

**Letters from the Future:
Discovering How Young People Make Sense of a Future Climate Changed World**

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Abstract

Climate change has become a more pressing matter than ever, which calls for inquiries into how to make sense of this impending future. This research aims to shine a light on how people between the ages of 18 and 28 ($n = 30$) make sense of this climate changed future. The sensemaking model by Dervin (1983) functions as the fundamental basis of this research with the respective elements of sensemaking (Situation, Bridge, Outcome and Gap). Using two narratives of the future (Deep ecology and Transhumanism) participants were assigned to one of these conditions and primed to think about the climate changed future. Consequently, participants were asked to mentally time travel 20 years into the future and write a letter to the present day. Through the analysis of these letters, it was found that the most pronounced elements in the letters were the Bridge and Outcome elements of a climate changed future, which means that the road towards this future and the eventual future were most prominently described by participants. These themes were mostly used by participants to talk about their personal advances such as how they lived, with whom they lived and in what way they lived. Next to that participants frequently described Deep ecology (e.g., sustainability, community living, satisfying basic needs only) or Transhumanism (e.g., technological advances, enhancing the human state with technology) in their Bridges and Outcomes. With some slight differences in importance of sensemaking, participants were remarkably similar in sensemaking with both diversity and distribution of the themes they used in their letters, both within their respective cultural narrative. Finally this research report concludes that participants make sense of the uncertain climate future with mental Bridges and Outcomes while conceptually moving from the present to the future. Inherent to the suggestions for future research is then to further investigate this model within futures sensemaking, and the broader applicability of it within futures research to explore the relevance of the elements of this model further.

Keywords: sensemaking, deep ecology, transhumanism, climate change, future letter writing.

1. Introduction

For many people, recent years have been tumultuous, and it has become more apparent than ever that the future is inherently uncertain. Making sense of the future might be especially relevant in times of climate uncertainty, whereas certainty gives people a sense of stability and a sense of the future. Within this research, this future uncertainty about climate change will be addressed, and imaginations of future-oriented sensemaking of the uncertain climate future by participants will be researched.

In the past decades, but especially in recent years, the uncertainty about climate issues has risen to the mainstream of (social) media and public discussion (Caracciolo, 2022), with the UN stating that it has been making a “profound impact on the consciousness of humanity” (UN, n.d.). Especially young people will face the influence of the changing climate on their lives, simply because they will be most likely to be on earth by the time true consequences set in, and hence considerable worry already exists among this population about the fact that they need to face these consequences (Hickman et al., 2021). Young people can be faced with news about the changing climate daily and even though climate change itself has been rendered undeniable, the prediction of the consequences of climate change are not exact and never presented with absolute certainty (Caracciolo, 2022). This has given rise, and power, to climate deniers, who use this fact to question climate change, resulting in more uncertainty.

Such feelings of uncertainty about the climate situation can cause young people to question themselves, resulting in making plans and choices which differ from decisions they would have made in a more certain state of mind (Tversky & Shafir, 1992). It is however an inherent part of life that uncertainty remains to a certain degree, eliminating all uncertainty from would be a supernatural feat. Within dealing with climate change uncertainty we can

however gain more certainty and try to be at peace with the uncertainty that remains. The sensemaking model by Dervin (1983) establishes just that. Through the sensemaking process young people will gain more certainty about the impending climate future, and be more aware of the gaps that remain in such a future, gaining more insight into that which remains uncertain and continuing to engage in the movement between certainty and uncertainty which is a pivotal part of sensemaking (Dervin, 2015).

This element of uncertainty complicates matters concerning making sense of the uncertain climate future. A barrier young people face when adopting responsibility towards large issues such as climate change is uncertainty, which is why Mulgan (2016) argues for a ‘future justification’, where people take more responsibility towards climate change. Obligation or responsibility to the future currently lacks the clarity that is needed as thinking about the uncertain climate future is currently very impersonal and intangible (for example a news article about climate change often contains an overarching event, such as a natural disaster) (Nikoleris, 2017), resulting in a generally low sense of agency towards this global problem. Especially as climate change is a *certain* global issue with largely *uncertain* global consequences, young people will need some assistance in envisioning exactly what a future could look like (Caracciolo, 2022; Mulgan, 2016). This uncertainty towards the consequences of actions causes young people to have difficulty with making sense of what might happen in the future and to envision what their own lives will look like. Through an exercise of imagining this climate changed future, a sample of this age group in the current research will be able to directly think about and reflect on what it would mean to them to be in such a future, or in other words, how to make sense of such a future.

