Make Science Make Sense for General Audiences: A Study to Compare Storytelling Elements in Videos and Blogs

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Abstract

Objective: Scientific literature is becoming increasingly unreadable due to the use of jargon and a formal writing structure. The field of science communication tries to counter these effects by communicating science through different formats. Thus, science is made more understandable to audiences not used to reading scientific papers. The effects of *blogs* and *videos* are investigated in the presence or absence of *storytelling*, to determine whether the science communication format or the addition of narratives affect *comprehension* and *perceived pleasantness*. **Method:** 124 participants filled out a survey. The participant first had to provide demographic information, followed by indicating their trust and their attitude towards science. The participant was then shown one out of four conditions: (Format: blog vs video) (Storytelling: with vs without). After the participant had viewed or read one of the four stimuli, the participant had to self-assess their pleasantness and comprehension, followed by questions measuring their actual comprehension. **Results:** Results showed significant differences in the means of both format and storytelling on perceived pleasantness (attitude), and in the means of storytelling on comprehension. The means of the blog format were always higher than the means of the video format, except for comprehension. The means of the conditions without storytelling were always higher than the means of the storytelling conditions. No interaction effect was found between format and storytelling. **Conclusions:** Blogs without storytelling result in significantly higher perceived pleasantness (attitude) and comprehension than narrative videos do. More research is needed to replicate these results more reliably, and follow up on the gaps that have been stated by this study. It is suggested that factual blogs are more efficient at communicating science than narrative blogs because authors can be more contextual and give their readers more time to process the information at their own rate.

Keywords: science communication, blogs, videos, storytelling

Content

1. Introduction

Audiences with limited experience reading scientific literature are likely to have difficulties in understanding it. According to Plavén-Sigray et al. (2017) these reading issues are primarily caused by jargon, which has been increasing with more than ten per cent in scientific literature since the 1900's. At the same time, the use of common words has been decreasing at the same rate. While the use of science-specific common words also has been increasing with 20 per cent during this time. Scientists and experts, who have experience in reading papers, learn to know scientific jargon and can read through texts without looking up the meaning of each word. Conversely, less experienced readers have difficulties reading scientific abstracts, as more than 20 per cent of scientific abstracts are beyond the understandability level of students graduating from college (Plavén-Sigray et al., 2017). Aside from abstracts becoming unreadable due to the increasing use of jargon, Sand-Jensen (2007) also evaluated scientific literature as boring because of its formality and language use.

The consequences of unreadable and boring scientific texts can be severe. According to Brownell et al. (2013), incomplete understanding and mistrust of science can lead to audiences rejecting the information in its totality. Topics such as climate change or COVID-19 often affect the person's life reading about it. The rejection of accurate scientific information can affect many life choices. For instance, their voting choices, which can impact governmental regulation, policy, and funding (Brownell et al., 2013).

Fortunately, the problem of making scientific findings less boring and more comprehensive for people without experience reading them, can be solved. *Pleasantness* is one of the antonyms of boredom (Lewis, 2020), so enhancing people's pleasantness can counter the boredom of reading scientific papers (Whitten et al., 2019). To solve the problem, people's pleasantness and comprehension should be increased. This can be achieved by communicating

scientific findings in alternative ways than a standard scientific paper, which allows for the author to not be hindered by the rules of scientific literature.

One of the things focused on within science communication is communicating science in ways which are better understandable for general audiences. Which science communication type is most effective in communicating to general audiences is of interest to everyone communicating and reading about science. Contrary to scientists and experts in specific fields, other readers that are interested in reading about science commonly do not have experience in reading scientific literature.

Empowering general audiences with scientific knowledge can help them make several individual lifestyle-decisions. Examples include; decisions related to health and risk-taking, personal science career choices, political decision-making and participation in public debates as well as informed public support for science in terms of public funding (Blanton & Ikizer, 2019; Dawson, 2019; The Royal Society, 1985; Thomas & Durant, 1987, as cited in Humm & Schrögel, 2020). Therefore, general audiences will benefit from research conducted on different science formats than a paper. Carefully choosing a way of communicating about science can result in a more understandable and pleasant experience and thus make scientific literature more accessible to general audiences.

When science is communicated to general audiences, understandable language and visual material are often used to support the text (Carter, 2013; Zhu et al., 2021). Additionally, scientific findings can be formatted to achieve increased *pleasantness* and *comprehension*. Encouraged formats are videos (Berkowitz, 2013, as cited in Cooke et al., 2017, Putortì et al., 2019) and blogs (Cooke et al., 2017). In both videos and blogs, text and visuals are often combined. However, which format is most optimal for communicating science to general audiences is unclear. According to the media richness theory, videos are richer than blogs

because both auditory and visual senses are stimulated (Daft & Lengel, 1986). Daft and Lengel (1986) argue that videos are often shorter and require less attention to process, which could positively impact the understanding of scientific findings. With regards to blogs, readers can determine how fast they want to process something, giving them more time to understand it.

Additionally, storytelling shows great promise in science communication when complementing formats such as videos and blogs (Cortes Arevalo et al., 2020, Dahlstrom, 2014, Goulão, 2018). The words storytelling, narratives and plots are sometimes used interchangeably in scientific literature. According to Chatman (1980), a narrative is the overarching concept which consists of stories and plots. A story is how a reader or viewer subjectively experiences the characters, settings, actions and events within a story. Whereas a plot is what is objectively happening (Chatman, 1980). In this thesis, narratives and storytelling are used interchangeably.

Goulão (2018) stated that storytelling shows promise within science communication because characters invoke relatability; narratives can create a context that increases understanding and memory recall, and the development of a plot can highlight relationships which helps general audiences process complex knowledge. However, Farinella (2018) suggests further research should be conducted regarding visual and narrative science communication. Because so far, only comics and animations have been researched in this regard.

There have been a lot of different ways in which science can be communicated to a general audience aside from videos, blogs or storytelling (Cooke et al., 2017; Farinella, 2018). However, in this study, only the most encouraging ways of science communication by previous studies were researched. The outcomes of this study could enable scientists to communicate to their audiences directly in a pleasant and understandable way. The outcomes are derived by answering the following research question:

Which combination of blogs and videos with the presence or absence of storytelling results in the best comprehension and the highest perceived pleasantness of scientific findings for general audiences?

2. Theoretical Framework

In this section, it is shortly explained why comprehension and perceived pleasantness were chosen for this experiment and these variables are defined. Thereafter, theoretical evidence for the use of blogs, videos and storytelling within science communication is provided with supporting hypotheses. Following this, peoples' current perspectives on trust and attitude towards science are discussed. Consequently, peoples' attitudes towards a scientific subject are described. Finally, the hypotheses are visualised in a research model.

2.1 Comprehension and Perceived Pleasantness

Incomprehension and boredom are problematic when communicating scientific findings to general audiences (Plavén-Sigray et al., 2017; Sand-Jensen, 2007). Comprehension is the antonym of incomprehension, whereas pleasantness is one of the antonyms of boredom (Lewis, 2020). *Comprehension* has been defined as 'the ability to understand' (Oxford University Press, n.d.-a, "Comprehension" section). Additionally, Oxford University defines *pleasantness* as 'the fact of being fun or attractive or of giving pleasure' (Oxford University Press, n.d.-b, "Pleasantness" section). Stimulating comprehension and pleasantness are likely to counter the adverse effects of incomprehension and boredom.

2.2 Formatting Science Communication: Blogs and Videos

2.2.1 Blogs

A blog is a good format for communicating scientific findings to general audiences. A blog is defined as “a regular record of your thoughts, opinions, or experiences that you put on the internet for other people to read” (Cambridge Dictionary, 2022, "Blog" section). A blog can be a good format because the author has a lot of control of how the end result will look like. This control allows authors the freedom to communicate directly and informally with different audiences about their research. In contrast to scientific papers, blogs are more accessible to general audiences. Blogs allow the author to add more context (Cooke et al., 2017).

Additionally, Mahrt & Puschmann (2014) researched that 60 percent of the scientific blogs they researched did not contain jargon. Texts without jargon give readers without background knowledge the ability to read and comprehend the content. Besides being more comprehensive, scientific blogs are also more entertaining than papers, because humour, images, and video can support the text (Gardiner et al., 2018).

However, scientists should be careful using humour in their blogs, as this can affect an objective writing style (Perks, 2012). Another problem with using blogs could be that blogging is a skill that requires a learning process to master (Mahrt & Puschmann, 2014). Writing blogs could partly be hard because multiple audiences read blogs, which authors have to consider.

These audiences can consist of three science blog readers: super users, one-way entertainment users, and information-seeking users (Jarreau & Porter, 2017). In this study, one-way entertainment users made up the most considerable portion (46.85%) of science blog readers. They are less likely to have a scientific degree than other groups. They are also younger than the readers in the two other groups. One-way entertainment users are less likely to engage in scientific blogs that are difficult to read and prefer more entertaining content. For

this research, the focus will primarily be on one-way entertainment users. This group is the largest, containing the least educated people, and is most closely related to general audiences (Jarreau & Porter, 2017).

For the group of one-way entertainment users who are primarily nonscientists, the best way to design the blog is to use images (Gardiner et al., 2018). Science bloggers use text, humour, images, and videos to complement blogs. Blogs that contain images are ideal, as images increase recall and enjoyment among nonscientists. These elements are important to consider when constructing blogs for general audiences.

Videos have been used to complement blogs in the study of Gardiner et al. (2018). Videos and images are just as effective in increasing recall. However, videos do not effectively complement blogs in communicating to general audiences. Because videos were rated as less enjoyable than complementing blogs with images or text. Therefore, this study will research videos as an independent format.

2.2.2 Video

A video can outline scientific research and attractively portray the methodology and results of a paper, which cannot be achieved in the same way by news articles or blogs (Berkowitz, 2013, as cited in Cooke et al., 2017). The media richness theory might explain why the video format has more positive effects than news articles or blogs. In this theory, there is a division between richer and poorer forms of media (Daft & Lengel, 1986). Because the video format stimulates both visual and auditory senses, Daft & Lengel (1986) consider the format richer than using text supported with images. Because videos are multisensory, video allows the viewer to be more immersed in their viewing experience. Putortì et al. (2019) further state that videos are more engaging and attention-grabbing than text (Alley et al., 2014; Koehler et al.,

2005; Kristine et al., 2009, as cited in Putortì et al., 2019), visuals typically result in more affective responses than words (Clark & Paivio, 1991; Machula, 1980, as cited in Putortì et al., 2019) and video information is easier to process because it requires less cognitive effort (Sweller, 1994, as cited in Putortì et al., 2019).

