HOW CAN WE CHANGE NARRATIVE PERSUASION REGARDING CLIMATE CHANGE?

THE EFFECTS OF INTERACTIVITY AND SOCIAL DISTANCE ON THE NARRATIVE PERSUASION

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Snr: 2045251 | Anr: 498523

MASTER THESIS

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Business communication and digital media

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Word count: 11.580
February 2021

Abstract

Narratives are used to communicate all kinds of messages to audiences. The message and goal of Cli-Fi narratives is to positively influence behavior towards climate change and create more awareness on the subject, which can be achieved with the high persuasive power a narrative can have. All kinds of factors contribute to the persuasiveness of a narrative, but it remains unknown how cli-fi stories should ideally look like in order to reach these goals most effectively. This research aimed to establish how two of these possible factors, interactivity and social distance, can influence the level of narrative persuasion in Cli-Fi, measured by three indicators: transportation, identification and a selection of narrative persuasion statements.

96 people participated in a 2 x 2 between subject experiment, where they processed one of the four narratives manipulated on their level of interactivity (interactive or non-interactive) and social distance (small social distance or large social distance). Their level of transportation, identification and narrative persuasion statement scores were measured, as well as their level of climate change awareness before and after processing the narrative. The hypotheses tested in this study entailed the possible individual effects of both interactivity and social distance on narrative persuasion, and whether there was an interaction effect between both.

No significant effects of the independent variables on narrative persuasion were found in the statistical analyses of the data, and therefore all hypotheses were rejected. Processing the Cli-Fi narrative itself though, regardless of which condition participants were in, appeared to increase climate change awareness among participants significantly. Since effects were in contrast with prior studies and theories, it can be concluded that future research could implement stronger and even more contrasting manipulations in order to possibly find significant effects which could be more explanatory and generalizable.

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1. Introduction

Climate change has become a well-known issue in our society. The decrease of biodiversity, land degradation and polar ice caps melting 6 times faster than 30 years ago are all examples of the dooming effects of climate change (McMichael & Haines, 1997; Poloczanska, 2020). All around the world, people discover and create solutions in order to counter this change. Scientists and climate organizations agree that it is hard to bring about awareness and change behavior on a global scale (Tiller & Schott, 2013). Therefore, messages intended to communicate climate change to the general public should have considerable persuasion in order to generate behavioral change (Faddoul & Chatterjee, 2020; Slater & Rouner, 2002).

One of the ways to increase persuasion in climate change is with climate fiction, or Cli-Fi. Cli-Fi is a relatively new genre of fictional works about climate change in all possible disciplines from novels to films to plays, depicting possible future worlds and how humanity evolves in these changed worlds (Svoboda, 2015). One of the ultimate goals of Cli-Fi is to influence the behavior of people regarding climate change in a positive way and to create awareness of the problem. The genre is oftentimes seen as provocative and speculative, which can cause aversion to the topic of climate change by audiences due to the catastrophic speculations depicted (Jensen, 2020).

While there is increasing evidence for cli-fi to reach its goals (Schneider-Mayerson et al., 2020), prior studies have not yet established the ideal look and form of the narratives in order to reach their goals most effectively. When looking at previous literature on storytelling, one influential factor may lie in the interactivity of the story (Roth and Koenitz, 2016). Interactivity can be seen as the cyclic process between, in this case, the story and the audience where both alternately speak, listen and take action (Crawford, 2003). Crawford divides interactivity in three components: Speed, Depth and Choice. Speed refers to how quickly the system responses to the actions of the user, Depth refers to the human-likeness of the interaction with the story, and Choice includes how much agency the user has (ability to take meaningful actions) and whether a user gets the feeling of perceived completeness (all choices a user would face and think of in real life in the situation

depicted in the story). Adding these aspects of interactivity to a story could benefit the feeling of transportation into the narrative, which increases narrative persuasion and in turn helps reach Cli-Fi goals. Transportation can be defined as the absorption into a narrative and is a key factor in order to generate high persuasive impact (Green & Brock, 2000).

Interactivity could benefit Cli-fi goals, but no research has been conducted yet into the narrative persuasion of this specific field of fiction. Interactivity is proven to be effective in different fields though, such as generating more product-related thoughts on product websites (Sicilia et al., 2005) and reaching persuasion goals in modern media (Oh & Sundar, 2015). As it will be argued in the theoretical framework, interactivity in cli-fi stories may cause people to experience higher levels of transportation into the narrative. The first goal of this research is to investigate if interactive elements in cli-fi indeed increase narrative persuasion of the story,

According to Slater and Rouner (2002), transportation is one factor that contributes to narrative persuasion. Another factor included in their framework is identification with characters. Therefore, next to an interactivity manipulation, the current study will also apply a manipulation of social distance, since research also shows that attitude and the feeling of responsibility towards climate change are determined by demographical factors including gender, age or educational level (Wells et al., 2011). When the audience of a story can relate and identify to the character of the narrative, by for instance having similar demographical factors to this character, the persuasiveness and credibility of the story goes up (Slater & Rouner, 2002). When this high level of identification to a character is present, we speak of a small social distance (Liberman et al., 2007). Social distance refers to the features you, in this case the reader, have in common with the character. For instance, when you are a 20 year old female living in the Netherlands, and you read a story with a narrator of the same age, who is also Dutch, you will feel a lot more resemblance to the character than when your social distance to the narrator is large, for instance with one of a foreign nationality in a different age-group.

Social distance has been researched fairly extensively, but in the context of Cli-fi, no prior studies have been conducted. In the health domain, Ma and Nan (2017) researched the effect of social distance and storytelling on anti-smoking messages for non-smokers. They concluded that in message framing, a small social distance results in a higher impact on risk-belief. Another research was done by Carroll and Richardson (2011), who studied the effects of both interactivity and social distance in journalism. They concluded that readers prefer both factors to be present. They also argue that when readers identify more with the writer of an article, for instance in a personal blog, they prefer interacting with it by for instance commenting on the article or sharing it. Apart from this conclusion, no real interaction effect was studied between both factors, which leaves an opportunity for this research to confirm this possible amplified effect of social distance and interactivity and transportation and persuasiveness.

It can be concluded that in other scientific research domains, both interactivity and social distance individually influence the narrative persuasion of stories, but due to limited specific research, much remains unclear on whether they are also present in Cli-Fi and if these factors might interact with one another. Therefore, this research aims to answer the following research question: *What are the effects of interactivity and social distance on the narrative persuasion of Cli-Fi stories?*

The results of this study could be used by governments and organizations to optimize their climate change related campaigns by using the narrative persuasion of Cli-Fi to reach behavioral change.

2. Theoretical Framework

Climate change Fiction is a relatively new field of fiction. Originating about a decade ago, this field of fiction also became a new topic for scientific research. Many scholars discuss the ability of arts such as literature, music, films and theatrical pieces to positively influence beliefs and behaviors regarding climate change (Schneider-Mayerson et al., 2020) In the field of Cli-Fi, a close relationship to the issue in the forms of a sense of responsibility for the environment and environmental values are important to establish behavioral change regarding climate change directly (Dahlstrand & Biel, 1997).

Schneider-Mayerson et al. (2020) concluded that most scientific research on Cli-Fi is rather general and conducted the first experimental study on the direct and delayed effects of Cli-Fi on participants' beliefs on climate change. They found that, although the effect was small, Cli-Fi can positively influence the direct effect of beliefs on climate change. Von Mossner (2017) studied the possible effects Cli-Fi can have on young adults and their beliefs towards climate change. She argues that the genre can fulfill a far greater goal than just providing entertainment. Cli-Fi has the ability to influence young adults' understanding of climate change and increase their sense of urgency and risks associated with this issue.

We can therefore conclude that a successful Cli-Fi story can influence the beliefs on and understanding of climate change, but how does this process work? To answer this question, we first establish what is needed to create a successful narrative, how narratives work and especially what factors are of influence to make a narrative persuasive (which is the goal of Cli-Fi). Thereafter, having explained narratives in further detail in section *2.1 Storytelling and Narratives*, two factors which are central to the current study, and their possible interaction effect, are discussed. These factors are interactivity and social distance, and are included due to their ability of increasing the persuasiveness of a narrative.

2.1 Storytelling and Narratives

Stories are commonly associated with entertainment, are easy to understand and can also be used for information sharing, advices, explanation of difficult matters, and so on (Green, 2008). Green (2008) discribes stories as a sequence of thematically and temporally related events with a beginning, middle, and end. Audiences review these stories actively, constructing their own mental images and meaning and coming to an emotional realization of the story (Bilandzic & Busselle, 2013). The form in which these stories are told can differ from text to audio to film and can be used in many different fields and for many different purposes.

Kinnebrock and Bilandzic (2006) researched which "textual" factors should be present to create a "good" narrative to reach optimal transportation into the story world. These factors influence the *narrativity* of the story and the higher this narrativity, the better the narrative (Kinnebrock & Bilandzic, 2006). In their study they explain narrativity as: "the qualities that stories must have in order to be perceived as good and interesting" (p.2) and provide a list of narrativity factors which should be clearly present to achieve narrative persuasion. They divide these factors in three different narrative levels: Story, Discourse and Structure. The Story level contains the consistent system of events in a chronological order. Discourse level entails the "way" in which a story is told or the presentation of the story, and the Structure level includes factors that influence both the story and discourse into a wholesome network. These narrativity factors will be included in the materials of the current study to create a baseline narrative with basic narrative persuasion and are therefore discussed in more detail below.

Story level

The first of Kinnebrock and Bilandzic's narrative levels is the Story level. One very important narrativity factor in the Story level, which is essential in the current study is the multiplicity of possible storylines. This factor entails the presence of multiple storylines and the interaction between storylines and character's actions. It will increase the understanding of the narrative

message and allows intensive processing (Kinnebrock & Bilandzic, 2006). This narrativity factor can be eminently utilized to include interactivity in the narrative which can in itself increase persuasiveness (Green & Jenkins, 2014). The concept of interactivity is included as one of the independent variables in this study and will be explained in further detail later on.

Next, the narrativity factors transactiveness and transivity are closely related to one another. Transactiveness entails "the emphasis on character actions" and transitivity is the extent to which these different character(actions) interact with each other. Also the development of these characters and their changing (interpersonal) relationships benefit narrativity (Kinnebrock & Bilandzic, 2006).