1.1 Making sense of the uncertain future

Making sense of the world has been defined as constructing sensible explanations about the world which are built upon already existing information, therefore contextualising certain pieces of information, and thus making sense (Aaltonen & Barth, 2005). Sensemaking

is a fundamental human activity that happens on a daily basis as a way of filling in the unknown or bridging the gap. It is also used to fill in parts of the unknown when thinking about the future, regardless of whether this future is an hour away, tomorrow or 20 years from now. By moving across time and space in thought, people bridge gaps of the unknown, such as problems we have not found a solution for yet, in order to reason about what the future might look like (Aaltonen & Barth, 2005).

To better understand the process of making sense of an uncertain future, this research draws on Dervin's (1983) sensemaking methodology, which focuses on "better understanding the ways people make sense out of information" (Naumer, 2008, p1). According to this methodology, sensemaking is highly complex and, among many elements, involves the constant shift between certainty and uncertainty, when information is received and placed into the right context. According to this theory, people are subjected to situations with outcomes, with a gap in between which lasts for an unspecified amount of time (see Figure 1). The certain vs. uncertain element of this theory comes to play when a situation presents itself and the outcome has to be thought over, where a theoretical and conceptual step has to be taken in order to imagine a certain outcome of a situation that lies in the future, as is more clearly visualised in Dervin's sensemaking metaphor (see Figure 2). This 'journey-metaphor' visualises the journey that a hypothetical person goes through in the sensemaking process, where they start on the left-hand side (see Figure 2) and move towards the end goal, being the flags on the right-hand side. Within this metaphor, the person is seen as being in the Situation phase of sensemaking with contextual elements that he takes with him. Throughout his journey of sensemaking, he then builds a Bridge towards a future Outcome, in this Bridge ideas, attitudes, feelings and narratives (broadly speaking) are presented to help the person in creating this Bridge during sensemaking, on their way to the Outcome. At the outcome the

initial situation with its problem or query is placed into context and sense has been made (always only to a certain degree) of the initial situation where this person came from.

More recently, Dervin has focussed on the experiences of art audiences to gain insight into the context of experiences and how individuals were personally impacted by, and made sense of, cultural experiences (Foreman-Wernet & Dervin, 2011; 2017). Cultural experiences in this research (Foreman-Wernet & Dervin, 2011; 2017) were tangible experiences with books or games which shaped how the participants made sense of elements of life. Analysing such cultural experiences using the sensemaking model proved to assist researchers in constructively interviewing participants on their cultural experiences and how to make sense of these. In much the same way as this sensemaking model assisted researchers in previous research in asking interview questions, in the current research elements of this model will be ingrained into the instructions that are given to participants on how to go about visualising a post climate change world and in analysing these visualisations.

An example can illustrate how the model can be applied to how young people make sense of the uncertain climate future, where the sensemaking methodology clarifies tentative steps that need to be taken to bridge the gap between our current climate situation and the outcome, where provided information is used to bridge this gap. First, young people find themselves in a *situation* where they require information to create the bridge towards the outcome, this information can be small like a detail of an idea or big such as a delineation of an entire narrative for the future. Secondly, the creation of the bridge is done by thinking about the problem of the uncertain climate future and figuring out how to place this new piece of information into this. Consequently, someone will go over ideas, feelings, attitudes, and narrative information of the problem. The moment in between the situation and the outcome, before a bridge has been created, is labelled as the *gap*, wherein one needs to make sense of a situation, but is still uncertain and in the process (Dervin, 1983). When thinking about an

uncertain climate future, information coupled with personal ideas, feelings and experiences can be used in gap bridging (Dervin, 1983; Naumer, 2008; Savolainen, 2006).

The use of the current research and accompanying model is to allow young people time to think about this uncertain climate change situation, where they are provided with information to stimulate thought on this matter which can be very helpful to obtain a more certain state of mind (Nikoleris, 2017). Alternatively, someone can make sense out of the uncertain climate situation, yet remain in an uncertain state of mind. The sensemaking model does not prescribe certainty as the outcome of the process, rather at the end of the sensemaking journey, a person will have made sense of a certain situation, yet the query at hand might stay uncertain in nature. Consequently, within this state of mind more reflective considerations can be made about situations or events. This could mean that with a better idea of what a positive climate future could hold, young people could make more reflective choices pertaining to climate change and work with the certainty that they have gained and making their peace with the uncertainty which remains.