As for the delivery of science communication videos, there are several elements to consider. According to Welbourne & Grant (2015), the source of the video, the pace of speaking in a video, and the video length can impact the viewers. Short user-generated videos are generally more popular. However, the pace of someone speaking can also impact their comprehension. Speaking slowly in videos might improve people's comprehension, whereas speaking more quickly can increase engagement. Scientists should consider these things if they want to communicate their scientific findings through a video format.

There are successful examples of the video format within science communication. Examples are TED talks (Sugimoto & Thelwall, 2013), YouTube channel: Kurtzgesagt (Munoz Morcillo et al., 2016), and science film festivals (Staaterman et al., 2014). The video format has already led to better comprehension and higher perceived pleasantness than news articles reporting science communication (Putortì et al., 2019).

However, according to Putortì et al. (2019) there are some drawbacks to using videos. Although videos can be more stimulating and compelling than blogs or news articles, viewers' understanding might not be better when watching videos. This reduced amount of understanding is because videos can trigger strong emotions more quickly, reducing people's sensitivity to objective information.

Nevertheless, theoretical and exemplary evidence suggests that using videos can successfully stimulate comprehension and increase perceived pleasantness in science communication. Within science communication, the video format has been compared to news

articles (Putortì et al., 2019). However, because no studies compared videos to blogs, the first hypothesis is formulated:

> *H1: Scientific findings communicated through video can lead to better comprehension and higher perceived pleasantness for general audiences than scientific findings communicated through blogs*.

2.3 Complementing Science Communication: Storytelling

Storytelling is defined as “the activity of telling or writing stories” (Oxford Learner’s Dictionaries, n.d., "Storytelling" section).

Storytelling efficiently engages general audiences with scientific findings and explains challenging notions pleasantly. This is because narratives make concepts relatable, add context, increase understanding and memory recall, and can connect plots which helps general audiences process complex ideas (Goulão, 2018). Farinella (2018) supports this and emphasises that storytelling can make scientific findings more accessible and engaging to a wide range of audiences.

A factual science communication approach has been shown to be less effective as a narrative one. Cortes Arevalo et al. (2020) used interactive visuals and storytelling to explain scientific findings to water management professionals. They argue that a visual outline of the scientific findings is not enough. A traditional storytelling approach is needed with a clear protagonist to communicate to general audiences effectively. Davies et al. (2019) also state that mere facts do not have the persuasive power once assumed. Therefore, they suggest storytelling can offer a solution to communicate about science more effectively because storytelling can change people's attitudes and behaviours. Storytelling allows the reader to be

more immersed in the subject matter, which allows for increased attention, emotion and engagement, which is not possible by merely presenting the facts.

An example of storytelling in science communication is the genre of 'cli-fi' (climate fiction). Examples of cli-fi are narratives in various formats that can give the audience the feeling that the world is ending. These fictional narratives translate realistic concepts based on scientific findings to another format, to deliver the same message as a paper would (Davies et al., 2019). The attention that storytelling brings partly leads to better comprehension (Yildiz & Çetinkaya, 2017). Dahlstrom (2014) also states that storytelling directly leads to higher comprehension. Furthermore, it leads to more interest and higher engagement.

The positive effects of storytelling can also be explained through theory. The narrative paradigm created by Fisher (1984) can both explain how storytelling works and to some extent also has the same purpose as this thesis. Fisher realised that the gap between experts and the public should be bridged, partly by storytelling and sound argumentation. The reader of a story can then fully immerse themselves in the storyteller's perspective, leading to the story being more easily taken in by the reader (Fisher, 1984). This is also called transportation in scientific literature (Dessart, 2018),

The study of Cortes Arevalo et al. (2020) is an example of successful narrative science communication through a blog format. In this study, scientific papers were used as a baseline for blogs. Storytelling was used in these blogs with visuals to support the text. Non-researchers considered these blogs to be highly engaging (Cortes Arevalo et al., 2020).

Storytelling also has some downsides: it has to be tailored to specific audiences, as a story that appeals to one audience might not appeal to another. Therefore, scientists may find it challenging to appeal to many audiences. They also have to invest much time in identifying and researching their audience. Also, Dahlstrom (2014) further suggested that storytelling can

persuade audiences against their will. Additionally, storytelling displays itself in mass media, which also happens to be the places where non-expert audiences get their information. Dahlstrom stressed that authors should be careful in which cases and to what ends storytelling should be applied. Nevertheless, theoretical and exemplary evidence suggests that storytelling can successfully stimulate comprehension and increase perceived pleasantness in science communication. The second hypothesis is therefore formulated:

> *H2: Scientific findings communicated with storytelling lead to better comprehension and higher perceived pleasantness for general audiences than scientific findings communicated without storytelling.*

According to the media richness theory, the video format is richer than blogs (Daft & Lengel, 1986). Because videos are regarded as a richer media than blogs and using storytelling is supposedly more effective than not using storytelling, the third hypothesis is formulated as follows:

> *H3: Scientific findings can be communicated with videos or blogs in the presence of storytelling to result in higher comprehension and perceived pleasantness. However, storytelling combined with video leads to the most optimal comprehension and perceived pleasantness for general audiences when communicating scientific findings.*

2.4 Trust and Attitude towards Science

People's attitudes and trust toward science are critical to consider when researching the comprehension of scientific findings. People's comprehension of science impacts trust (Goldenberg, 2016), even though the reverse is true as well: the level of trust also plays a vital

role in understanding science (Hendriks et al., 2016). Additionally, Sari et al. (2018) suggest that people's attitudes toward science impact comprehension.

It is essential to note that European citizens' level of *trust* and *attitude* toward science is divided. A survey conducted by the European Commission (2021) asked EU citizens to what extent they agreed with the following statement: 'we can no longer trust scientists to tell the truth about controversial scientific and technological issues because they depend more and more on money from industry' (European Commission, 2021, p. 196). Almost half of the respondents trusted scientists to tell the truth. One-third of these interviewed people did not have a strong opinion about this statement. In contrast, about a fourth of the interviewees tended to mistrust scientists. These results are similar to the results of Dutch citizens. This is useful to note, as the focus of this study will shift to Dutch people later on. Age and level of education seemed to play an essential role in trust. Younger and higher educated people tended to trust scientists more quickly than older lower educated people.

As for the *attitude towards science*, almost 50% of European interviewees would like to learn more about scientific developments, which is about 15% less than Dutch respondents on average. However, 50% of the European interviewees do not understand science because it is too complicated. For Dutch people this accounts for 25% for the same statement. (European Commission, 2021).

2.5 Attitude towards a Scientific Subject: Climate Change

For this study, people's attitude toward a scientific subject is essential to take into account, as a negative attitude towards a subject might influence people perceive the way scientific findings are presented. The European Commission (2021) interviewed Dutch respondents in a survey. Between 90 and 96 per cent of respondents thought subjects like solar

or wind energy within climate change could positively impact their way of life in the next 20 years (European Commission, 2021). Because the subject of climate change at least does not elicit negative emotions, this subject could be taken into account when communicating to Dutch general audiences.

2.6 Research Model

Based on the hypotheses formulated in the previous chapters, the following research model is shown in Figure 1 below to visualise the relationships that are central to this study. The hypotheses included in the research model are repeated here:

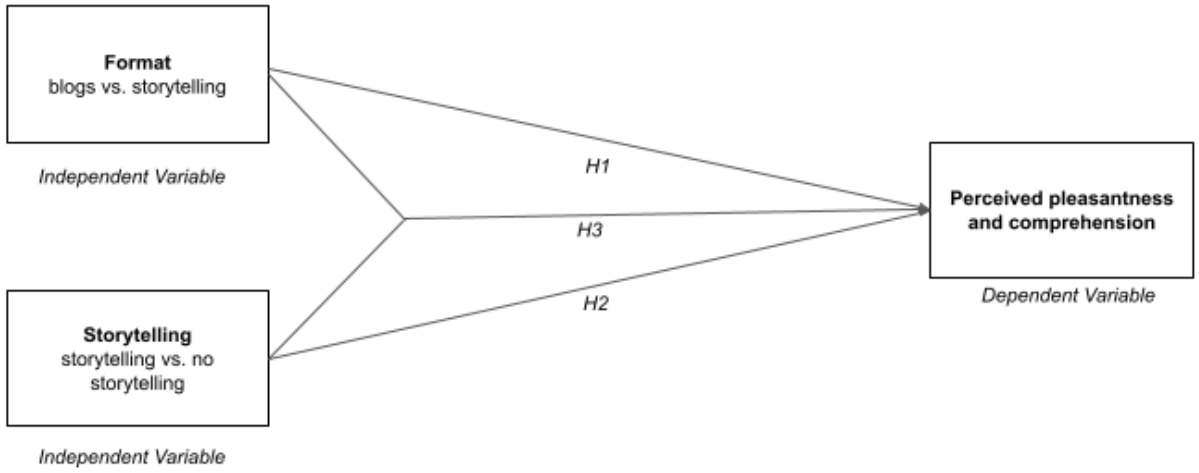
H1: Scientific findings communicated through video can lead to better comprehension and higher perceived pleasantness for general audiences than scientific findings communicated through blogs.

H2: Scientific findings communicated with storytelling lead to better comprehension and higher perceived pleasantness for general audiences than scientific findings communicated without storytelling.

H3: Scientific findings can be communicated with videos or blogs in the presence of storytelling to result in higher comprehension and perceived pleasantness. However, storytelling combined with video leads to the most optimal comprehension and perceived pleasantness for general audiences when communicating scientific findings.

Figure 1

Research Model



3. Methodology

In the following chapter, the research methodology of this study will be described. First, the research design will be shortly addressed. Second, the research procedure of the main study will be outlined. Third, the creation of the stimulus materials will be expanded upon, as the preliminary study to test the stimulus materials. Fourth, the manipulation check will be discussed. Fifth, the participants of this study will be described. Last, the measurements used in this experiment will be addressed in terms of their validity and reliability.

3.1 Research Design

This study performed a quantitative two (*Format*: blog vs video) x (*Storytelling*: with vs without) between-subjects experiment to answer the main research question and the hypotheses shown in Figure 1.

3.2 Research Procedure

The data was collected through a web-based survey using the cloud-based platform Qualtrics. Approval for this study was given by the Ethics Committee of the University of Twente (nr. 220896).

