg» illustration can be removed to minimize the amount of elements to look at.

4.2.4 It is difficult to understand the amount of emissions

Several of the candidates commented on the illustration of the CO_2 bubbles and the CO_2-mountain shown in Figure 16. Some thought it was too abstract and difficult to imagine how large the emissions were, based on these animations. One candidate said the following: *It is a little difficult to imagine a large mountain with tons of CO_2. I didn't necessarily understand how big it was*. One reason for this may be that the video does not illustrate how much emissions each CO_2 bubble contains well enough. According to the climate principle - show climate causes on a scale, the bubbles should be replaced with something people are already familiar with. An example might be to replace the bubble with a car, and let it represent the consumption of an average car within one year. Then the cars could be a mountain. In this way, the viewer understands how much emissions each car represents, making it easier to understand the amount in its entirety.

Figure 16: Some of the candidates found it difficult to understand how large the CO_2-mountain was compared to the Oslo Opera House. (screenshot: Rommetveit, 2015).

In the video, the mountain is compared to the opera house in Oslo, which might not be a relatable scale for all of us, thus making it difficult to immediately know or understand how large it actually is (see Figure 16). By comparing the mountain with something people know the size of, it might have been easier for the informants to understand the amount of emissions. An informant suggested comparing the mountain with a known Norwegian mountain, which we also believe is a good suggestion.

4.2.5 NRK is a credible source

The candidates found the video to be very credible because it is produced by NRK. One of the candidates said the following: *NRK is one of the only media I really trust because they are supported by the state and I feel like they are very critical.* Another factor that made the content believable was that people were familiar with the narrative voice. Selda Ekiz is a well-known physicist and program manager for NRK, and is a recognizable voice for the target group's generation. Some pointed this out during the interview and others knew who she was when we said her name. Everyone agreed that she is a credible person in this setting.

4.3 Tendency of confirmation

From the data, it was clear that everyone understood the theory being presented, and there were several who recognized it. All the candidates were able to reproduce large parts of the content, and they pointed out that the pace and the amount of information was pleasant. Most people said that the tendency of confirmation was a new concept, although it was known to some. One candidate said: *It was a bit of fun to watch, because in a way I have thought about it myself, but not been able to put it into words.* Furthermore, several people believed that some of the video's animations did not necessarily amplify the message.
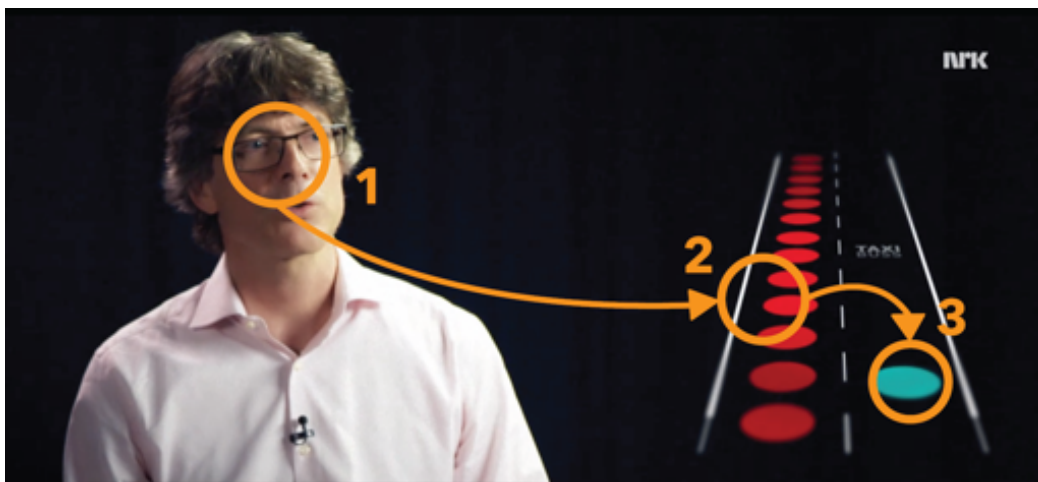
4.3.1 The gaze moves logically

Figure 17: The candidate's gaze pattern is logical for what appears on the screen.

Several of the candidates expressed that they experienced the video as clear. The pace was slow and relatively little information was communicated. One candidate said: *It was easy to get what he said. There was little information and things didn't go so fast.* In the video, all of the elements are presented one at a time. This led to few saccades in the eye tracking. The gaze moved logically in relation to what appeared on the screen. Figure 17 shows how the gaze of one of the candidates moved chronologically. First she looks at the man's face, which is a natural eye-catcher. When the illustration with the red dots appears, the gaze moves over there. Then the blue dot comes into the picture, and the gaze moves again. In this case, the animations satisfy the design principle of visibility, because they do not disturb the viewer but rather reinforce the psychologist's message.