Figure 1
The Situation-Gap-Outcome Triangle (Dervin, 1983)

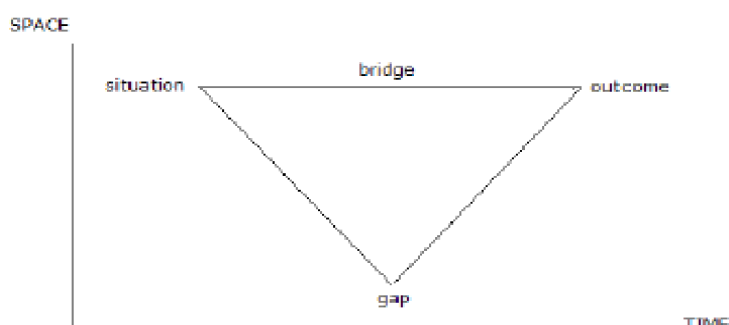
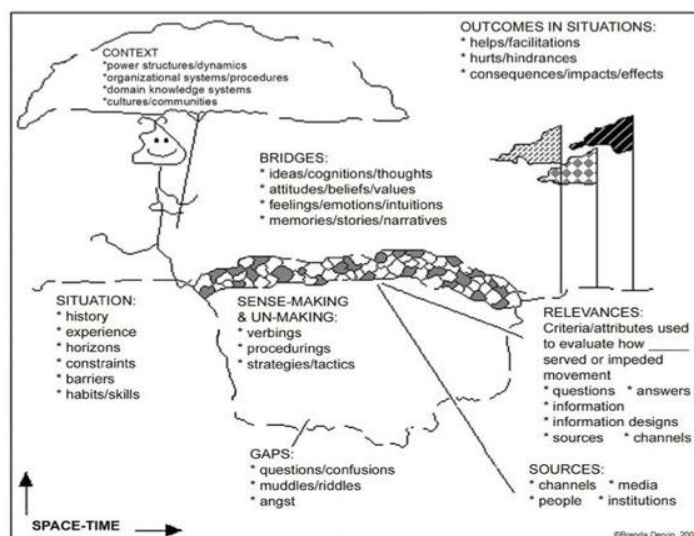


Figure 2
Dervin's Sensemaking Metaphor (Dervin, 2008)



1.2 Narrative approach to the imagined future

Imagining the future can be done in many ways, for some that is having a short thought about what the future might look like, for others it might be writing a clear vision in a journal entry. Narrative writing could help when being confronted with the uncertain future (Uprichard, 2011). When thinking about the future and putting this into narrative writing the process of imagining hypothetical futures can function as a means to direct thoughts and behaviour (Tricia et al., 2020). As one is guided in their thinking about the future, which is inherently uncertain, the amount of uncertainty can be reduced or accepted by the process of moving towards (changed) outcomes (Dervin, 1983) and a desired future (Sools, 2020; Uprichard, 2011).

To think about the future, one needs to have an idea on how to fill in the blanks. This can be done by handing people a certain narrative along which they can imagine the future, where the situation (or the now) is known to people and filling in the blanks will require some sort of information to arrive at the imagined outcome (Dervin, 2008; Nikoleris, 2017). In this sense the personal aspect is linked to the broader societal / cultural aspect. The personal aspect contains the ideas and thoughts already present within the individual and the cultural

aspect is the added element (or context) along which the individual will think about their ideas and thoughts. The current narrative approach ties well into this, as a narrative always contains the personal and the cultural aspect (Murray & Sools, 2015).