First, the survey introduced participants to the topic, the goal of the survey, the ethical risks of participating and the researcher's contact details, all according to the BMS Ethics Committee (n.d.) guidelines. Second, the survey asked participants to fill in their gender, date of birth, and highest achieved education. Third, the participants' attitudes and trust toward science were measured.

After these preliminary questions, the survey showed one of the four different experimental conditions to the participants. A different stimulus was shown in each of these four experimental conditions. The blog stimuli can be found in Appendix A of this document. The video stimuli can be found here: the link to the narrative video and the link to the paradigmatic video. Next, the survey asked participants to rate the stimuli based on how factual or narrative they were, to once more check whether the manipulations were successful. Consequently, 12 questions were asked about the perceived pleasantness of the experienced stimuli. Following this, one question measured whether participants thought they understood the content, to measure comprehension. Lastly, three questions were asked about whether participants understood the content. Afterwards, participants were thanked for their time and given contact details for possible questions. The final survey can be seen in Appendix B of this document.

3.3 Stimulus Material

3.3.1 Construction of the Stimuli

For this experiment, four stimuli sought to manipulate comprehension and perceived pleasantness. All four stimuli were centred around a science blog regarding climate change

(Dreyfus, 2016). Climate change is regarded as a neutral topic, as discussed in section 2.5. Dreyfus (2016) writes about how communities and citizens have the power to do something about climate change on a subnational level, called *people power* or *community power*. *Community power* means that citizens, local governments or communities produce sustainable energy systems to improve their local environment.

Of the four stimuli, two stimuli are formatted as videos, and two stimuli are formatted as blogs. Within each format, one condition was driven by narratives, whereas the other used a paradigmatic (factual) structure. The narrative stimuli featured a fictional character called 'Lieke', who owns a non-existing, communitarian, pro-environmental organisation. Stimuli featuring authoritative figures (boss of a company) engage people in the stimulus (Yang et al., 2022), which adds to the narrative. The paradigmatic stimuli did not feature a fictional character, a fictitious organisation or contained quotes by the fictional character. The narrative videos also contained visual material of the fictional character and organisation.

After finishing the blog stimuli, the blogs were used as a baseline for the content of the video stimuli. Visuals were used both in blogs and videos, with and without storytelling. However, these visuals were static in the blog format, whereas the visuals in the video stimuli were dynamic. Also, a voice-over was recorded for the video. This voice-over included a female neutral voice, which should not affect participants negatively (Esposito et al., 2019).

The initial length of the blog was long for the participants to read. Therefore the length was shortened to 600-800 words for the blog stimuli and 350-450 words for the video stimuli. The read and watch time would result in a maximum of four minutes for all stimuli. The goal was that participants would not lose focus or patience during the experiment, and it ensured that the read and watch time was similar for all variations. When shortening the text, additional examples or irrelevant parts to the story were excluded. In order to leave the essential parts of

the text intact, both the introduction and conclusion paragraphs were kept identical in all stimuli. Lastly, the use of jargon was minimised evenly in all stimuli to make the content understandable for the participants.

3.3.2 Preliminary Study

Before the main study, a preliminary study was conducted to confirm whether the manipulation of the stimulus materials would be successful, whether the flow of the survey was clear and whether the formulation of the introduction, questions and statements was correct.

First, respondents indicated that the titles of some of the questions were not clearly indicated. Therefore, the titles were emboldened so it would be more clear to participants that they were titles. Second, some of the stimuli contained some spelling errors, these were removed so this would not affect the participants in any way. Third, a statement was formulated vaguely because it included the word ‘almost’. This word was omitted from the statement so participants could indicate their preferences more clearly. Fourth, the introduction was edited because one of the sentences was too elaborate. This sentence was shortened because the details were not that relevant. Most important to the preliminary study, participants had to answer the manipulation check questions. For the preliminary study, the manipulations were successful. Afterwards, participants were thanked for their participation and all their relevant feedback was processed in the main study.

3.4 Manipulation Check

In order to see whether the manipulations in the experiment were successful, participants of the preliminary and the main study were asked to rate manipulation check statements. For the stimuli to work, the respondents had to view the storytelling stimuli as sufficiently narrative and the paradigmatic stimuli as sufficiently factual. The outcomes of this

question can be seen in Table 1 below. A 10-point scale was used to measure the outcome of this question, with one being factual and 10 being narrative.

For the manipulation to be effective, five was used as a cut-off point, as this number is in the middle between one and 10. The means of the storytelling stimuli should be above five, while the means of the paradigmatic stimuli should be below five. An independent-samples t-test was run to compare the means and to check whether the means were significantly different.

The storytelling stimuli had a higher mean (M = 5.14, SD = 2.13) than the mean of the paradigmatic stimuli (M = 4.72, SD = 2.39). Additionally, the mean of the storytelling was above five, while the mean of the paradigmatic stimuli was below five. However, the mean difference was not significant (t (105) = 0.96, p = 0.29). The means of the manipulations were also compared for all age groups and levels of education. Nonetheless, no significant differences were found. Although the preliminary study indicated that the manipulation would work, and the means of the storytelling stimuli are higher than the paradigmatic stimuli, the outcomes are not significantly different.

However, Cohen's d showed a large size of the effect (d = 0.96), meaning a difference of almost one standard deviation between storytelling and no storytelling after experiencing the stimuli. The reason why there was a large effect size but no significant difference might be because of a small sample size (n = 124), and the even smaller number of respondents that rated the Manipulation check statement (n = 107). It commonly happens in studies that findings are not significant because of the small sample size (Sullivan & Feinn, 2012). Therefore, it cannot be stated that the manipulation failed because of the small sample size or the stimuli materials not being distinct enough. Because the cause of the failed manipulation cannot be stated, the results will be discussed further in this thesis. Yet, this is primarily to encourage

future studies to replicate these results with either larger samples or better constructed stimuli. The results concerning storytelling should not be generalised outside of this study.

Table 1

Descriptive Statistics for the Manipulation Check Question

Condition	*N*	*M*	*SD*
Storytelling	50	5.14	2.13
Without storytelling	57	4.72	2.39

Note. N = 107. Range from 1 (= factual) to 10 (= narrative)

3.5 Participants

For this project, convenience and snowball sampling provided access to participants through the researcher's network. These subjects lived in the Netherlands and completed secondary school. At the end of data collection, 164 participants were gathered. However, participants that did not finish the questionnaire (n = 38) and took longer to complete the survey than a week (n = 2) were excluded from the data, which provided the dataset with 124 usable participants, with around 30 respondents per condition as can be seen in Table 2 below.

Table 2

Distribution Across Conditions

Condition	*N*	%
1	31	25.00%
2	26	20.97%
3	33	26.61%
4	34	27.42%
Total	124	100.00%

Note. N = 124.

In Table 3 below, an overview is provided with demographics for all respondents per condition. Of the 124 respondents, 56.45% were male (*n* = 70), 41.93% were female (*n* = 52) and 0.81% belonged to a third/non-binary gender or chose not to indicate their gender (n = 2). The participants were aged 19 to 70 years of age, with their average around 34 years (*M* = 34.35, *SD* = 13.48). The demographics of gender, education, and age were fairly equal under all conditions. However, age was not always normally distributed throughout all age groups. The first four age groups (18-25, 26-35, 36-45, 46-55) were fairly normally distributed, however the two older age groups (56-65, 66-75) were not. This should be considered when generalising the data for older age groups.

Table 3

Descriptive Statistics on Participant Characteristics per Condition

Condition			*Video*				*Blog*			
	Variable	Participant Characteristic	*N (34)*	*%*	*M*	*SD*	*N(26)*	*%*	*M*	*SD*
Storytelling	Gender[a]	Male	21	61.76%			16	61.54%		
		Female	13	38.24%			9	34.62%		
		Non-binary / Third Gender	0	0.00%			1	3.85%		
		Prefer not to say	0	0.00%			0	0.00%		
	Level of Education[c]	Low Educated	1	2.94%			1	3.85%		
		Medium Educated	12	35.29%			10	38.46%		
		High Educated	21	61.76%			15	57.69%		
	Age[b]	Mean			32.41	13.19			32.77	11.44
	Variable	Participant Characteristic	*N (32)*	*%*	*M*	*SD*	*N(31)*	*%*	*M*	*SD*
No Storytelling	Gender[a]	Male	17	51.52%			16	51.61%		
		Female	15	45.45%			15	48.39%		
		Non-binary / Third Gender	0	0.00%			0	0.00%		
		Prefer not to say	1	3.03%			0	0.00%		
	Level of Education[c]	Low Educated	1	3.03%			0	0.00%		
		Medium Educated	10	30.30%			6	19.35%		
		High Educated	22	66.66%			25	80.65%		
	Age[b]	Age			36.06	14.54			35.97	14.36

a) Percentage division Male / Female / Other
b) Mean age per condition in relation to content
c) Percentage division level of education

As can be seen in Table 4 below, the means of trust (*Means* = 3.87 - 4.06, *SD* = 0.52 - 0.89) and attitude towards science (interest) (*Means* = 3.78 - 4.03, *SD* = 0.47 - 0.74) were

higher than three under all conditions. It can be concluded that participants tended to both trust and be interested in science. However, the means regarding attitude towards science (limits) were lower than three (*Means* = 2.23 - 2.53, *SD* = 0.72 - 0.80), so they tended to be negative towards the limits that science has or should have.

Table 4

Descriptive Statistics on Participant Characteristics per Condition

Condition		*Video*		*Blog*	
	Participant Characteristic	*M*	*SD*	*M*	*SD*
Storytelling	Trust	3.87	0.89	4.06	0.52
	Interest towards Science	3.81	0.65	4.03	0.55
	Limits of Science	2.50	0.80	2.53	0.73
No Storytelling	Trust	3.94	0.71	3.88	0.57
	Interest towards Science	3.78	0.74	3.92	0.47
	Limits of Science	2.23	0.75	2.35	0.72

a) $N = 124$. Range from 1 (= low amount of trust) to 5 (= high amount of trust)

b) $N = 124$. Range from 1 (= negative attitude) to 5 (= positive attitude)

c) $N = 124$. Range from 1 (= negative towards scientific limits) to 5 (= positive towards scientific limits)

3.6 Measurements

Multiple scales of interest to this study were validated by prior research, namely trust towards science, attitude towards science, perceived pleasantness and perceived comprehension. For comprehension, three multiple choice questions were developed originally for this study. This section will give an overview of the measurements, whereas a list of all the measurements can be found below in Table 5.