4.3.2 The animations are not favorable

Despite relatively little information being presented, several commented that some of the animations created confusion. Some candidates said that it was challenging to understand the purpose and location of the animations at times.

Figure 18: The candidate discovers the dot after ten seconds (screenshot: Stoknes, 2015).

Figure 19: The candidate does not see the dot (screenshot: Stoknes, 2015).

This could also be implied by looking at the eye tracking data. One of the animations shown in the video was a red dot, which illustrates an individual. The first time the dot appeared, it took over ten seconds for the candidate to see it. The reason why she finally saw it may be because the animation got the accompanying text and that the psychologist's hands were in that area (Figure 18). The second time the dot appeared, it was visible on the screen for eight seconds before it disappeared without the candidate seeing it (Figure 19).

Another example, shown in Figure 20, is the illustration of left and right hands. Here the example is illustrated by means of circles. One informant said: *I didn't quite understand the right-handed and left-handed bubbles. I felt like they didn't help that much.*

Figure 20: Animations that visualize the example of the left-handed as more creative than the right-hand (screenshot: Stoknes, 2015).

Therefore, the red dot and illustration of the right and left hands do not satisfy the design principle of visibility, as they do not seem to enrich the candidates' experience. In connection to this, one candidate suggested that the video could alternate between showing the psychologist for a few seconds before going over to illustrate what was said by appropriate animations. In this way, the animations are shown alone the first time they are presented, so that the viewer will know them when they are later shown with the psychologist (see Figures 22 and 24).

Another suggestion might be to change the animations so that they have a natural connection to what is being talked about. Thus, in order to satisfy the principle of coherence, the illustration of the left and right hands should be hands, rather than circles (Figures 21 and 22). Furthermore, the red dot which represents an individual's identity and the blue dots representing the advice given by experts should be replaced with humans (see Figures 23 and 24).

Figure 21: Animations that visualize the example of left and right hands (screenshot: Stoknes, 2015).
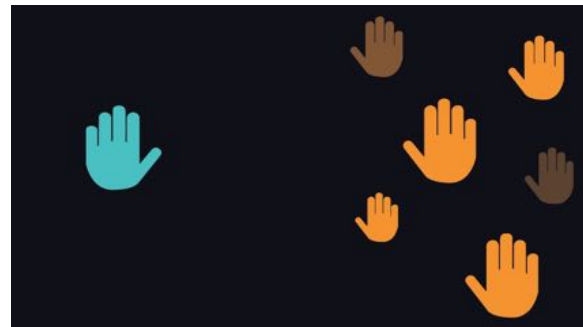

Figure 22: The bubbles are replaced with hands and appear without the psychologist.

Figure 23: The red dot represents identity, while the blue dots represent expert statements (screenshot: Stoknes, 2015).

Figure 24: The dots are replaced with humans and appear without the psychologist.

4.3.3 The body language highlights the animations

From the eye tracking, we could see how the candidates' eyes automatically focused on the psychologist's face. As we saw in the example of the red dot in Figure 19, the psychologist in this case is a bigger eye-catcher than the animations. In addition, we saw that body language, in this case arm movements, could lead the eyes of the viewer. Figure 25 shows a section where the candidate moved his gaze from the man's face, towards the animation his hands led to. This indicates that the psychologist's behavior could be crucial for the effect of the animation. If body language and animation are used harmoniously with one another, the principle of coherence is satisfied.

Figure 25: how the gaze is controlled by the man's body language (screenshot: Stoknes, 2015).

4.3.4 The psychologist adds credibility to the video

Like the first video, it was clear that the informants believed this video to be credible because it was produced by NRK. Additionally, everyone believed that credibility was enhanced by using a psychologist to explain the theory. One of the candidates said: *This video seemed believable, because you have someone who is an expert and explains. Because it is a real person talking, the sender's credibility is strengthened*, says another informant.

5 Conclusion

Based on the analysis, we would say that both videos mainly succeed in communicating their message, and are characterized by being produced by a professional media company such as NRK. Nevertheless, the videos should communicate the consequences of climate change, in order to create engagement. At the same time, it is important to also show solutions to the problem so that the viewer does not experience hopelessness. In addition, animations should always help reinforce the contents message, rather than disrupt. All comparisons should be linked to familiar concepts, and all the elements that appear on the screen at the same time should have a clear relation with each other. Additionally, the analysis shows that it is positive that the message is conveyed by an expert, as this strengthens the video's credibility. If NRK follows these advice, their climate communication will have a greater impact on young people, thus increasing the likelihood that their climate department will achieve its goal that young people can participate in the climate discussions and make good choices.

For further studies, it would have been interesting to see if, based on this project, we can create climate journalistic content that will affect young people to a greater extent than we assume the CO_2-mountain and the Tendency of confirmation does.

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