Discourse level

Next is the second narrative level: the Discourse level. The first narrativity factor on the Discourse level is dramatic mode. When this factor is present in a narrative, the actions an dialogues are not narrated, but displayed and experienced, allowing the audience to get the perception of a first-hand experience or involvement, which in turn generates intense mental processing (Kinnebrock & Bilandzic, 2006). A way to enhance this factor is when the audience feels attached to the characters, or in other words, with identification. This feeling of identification with a character can also be described as the level of social distance to the character. This concept of social distance will be clarified later on. Another Discourse level factor is craftsmanship which allows both intense and uncritical processing by providing the audience with an understandable and user-friendly presentation of the narrative (Kinnebrock & Bilandzic, 2006).

Structure level

The third narrative level that will be discussed is the Structure level. The structure of a narrative is important in order for an audience to understand the message, and can be expressed by creating an autonomous whole. An autonomous whole narrative includes a beginning, middle part and clear ending. This perhaps supposedly plain structure might seem simple, but it allows easy

understanding and uncritical processing. This is also accomplished by assigning a genre to the narrative, based on typical sets of, for instance, action or situation schemes (Kinnebrock & Bilandzic, 2006). Lastly, narrativity goes up when surprise, suspense and curiosity are evoked by both the story and the presentation style, naturally allowing for intense mental processing, summarized as the affective structure.

2.2 Persuasive effects of narratives

In the previous section we explained which specific factors are important to reach high levels of narrativity. Next, the questions arise which effects narratives could generate and what affects the level of persuasion of a narrative, as is important in the Cli-Fi genre. CLi-Fi is an example of persuasive storytelling, which has the specific goal of using a narrative to convince or persuade its audience of something (Lee & Leets, 2002). As we have seen, the term narrative includes not just a story(line) itself, but also the way in which a story is told (Kinnebrock & Bilandzic, 2006). Non(or low)-narratives can for instance be simple explanations of information with arguments and conclusions, where narrative messages include the same information explained but with characters, storylines and a sequence of events (Kreuter et al., 2007).

How can a narrative be persuasive? And which aspects are crucial to reach persuasive goals? Research shows that in many different domains, such as health, education and advertising, theoretical and methodological elements of narrative persuasion have been integrated into their communication messages (Bilandzic & Busselle, 2013). This is not without a reason: Green (2008) argues that strong narratives can motivate audiences to take actions and change behavior. Kinnebrock and Bilandzic (2006) conclude that this change in behavior might be attributed to intense mental processing of experiencing a narrative. When a narrative is strong, it allows for the feeling of *transportation* to arise. Green and Brock (2000) researched the transportation within narratives and define it as the *absorption* into a narrative. Transportation takes place when all mental systems and focus of the audiences shift towards the narrative, as if actually being

transported from your own world into the story world. It reduces the likeliness of counter-arguing with the message of the narrative. The process of transportation is essential to generate persuasive effects (Green, 2008).

The process of transportation is described in the Transportation-Imagery Model (T-IM) (Green & Brock, 2000), which describes the causal relationship between the before mentioned mental (intense and uncritical) processing and the level of transportation. Green and Brock (2002) claim in their studies that the more an audience is immersed into a narrative, the more persuasive this message is being perceived. They also conclude that even if the message of the narrative exceeds or counters their own beliefs, audiences are unlikely to feel negatively towards the message during their transported state (Green & Brock, 2002). One factor that can positively enhance the level of transportation is the possibility to interact with the narrative (Green et al., 2004). Therefore, the level of interactivity is manipulated as used as an independent variables of this study and will be explained in further detail in chapter *2.3*.

Continuing on the persuasiveness of narratives, Slater and Rouner (2002) argue that narrative persuasion, or persuasive power of a narrative, should ideally be high and implicitly present in order to reach the intended goals or the narrative. Persuasive power can be explained as the capability of a storyline to convince an audience of a message depicted in the story. In addition to this, Slater and Rouner argue that while processing, the intent of this persuasive message should never be more obvious than the narrative itself, since it will cause both the narrative and the persuasive message to fail. Narrative persuasion works best when the audience is interested in the narrative, for instance by including identification with characters (Slater & Rouner, 2002).

Slater en Rouner's study (2002) concludes, based on their Extended Elaboration Likelihood Model (E-ELM), that the attitude towards characters influences the persuasive effects of the story. Similarly, Green and Brock (2000) mention that attachment to the character can play a critical role to reach transportation and more specifically a change in behavior. We can conclude from both these

studies that identification is not only an important part of the transportation process, but also important for the level of narrative persuasion.

Both models mentioned before, the Transportation Imagery Model (Green & Brock, 2000) and Extended Elaboration Likelihood Model (Slater & Rouner, 2002), explain how narrative persuasion works, how it can be increased, and the fact that identification can enhance it. This overlap between these models and theories indicate the importance of identification in narratives for the current study. When there is a high level of identification with the character, we speak of a small social distance (Liberman et al., 2007). Therefore, social distance is manipulated as the other independent variable in the current study and will be explained in further detail in chapter *2.4*.

Having established what is needed to generate narrative persuasion, we conclude that transportation can be linked to interactivity and identification to social distance. The processes and importance of these independent variables will be discussed in the following sections as well as the possible interaction effect of both these variables on narrative persuasion.

2.3 Interactivity

Interactivity can be used to increase persuasiveness (Crawford, 2003). The concept of interactivity can be explained as the cyclic process where both alternately listen, think and take action (Crawford, 2003). In the context of storytelling, ideally, the audience makes choices and the story "responds" to those choices. Crawford explains three essential factors affecting the degree of interactivity of a narrative: Speed, Depth and Choice. Speed refers to how fast the turnaround or respons of the action can be seen. The faster the reaction of a communication partner is, the higher the level of perceived interactivity gets, ideally causing a continuous 'motion' between both parties. Depth refers to the human-likeness of the interaction with the narrative, and the deeper the interaction, the more an appeal to the audience is made for what makes them human. Choice includes two different focuses: agency and perceived completeness. Agency refers to the ability to take actions in the narrative, or in other words, the functional significance of the choices of the

interactor. Perceived completeness entails the amount of choices the interactor is able to make and the significance of those. Perceived completeness is reached when all choices a user would face and think of in real life in the situation depicted in the story are included in the narrative. Where Crawford focuses more on the concept of interactivity in general, other researchers focus more specifically on interactivity in narratives.

Green and Jenkins (2014, p. 481) define interactive narratives as: "A story in which the reader has opportunities to decide the direction of the narrative, often at a key plot point". They describe the difference between traditional narratives and interactive narratives as traditional narratives moving from beginning, middle to end without opportunities to explore different paths or endings, which are available in interactive narratives.

Roth and Koenitz (2016) provide a more concrete explanation of interactivity on the user experience level. Similar to Crawford, they agree on the importance of agency in interactive narratives, but further divide this concept into three dimensions: Usability, Effectance and Autonomy. Usability, comparable to Crawford's (2003) Speed, entails the experienced ease of use with the interface of the narrative. Effectance refers to the meaningfulness of the choices and actions taken in the interactive narrative and whether these actions are satisfying the interactor's needs and desires. This concept can be sub-divided in local and global effectance. Local effectance is met when consequences of an action are noticeable immediately in the narrative whereas global effectance influences the ending of a narrative with a delayed effect. Lastly, autonomy means the interactor has an extensive set of options and choices to choose from and is free to take any actions without feeling like being pushed towards particular ones (Roth & Koenitz, 2016).

When all, or at least a large amount, of the before mentioned factors of interactivity from both Crawford (2003) and Roth and Koenitz (2016) are present in a narrative, a high level of interactivity is established which allows the audience to feel like they are being transported into the story, which in turn enhances persuasiveness (Green & Brock, 2000). Therefore, these factors will be included in the current study as much as possible, creating two conditions where one condition has a no

interactivity (all these factors absent) and the other condition a high level of interactivity (several factors present), establishing a verifiable difference between both conditions.

Green et al. (2004) argue that interactivity in narratives should evoke transportation, which leads to a more immersive and enjoyable experience of the narrative. Since interactive narratives require the audience to actively engage with the events and characters in the narrative, transportation is more easily established. Green and Jenkins (2014) concluded from their experiment comparing traditional and interactive narratives, that interactive narratives can be more transporting, although this difference was small. They attribute this finding to interactive narratives having a larger effect on attitudes compared to traditional narratives, due to interactivity influencing the mental processes caused by transportation.

One of the mental processes that is influenced by interactivity is the reduction of counter arguing with the message in the narrative. Counter arguing is the critical evaluation of the message resulting in conclusions in contrast with the message opposed to the preferable conclusions in line with the message. The constant decision making in interactive narratives allows audiences to carefully evaluate every choice within the narrative which can cause a more elaborative mindset towards the message of the narrative. Also, interactive narratives have a higher cognitive demand than traditional narratives, which in turn can further reduce counter arguing. Another mental process of transportation is identification with characters. Interactive narratives, due to audiences actively taking on goals and beliefs of characters in a narrative, can cause for more identification to arise between the audience and characters (Green & Jenkins, 2014).

Soto-Sanfiel et al. (2010) researched the effects of interactivity by comparing interactive films with non-interactive films. They found that participants who watched the interactive film experienced more empathy with the characters, and a higher level of identification. These findings suggest that interactivity enhances identification and transportation into the narrative, which in turn enhance the level of narrative persuasion (Green & Brock, 2000; Soto-Sanfiel et al., 2010). Bietti et al. (2019) provide examples like the transmission of narrative texts and route descriptions, where

interactivity can boost information transmission and learning. Cavazza et al. (2002) experimented with the form of interactive storytelling, where users are influencing the story rather than just being immersed in the story, and found positive results on this in their user evaluation. This immersive experience is the most commonly used form of interactive storytelling though, since it is argued to influence experiences and behavior (Nakevska et al., 2017). Similar Thue et al. (2007) adapted standard interactive storytelling by combining it with Player Modelling (predictive model of player's actions to the content in a game (Smith et al., 2011)) and showed that users can experience more joy when the story automatically adapts to choices and preferences users indicated in the game.

All this prior research establishes that high levels of interactivity can bring many positive effects which can or could also be applied in storytelling. Specifically the benefits in learning (Bietti et al., 2019) and the positive impact it can have on the level op transportation and identification (Green & Jenkins, 2014), could be useful in the case of climate change. Although proven to be effective in other domains such as modern media (Oh & Sundar, 2015) or product websites (Sicilia et al., 2005), interactivity used in Cli-Fi has not yet been researched. Taking these effects into account, the following hypothesis is tested in the current study:

H1: The level of narrative persuasion of a Cli-Fi story will be higher when interactivity is included in the narrative than when no interactivity is included.