Both the trust and attitude towards science scales and the questions were derived from the Eurobarometer (European Commission, 2021). For measuring attitude and trust, a unipolar Likert-type scale was used. Nine questions were asked to measure attitude, and four questions

were asked to measure trust. The nine questions were maintained within one construct in the Eurobarometer. The four questions measuring trust were spread throughout the report. However, nothing was reported about the reliability and validity of the questions.

The study of Putorti et al. (2019) also used a survey to measure the same dependent variables. From this study the scales and questions for measuring perceived pleasantness and perceived comprehension were derived. A unipolar Likert-type scale was used to measure the answers to perceived pleasantness and perceived comprehension. Perceived pleasantness was measured with 12 statements, whereas perceived comprehension was measured with one statement.

Lastly, three multiple-choice questions were developed with four mutually exclusive answers (Putortì et al., 2019) to measure comprehension. These questions were original to this study and were based on the contents of the final stimuli.

3.7 Validity and Reliability of the Measurements

A factor analysis and reliability analysis was performed to check whether the measured variables were reliable. For the constructs to be reliable, the correlation coefficients between the variables within the constructs had to be higher than 0.50 (Kaiser, 1974). At the same time, Cronbach's Alpha had to be around 0.70 (Tavakol & Dennick, 2011). The outcomes of these analyses are presented in Table 5 below.

Following the factor analysis, five reliable constructs were formed to be used in further data analysis. The four statements centred around trust had high enough correlation coefficients to be kept in one construct. In the study of Putorti et al. (2019), perceived pleasantness was maintained in one reliable construct. In contrast, the 12 perceived pleasantness statements were not reliable as one construct in this study. Statements regarding clearness, confusion and

the shortness of the stimuli had to be omitted, because they did not fit any of the constructs. Six statements regarding perceived pleasantness that were negatively formulated, were re-coded. The remaining nine statements were split up into two constructs: perceived pleasantness (attitude) and perceived pleasantness (ease of understanding). The nine statements regarding attitudes towards science were also not reliable as one construct. Two statements about science being simple and scientists taking time to meet with the participants were omitted, because they did not fit any of the constructs. The remaining seven statements were split up into two constructs: attitude towards science (interest) and attitude towards science (limits). After the factor analysis, the reliability analysis showed all constructs ended up with a Cronbach's Alpha between $\alpha = 0.64$ and $\alpha = 0.86$ as can be seen in Table 5.

Table 5

Factor Analysis (Rotated Component Matrix)

Statements	*Trust in Science*	*Attitude towards Science (Interest)*	*Attitude towards Science (Limits)*	*Perceived Pleasantness (Attitude)*	*Perceived Pleasantness (Ease of Understanding)*
Wetenschap en technologie kunnen mensen hun levens verbeteren.	0.86				
Wetenschap en technologie kunnen helpen het millieu te verduurzamen.	0.82				
Wetenschappers vertellen de waarheid over controversiële wetenschappelijke en technologische kwesties.	0.78				
Wetenschappers en technologische experts zijn te vertrouwen.	0.79				
In mijn dagelijks leven is het belangrijk om op de hoogte te zijn over wetenschappelijke ontwikkelingen.		0.76			
Ik zou graag meer te weten komen over wetenschappelijke ontwikkelingen.		0.82			
De resultaten van maatschappelijk gefinancierd onderzoek moeten gratis online beschikbaar worden gesteld.		0.55			
De belangstelling van jongeren voor wetenschap is essentieel voor onze welvaart in de toekomst.		0.69			
Schadelijke gevolgen van wetenschappelijke en technologische ontwikkelingen kunnen altijd worden verholpen door nieuwe uitvindingen.			0.79		
Wetenschap en technologie kunnen elk probleem oplossen.			0.73		
Er mag geen grens zijn aan wat de wetenschap mag onderzoeken.			0.71		
Deze blog/video is lang.*				0.75	
Deze blog/video is saai.*				0.88	
Deze blog/video is interessant.				0.76	
Deze blog/video is plezierig.				0.77	
Deze blog/video is irritant.*				0.73	
Deze blog/video maakt gebruik van eenvoudige termen.					0.85
Deze blog/video is makkelijk te begrijpen.					0.75
Deze blog/video maakt gebruik van moeilijke termen.*					0.81
Deze blog/video is moeilijk te begrijpen.*					0.66
(DEL) Wetenschap is zo eenvoudig dat ik er veel van begrijp.					
(DEL) Wetenschappers besteden voldoende tijd aan ontmoetingen met mensen zoals ik om hun werk uit te leggen.					
(DEL) Deze blog/video is verwarrend.*					
(DEL) Deze blog/video is duidelijk.					
(DEL) Deze blog/video is kort.					
Cronbach Alpha:	0.86	0.72	0.64	0.85	0.80
Explained Variance (total: 64.32%):	13.85%	8.26%	7.09%	23.66%	11.46%
Eigenvalue:	2.77	1.65	1.42	4.73	2.29

(DEL) : Deleted items; attitude 1,3, perceived pleasantness 3, 9, 12

Note. All statements were tested on a unipolar five-point Likert scale 1 (= Strongly disagree) to 5 (= Strongly agree) and (1 = Very unlikely) to (5 = Very likely)

** Indicates recoded* items

4. Results

In the following chapter, the outcomes of the data analysis are presented. The formulated hypotheses from Chapter 2 were tested using a MANOVA through SPSS. A two-way MANOVA test was performed to see whether the independent variables can explain some of the variances in the dependent variables. The outcomes of this test allowed the hypotheses to be rejected, supported, or remain inconclusive. Wilks' Lambda is the test statistic used to see

whether the variables significantly contribute to the model. The main effects and the interaction effects of the independent variables will be discussed.

4.1 Main Effects

To check whether there were any significant outcomes between the dependent variables, a MANOVA was performed. For any outcomes to be significant, they had to be below 0.05. The outcomes can be seen below in Table 6.

The P-values of the Wilk's Lambda test for storytelling and format were significant, which means that both these variables contributed to the model. However, the P-value of the interaction effect was not significant, which means that the combination of storytelling and format did not contribute to the model.

As for the relationships between the variables, there were three significant effects. Both format and storytelling had a significant effect on perceived pleasantness (attitude) (F = 12.36, p = <.01) (F = 12.36, p = .04), whereas storytelling also had a significant effect on comprehension (F = 8.45, p = <.01). The means of the dependent variables under all conditions had to be compared to see whether these significant effects had the expected directions.

Table 6
Multivariate Test for Variance

Multivariate tests	Independent variable	*F-value*	*Sig.*
Wilk's Lambda	Storytelling	3.12	0.02
	Format	4.09	0.00
	Storytelling * Format (Interaction)	1.64	0.17
Tests of between-subjects effects	**Construct**	***F-value***	***Sig.***
Storytelling	Perceived Pleasantness (Attitude)[(a)]	4.26	0.04
	Perceived Pleasantness (Ease of Understanding)[(b)]	3.40	0.07
	Perceived Comprehension[(c)]	1.06	0.31
	Comprehension[(d)]	8.45	0.00
Format	Perceived Pleasantness (Attitude)[(a)]	12.36	0.00
	Perceived Pleasantness (Ease of Understanding)[(b)]	1.35	0.25
	Perceived Comprehension[(c)]	0.13	0.72
	Comprehension[(d)]	2.63	0.11
Storytelling * Format (Interaction)	Perceived Pleasantness (Attitude)[(a)]	2.00	0.16
	Perceived Pleasantness (Ease of Understanding)[(b)]	0.24	0.63
	Perceived Comprehension[(c)]	0.12	0.73
	Comprehension[(d)]	3.45	0.07

a) N = 124. Range from 1 (= low perceived pleasantness (attitude)) to 5 (= high perceived pleasantness (attitude))

b) N = 124. Range from 1 (= low perceived pleasantness (ease of understanding)) to 5 (= high perceived pleasantness (ease of understanding))

c) N = 124. Range from 1 (= low perceived comprehension) to 5 (= high perceived comprehension)

d) N = 124. Range from 1 (= low comprehension) to 3 (= high comprehension)

As can be seen in Table 7, the respondents that saw the blog stimuli had overall higher mean scores than the video stimuli. The only significant difference was found for perceived pleasantness (attitude) (M = 3.42, SD = 0.73) vs (M = 2.86, SD = 0.80).

Although a significant difference for format was found with perceived pleasantness (attitude) (F = 12.36, p = <.01), it had the opposite effect than what was expected by hypothesis one, which means that hypothesis one can only be partly rejected based on perceived pleasantness (attitude). The rest of the hypothesis, that video resulted in higher comprehension than blogs, cannot be rejected or supported. Conclusively, the opposite is partly true of what

was previously expected. In this context, blogs lead to higher perceived pleasantness (attitude) than videos.

Table 7

Descriptive Statistics of Format on Dependent Variables

	Video		*Blog*	
Construct	*Mean*	*SD*	*Mean*	*SD*
Perceived Pleasantness (Attitude)[(a)]	2.86	0.80	3.42	0.73
Perceived Pleasantness (Ease of Understanding)[(b)]	3.75	0.68	3.88	0.57
Perceived Comprehension[(c)]	3.54	0.97	3.63	0.94
Comprehension[(d)]	2.21	0.60	2.06	0.71

a) N = 124. Range from 1 (= low perceived pleasantness (attitude)) to 5 (= high perceived pleasantness (attitude))

b) N = 124. Range from 1 (= low perceived pleasantness (ease of understanding)) to 5 (= high perceived pleasantness (ease of understanding))

c) N = 124. Range from 1 (= low perceived comprehension) to 5 (= high perceived comprehension)

d) N = 124. Range from 1 (= low comprehension) to 3 (= high comprehension)

As can be seen in Table 8, the respondents that experienced the paradigmatic stimuli attributed higher means than the narrative stimuli for all dependent variables. Significant differences for storytelling were found with perceived pleasantness (attitude) (M = 3.25, SD = 0.86) vs (M = 2.97, SD = 0.74) and comprehension (M = 2.29, SD = 0.55) vs (M = 1.98, SD = 0.72).