Regarding the context element of the sensemaking methodology, two deeply contrasting, yet influential cultural narratives have gained traction over the years as to what our future will look like, which could shape young people's ideas about a climate changed future. These are the *deep ecology* narrative (Eisenstein, 2018; Naess, 1984) and the *transhumanism* narrative (Huxley, 1957; Kurzweil, 2005; 2022; Pearce, 1995). The Deep ecology narrative mainly states that humanity should live in a balanced ecosystem where all life (human and non-human) is valued equally and where diversity and richness contribute to this intrinsic value of all living things (Naess, 1984). Furthermore, humanity should go back to only satisfying its vital needs (e.g., food and drink) in the current ecosystem. Through this manner of living humanity could live in harmony with the natural order (Naess, 1984). Transhumanism contrastingly focusses on the rise of technology and ways in which humanity can progress and thrive being engrained with this technology, broadly pertaining to longevity, well-being, and intelligence (Lee, 2019). Both narratives embody a fundamental pessimism as the starting point of their narratives, where the content of the narrative offers solutions for the current state of the world which is regarded pessimistically. This pessimism comes from a deep belief that the current way the world is run and designed is inherently unsustainable. Deep ecology for example thinks that a system of capitalism (continual investment into growth and efficiency) is wrong, and the world should strive towards essential use only (Naess, 1984). Transhumanism, in turn, follows the train of thought that currently the world is not engrained with technology enough, where technology nowadays is not advanced enough to solve the world's problems, and a state where technology could solve increasingly more problems is more desirable to humanity.

These two cultural narratives could play an important part in making sense of the climate changed future for young people, as sensemaking always requires information to aid the person. Information, or more specifically, contextual elements are pivotal within the sensemaking model by Dervin (1983), where context is carried with a person in the entire sensemaking journey and added on within the phase of bridge constructing. In this conception of the sensemaking model, young people already have limited contextual elements in mind about climate change. The two cultural narratives will then aid them in creating a broader context along which to visualise their future climate changed world.

1.3 The current research

The aim of the current research is to map how young people make sense of a climate changed future and to gain insight into how they think the world will change towards this future. As previously mentioned, the agency towards climate change is low for multiple reasons. With this imagination task, this younger population will have to actively engage with this future and think about actions and consequences pertaining to climate change and how this will result in a climate changed future. In the current research, mapping young people's climate changed future is relevant because it could clearly indicate contextual elements which are most important for young people's conception of a climate changed future. This insight will then further our knowledge on the most important elements of young people's lives in such a future and can be used to inform a broader group of young people in the current choices they make regarding climate change, or to inform future researchers of these important themes and contextual elements. The two cultural narratives that were presented above will guide participants to think about the future, following the theoretical framework behind the sensemaking methodology by Dervin (1983). Although previous research has explored making sense of the future, making sense of a climate changed future with the analysis using Dervin's sensemaking model has not been explored before. The current research will thus address the knowledge gap that pertains to how young people make sense

of the uncertain climate changed future with the use of Dervin's sensemaking model in analysing these envisioned futures. This will then aid in giving young people more certainty or more perspective on the current climate situation.

Together this allows for two research questions: How do participants make sense of a climate changed future? And how do the two cultural narratives (DE and TH) play a role in their future-oriented sensemaking?

2. Method

To obtain future-oriented sensemaking data was gathered in a qualitative manner, meaning that data was collected that answers questions about the why and the how about the possible future world. Within qualitative research (examination and interpretation of observation) meanings and patterns of observations are found (Babbie, 2016). In this field of qualitative research, varying types of data can be collected, one among which is data in the form of a narrative. A narrative (or story) is often loosely defined by scholars, ranging from focusing on structure and form, to emphasis on metaphor (Lohuis et al., 2016). In contrast to other forms of qualitative data (such as interviews) the narrative approach provides researchers with stories, which are more natural and personal than interview data (Browning, 1992). Within the narrative approach, a participant is given instruction and left alone with their thoughts, to produce their narrative account of a certain assignment. In contrast, in an interview setting the participant is often asked questions varying in specificity, to prime a certain answer from the participant.

2.1 Participants and recruitment

Firstly, ethical approval was obtained for this research from the BMS Ethics Board from the University of Twente (ethics approval number: 221299). Data in this research was obtained via the online questionnaire software Qualtrics, using convenience sampling for recruitment. This type of sampling is a non-probability method where people within the target group meet certain practical criteria, such as easy accessibility or availability (Etikan, 2016). This method of sampling was chosen because of the limited time frame that was available and the ease to which participants could be reached to participate in the research. Inclusion criteria for the research were for participants to be between 18 and 28 years of age, possess sufficient skills in the English language and to have access to an electronic device on which they could partake in filling out the questionnaire. In total 30 participants between 18 and 28 years of age were recruited, which was done at the University of Twente and elsewhere in the Netherlands with the use of posters with a QR-code (Appendix B Research Poster) which were hung in hallways and libraries, linking to the questionnaire. Moreover, participants were recruited through the online study platform from the University of Twente called Sona. On this platform Psychology students from this university can apply to partake in studies in return for credits. Although these participants were recruited in the Netherlands, nationalities of these participants varied, as having a Dutch nationality was not a requirement for this research. The same was observed for the student population of this sample, where all participants indicated to be a student, yet this was not a requirement. This poster, next to the QR-code also included information on the inclusion criteria, a brief description of the research and information on how to contact the research team.