2.4 Social distance

The level of narrative persuasion is not only influenced by interactivity, but also by identification, as explained in both aforementioned models (T-IM and E-ELM). This feeling of identification with a character can also be defined as having a close social distance with this character. Social distance is one of the dimensions from the Construal Level Theory (CLT) developed by Trope and Liberman (2010). This theory describes the relationship between psychological distance and the abstractness of a person's thinking. For instance, if psychological

distance is larger, a person will feel more abstract towards a person, idea or object. Psychological distance is the "subjective experience that something is close or far away from the self, here, and now" (Trope & Liberman, 2010, p. 440), and can be divided in four main dimensions which interact with each other: social, spatial, temporal and hypothetical distance. Spatial distance entails the physical distance between people, temporal distance refers to the distance in time between e.g. events and hypothetical distance includes the feeling or imagination of something (e.g. an event) to be likely or unlikely to occur (Trope & Liberman, 2010).

The dimension that is central to the current study, social distance, focuses on the feeling of closeness between a person and another person, object, idea etc., or the interpersonal similarity between people (Liviatan et al., 2008). The current study focuses specifically on this dimension due to the similarity with the concept of identification, which will most likely lead to the highest impact on narrative persuasion. Liviatan et al. (2008) provide the example of holding a job interview with a close friend, compared to holding the exact same interview with a complete stranger, and the probability that you will be more convinced by your friend due to a high interpersonal similarity. Kinnebrock and Bilanzic (2006) claim that when being transported and counter-arguing is absent (which could be ensured by a high level of narrativity and high level of interactivity), the audience regards situations in the narrative as their own close personal experience, which evoke strong feelings for the characters, which may in turn change beliefs and attitudes.

In order to generate a small social distance, identification with the character of the narrative should be high. One way to establish small social distance is via the use of visualizations, for which Tasci (2008) found that people experience a small social distance when being visually informed, in this case about tourist destinations. This data is included in the design of current study by incorporating contrasting visualizations for the different social distance conditions. For the actual manipulations of social distance, we take Karakayali (2009) as a starting point. She provides some dimensions on which social distance focused in different studies, generating conceptions which build social distance. Aspects of two of these will be included in the current study in order to work

with a comprehensive conceptualization, due to their relevance for the subject. First, affective distance mainly focuses on the belief that a person who *is* socially close to you (same gender, age, educational level etc.) also *feels* close to you, and implies the (subjective) presence of emotions and feelings as measurement tools to be crucial. Second, the distance between two cultural classes is referred to as cultural and habitual distance, focussing more on economical (e.g., income) and culture-specific (e.g., social-groups) similarities between people.

Other empirical research focused specifically on narratives where characters test positive or negative on Sexual transmitted diseases (STDs) and how social distance can influence the perception of self-risk (of STDs). Results show that a smaller social distance produces a higher perceiving of self-risk, and also that narrative engagement leads to higher risk convergence, mediated by smaller social distance (So & Shen, 2016). Similarly, Ma and Nan (2017) researched the effect of social distance and storytelling on anti-smoking messages for non-smokers. They concluded that in message framing, a small social distance (close relatedness) results in a higher impact on risk-belief. So and Shen (2016) attribute small social distance creating higher risk-beliefs to the fact that when exposed to the narrative with a risk-message, the audience feels more vulnerable to the risk, which is preferable in risk-communication. It can be concluded from both these studies that a smaller social distance enhances the risk perceiving, which can in turn possibly change behavior (Ma & Nan, 2017). This data is useful for the current study as the enhancement of the risk-perception of climate change could have a positive effect on the level of narrative persuasion.

Similar findings of enhanced persuasiveness due to small social distance were found in the field of commercial advertising. Specifically on the topic of creating awareness of domestic violence, narratives with small social distance to the characters are argued to have more positive effects and are more persuasive than narratives with large social distance. This study attributes these findings to the fact that when people identify with the characters in the ad, there is more likely they adopt beliefs and behaviors consistent to the story (Muralidharan & Kim, 2019).

In contrast to aforementioned studies, Xu (2018) found that in the specific case of narrative persuasion for risk prevention on drinking and driving, small social distance is not more effective than large social distance to increase persuasion. The potential explanation provided for these results is that negative consequences of the behavior were included (severe car accidents), resulting in a threatening message which is perceived as highly negative. In this case, the effect of a threatening message neutralizes the effect of small social distance. It is important to keep this data in mind during this study, to not possibly neutralize the effect of social distance by creating a narrative that could be perceived as threatening.

Overall, we can conclude from this prior research that the implementation of a small social distance in narratives can oftentimes lead to higher persuasive impact and other positive effects in the fields of specific detrimental global issues such as STDs and domestic violence. It is therefore likely that the implementation of a small social distance can also have a positive impact on the awareness of climate change and the narrative persuasion of Cli-Fi stories. Studies show that attitude and feeling of responsibility towards climate change is determined by demographical factors including gender, age or educational level (Wells et al., 2011). Although climate change has been researched extensively, this is not the case for Cli-Fi, especially not in a manipulation of social distance using demographical factors. Apart from this and the impact of social distance on detrimental global issues, Karakayali (2009) argues that due to technological evolution, social distance plays an increasingly important role in our society and has a direct link with identification (Slater & Rouner, 2002). Therefore, social distance is included as an independent variable in the current study. We hypothesize that when these demographical factors are similar to the characters (identification is established) in the Cli-Fi story, and a small social distance is created, higher levels of transportation will be experienced (Green & Brock, 2000; Slater & Rouner, 2002) and in turn the level of narrative persuasion of the Cli-Fi story will be enhanced. This leads to the following hypothesis:

H2: The level of narrative persuasion of a Cli-Fi story will be higher when the narrative includes a small social distance than when the narrative includes a large social distance.

2.5 Interaction

Taking all aforementioned studies, theories and hypotheses into account, we can assume that both interactivity and social distance influence the narrative persuasion of a Cli-Fi story. The question remains how these two variables interact and if they possibly amplify each other. A study by Carroll and Richardson (2011) included both these variables (with social distance defined as identification), in the field of journalism. They argued that readers prefer both factors to be present. They also conclude that when readers identify more with the writer of an article, for instance in a personal blog, they prefer interacting with it. The concept of interaction in their study included for instance actively engaging in the comment section of an article or sharing the article with possibly even a personal remark. Merrilees (2002) argued in his study on online relationships that interactivity serves as a positive determinant for the quality of online relationships and recommends firms and organizations to integrate interactivity to their online media in order to build relationships with consumers and create smaller social distance.

Although similar to the variables in the current study, we cannot assume journalistic articles are necessarily comparable to Cli-Fi narratives. Also it is not researched whether the quality of online relationships can also influence narrative persuasion. This leaves the opportunity for this study to confirm this possible amplified effect of small social distance (identification) in combination with the presence of interactivity on the level of narrative persuasion of the Cli-Fi narrative, generating the following hypothesis:

H3: The level of narrative persuasion of a Cli-Fi story will be highest when a high level of interactivity and small social distance are included in the narrative.

3. Method

3.1 Design

To test what the effects of interactivity and social distance on the narrative persuasion of Cli-Fi stories are, an online experiment with a 2x2 between subject design was conducted. Interactivity (non-interactive vs. interactive) and Social distance (Small vs. Large) were included as the independent variables and narrative persuasion as the dependent variable. As a control variable, awareness of climate change was measured, comparing answers before and after processing the narrative (Halady & Rao, 2010). Participants were randomly assigned to one of four conditions. The first condition contained a non-interactive Cli-Fi narrative, with large social distance to the main character. The second condition included an interactive Cli-Fi narrative, again with large social distance to the main character. Condition three contained a non-interactive narrative with small social distance to the main character. The last and fourth condition included an interactive narrative with small social distance to the character.

3.2 Participants

The online survey for this study was filled out by 124 participants. 19 participants did not finish the experiment, so their data was excluded from the dataset. The data of 4 other participants contained so many outliers or errors that it was decided to exclude these as well (e.g. when the duration of survey was much longer than average or when the Qualtrics system failed to record which condition a participant had). Finally, 5 participants from conditions 2 and 4 were excluded because their age was too close to the set age of 45 (between 40 and 50), which could negatively affect the manipulation. The final sample of 96 participants had a mean age of 33.5 (SD = 14.31) and consisted of 20 males and 76 females. 72 participants were from the Netherlands, 12 from the UK, 7 were from the United States, 2 from Germany, 1 from Belgium, 1 from Portugal and one participant came from Norway.

3.3 Materials

3.3.1 Generating the baseline narrative

A baseline narrative was created for this study which was later manipulated into the four conditions. The climate change related subject chosen for the narrative was water scarcity and how it developed over the years. The narrative entailed a main first-person character living in the year 2080, who through flashbacks, reminisces events in the past that lead to the water scarcity crisis in the fictional world of 2080. The narrative was based on the story 'Thirst' by Max Andrew Dubinsky, created for the After Water project from Chicago radio station WBEZ.

The original narrative was altered and supplemented by the researcher in order to fit the research purposes. To keep particpiants' attention, it was decided to use multiple forms of visual information, including text with images, videos and audio. Research by Tasci (2008), who argued that people experience a close social distance when being visually informed, was considered when generating the baseline narrative. Hence, it was decided to include audiovisual narratives for both conditions, generating basic social proximity for all conditions. When it comes to valence, research shows that dystopian Cli-Fi narratives are proven to provoke more concern and generate more persuasiveness than utopian narratives (O'Neill & Nicholson-Cole, 2009). Therefore, the baseline narrative had a dystopian context, but refrained from dramatic extremes to keep the narrative relatable. The narrative was written from an "I" perspective because this is said to be more effective for narrative persuasion than a third person perspective even when the level of social distance is different (Hoeken et al., 2016; Hoeken & Fikkers, 2014). Therefore, all conditions took an "I" perspective, to prevent this effect from biasing the results. The full text of the narrative can be found in Appendix A.