Although storytelling had a significant effect on perceived pleasantness (attitude) (F = 12.36, p = .04), and comprehension (F = 8.45, p = <.01), the effects had the opposite direction than expected when formulating the second hypothesis, which means that the second hypothesis can also be partly rejected based on perceived pleasantness (attitude) and comprehension. Perceived pleasantness (ease of understanding) did not show a significantly different outcome based on storytelling. Therefore the entire hypothesis cannot be rejected. However, the biggest part of the hypothesis can be rejected. So it can be stated that using no

storytelling in this context leads to higher comprehension and a higher perceived pleasantness (attitude).

Table 8

Descriptive Statistics of Format on Dependent Variables

	Storytelling		*No storytelling*	
Construct	*Mean*	*SD*	*Mean*	*SD*
Perceived Pleasantness (Attitude)[a]	2.97	0.74	3.25	0.86
Perceived Pleasantness (Ease of Understanding)[b]	3.70	0.61	3.91	0.64
Perceived Comprehension[c]	3.52	0.89	3.64	1.01
Comprehension[d]	1.98	0.72	2.29	0.55

a) N = 124. Range from 1 (= low perceived pleasantness (attitude)) to 5 (= high perceived pleasantness (attitude))

b) N = 124. Range from 1 (= low perceived pleasantness (ease of understanding)) to 5 (= high perceived pleasantness (ease of understanding))

c) N = 124. Range from 1 (= low perceived comprehension) to 5 (= high perceived comprehension)

d) N = 124. Range from 1 (= low comprehension) to 3 (= high comprehension)

4.2 Interaction Effect

As can be seen in Table 9, the respondents that saw the paradigmatic blog condition also attributed higher means to all constructs compared to the narrative video condition. Although the means for the narrative video condition were lower than the paradigmatic blog condition, the differences were not significant for any of the constructs. Therefore, the third hypothesis cannot be rejected or supported. No interaction between the independent variables was found. Consequently, it cannot be stated that communicating science through narrative videos is better than communicating science through a more factual blog. The evidence seems to suggest the contrary when looking at storytelling and the used format independently.

Table 9

Descriptive statistics of interaction on dependent variables

Condition		*Video*		*Blog*	
	Construct	*Mean*	*SD*	*Mean*	*SD*
Storytelling	Perceived Pleasantness (Attitude)[(a)]	2.81	0.64	3.19	0.81
	Perceived Pleasantness (Ease of Understanding)[(b)]	3.63	0.67	3.80	0.51
	Perceived Comprehension[(c)]	3.50	0.79	3.54	1.03
	Comprehension[(d)]	2.15	0.62	1.75	0.79
No storytelling	Perceived Pleasantness (Attitude)[(a)]	2.92	0.94	3.61	0.61
	Perceived Pleasantness (Ease of Understanding)[(b)]	3.87	0.67	3.95	0.62
	Perceived Comprehension[(c)]	3.58	1.15	3.71	0.86
	Comprehension[(d)]	2.27	0.57	2.30	0.53

a) N = 124. Range from 1 (= low perceived pleasantness (attitude)) to 5 (= high perceived pleasantness (attitude))

b) N = 124. Range from 1 (= low perceived pleasantness (ease of understanding)) to 5 (= high perceived pleasantness (ease of understanding))

c) N = 124. Range from 1 (= low perceived comprehension) to 5 (= high perceived comprehension)

d) N = 124. Range from 1 (= low comprehension) to 3 (= high comprehension)

4.3 Covariate Effects

Trust and attitude towards science, age, level of education and gender were also included in a MANOVA as covariates. However, none of the mentioned covariates had any significant differences between the conditions.

5. Discussion

The effect of the format and the use of narratives were researched on the perceived pleasantness and comprehension for a general audience. The goal was to measure the main and interaction effects of blogs, videos, storytelling and no storytelling. Additionally, it was examined whether gender, age, level of education, trust and attitude towards science had any significant effects on perceived pleasantness and comprehension. Three significant effects were found. Although all three hypotheses were not supported, the three significant effects partly

suggest the opposite of what was hypothesised. Stimuli without storytelling resulted overall in higher results, and significantly impacted perceived pleasantness (attitude) and comprehension. Because none of the hypotheses could be fully supported or rejected, the research question could not be answered convincingly. However, the significant results did lead to an interesting discussion as can be seen in the following sections.

5.1 Discussion of Results

Blogs might have yielded better outcomes than videos because of how the stimuli are constructed. Interestingly, the video's watch time (2:39 - 3:20 minutes) is almost identical to the time it takes for the blogs to be read (2:47 - 3:16 minutes). The blog reading times are based on the average reading speed of 238 words per minute (Brysbaert, 2019). Whatever the actual watch and read time, the two statements measuring the length of the stimuli were higher for the video stimuli.

The absolute time that someone can concentrate on a format appears to be longer for blogs than for videos. This might be because video length is inversely correlated with capturing and holding viewers' attention, with 50% of YouTube videos being under two minutes (Ruedlinger, 2012, as cited in Welbourne & Grant, 2015). Whereas blogs only achieve the highest level of engagement at 1600 words, which takes on average six minutes and 43 seconds to read (Lee, 2020).

It should be noted that there were only marginal differences between the means of the two formats regarding ease of understanding and comprehension. That would mean that aside from eliciting a more positive attitude towards the blog/format, the ease of understanding and comprehension between the formats were relatively the same. The reason why video stimuli did not significantly affect participants' comprehension might be due to the pace of the voice-over. Blogs can be read at people's own rate, while the maker of the video determines the pace of the

video. The pace of the voice-over might have been too fast, which can negatively affect the listener's comprehension (Welbourne & Grant, 2015).

An alternative explanation why blogs worked better than videos might be due to cognitive overload. According to Kalyuga (2000), audio and visuals are used in education to simultaneously explain a singular subject. However, it is stated that triggering multiple senses to explain one thing is more likely to overload the viewers' working memory, contrary to triggering one of the senses. It could be the case that the videos in this study caused an overload of participants' working memory due to the fact that multiple senses were triggered, which was not the case for blogs. Nonetheless, participants' working memory was not measured for this study. Hence, this explanation cannot be confirmed.

Additionally, the survey was filled in by participants in an uncontrolled setting. Participants verbally indicated that they interrupted the survey due to the fact that they had to view a video. Some participants did not have a headset and were not in an environment where they could view the video without a headset. Because it was an uncontrolled setting, participants might have been distracted while filling in the questionnaire. If next to an uncontrolled setting, participants also experienced cognitive overload, they might have been too distracted. This might have affected the outcomes of this study. Future research might benefit from conducting similar surveys in a controlled setting and measuring the cognitive load of multisensory and unisensory formats.

There were two more significant outcomes: the effects of storytelling on the attitude and the comprehension of the stimuli.

Firstly, storytelling stimuli could have yielded better results than paradigmatic stimuli because the storytelling stimuli were not significantly distinct from the paradigmatic stimuli. This

might have been due to the sample size, or due to the stimuli not being distinct enough from one another.

Secondly, the efforts in the storytelling stimuli to convince a general audience of the benefits of community power might have been too obvious. As long as the participants were not aware of the storytelling stimuli trying to convince them of community powers' benefits, no harm is done. However, the audience might have become aware of being manipulated, which is identified as a possible hindrance for narrative persuasion (Moyer-Guse & Nabi, 2010, as cited in Dahlstrom, 2014). This awareness might have caused the participants to reject the information communicated through the narrative stimuli. Conversely, the more factual stimuli does not contain persuasive narrative techniques. Hence, they could not have given participants the impression that they are being deceived.

Lastly, storytelling might not have led to better comprehension than facts because the storytelling elements in the stimuli were too simple. It has been stated that coherent narratives are needed to achieve the benefits of narratives within science communication to non-expert audiences. Moreover, coherent narratives require high levels of internal complexity, cultural and social alignment (Monteagudo-Gonzalez, 2011; Graesser & Ottati, 1995, as cited in Dahlstrom, 2014).

One of the reasons that factual blogs might have yielded better results than narrative videos could have been because the manipulation might not have been successful. This might have been caused by the simplicity of the storytelling elements involved in the stimuli. Another reason might be that the perceived lengths of stimuli had to be similar because the length of the stimuli might have affected the results too much.

However, narrative videos have less time to tell everything that needs to be told. In the blog format, a lot more words can be used to describe the same thing discussed in a video. On

average, words are read faster than they can be spoken, which gives a blog much more time to add more context. Furthermore, storytelling elements like a protagonist, a setting or examples take time to introduce, which works conversely with narrative videos, as narratives are expansive and complex, whereas videos should be simple and compact.

5.2 Implications

5.2.1 Practical Implications

This study shows that the conventional statement: narrative videos might work better than more factual blogs in many situations, might not be as straightforward as it seems. In this study, using facts or blogs resulted in better comprehension and higher perceived pleasantness (attitude) when communicating science to general audiences. Possibly general audiences are more fond of straightforward communication regarding complex subjects. The outcomes of this study are relevant for policymakers, politicians, science journalists and scientists.

5.2.2 Theoretical Implications

The blog format was significantly more effective in eliciting positive attitudes towards the stimulus than the video format. These findings were contrary to expectations, which were based on literature and theory that suggested videos were a more attention-grabbing, more attractive and richer format (Alley et al., 2014; Koehler et al., 2005; Kristine et al., 2009, as cited in Putortì et al., 2019; Berkowitz, 2013, as cited in Cooke et al., 2017; Daft & Lengel, 1986).

Additionally, the expectation was that storytelling would result in better comprehension and higher perceived pleasantness, which was based on findings in literature and theory (Cortes Arevalo et al., 2020; Davies et al., 2019; Fisher, 1984; Goulão, 2018; Yildiz & Çetinkaya, 2017). However, the directions of these effects were the opposite of what was expected.

Namely, the stimuli that used no storytelling resulted in a more positive attitude and a higher comprehension of the content.

Lastly, no significant effects were found for an interaction effect between format and storytelling, which is against expectations based on findings previously found in previous studies (Farinella, 2018; Putortì et al., 2019).

The findings in this study challenge the literature and theory that state narratives and richer media formats are superior to factual and poorer media formats. Although narrative videos might be better in a multitude of cases, context plays an important role. Future studies within the field of science communication might benefit from the recommendations in the following section.

5.3 Limitations and Future Research

The effects of storytelling and format individually have been researched broadly within science communication. However, the presence and absence of storytelling were not researched in a combination of videos and blogs. This study aimed to fill this research gap. As with each scientific study, some limitations were encountered during this research.