Materials

2.1.1 Letters from the Future

In the current research the imagined future will be observed following the *Letter from the Future* method (Sools, 2020). This prospective narrative methodology follows the train of

thought of social psychologists Zittoun and Gillespie (2018) who delineated that the only way to analyse imagination of others is through externalisation; imagination made observable to others. This method gives people an imaginary task of travelling a certain number of years into the future, to write about their experience of the future to either their present-day self or someone else in the present. This way a letter can be analysed that indicates thoughts and ideas about the future, and maybe the steps that people took to make sense of this future (in other words the situation, bridge, outcome, and gap elements) (Figure 2).

Within this research, participants were thus asked to imagine a desired climate future. As writing a story is generally a challenging task for any person, the exercise included prompts to help participants along with writing their future story. Additionally, participants were directed towards their desired future by the explicit time frame that was given to the participants as part of the assignment. This time frame was set for 20 years into the future, this to give participants more structure in imagining the future, rather than allowing for a more abstract time frame such as ‘at some point in the future’ or simply ‘a desired climate changed world’. As it is likely that within the upcoming 20 years some results of climate change will have been faced by humanity (Caracciolo, 2022), this time frame was considered appropriate. To further the process of imagining oneself in this desired future, participants were shown a video which appealed to inspiration by providing metaphors and stimulating questions. This video had two functions, namely part instruction (inspiration) of the assignment and part meditation to be in the right state of mind to write this letter. The desired future world that participants were asked to explore was a desired future climate changed world. The video therefore clearly stated that climate change had happened, and some uncertainty concerning this global problem was in the past.

2.1.2 Cultural narrative videos

In this research a cultural narrative (either Deep Ecology or Transhumanism) was used as a means of guiding the participants to think about their desired future, almost akin to a pair

of glasses one would wear, through which one would observe the world. In this case the pair of glasses is a cultural narrative (a frame of reference), and one looks at the future through these glasses. More formally, people are part of a societal structure with its cultural connotations and value structures. To think about a desired future, people need to take these connotations and values into account. In this research two opposing cultural narratives were chosen to provide participants with some contextual ideas through which to look at their desired future world. In line with both narratives, videos were created in which these cultural narratives were extensively explained, including a definition and varying elements which have a clear relevancy for the future climate changed world. These videos were created by the researchers specifically for this purpose. The structure of the videos was determined by the slides that were presented in the video, which were accompanied by a voice-over that provided information on the relevant narrative.

2.2 Procedure

In this research participants were stimulated to think about the uncertain future of the world in respect to climate change, and for them to construct a desired future climate changed world. This was done using the creative writing method *Letters from the future* (Sools, 2020) where participants had the opportunity to think about and construct a desired future world. Participants were able to access this creative writing task through Qualtrics. Within this environment participants were informed on the research, randomly shown a video on a cultural narrative (either Deep Ecology or Transhumanism), were shown another video on how to write the letter and to mentally prepare for this task, after which participants were asked to write said letter. This letter was required to be at least 900 characters (approximately 180 words) in length and would take participants between 15 to 30 minutes to write. Lastly participants were asked to fill in a short survey concerning demographics and additional information (**Appendix A Questionnaire**) and then debriefed, including the email addresses of the research in case participants needed to reach out.

2.3 Analysis

The form of analysis used in this research is thematic analysis. The themes were deductively derived from the sensemaking methodology (Situation, Bridge, Outcome and Gap) and the sub-themes that were discovered were formed around these themes (Dervin, 1983). For these themes, subthemes were identified inductively by reading the letters, specifying the content of the themes. For example, for the theme Bridge, the context could, as expected, concern climate change, but also other content was mentioned, such as a cultural narrative (TH or DE) or personal life elements. Sub-themes that were identified per theme partially varied per theme, this means that some sub-themes were present in multiple themes, but other sub-themes did not show this overlap and only appeared in one theme.