In every condition, the narrative started off with an introduction into the story, stating the age, gender and nationality of the 'I' character, which differed depending on the condition presented. To further develop the baseline Cli-Fi narrative, some narrativity factors from Kinnebrock and Bilandzic (2006) were integrated: the multiplicity of storylines, transitivity, dramatic mode,

craftsmanship and affective structure. These specific factors were chosen, because they appeared to be the most feasible in this narrative. Multiplicity of storylines was for instance applied by having different characters experiencing different storylines: We follow the main ("I") character in his day, but also his/her father's and cousin's storyline are explained. Another example of a narrativity factor applied is Dramatic mode. This was achieved by not just narrating the actions, but also displaying them in detail, in this case even by images and videos.

3.3.2 Manipulation of interactivity

To manipulate the first independent variable, interactivity, the participants in the interactive conditions were asked to choose between two options five times to continue the story, whereas the non-interactive conditions had no options for interaction with the story. They had the same blocks of text which were also present in the interactive conditions, but had no option to choose between answers. They could only click the arrow to go to the next page. Although participants in the interactive conditions had the impression that their choice influenced the continuation of the story, in reality all choices led to the same course of the narrative but with a very small text explaining their decision. Examples of these choices and small texts can be found in Appendix A.

To further manipulate interactivity, the interactivity factors from both Crawford (2003) and Roth and Koenitz (2016) were considered: Speed/usability, depth, agency, local effectance, perceived realism and autonomy. For the non-interactivity conditions these factors were absent whereas in the high interactivity conditions, forms of all these factors were included.

Speed/Usability, for instance, was included in the form of making the interaction fast and user-friendly, allowing participants to simply click on choice buttons to continue and receive immediate feedback from their choices which also allows for agency. Depth was implemented by making the choices for interaction as human-like as possible, for instance by providing the choice between staying and caring for your elderly father or leave and search your cousin. Effectance was added to the interactive conditions only as local effectance (effects of a choice noticeable

immediately), by providing a small text explaining the outcomes of their choice, immediately after choosing. The full text, including the small texts added for different choices in the 5 interactions, can be found in Appendix A.

3.3.3 Manipulation of social distance

The manipulation of social distance, the second independent variable, was based on the two conceptualizations mentioned in the theoretical framework (Karakayali, 2009), namely affective distance and distance between cultural levels. Affective distance was manipulated by adapting demographical factors (gender, age) of the characters in the narrative to either be similar to the demographical factors of the participant (small social distance) or very contrasting to demographical factors of the participant (large social distance). When the participant indicated to be 26 years of age and male in the small social distance condition, the survey automatically adapted the character's age and gender as the same as the participant as piped text. In the large social distance conditions the age was set to 45 and the survey automatically provided the opposite gender of the participant for the character. The data from participants in the large social distance conditions who indicated to be around 45 (40-50), was excluded from the dataset, because this would reduce the impact of the manipulation. Educational level, which is another factor related to affective distance, was also excluded from this research. This decision was made because this factor was considered irrelevant in a narrative on a dystopian world where your only goal is to survive and educational level is of no importance.

The second conceptualization, the distance between two cultural classes, was manipulated by including two very different cultures. The small social distance conditions were presented with western culture whereas the large social distance conditions were presented with eastern (Indian) culture, because all participants for this study came from countries with western cultures. This manipulation was not only applied to the text of the narrative (with the piped text mentioned earlier) but also the visuals corresponded with the condition. In the small social distance condition,

participants saw images of western cultured people and an overview of websites with the Euro as currency, whereas in the large social distance condition participants saw eastern cultured people and an overview of websites with the Rupee as currency. Two examples of these manipulated images can be found in Appendix B.

3.4 Measures

To measure the narrative persuasion of the Cli-Fi narrative, three indicators were considered: transportation, identification and narrative persuasion statements (regarding the subject of the narrative), which were all analyzed independently.

Transportation was measured using Green and Brock's (2000) Transportation Imagery Model. This model includes 11 general items to measure transportion. The general items include questions such as "I *was mentally involved in the narrative while reading it*." and "*After finishing the narrative, I found it easy to put it out of my mind*." Some of the questions were to be reverse coded in order to increase the reliability of the scale. The word 'narrative' was altered from all the original questions of the model to the word 'story', to make the questions more understandable for participants (e.g., *I could picture myself in the scene of the events described in the story*). All questions were measured on 7-point Likert scales ranging from 'very strongly disagree' to 'very strongly agree'. The reliability of this transportation scale was good, Cronbach's $\alpha = .77$. All questions from the survey can be found in Appendix D.

Identification was measured using Cohen's (2001) Identification Scale. The scale is one of the most commonly used scales to measure identification in scientific research and was therefore included in this study. The scale was adapted to fit the current study and 7 out of 10 of the original statements were included. Examples of these are '*I think I have a good understanding of character X*." and "*While viewing the show I could feel the emotions character X portrayed*.". The original phrase was: "viewing the program", and was substituted by "reading the story". Three of the statements were excluded because they were not relevant for the context of the narrative. Also, one

of the statements was adapted to a reverse coding question in order to improve the reliability of the scale, since the original scale did not include questions that required reverse coding (*I do NOT understand the reasons why the 'I' character does what he or she does*). All statements were again measured on 7-point Likert scales ranging from 'very strongly disagree' to 'very strongly agree'. The reliability of the identification scale was good, Cronbach's $\alpha = .86$.

As a third indicator of narrative persuasion, other studies include one or a selection of additional statements (Nera et al., 2018; Green and Brock, 2000). For instance, Green and Brock (2000) presented their participants with the statement: *Malls are unsafe places* and participants were asked to what extent they agree or disagree with this statement. The current study included three of those statements to measure narrative persuasion directly. The three statements were: *Water scarcity is an impending problem*, *Attention has to be paid to increasing global drought* and *Our current actions will lead to severe negative consequences for future generations*. These statements applied to the subject of the narrative, being water scarcity and drought and were also measured on 7-point Likert-scales ranging from 'very strongly disagree' to 'very strongly agree'. The reliability of this additional narrative persuasion scale was good, Cronbach's $\alpha = .88$.

The learning benefits that narratives can generate, form an opportunity to increase awareness on climate change, which is important because global awareness and knowledge of this issue is still a problem (Lee et al., 2015). To gain insight into the attitude of people towards this subject, the level of awareness on climate change was included as a control variable. This variable was measured before and after the experiment, to see whether reading the narrative had an effect. To measure awareness, items from the "Awareness to Climate Change Questionnaire" (ACCQ) by Halady and Rao (2010) were used. Nine of these items from different levels were included in the current study, selecting them based on their relevance to the narrative. Questions on for instance ecological friendly lightning or industrialization were excluded while questions on water scarcity an increasing stress/disease were included, due to their relevance to the narrative. These questions

included statements which were measured on 4 point scale ranging from ‘not very ware’ to ‘very aware’, according to the original questionnaire by Halady and Rao.

Apart from the awareness and persuasion variables mentioned above, some demographics were asked from the participants which were also included as piped text in the introduction of the narrative. These demographics were age, gender and nationality.

3.5 Procedure

The survey for this study was created and conducted using Qualtrics software. After giving their consent to participate (This consent form can be seen in Appendix C), the survey started with the demographical questions. After finishing these questions, the pretest to measure the level of climate change awareness was conducted. Next, the introduction of the narrative explained who the I character was: either a person with the same age and gender from the same country (small social distance) or a person age 45 from India with the opposite gender (large social distance). Then participants were asked to process the narrative.

After finishing the story, participants were asked to indicate the levels to which they agreed with the transportation and identification statements and also again the level of climate change awareness was measured. Finally, the narrative persuasion statements were shown along with the manipulation check. This manipulation check was added to ensure people experienced their narrative as being interactive or non-interactive. This was measured by one question: *While reading the story, did you feel like you were allowed to make choices to influence what happened next in the story?* And could be answered with ‘yes’ or ‘no’. Participants spend an average of 1113,91 (*SD*= 439.95) seconds on taking the survey, which corresponds to roughly 19 minutes.

4. Results

In this section the results of the statistical tests will be discussed. First, the results from the manipulation check and control variables are argued. Thereafter, the effects on narrative persuasion by the three individual indicators are specified.

4.1 Manipulation check and control variables

The manipulation check was conducted for two reasons. Firstly, to test whether the manipulation of interactivity was successful, and secondly to measure if all participants had actively participated in the survey. Most participants passed the manipulation check (92 out of 96), indicating that the manipulation was successful and the majority of the sample actively participated. Since the manipulation check was the last question of the survey and results indicate that over 95% of participants passed, it was chosen to not exclude the four participants who did not pass the check.

Since there is still a lack of global awareness of climate change (Lee et al., 2015) and the learning benefits of narratives can form an opportunity to increase this awareness, the level of climate change awareness was tested. A paired samples T-test was performed to analyze whether processing a narrative itself (without considering which condition every participant had) created more climate change awareness, which was included in this study as a control variable. The data was not normally distributed with some skewness and kurtosis in the non-interactive, small social distance condition (z-score skewness/kurtosis = 3.12 and 4.19). Therefore, the *p*-value may not be reliable and more weight should be placed on the bootstrapped 95% confidence interval that is provided below. On average, the climate change awareness POST narrative score (M = 3.33, SD = 0.44) was higher than the climate change awareness PRE narrative score (M = 3.10, SD = 0.57). This difference was significant (Mdif = 0.23, $t(95) = -4.59$, $p < .000$) and generalizes to the population (95% CI -0.33, -0.14). The difference represents a medium-sized effect, $d = .45$.

A factorial ANOVA was performed to see whether the independent variables had an effect on climate change awareness. To perform this test, a new variable was computed providing the difference scores of climate change awareness measured before and after reading the narrative. As mentioned before, the climate change awareness scores were not normally distributed, but because the ANOVA is fairly robust against the violation of the assumption of normality, this should not bias the results very much. The assumption of homogeneity of variances was met, because Levene's test of equality of error variances was not significant $F(3, 92) = 2.18, p = .096$.).

The factorial ANOVA showed no significant main effects for interactivity, $F(1, 92) = 0.15, p = .696, \eta_{partial}^2 = .00$, and social distance $(1, 92) = 0.63, p = .353, \eta_{partial}^2 = 01$. These results show that both interactivity and social distance do not have an effect on climate change awareness scores. There was also no interaction effect found $F(1, 92) = 2.65, p = .107, \eta_{partial}^2 = .03$. The individual mean scores and standard deviations can be found in table 1.