First and foremost, although the manipulation of storytelling worked successfully in the preliminary study, the storytelling stimuli did not have significantly different means than the paradigmatic stimuli, which means that all the results regarding storytelling might be ungrounded. Storytelling stimuli differed from non-storytelling stimuli by having a protagonist, relatable examples and a fictive organisation. Future studies might benefit from a larger sample size, a more extensive preliminary study, and might need more extreme measures to achieve the right stimuli. Literature might also benefit from studies that take different storytelling approaches, construct typologies based on how extensive storytelling can go, and measure the

effects to see the ultimate combination of storytelling elements when communicating about science.

Secondly, the sample used for this study might not have been representative of general audiences within the Netherlands. Convenience and snowball sampling was used, which means that the representativeness of the population was not accounted for in this study. Additionally, the sample size might not have been big enough to statistically discern the difference between the storytelling and factual stimuli. Next, the mean age was also relatively young: 35 years. While collecting respondents above 18 years old, elderly participants should have been gathered more. In order to achieve a higher balance within the age groups to get more reliable data. The balance between men and women also was not entirely equal, with 70 participants being men and 52 being women. Conclusively, the level of education was not balanced in the least. With 83 participants being highly educated, 38 having middle-level education and only three being lowly educated. The sample of this study was more representative of the researchers' network than the Dutch population of general audiences. Future studies might benefit from larger, more representative sampling methods.

Thirdly, the stimuli were served in PDFs and embedded YouTube iFrames. It might have been better for the blog to be in a more natural setting, like a blog website, or for the video to be viewed without references to YouTube or a Youtube channel. However, viewing the video purely without a YouTube iFrame was not possible. It is recommended that future studies use an online survey tool that allows video stimuli to be shown without the YouTube iFrame and that blogs are placed in their natural environment. Both these things might affect the outcomes.

Fourthly, the subject of this study might have influenced the outcomes of this study. Although precautions were taken by choosing a reasonably neutral topic, this might not have been enough. Even though the format and the presence of storytelling are the focus of this

study, the content can be very decisive. Future researchers can benefit from researching the sensitivity and attitudes of general audiences towards scientific and technological topics. Doing so allows other science communicators to adapt their communication and format based on the topic.

Fifthly, due to the survey being held online in an uncontrollable setting, participants might have been exposed to distractions present in their environment. Also, stimuli triggering multiple senses might have cognitively overloaded the participants. Future research might benefit from reproducing these results in a controlled setting, or measuring whether participants are cognitively overexposed by the stimuli and their environment.

5.4 Conclusion

When collecting information about science communication, it seemed clear-cut to conclude that using narratives and videos would work better than a blog that only used facts. Videos can be processed more easily than blogs, and storytelling is more engaging than facts. However, videos should also be short, simple and straightforward, whereas narratives are complex and extensive. These narrative videos, therefore, either end up being very long in watch duration or need to be thought out very carefully in order to achieve the right balance between video duration and narrative complexity. When this balance is not achieved, which might have been the case for this study, blogs using facts might be the better alternative. Authors of blogs can be a lot more contextual, as the engagement span of blog readers is a lot higher than for people watching videos. Also, blogs are less likely to cognitively overload their audience than videos because fewer senses are stimulated. Future studies should carefully construct the manipulation, use a larger, representative sample and place the stimuli in a more natural, controlled setting. Lastly, it is recommended that future research inquire about the

composition of typologies to determine the balance of storytelling elements and the sensitivity of scientific and technological subjects.

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Appendices

Appendix A: Blog stimuli

Blog with storytelling

“People power”: hoe lokale gemeenschappen en steden een bijdrage kunnen leveren om het milieu te redden

Beleidsmakers hebben wereldwijd nog steeds moeite om de doelstellingen van het Parijs Akkoord in daden om te zetten. De titel van de klimaatconferentie in Marrakech was daarom: Zet de belofte van Parijs om in daden. Hoewel internationale gemeenschappen moeite hebben om in actie te komen, ondernemen steden en lokale gemeenschappen plannen om klimaatverandering tegen te gaan.

Steden nemen het voortouw

Lieke de Jong is oprichter van CommuniTrees, een organisatie die burgers betrekt om op lokaal niveau te verduurzamen. Lieke geeft aan dat steden en regio's steeds meer te zeggen hebben over wereldwijde verduurzaming. Beleidsmakers en wetenschappers vinden dit ook terecht, omdat steden zowel kwetsbaar als verantwoordelijk zijn voor de achteruitgang van het milieu. Lieke vervolgt dat

steden die verantwoordelijkheid ook nemen: “De C40-burgemeester top in Mexico City liet zien dat burgemeesters graag koolstofarme en flexibele toekomstscenario's voor hun steden opstellen.”

Als inspiratie kijkt Lieke ook naar andere steden, zoals Tokyo: “Hier heeft de lokale overheid het eerste systeem op stadsniveau opgezet om gebouwen efficiënter met hun energie om te laten gaan. ‘Cap-and-trade’-systemen zorgen ervoor dat bedrijven punten scoren als ze zuiniger met hun energie omgaan. Als de grootste energieverbruikende gebouwen bepaalde doelstellingen niet halen, moeten ze punten kopen van nabijgelegen gebouwen die de doelstellingen wel halen.”

Een andere stad waar Lieke ideeën uitput is de Duitse stad Hamburg. “Hamburg is van plan om de stad binnen 20 jaar autovrij te maken door een groen netwerk te bouwen van fiets- en voetpaden die de stad verbindt met de buitenwijken, parken, speelplaatsen, begraafplaatsen en andere openbare ruimten. De groene wegen

maken auto's overbodig en zorgen er voor dat de stad beter bestand is tegen overstromingen, natuurrampen, én dat er meer kooldioxide wordt geabsorbeerd.”

De kracht van de mens
Lieke geeft aan dat mensen veel kracht hebben om klimaatverandering aan te pakken: “Studies tonen aan dat het stimuleren van burgerparticipatie in energieprojecten de vraag naar energie en de uitstoot van broeikasgassen verminderd.”

Het stimuleren van burgerparticipatie in energieprojecten inspireerde niet alleen Lieke met haar organisatie CommuniTrees, maar ook de wereld burgerenergie conferentie. Deze conferentie werd in 2016 in Fukushima in Japan gehouden. Deelnemers bij deze eerste editie van het evenement onderzochten hoe lokale gemeenschappen kunnen omschakelen naar 100% hernieuwbare energie in 2040. Lieke geeft aan dat een samenwerking tussen bewoners, bedrijven en lokale overheden dit doel kan behalen door zonne- en windenergie tot primaire energiebronnen maken.

Lieke weet ook nog twee voorbeelden van burgerparticipatie. In het Fukushima Airport Solar Power Project investeerden burgers geld in de aankoop en installatie van zonnepanelen. Dat leverde ongeveer 1,2 megawatt elektriciteit op voor de luchthaven. Bij een ander initiatief binnen de regio hielpen burgers lokale boeren een zonnepark te financieren en te installeren. Deze leverde ongeveer 50 kilowatt stroom.

Wat is 'community power' eigenlijk?
"Community power betekent vrij vertaald burgerkracht. Het houdt in dat burgers deelnemen aan de productie en het gebruik van een duurzaam energiesysteem, en daarin controle over de aanpak hebben."

Lieke noemt wat voorbeelden: "Burgers die (gedeeltelijk) eigenaar zijn van systemen die duurzame energie opwekken, of burgers die aandelen nemen in een bedrijf, deelnemen aan de planning, beslissingen nemen over de installatie en het draaiende houden van een energiebedrijf ontwikkelen 'community power'."

Volgens Lieke helpt het delen van ervaringen niet alleen CommuniTrees, maar ook lokale gemeenschappen wereldwijd om vooruitgang te boeken. “In Denemarken is het wettelijk verplicht dat consumenten of gemeentelijke coöperaties eigenaar zijn van de stadsverwarming en de elektriciteitsproductie. De betrokkenheid van burgers kan de ontwikkeling en omarming van duurzame projecten makkelijker maken.”

De Fukushima-verklaring

De oprichter van CommuniTrees geeft aan dat het succes van deze burgerprojecten niet voor niets is geweest: “Uit de Fukushima-verklaring kwam voort dat deelnemende overheden van ‘community power’ het ‘belangrijkste model voor hernieuwbare energievoorziening in de hele wereld’ willen maken.”

Lieke geeft een aantal manieren aan waarop deze doelstelling bereikt zal worden: “Dit kan doordat lokale gemeenschappen zich richten op het verbeteren van de communicatie over de beste methodes en samen met lokale overheden werken aan plannen. Door kennis over te dragen proberen ze het daadkrachtig vermogen van lokale gemeenschappen in ontwikkelingslanden te verbeteren.

Tot slot geeft Lieke aan waarom ‘Community power’ de oplossing is: “Decentralisatie brengt de controle over belangrijke hulpmiddelen dichter bij burgers. Dat geeft steden de kans om aan de basis te innoveren, in plaats van energie-innovatie alleen over te laten aan rijke gemeenschappen die over de middelen beschikken om ambitieuze energieprogramma's op te zetten.”

Het overleg in Fukushima was een voorbeeld voor de start van het organiseren en stimuleren van “community power”. Het is van cruciaal belang om te zien hoe deze kracht wereldwijd uitgebreid kan worden.

Blog without storytelling

“People power”: hoe lokale gemeenschappen en steden een bijdrage kunnen leveren om het milieu te redden

Beleidsmakers hebben wereldwijd nog steeds moeite om de doelstellingen van het Parijs Akkoord in daden om te zetten. De titel van de klimaatconferentie in Marrakech was daarom: Zet de belofte van Parijs om in daden. Hoewel internationale gemeenschappen moeite hebben om in actie te komen, ondernemen steden en lokale gemeenschappen plannen om klimaatverandering tegen te gaan.

Steden nemen het voortouw
Steden en regio's krijgen steeds meer zeggenschap in internationale onderhandelingen. Beleidsmakers en wetenschappers vinden dat steden zowel kwetsbaar als medeverantwoordelijk zijn voor de achteruitgang van het milieu. De C40-top van burgemeesters in Mexico City liet zien dat burgemeesters graag koolstofarme en flexibele toekomstscenario's voor hun steden opstellen.

In Tokyo heeft de lokale overheid het eerste systeem op stadsniveau opgezet om gebouwen efficiënter met hun energie om te laten gaan. ‘Cap-and-trade’-systemen zorgen ervoor dat bedrijven punten krijgen als ze zuiniger met hun energie omgaan. Als de grootste energieverbruikende gebouwen bepaalde doelstellingen niet halen, zijn ze verplicht punten te kopen van nabijgelegen gebouwen die de doelstellingen wel halen.

De Duitse stad Hamburg is van plan om de stad binnen 20 jaar autovrij te maken door een groen netwerk te bouwen van fiets- en voetpaden die de stad verbindt met de buitenwijken, parken, speelplaatsen, begraafplaatsen en andere openbare ruimten. De groene wegen maken auto's overbodig en zorgen er voor dat de stad beter bestand is tegen overstromingen, natuurrampen, én dat er meer kooldioxide wordt geabsorbeerd.

De kracht van de mens
Mensen hebben veel kracht om klimaatverandering aan te pakken. Studies tonen aan dat het stimuleren van burgerparticipatie in energieprojecten de vraag naar energie en de uitstoot van broeikasgassen verminderd.

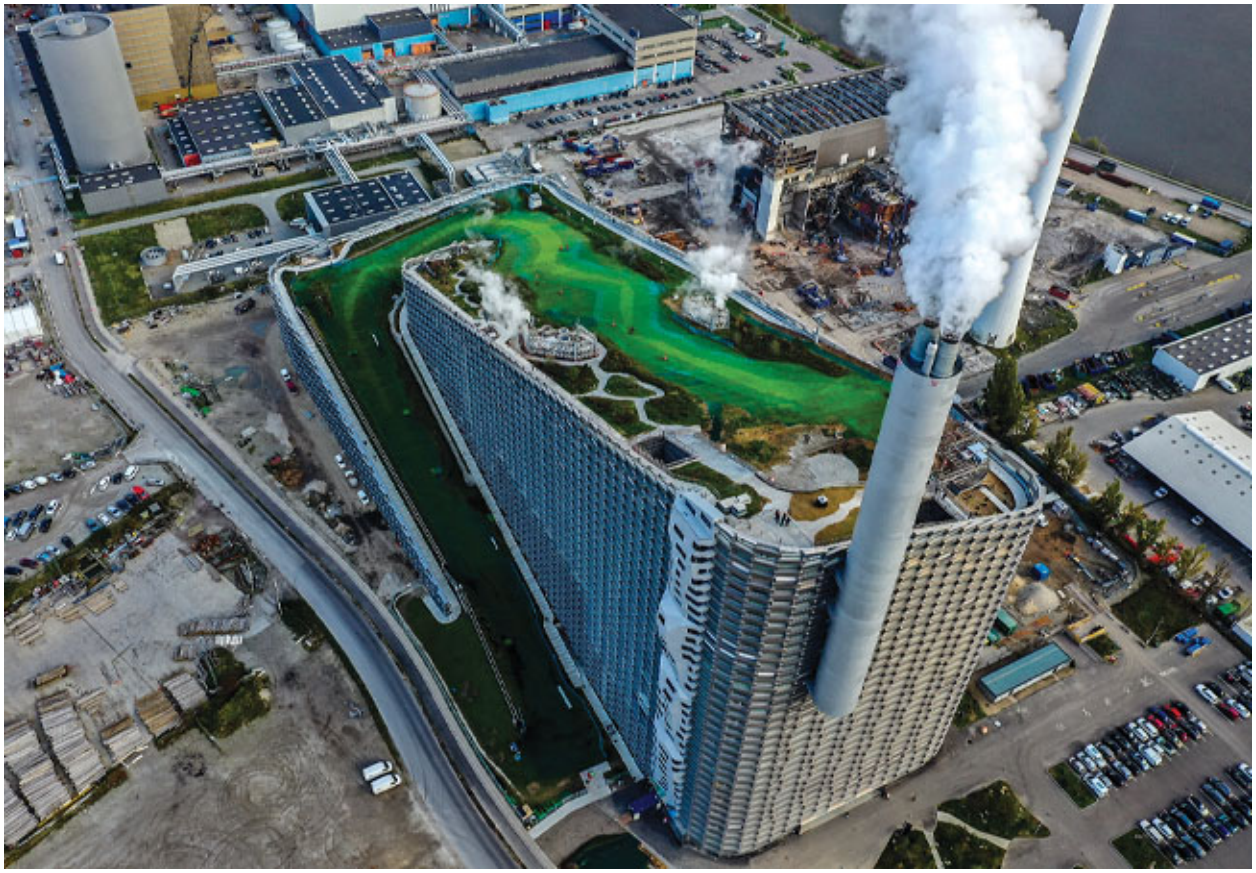
Het stimuleren van burgerparticipatie in energieprojecten inspireerde de wereld burgerenergie conferentie. Deze conferentie werd in 2016 in Fukushima in Japan gehouden. Deelnemers bij deze eerste editie van het evenement onderzochten hoe lokale gemeenschappen kunnen omschakelen naar 100% hernieuwbare energie in 2040. Dit kan doordat bewoners, bedrijven en lokale overheden samen zonne- en windenergie tot hun primaire energiebronnen maken.

In verschillende projecten werkten ze samen. In het Fukushima Airport Solar Power Project investeerden burgers geld in de aankoop en installatie van zonnepanelen. Dat leverde ongeveer 1,2 megawatt elektriciteit op voor de

luchthaven. Bij een ander initiatief binnen de regio hielpen burgers lokale boeren een zonnepark te financieren en te installeren. Deze leverde ongeveer 50 kilowatt stroom.

Wat is 'community power' eigenlijk?
Community power, wat vrij vertaald burgerkracht betekent, houdt in dat burgers deelnemen aan de productie en het gebruik van een duurzaam energiesysteem, en daarin controle over de aanpak hebben.

Burgers die (gedeeltelijk) eigenaar zijn van systemen die duurzame energie opwekken, of burgers die aandelen nemen in een bedrijf, deelnemen aan de planning, beslissingen nemen over de installatie en het draaiende houden van een energiebedrijf ontwikkelen 'community power'.



Het delen van ervaringen helpt andere lokale gemeenschappen om vooruitgang te boeken. In Denemarken is het wettelijk verplicht dat consumenten of gemeentelijke coöperaties eigenaar zijn van de stadsverwarming en de

elektriciteitsproductie. De betrokkenheid van burgers kan de ontwikkeling en omarming van projecten voor hernieuwbare energie vergemakkelijken.

De Fukushima-verklaring

Uit de Fukushima-verklaring kwam voort dat deelnemende overheden van “community power” het "belangrijkste model voor hernieuwbare energievoorziening in de hele wereld" willen maken.
Deze doelstelling kan worden gehaald doordat lokale gemeenschappen zich richten op het verbeteren van de communicatie over de beste methodes en samen met lokale overheden werken aan plannen. Door kennis over te dragen proberen ze het daadkrachtig vermogen van lokale gemeenschappen in ontwikkelingslanden te verbeteren.

Decentralisatie brengt de controle over belangrijke hulpmiddelen dichter bij burgers. Dat geeft steden de kans om aan de basis te innoveren, in plaats van energie-innovatie alleen over te laten aan rijke gemeenschappen die over de middelen beschikken om ambitieuze energieprogramma's op te zetten.

Het overleg in Fukushima was een voorbeeld voor de start van het organiseren en stimuleren van “community power”. Het is van cruciaal belang om te zien hoe deze kracht wereldwijd uitgebreid kan worden.

Appendix B: Survey

Vragenlijst voor het meten van effectieve wetenschapscommunicatie

Survey Flow

Block: Inleiding van de vragenlijst (1 Question)
Standard: Demografische gegevens (4 Questions)
Standard: Vertrouwen in de wetenschap (1 Question)
Standard: Houding tegenover de wetenschap (1 Question)
BlockRandomizer: 1 - Evenly Present Elements
  Group: Condition 1: Blog zonder storytelling
    Standard: Blog zonder storytelling (7 Questions)
    EmbeddedData
      Condition = 1
      Create New Field or Choose From Dropdown...Value will be set from Panel or URL.
  Group: Condition 2: Blog met storytelling
    Standard: Blog met storytelling (7 Questions)
    EmbeddedData
      Condition = 2
  Group: Condition 3: Video zonder storytelling
    Standard: Video zonder storytelling (7 Questions)
    EmbeddedData
      Condition = 3
  Group: Condition 4: Video met storytelling
    Standard: Video met storytelling (7 Questions)
    EmbeddedData
      Condition = 4
EndSurvey: Advanced

Page Break

Start of Block: Inleiding van de vragenlijst

Q1.1 Geachte heer/mevrouw,

Bedankt voor het deelnemen aan het onderzoek getiteld “Make science make sense for general audiences”. Voor het onderzoek vult u een vragenlijst in. In deze vragenlijst wordt gevraagd naar uw demografische gegevens, u krijgt een blog te lezen of een video te zien en vervolgens worden daar een aantal vragen over gesteld. Dit onderzoek wordt uitgevoerd door Daniël Bloemendal, Masterstudent aan de Faculteit Gedrags-, Management- en Maatschappijwetenschappen van de Universiteit Twente.

Het doel van dit onderzoek is om een effectieve manier te vinden om wetenschappelijke bevindingen te communiceren naar een algemeen publiek. Het kost u 7 tot 13 minuten om het onderzoek in te vullen. De bevindingen kunnen worden gebruikt zodat wetenschappers, wetenschapsjournalisten en iedereen die over wetenschap communiceert dit effectiever kan doen.

Uw deelname aan dit onderzoek is geheel vrijwillig en u kunt zich op elk moment terugtrekken. Het staat u vrij om een vraag niet te beantwoorden.

Wij zijn van mening dat er geen bekende risico's verbonden zijn aan dit onderzoek; echter, zoals bij elke online gerelateerde activiteit is het risico van een inbreuk altijd mogelijk. Uw antwoorden in dit onderzoek zullen zo vertrouwelijk mogelijk blijven. We zullen eventuele risico's minimaliseren door de gegevens alleen intern op te slaan en alleen te delen met de onderzoekers en de beoordelaars. Daarnaast worden alle deelnemers geanonimiseerd en genummerd, zodat elke individuele deelnemer vertrouwelijk blijft.

Heeft u vragen of wilt u hulp bij het invullen van de vragenlijst? Neem dan contact op met Daniël Bloemendal via het email adres ***email adres niet getoond vanwege privacyregels***. Veel succes!

Daniël Bloemendal
Masterstudent bij de Universiteit Twente

- o Ik ga akkoord met de voorwaarden (1)

End of Block: Inleiding van de vragenlijst

Start of Block: Demografische gegevens

Q2.1 **Demografische gegevens**

Q2.2 Wat is uw geslacht?