Table 1

Climate change awareness Means scores and Standard Deviations

	M	***SD***
Interactiveness	0.20	0.43
Non-interactiveness	0.25	0.55
Small social distance	0.17	0.46
Large social distance	0.27	0.55

4.2 Effects on narrative peruasion

4.2.1 Transportation

To test how the level of narrative persuasion of a cli-fi story was affected by interactivity and social distance, three ANOVA's were performed. The first factorial ANOVA was performed based on transportation scores. The transportation scores were not normally distributed for the interactive, large social distance condition (z-score skewness/kurtosis = 2.94 and 2.64). Because this was no severe violation and the normality assumption does not influence the outcomes of ANOVA as much, it was assumed that the findings were not biased. The assumption of homogeneity of variances was met, because Levene's test of equality of error variances was not significant $F(3, 92) = .42$, $p = .739$).

The factorial ANOVA showed no significant main effect of interactivity, $F(1, 92) = 2.13$, $p = .148$, $\eta_{partial}^2 = .02$. On average, the score for transportation for interactiveness ($M = 4.53$, $SD = 0.61$) was similar to the scores of non-interactiveness ($M = 4.71$, $SD = 0.62$). There was also no significant main effect of social distance, $F(1, 92) = 0.06$, $p = .802$, $\eta_{partial}^2 = 00$. The transportation scores for small social distance to the character ($M = 4.60$, $SD = 0.57$) were similar to large social distance scores ($M = 4.64$, $SD = 0.66$).

Finally, no interaction effect was found $F(1, 92) = 0.10$, $p = .755$, $\eta_{partial}^2 = .00$. It can therefore be concluded that the independent variables, interactivity and social distance, do not effect transportation and the mean scores of all four conditions are interchangeable. These results are also shown in Figure 1, in which it is clearly visible that the transportation scores do not significantly differ from each other, since the error bars of both lines all overlap.

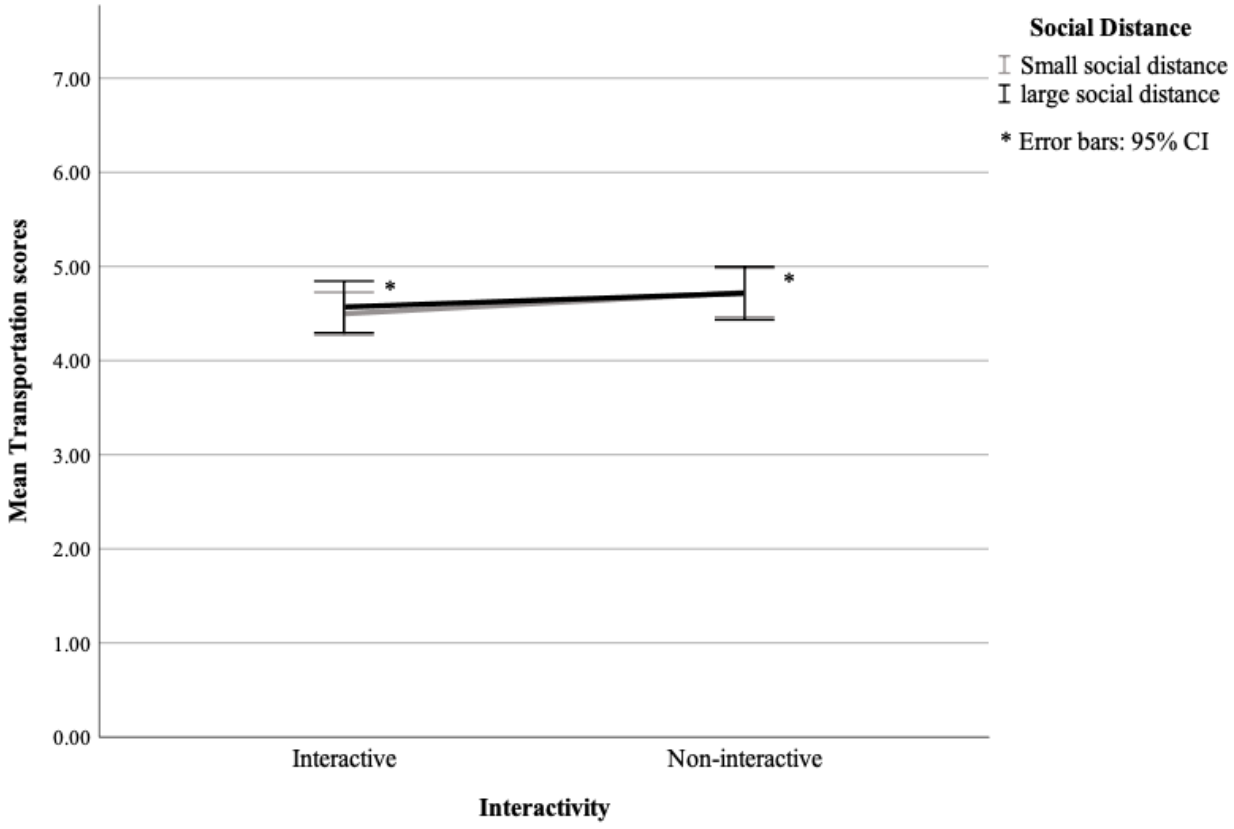

Figure 1: Line graph showing the independent variables against Transportation scores

4.2.2 Identification

The second factorial ANOVA was performed to test the effect of both independent variables on identification scores. The identification scores were not normally distributed for the interactive, large social distance condition (z-score skewness = 2.09). Because the ANOVA is robust against violation and the normality assumption, this does not bias the outcomes. The assumption of homogeneity of variances was met, since Levene's test of equality of error variances was not significant $F(3, 92) = 1.41, p = .243$).

Again, no significant main effect was found of interactivity, $F(1, 92) = 1.35, p = .248, \eta_{partial}^2 = .01$. The identification scores for interactiveness *(*$M = 4.72, SD = 0.63$) were similar to the scores of non-interactiveness ($M = 4.90, SD = 0.87$). There also was no significant main effect of social

distance, $F\ (1, 92) = 0.37, p = .547, \eta_{partial}^2 = 00$. The identification scores for small social distance *(M* = 4.76, *SD* = 0.74) were similar to large social distance scores *(M* = 4.85, *SD* = 0.77).

Finally, no interaction effect was found $F\ (1, 92) = 0.28, p = .595, \eta_{partial}^2 = .00$, indicating that the mean scores of all conditions are interchangeable. It can therefore be concluded that both interactivity and social distance do not effect identification. The results of this analysis are shown in Figure 2, in which it can be seen that the mean identification scores do not significantly differ from each other, because the error bars of both lines again overlap.

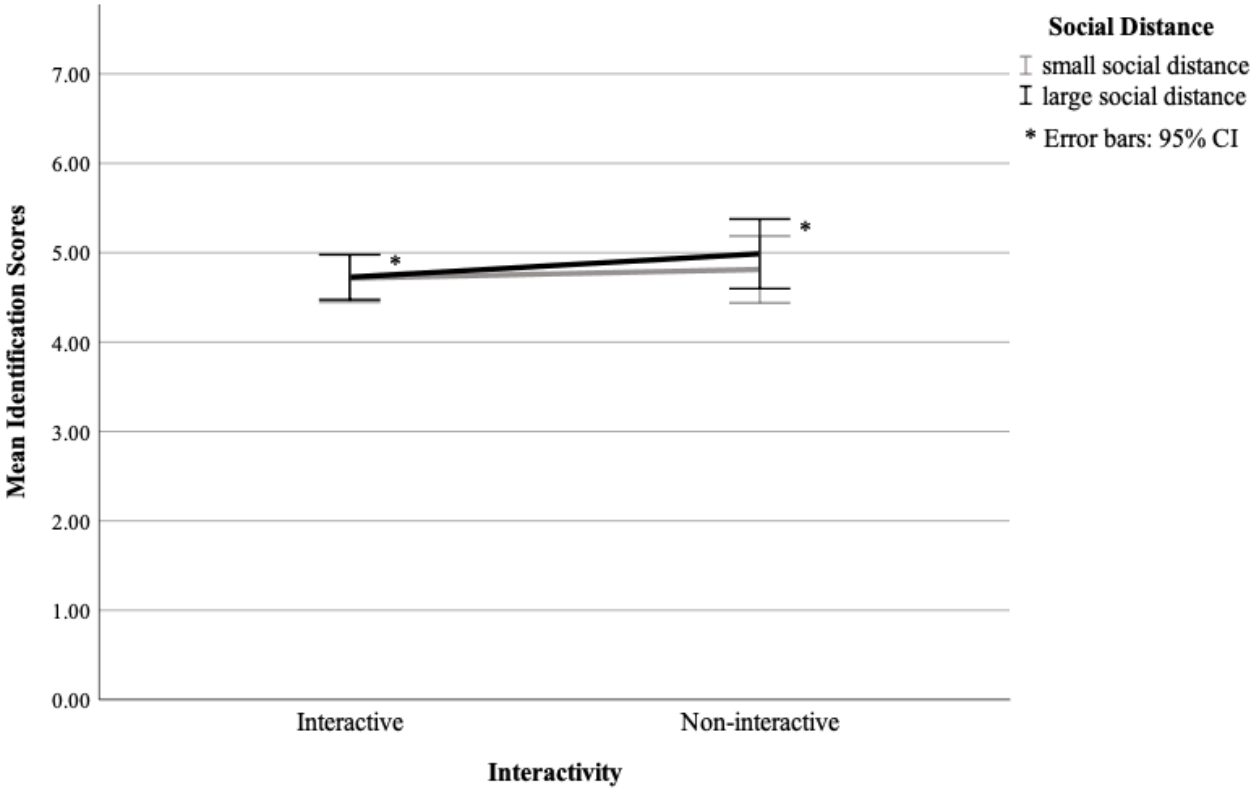

Figure 2: Line graph showing the independent variables against Identification scores

4.2.3 Narrative persuasion statements

A third ANOVA was performed to test the effect of interactivity and social distance on the three narrative persuasion statements. These scores were not normally distributed for the non-interactive, small social distance condition (z-score skewness/kurtosis = -3.02 and 3.42), but because the violation was not extreme and the ANOVA is robust against it, this should not bias the result very much. The assumption of homogeneity of variances was met, because Levene's test of equality of error variances was not significant $F(3, 92) = 1.14, p = .336$.).

The third factorial ANOVA showed no significant main effect of interactivity, $F(1, 92) = 1.72$, $p = .193$, $\eta_{partial}^2 = .02$. On average, the narrative persuasion statement scores for interactiveness *(*$M = 5.39$, $SD = 1.11$) were similar to the scores of non-interactiveness ($M = 5.67$, $SD = 1.09$). There also was no significant main effect of social distance, $F\ (1, 92) = .00, p = .954, \eta_{partial}^2 = 00$. On average, the narrative persuasion statement scores for small social distance *(*$M = 5.52$, $SD = 1.41$) were similar to scores of large social distance to the character *(*$M = 5.52$, $SD = 1.07$).

Finally, no interaction effect was found $F\ (1, 92) = 1.76, p = .187, \eta_{partial}^2 = .02$, indicating that the mean scores are again interchangeable. The results of this factorial ANOVA are also shown in Figure 3. Although the difference between interactive and non-interactive conditions seem to differ when combined with small social distance, the error bars of both values overlap, indicating no significant difference to be present.

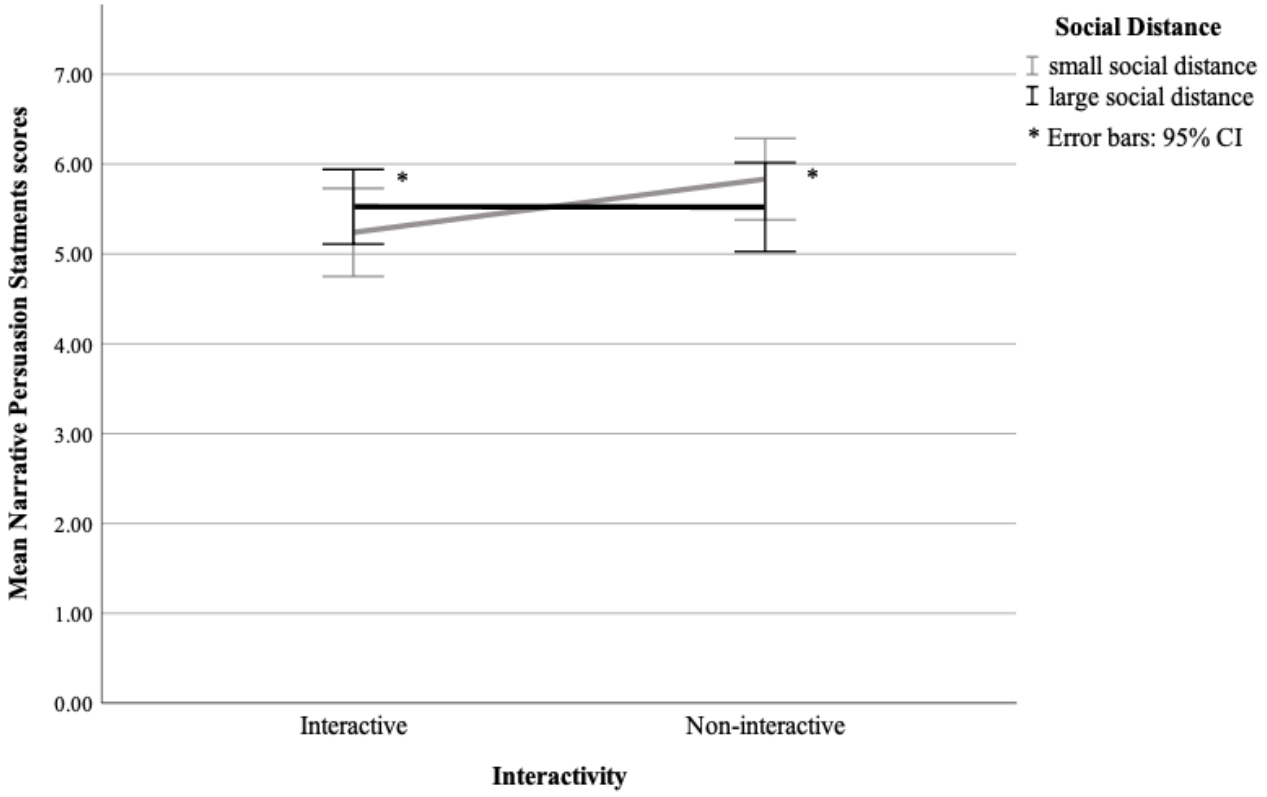

Figure 3: Line graph showing independent variables against narrative persuasion statement scores

5. Conclusion

The main aim of this study was to examine whether interactivity and social distance have an effect on narrative persuasion in climate change fiction stories. Three hypotheses were tested, concerning the effects of the independent variables individually on narrative persuasion and their interaction effect. Additionally, the effects of the independent variables and the narrative itself on climate change awareness were tested. Regarding the latter, the results showed that the level of climate change awareness was significantly higher after experiencing the narrative, compared to the level of awareness beforehand, at the start of the survey.

The first hypothesis stated that the level of narrative persuasion of a Cli-Fi story would be higher when interactivity is included in the narrative than when no interactivity is included. The level of narrative persuasion was measured using three indicators: transportation, identification and narrative persuasion statements, which were all tested with separate ANOVAs. The results from the three ANOVA's all showed that the effects of interactiveness or non-interactiveness on narrative persuasion were not significant, and therefore this hypothesis was rejected.

The second hypothesis stated that the level of narrative persuasion of a Cli-Fi story would be higher when the narrative includes a small social distance than when the narrative includes a large social distance. The results from the ANOVAs did not support this hypothesis either, because no significant effects of social distance were found on narrative persuasion, resulting in the second hypothesis also being rejected.

Thirdly, the interaction hypothesis (H3) predicted that the level of narrative persuasion of a Cli-Fi story would be highest when a high level of interactivity and small social distance are included in the narrative. Just like the main effects, the results from the ANOVAs did not show a significant interaction effect between both independent variables on narrative persuasion. Therefore, this hypothesis was also rejected.

6. Discussion

The findings reported in the current study did not support any of the three hypotheses that were formulated. Possible explanations for these findings are discussed below, as well as limitations, future research suggestions and implications.

6.1 Possible explanations of findings

The results showed that interactivity did not affect narrative persuasion of a Cli-Fi narrative. These findings are not in line with the prior research conducted on transportation and narrative persuasion by Green and Jenkins (2014), who concluded that high levels of interactivity allow audiences to experience more transportation into the narrative, which in turn enhances narrative persuasion. Since interactive narratives require the audience to actively engage with the events and characters in the narrative, transportation is more easily established. They attribute this finding to interactive narratives having a larger effect on attitudes compared to traditional narratives, due to interactivity influencing the mental processes caused by transportation.

A reason for the contradictory findings of the current study might be found in these mental processes. While Green and Jenkins (2014) concluded that interactive narratives can indeed be more transporting, this difference was small. We can thus conclude that transportation processes are quite subtle in general, and therefore sometimes hard to elicit. This has also proven difficult in the current study, partly because the transportation level and the intensity of mental processes were not as high as in their study. The reason this transportation level was not high enough could be attributed to the interactivity manipulation not being strong enough. Research by Soto-Sanfiel et al. (2010) found that watching an interactive film leads to more empathy with the characters, and a higher level of identification, compared to a traditional film, and therefore suggest that interactivity enhances identification and transportation into the narrative, which ultimately leads to higher levels of narrative persuasion (Green & Brock, 2000; Soto-Sanfiel et al., 2010). Since the results show that

the identification scores of all conditions did not differ, this might suggest that the interactivity manipulation was not strong enough to elicit effects on persuasion.

A second possible explanation for these contradictory findings might be attributed to the duration of the online survey. Green et al. (2004) mention that interactive narratives lead to active engagement with the events and characters in the narrative, which in turn establishes high levels of transportation. The survey used in this study was relatively long for an online survey. Ideally, a web survey take participants between 10 and maximum 20 minutes (Revilla & Ochoa, 2017), which categorizes the survey in this study with an average of 19 minutes on the very long side. This might have influenced participants in their ability to remain actively engaged during the entire survey, additionally influencing transportation levels. Future research could therefore implement a research method more suitable for this duration, but also employ a stronger manipulation for interactivity, in order to find more accurate effects of interactivity on narrative persuasion.

The results did not support the second hypothesis either: no significant effects of social distance on narrative persuasion were found. This is in contrast with the results from prior research, showing that the implementation of a small social distance in narratives can oftentimes lead to higher persuasive impact. These effects were found in specific fields of global issues such as STDs and domestic violence (So & Shen, 2016; Muralidharan & Kim, 2019), and therefore assumed to apply to narrative persuasion regarding climate change.

A possible reason for the absence of significant effects of socials distance on narrative persuasion can be found in the research by Xu (2018), where no difference between social distance was found either. They attribute these results to the negative consequences of the behavior being included in their message (consequences of severe car accidents), which resulted in a threatening message which can neutralize the effect of social distance. For the current study, a dystopian narrative was used, which almost automatically means that negative effects of climate change are included. Although it was a deliberate decision to include a dystopian storyline for this study, the possibility remains that participants were negatively influenced by the negative outcomes and

effects mentioned in the narrative. Another possible explanations for the results of this study might be found in the strength of the manipulation of social distance. Since identification scores of all conditions were similar, it can be concluded that all participants experienced the same amount of social distance towards the 'I' Character. This suggests that in future research, the manipulation of social distance should be stronger to more accurately study the effect of this factor on narrative persuasion.

Similar to the first two hypotheses, the results also did not support the third hypothesis, since no interaction between interactivity and social distance was found. This hypothesis was based on theory of both transportation and identification, but also on the study by Carroll and Richardson (2011) and Merrilees (2002). Carroll and Richardson (2011) argued that when a small social distance towards the writer of a journalistic article is experienced, participants prefer to interact with the article, by for instance commenting on it. The contradictory results of the current study might be dedicated to the fact that Cli-Fi narratives are very different from journalistic articles. Journalistic articles usually deal with current and ongoing topics in society on which readers have formed an attitude towards. Cli-Fi narratives, on the other hand, are set in a fictional future world, perhaps influencing the forming of a specific attitude and the absence of the preference to interact with this narrative.