- o Man (1)
- o Vrouw (2)
- o Niet-binair / derde geslacht (3)
- o Zeg ik liever niet (4)

Q2.3 Welke leeftijd heeft u?

_____

Q2.4 Wat is de hoogste school/opleiding die u heeft afgerond?

- o Basisonderwijs (1)
- o Vmbo-b/k, mbo1 (2)
- o Vmbo-g/t, havo-, vwo-onderbouw (3)
- o Mbo2 en mbo3 (4)
- o Mbo4 (5)
- o Havo, vwo (6)

o Hbo-, wo-bachelor (7)

o Hbo-, wo-master, doctor (8)

o Anders, graag specificeren: (9)

_____

End of Block: Demografische gegevens

Start of Block: Vertrouwen in de wetenschap

Q3.1 **Vertrouwen in de wetenschap**

* Gedefinieerd als de mate van vertrouwen in de wetenschap

Er volgen 4 uitspraken over de wetenschap. Wilt u aangeven in hoeverre u het hiermee eens of oneens bent?

	Volledig mee oneens (1)	Mee oneens (2)	Neutraal (3)	Mee eens (4)	Volledig mee eens (5)
Wetenschappers vertellen de waarheid over controversiële wetenschappelijke en technologische kwesties. (2)	o	o	o	o	o
Wetenschappers en technologische experts zijn te vertrouwen. (3)	o	o	o	o	o
Wetenschap en technologie kunnen mensen hun levens verbeteren. (11)	o	o	o	o	o

Wetenschap en technologie kunnen helpen het millieu te verduurzamen. (12)	o	o	o	o	o

End of Block: Vertrouwen in de wetenschap

Start of Block: Houding tegenover de wetenschap

Q4.1 **Houding tegenover de wetenschap**
* Gedefinieerd als het gevoel of de emotie ten opzichte van de wetenschap

Er volgen 9 uitspraken over de wetenschap. Wilt u aangeven in hoeverre u het eens of oneens u het hiermee bent?

	Volledig mee oneens (1)	Mee oneens (2)	Neutraal (3)	Mee eens (4)	Volledig mee eens (5)
Wetenschap is zo eenvoudig dat ik er veel van begrijp. (2)	o	o	o	o	o
In mijn dagelijks leven is het belangrijk om op de hoogte te zijn over wetenschappelijke ontwikkelingen. (3)	o	o	o	o	o

Wetenschappers besteden voldoende tijd aan ontmoetingen met mensen zoals ik om hun werk uit te leggen. (10)	o	o	o	o	o
Ik zou graag meer te weten komen over wetenschappelijke ontwikkelingen. (11)	o	o	o	o	o
De resultaten van maatschappelijk gefinancierd onderzoek moeten gratis online beschikbaar worden gesteld. (12)	o	o	o	o	o
De belangstelling van jongeren voor wetenschap is essentieel voor onze welvaart in de toekomst. (13)	o	o	o	o	o
Wetenschap en technologie kunnen elk probleem oplossen. (14)	o	o	o	o	o
Er mag geen grens zijn aan wat de wetenschap mag onderzoeken. (15)	o	o	o	o	o

Schadelijke gevolgen van wetenschappelijke en technologische ontwikkelingen kunnen altijd worden verholpen door nieuwe uitvindingen. (16)	o	o	o	o	o

End of Block: Houding tegenover de wetenschap

Start of Block: Blog zonder storytelling

Q5.1 Hieronder is een link die leidt tot de download van een blog. Lees deze blog aandachtig, omdat er later vragen over worden gesteld. Het lezen duurt ongeveer 4 tot 8 minuten. Vervolg na het lezen van de blog de enquête.

Page Break

Q5.2 Deze blog...

	… maakt vooral gebruik van feiten.								… maakt vooral gebruik van verhalen.
	0	1	2	3	4	5	6	7	8	9	10
Feitelijk - verhalend ()											

Q5.3 Er volgen 12 uitspraken. Wilt u aangeven in hoeverre u het eens of oneens u het hiermee bent? Deze blog...

	Volledig mee oneens (1)	Mee oneens (2)	Neutraal (3)	Mee eens (4)	Volledig mee eens (5)
... is makkelijk te begrijpen. (1)	o	o	o	o	o
... maakt gebruik van eenvoudige termen. (2)	o	o	o	o	o
... is verwarrend. (3)	o	o	o	o	o
... is lang. (4)	o	o	o	o	o
... is saai. (5)	o	o	o	o	o
... is moeilijk te begrijpen. (6)	o	o	o	o	o
... is interessant. (8)	o	o	o	o	o
... is plezierig. (9)	o	o	o	o	o
... is duidelijk. (10)	o	o	o	o	o

... maakt gebruik van moeilijke termen. (12)	o	o	o	o	o
... is irritant. (13)	o	o	o	o	o
... is kort. (14)	o	o	o	o	o

Q5.4 Wilt u aangeven in hoeverre u het eens of oneens u het hiermee bent?

	Volledig mee oneens (1)	Mee oneens (2)	Neutraal (3)	Mee eens (4)	Volledig mee eens (5)
Ik heb het gevoel dat ik alles begrepen heb wat er in de blog geschreven is. (1)	o	o	o	o	o

Q5.5 Deze blog [die gaat over “community power”] is vooral belangrijk omdat het aangeeft hoe moeilijk:

- o Regio’s/provincies het vinden om klimaatverandering tegen te gaan. (1)
- o Steden het vinden om klimaatverandering tegen te gaan. (2)

o Mensen/gemeenschappen het vinden om klimaatverandering tegen te gaan. (3)

o Landen/werelddelen het vinden om klimaatverandering tegen te gaan. (4)

Q5.6 Deze blog [die gaat over “community power”] is vooral belangrijk omdat het uitlegd dat “community power” betekent dat:

o Burgers deelnemen aan de productie en het gebruik van een duurzaam energiesysteem, en daarin controle over de aanpak hebben. (1)

o Burgemeesters samen hun krachten bundelen om hun steden te verduurzamen. (2)

o Lokale particuliere bedrijven die gespecialiseerd zijn in het verduurzamen de klimaatverandering moeten aanpakken. (3)

o Regio’s/provincies verantwoordelijk zijn voor het uitdelen van subsidies, om zo steden, dorpen en gemeenschappen te verduurzamen. (4)

Q5.7 Deze blog [die gaat over “community power”] is vooral belangrijk omdat het aangeeft hoe:

o Het wettelijk opleggen van burgerparticipatie dé oplossing is om hun medewerking te garanderen. (1)

o Het betrekken van burgers de ontwikkeling van duurzame projecten vergemakkelijkt. (2)

o Zonne-energie de beste manier is om duurzame energie op te wekken. (3)

o Verduurzaming vooral is weggelegd voor bedrijven/individuen die daar de financiële middelen voor hebben. (4)

End of Block: Blog zonder storytelling

Start of Block: Blog met storytelling

Q6.1 Hieronder is een link die leidt tot de download van een blog. Lees deze blog aandachtig, omdat er later vragen over worden gesteld. Het lezen duurt ongeveer 4 tot 8 minuten. Vervolg na het lezen van de blog de enquête.

Page Break

Q6.2 Deze blog...

	… maakt vooral gebruik van feiten.								… maakt vooral gebruik van verhalen.	
	0	1	2	3	4	5	6	7	8	9	10
Feitelijk - verhalend ()											

Q6.3 Er volgen 12 uitspraken. Wilt u aangeven in hoeverre u het eens of oneens u het hiermee bent? Deze blog...

	Volledig mee oneens (1)	Mee oneens (2)	Neutraal (3)	Mee eens (4)	Volledig mee eens (5)
... is makkelijk te begrijpen. (1)	o	o	o	o	o
... maakt gebruik van eenvoudige termen. (2)	o	o	o	o	o

... is verwarrend. (3)	o	o	o	o	o
... is lang. (4)	o	o	o	o	o
... is saai. (5)	o	o	o	o	o
... is moeilijk te begrijpen. (6)	o	o	o	o	o
... is interessant. (8)	o	o	o	o	o
... is plezierig. (9)	o	o	o	o	o
... is duidelijk. (10)	o	o	o	o	o
... maakt gebruik van moeilijke termen. (12)	o	o	o	o	o
... is irritant. (13)	o	o	o	o	o
... is kort. (14)	o	o	o	o	o

Q6.4 Wilt u aangeven in hoeverre u het eens of oneens u het hiermee bent?

	Volledig mee oneens (1)	Mee oneens (2)	Neutraal (3)	Mee eens (4)	Volledig mee eens (5)
Ik heb het gevoel dat ik alles begrepen heb wat er in de blog geschreven is. (1)	o	o	o	o	o

Q6.5 Deze blog [die gaat over “community power”] is vooral belangrijk omdat het aangeeft hoe moeilijk:

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End of Block: Blog met storytelling

Start of Block: Video zonder storytelling

Q7.1 Hieronder is een video te zien, deze duurt ongeveer 3 minuten. Bekijk deze aandachtig, omdat hier later vragen over worden gesteld. Vervolg na het zien van de video de enquête.

Page Break

Q7.2 Deze video...

	… maakt vooral gebruik van feiten.								… maakt vooral gebruik van verhalen.
0	1	2	3	4	5	6	7	8	9	10

Feitelijk - verhalend ()	

Q7.3 Er volgen 12 uitspraken. Wilt u aangeven in hoeverre u het eens of oneens u het hiermee bent? Deze video...

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... is verwarrend. (3)	o	o	o	o	o
... is lang. (4)	o	o	o	o	o
... is saai. (5)	o	o	o	o	o
... is moeilijk te begrijpen. (6)	o	o	o	o	o
... is interessant. (8)	o	o	o	o	o
... is plezierig. (9)	o	o	o	o	o

... is duidelijk. (10)	o	o	o	o	o
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End of Block: Video zonder storytelling

Start of Block: Video met storytelling

Q8.1 Hieronder is een video te zien, deze duurt ongeveer 3 minuten. Bekijk deze aandachtig, omdat hier later vragen over worden gesteld. Vervolg na het zien van de video de enquête.

Page Break

Q8.2 Deze video...

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... is saai. (5)	o	o	o	o	o
... is moeilijk te begrijpen. (6)	o	o	o	o	o
... is interessant. (8)	o	o	o	o	o
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End of Block: Video met storytelling