Merrilees (2002) argued that interactivity serves as a positive determinant for the quality of online relationships and creates smaller social distance. The results of the current study are not in line with these prior research results, which might be attributed to the difference in the kind of relationship between both studies. The study by Merrilees (2002) include long(er) term relationships between organizations and user/customers, whereas the current study includes a singular intercourse with the 'I' character. The results are also in contrast with the research by Slater and Rouner (2002), who conclude that high levels of both transportation (absorption) and identification should benefit narrative persuasion. The results of the current study could possibly be

explained by the same explanations provided for the independent variables, as those manipulations were perhaps not strong enough to indicate a possible significant effect.

6.2 Limitations and future research suggestions

The results reported in this study should be considered in the light of some limitations. One of the limitations of the current study is that the manipulation of the independent variables were arguably not strong enough. The manipulation of social distance was shown to be not effective enough, since the results for identification show that participants in small social distance conditions did not identify with the character more than the participants in large social distance conditions. Because the Identification scale was included, there was no need to add an extra manipulation check question and in the testfase of the survey, the manipulation seemed successful. Nonetheless, in order to generate more useful findings, future research should further intensify the contrast between both social distances and test this with for instance the Identification scale by Cohen (2001) prior to collection of the final data. This could for instance be done by creating more longitudinal relationships with the characters or recognizable and present day topics, in a less dystopian setting, to intensify the effect of social distance.

Future research could also focus on strengthening the manipulation of interactivity. Since the effect aimed to find was expected to be very small, based on research by Green and Jenkins (2014), the manipulation of interactivity had to be very effective. Since no effects of interactivity on the level of transportation nor narrative persuasion were found, we can conclude that the manipulation was perhaps not strong enough. Future research could implement even clearer extremes of interactivity, to better facilitate finding a very small effect. This could be done by making one of the conditions completely non-interactive (without any clicks for videos or buttons to continue) and the other extremely interactive by implementing all of the interactivity factors by both Crawford (2003) and Roth and Koenitz (2016). Additionally, measures could be taken in order to not bias the level of

transportation for participants, for instance, by making use of a controlled environment with no distractions.

Another limitation of this study is that, as mentioned above, the online survey was on the long side. Because one of the indicators to measure narrative persuasion was transportation, the length of the online survey might have made it more difficult for participants to be fully transported, and therefore biased the outcomes somewhat. Future research could therefore implement a different research method, which is more suitable for this research duration. An example of such a research method is a lab study. Not only is this method more suitable for a 20 minute long survey, the controlled environment can ensure that participants are more focussed on the narrative and have the opportunity to be fully transported. In addition to this limitation, the results show *p*-values were insignificant, but rather close to the .05 threshold, which could suggest that effects may have been found with increased statistical power was present. The length of the online survey might be one of the causes that only 96 participants were included in the final sample size, creating a limited scope of the analysis and its outcomes. Many participants had to be excluded because they did not finish the survey and therefore their data could not be used. Future research should thus aim for a more extensive sample size in order to further examine the possible effects introduced in this study. Another suggestion to generate a larger sample size is by providing the narrative in participants' native language instead of English, because participants will presumably experience more transportation when they most effectively understand and comprehend the full story with all its details.

6.3 Implications

Although the results of this research were unable to provide significant effects, it can be argued that stronger manipulations of the independent variables could reveal compelling effects. This research can therefore serve as an initial study into the effect of these factors and how they can ideally enhance narrative persuasion for Cli-Fi in the highest form possible. Although still seen as

fictional entertainment, this study did show that processing a narrative about climate change enhances climate change awareness. Cli-Fi through narratives could therefore be considered as an important communication strategy to globally increase climate change awareness among people, and knowing how its narrative persuasion can be optimized is a huge advantage for organizations and companies who focus on this.

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8. Appendices

Appendix A

The full text of the Cli-Fi narrative used in this study.

The Sun was beginning to beam luminously through my window. I sat up in my bed in a jolt, only to roll back over onto my face onto the only remotely cool part left of my bed. My bedroom isn't impressive, just the essentials, a comfortable bed and a computer. As I got up, I strolled around our apartment looking for my cousin, only to discover a small note saying she's out for a scavenge. Me and my cousin were some of the blessed humans in this world to still have family, let alone be in contact with them. Although happy to still have my family around, I'm reminded everyday of the downside of this dubious blessing. With drinking water being the most scarce good, it remains a daily struggle to provide me and my cousin, as well as now old father with enough water to prevent us from dying of thirst.

Interaction: What should I do next?
Stay in bed a bit longer. I stayed in bed a bit longer to get some more sleep, and make the days go by faster. Nowadays the sun is burning so bright and temperatures have risen so high, I wake up sweating only half an hour later. Frustrated, I get up and walk towards a more cool room in the apartment, usually being the ones without windows, in order to look for some food.
Get up to find your cousin. As I got up, I strolled around our apartment looking for my cousin, only to discover a small note saying she's out for a scavenge.

My father spends most of his days on his own floor of the abandoned building we live in. He is usually sleeping most of the day, worn out by life in this new changed world. He changed from a vibrant active happy man, to a sad and confused lived-out version of himself. He spends his waking hours reading old books and writing about the world-changing events of the past as well as the present. Writings that, to my fathers defeat, no one is ever going to read.

Since the options for daily activities are limited, I decide to check up on my father, finding him asleep on his couch with paperwork and old books scattered around him. Intrigued by the articles that laying around, I rummage through the papers to see what the old man had written today. Although feeling quite guilty about looking through my father's personal work, I have to admit I'm

just as intrigued by the subject as he is. Scrabbling through, I finally dug up a folder that I have some sort of intangible attraction to.

Interaction: Should I open the folder I found among my father's work?
Yes, open it. Continue narrative below
No, keep on going through your father's files. I continue to go through your fathers files, books and folders scattered around his appartment. He has everything from philosophy to science to photo collections. Most of them decades old and dating back to the old world. As I decide to start organizing some of the mess to help my him out, I see one of the folders that I have seen so many times before.

It read *Earth: Climate Change* on the tab. Instantly, memories spiraled into my brain. It seemed so marvelous, luscious grasslands, expansive oceans filled with wildlife, undulant mountains and valleys, the extremity of beautiful creatures, what was not to like. I took the file, and went back to the armchair in the corner of the room, and began flipping through the files, skimming through the pictures, trying to recollect the beauty in my mind.

As I started remembering how earth used to be, I also remembered how it had changed over the past decade. The end of the world started slow and ended even slower.
We looted department stores and grocery stores and dollar discount stores, but what we brought home each night never made any sense.

“It’ll get better,” the government promised as our thermometers burst and our yards burned.
“We as a nation have never been stronger,” was what most leaders and politicians around the world declared.

Interaction: What memories should I reminisce about next?
High school. Continue narrative below
The beginning of water scarcity. Continue narrative below: “started around high school” is replaced by “started when I was about 15”

The real change started around high school. Showers were limited to once a week and could last no longer than five minutes, then four minutes, then three minutes. This meant if you were a part of a

family of four, like I used to be, you showered once a month on rotation, which happened to fall on the Friday before the annual school party, to my relieve of course.

Not long after this peaceful night, the government declared an official state of emergency, most of the country hadn't experienced rain in 429 days.

Decorative fountains went dry, their pools drained. Crops died. Gardens wilted. Any market branded "local" went out of business. Our faucets sputtered and splashed, the pipes protesting each time we tried to have a drink or take our allotted shower. And every time we'd wait with our hands on the cold water knob, our fingers crossed, hoping for some water to come out just one more time.

Livestock started dying off and wildfires consumed our trees and our grass and our forests. Artists painted murals of green meadows and fat cows and cloudy days on the sides of our buildings so the children wouldn't grow up in a world so yellow.
But this didn't stop us from practicing our favorite hobby: the internet. We watched videos of better times, read the news, out of pure boredom not caring whether it was fake or not, updated our social media to show friends we were doing just great. We got good and then we got better at pretending everything was fine.

And then the production of bottled water was halted without notice. Cases sold on online for a hundred, two hundred, five hundred euros. Pretty soon, an unopened bottle of water jumped past the value of the Euro, and Doomsday nuts and conspiracy theorists were our new one percent—their basements, bomb shelters and panic rooms worth more than the largest luxurious mansions in the country.

When our teachers stopped showing up to teach, exams were canceled and outside temperatures reached alarming highs, we were forced to stay inside. It was the end of the world and we were bored to death.

Interaction: I'm extremely thirsty, but unfortunately there is no more drinking water around in our homes. What should I do next?
Look online for drinking water. I open my laptop and visit the Amazon website to see if there is any affordable drinking water for sale.Unfortunately, we can never afford this. I close my laptop again and stare out of the window, hoping my cousin will come back home with some drinkable water she found.

Go out on a scavenge for drinking water. As I look back at my father sleeping restlessly, I decide it's probably not the best idea to leave him alone right now. I'll have to wait until my cousin gets back from her scavenge, who hopefully already found some drinkable water. In the meantime I open my laptop to see if Amazon perhaps has any affordable drinking water for sale. Unfortunately, we can never afford this. I close my laptop again and stare out of the window, hoping my cousin will come back home soon.

When it became illegal to burn fossil fuels because the Polar Ice Caps began to melt at alarming rates, all mail delivery was ceased. All air traffic was grounded. We stopped making cement, iron, and steel, which meant no more sea walls to keep cities close to the cost from sinking into the sea-level. Whatever had not been quarantined was pretty much on fire by the burning summer temperatures and reduced to ash and dust. Yet we were still here. No doomsday or Armageddon, no great rapture took us into the sky. The ground never opened to swallow us whole.
We simply stood around thirsty, hungry and sweating.

All we had now was the never-ending search for food and water, with our only distraction being the internet. Although still being a useful distraction, the internet also became a more depressing place. The social networks are the hardest; they are the domain of the dead. There remain the people you knew. The people you loved, frozen in time. A gallery of self-portraits painted clumsily by people who wanted to appear at their most interesting. Images on social media serving as a place of memorial and mourning, with profile pages as their headstone. The loss of the people around me becoming easier to digest through the frame of the screen.

I get snapped back to the present day when I hear my father grunting while trying to get up from the couch. As I rush over to help him, I sigh when I see that sad desperate look in his eyes. Supporting his now slender arm, we walk towards the bedroom where I put my weakened father back to his bed. While he drifts off back to sleep, a sudden sadness rushes over me as I imagine how it must feel like to end up living such a meaningless life, completely dependent on others. In a world like this.

Interaction: What should I do next?

Stay with my fater. As my father continues his restless sleep, I walk back to his living room.
Go back to my apartment to look for my cousin. I leave my father to continue his restless sleep and walk back to my own apartment. I look around for my cousin, but she hasn't returned yet.

Sitting back down in the chair, looking out of the window that overlooks the mostly abandoned buildings and barren fields behind those, I return back to my thoughts. My thoughts, a place where I spend way too much time nowadays. Almost automatically, my mind wanders to the events and actions that led humanity down this path. About oil and coal. About how many wind farms I saw in my life. I think about traffic jams and empty trains. About the governments and companies we blame.

It is my fault too; this is the conclusion that always appears to follow my train of thoughts. What did I do to help? My cousin and I have had this conversation more times than I can remember. Thousands of minds over hundreds of years all wondered what would be left at the end of the world; so far the only answer they have found are more questions.

Global warming was a warning. Now the arrogance and ignorance of billions has been thrown in the face of humanity. We abused and scarred our little planet. We forgot it was a wild thing and in turn it fought back. Things that were once normal, are now distant memories becoming more distant everyday. Years from now, you think we'd still remember the taste of falling rain?

Appendix B

Examples of manipulated images presented in the different conditions

Image 1: Image of political leaders from western cultured nations, which was presented in the small social distance conditions.

Image 2: Image of political leaders from Eastern cultured nations, which was presented in the large social distance conditions.

Image 3: Image of social media timeline presented to small social distance conditions.

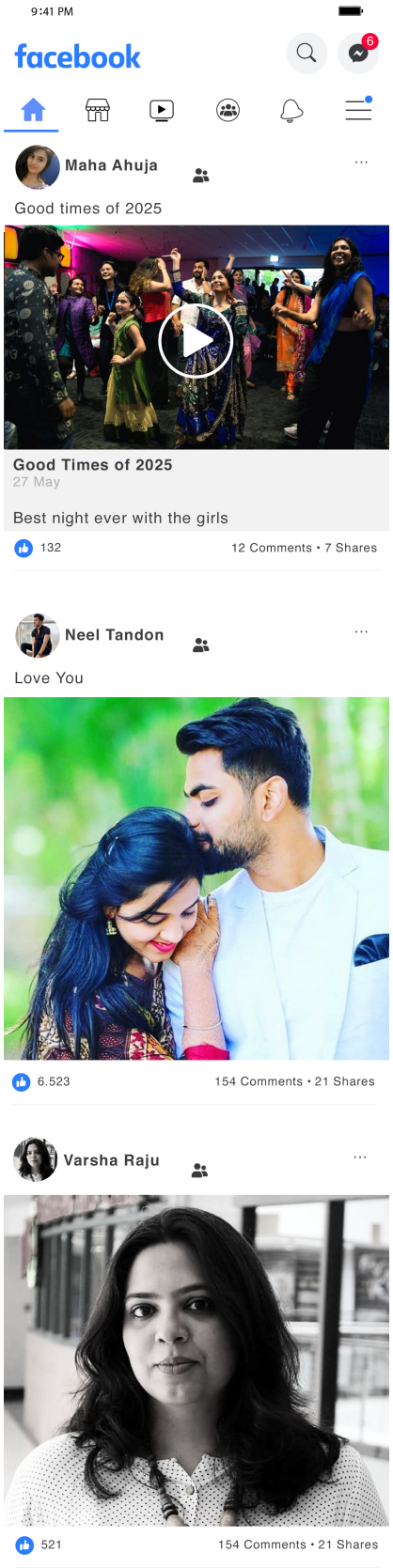

Image 4: Image of social media timeline presented to large social distance conditions.

Appendix C

Informed consent form of the survey

This survey is about Cli-Fi narratives

Hi,

Thank you for participating in my online survey! This survey is part of my Master Thesis in Business Communication and Digital media at Tilburg University.

After giving your consent to participate, the survey will start with basic demographic questions (age, gender etc.). Since this research focusses on climate change, some general questions about your current opinion on this subject will be asked. Next you will be presented a Cli-Fi (Climate change fiction) story, which includes text, video and audio. Afterwards you will be asked to answer some more questions about the story and your opinion.

Please note that the story is set in a dramatized future world. You are therefore asked to reconsider your participation if you think you might experience negative consequences with this setting.

Your data will be processed anonymously and is only available for me, the researcher, and my supervisor. The survey will take about 10 - 15 minutes.

Thank you for your time to fill out my survey and help me finish my thesis!

Karlijn Simons

Participation in this survey is voluntary. Your answers will be processed anonymously and are only available for the researcher and her supervisor. You will not be identifiable based on your responses. You have the right to withdraw at any point during the study, for any reason, and without any prejudice. You have the right to request access to and rectification, erasure, restriction of or object to the processing of your personal data. The consent remains valid until the end of this study (January 2021). The data will be deleted after the researcher has graduated (February 2021). By giving your consent you agree that you participate voluntarily and that you are at least 18 years old. If you would like to contact there researcher of the study please e-mail k.simons_1@tilburguniversity.edu.

By clicking Yes, you confirm that you have read and agree to the information above. You also confirm that you had room for any questions. By continuing to the next page, you agree to participate in the online experiment and to give permission to process your data anonymously. The consent only applies for the duration of the study (January 2021). Please remember that you may withdraw from the study at any given time without negative consequences.

Appendix D

Full list of the questions included in the online survey.

Demographics

What is your age? Answer…

What is your gender?

- Male
- Female

Which country are you from?

- The Netherlands
- Belgium
- France
- Germany
- Spain
- The UK
- Italy
- Portugal
- The United States
- Poland
- Denmark
- Sweden
- Norway
- Finland

Climate change awareness PREtest

Please indicate to which degree you are aware of the following impacts/effects of climate change.

Temperature rise in the next decade

- 1- 4 scale (Not very aware - Very aware)

Water scarcity

- 1- 4 scale (Not very aware - Very aware)

Sea levels rising

- 1- 4 scale (Not very aware - Very aware)

Increased stress/disease

- 1- 4 scale (Not very aware - Very aware)

Increased spending needs worsening public finances

- 1- 4 scale (Not very aware - Very aware)

Please indicate to which degree you are aware of the following initiatives to address climate change**.**

Emission-free cars

- 1- 4 scale (Not very aware - Very aware)

Other resources instead of gasoline

- 1- 4 scale (Not very aware - Very aware)

Carpooling to reduce the amount of trips

- 1- 4 scale (Not very aware - Very aware)

Conscious use of water

- 1- 4 scale (Not very aware - Very aware)

The narrative in specific conditions is presented after which the questions of the survey continued

Transportation

Please indicate to which degree you agree with the following statements.

While I was reading the story, I could easily picture the events in it taking place.

- 1- 7 point Likert scale (Very strongly disagree - Very strongly agree)

While I was reading the story, activity going on in the room around me was on my mind.

- 1- 7 point Likert scale (Very strongly disagree - Very strongly agree)

I could picture myself in the scene of the events described in the story.

- 1- 7 point Likert scale (Very strongly disagree - Very strongly agree)

I was mentally involved in the story while reading it.

- 1- 7 point Likert scale (Very strongly disagree - Very strongly agree)

After finishing the story, I found it easy to put it out of my mind.

- 1- 7 point Likert scale (Very strongly disagree - Very strongly agree)

I wanted to learn how the story ended.

- 1- 7 point Likert scale (Very strongly disagree - Very strongly agree)

The story affected me emotionally.

- 1- 7 point Likert scale (Very strongly disagree - Very strongly agree)

I found myself thinking of ways the story could have turned out differently.

- 1- 7 point Likert scale (Very strongly disagree - Very strongly agree)

I found my mind wandering while reading the story.

- 1- 7 point Likert scale (Very strongly disagree - Very strongly agree)

The events in the story are relevant to my every day life.

- 1- 7 point Likert scale (Very strongly disagree - Very strongly agree)

The events in the story have changed my life.

- 1- 7 point Likert scale (Very strongly disagree - Very strongly agree)

Identification

Please indicate to which degree you agree with the following statements.

While I was reading the story, I forgot myself and was fully absorbed.

- 1- 7 point Likert scale (Very strongly disagree - Very strongly agree)

I was able to understand the events in the story in a manner similar to that in which the 'I' character understood them.

- 1- 7 point Likert scale (Very strongly disagree - Very strongly agree)

I think I have a good understanding of the 'I' character.

- 1- 7 point Likert scale (Very strongly disagree - Very strongly agree)

I do NOT understand the reasons why the 'I' character does what he or she does.

- 1- 7 point Likert scale (Very strongly disagree - Very strongly agree)

While reading the story I could feel the emotions the 'I' character portrayed.

- 1- 7 point Likert scale (Very strongly disagree - Very strongly agree)

While reading, I felt I could really get inside the 'I' character head.

- 1- 7 point Likert scale (Very strongly disagree - Very strongly agree)

At key moments in the story, I felt that I knew exactly what the 'I' character was going through.

- 1- 7 point Likert scale (Very strongly disagree - Very strongly agree)

Climate change awareness POSTtest

Please indicate to which degree you are aware of the following impacts/effects of climate change.

Temperature rise in the next decade

- 1- 4 scale (Not very aware - Very aware)

Water scarcity

- 1- 4 scale (Not very aware - Very aware)

Sea levels rising

- 1- 4 scale (Not very aware - Very aware)

Increased stress/disease

- 1- 4 scale (Not very aware - Very aware)

Increased spending needs worsening public finances

- 1- 4 scale (Not very aware - Very aware)

Please indicate to which degree you are aware of the following initiatives to address climate change**.**

Emission-free cars

- 1- 4 scale (Not very aware - Very aware)

Other resources instead of gasoline

- 1- 4 scale (Not very aware - Very aware)

Carpooling to reduce the amount of trips

- 1- 4 scale (Not very aware - Very aware)

Conscious use of water

- 1- 4 scale (Not very aware - Very aware)

Narrative persuasion statements

Please indicate to which degree you agree with the following statements.

Water scarcity is an impending problem.

- 1- 7 point Likert scale (Very strongly disagree - Very strongly agree)

Attention has to be paid to increasing global drought

- 1- 7 point Likert scale (Very strongly disagree - Very strongly agree)

Our current actions will lead to severe negative consequences for future generations

- 1- 7 point Likert scale (Very strongly disagree - Very strongly agree)

Manipulation check

While reading the story, did you feel like you were allowed to make choices to influence what happened next in the story?

- Yes
- No