When the letters were collected, the first round of reading was done to check if all the letters fulfilled the requirements that were set beforehand in terms of language (required to be English), letter length and whether participants actually completed the assignment. This was done using the qualitative data analysing program Atlas.ti, into which all letters were uploaded and reviewed. When the letters were considered proper for analysis (concerning length, correct language and being on-topic) the second round of the iterative process continued. Firstly, the themes were identified in a round of deductive analysis where the themes to be identified were known to the researcher. Then the inductive approach was used where the letters were read multiple times to indicate the contextual elements that were used to fill in these themes by participants. After this the letters were reviewed multiple times over to see if the initial themes and sub-themes were correctly identified and to see if more sub-themes needed to be added. As it was a challenge to know when to stop with identifying new sub-themes in the inductive approach, it was decided that sub-themes that only occurred less than five times over all 30 letters would be ignored. Within this process of analysis, the two conditions were kept separated in order to analyse the differences and similarities between the

two conditions. While analysing letters from both conditions, the researcher doing the analysis was aware of the condition that a letter belonged to.

For the initial coding of the themes, derived from the sensemaking model, all letters were randomly analysed. After this, the coding of the sub-themes was done, which was expected to be quite condition specific, so first all TH letters were analysed and then all DE letters. For the iterative analysis process the letters were analysed multiple times, yet first all letters from one condition were read and only then all letters from the other condition, to not be confused about continually switching in content of the sub-themes.

3. Results

In this research sample the mean age of participants is 22 years (SD = 1.98), which is also the case in respect to both conditions separately. Out of the collected letters, there was one letter that was excluded as the writer of the letter indicated to be over 28 years of age, and thus did not meet the participant requirements. Among the participants in this research (n=30) there is a broad range of nationalities that completed the letter writing assignment (see Table 1). Within this sample there are students from the Netherlands (n=13), Germany (n=9), the UK (n=2), Italy (n=2), Ukraine (n=1) and Greece (n=1). 60% of all participants ended up writing a letter in the Transhuman condition, whereas only 40% of participants then ended up in the Deep Ecology condition. An explanation for this is the great number of participants that decided to quit the research without completing it in the Deep Ecology condition, resulting in an unequal distribution of the conditions. A relatively great number of participants in this sample indicated that they do not work next to being a student (n=27), with the remaining three participants all being involved in some sort of a part time job, all of which are in the Transhuman condition. Furthermore, there was a high number of participants who indicated to be at university but not have a degree yet (n=17) and participants who indicated that they

already have a Bachelor's degree (n=12), leaving one participant who indicated to have a university degree but who did not specify of which kind.

A general statement concerning the letters is that the proclivity for negativity is present in many letters. One could interpret this as negativity towards the future, but in reading the letters another point of view could be taken, as writers could have been sceptical about the letter writing assignment itself. An example of this is presented below, where a Dutch female indicates a desire to console her present-day audience, but also uses sceptical vocabulary such as "*I am writing this with the deluded idea...*". The use of *deluded* to describe the message of consolation to reach the future could have multiple implications, either a scepticism towards the assignment, a scepticism that the past-audience will need the encouragement, the fantastical nature of this assignment or another meaning altogether. The Dutch male writer of letter 24 also indicates the extraordinariness of the assumption that someone in the present would receive a message from the future, "*I know this sounds rather extraordinary...*".

Inherent to the analysed letters are the descriptions of the sensemaking steps (namely the description of the *situation, bridge, and outcome*). In this research the letters that were analysed ranged in their set-up, some letters were very structured in paragraphs, others were written less structured (e.g., no paragraphs indicated or recognisable). There are no clear patterns in the way that participants chose to structure their letters. More extensive letters (more than 400 words, n=17) sometimes resulted in many sub-themes (>15 sub-themes) being allocated to said letter (n=8), yet this was not always the case (n=10), where some more extensive letters merely address the same specific sub-theme longer, not adding any new information (remaining under 10 sub-themes, n=1).

Furthermore, around one third of participants (n=11) expressed consolation to the audience of their letter, this particular sub-theme occurring 16 times, sometimes multiple

times per letter. This consolation often consists of addressing insecurities and reassuring that all will be well in the future as per the following excerpt:

If only younger you could see what it has achieved now... I am writing this with the deluded idea that if younger you needs the encouragement, she could by some miracle receive this and take heart from it. – Letter 4, Dutch female

The desire to address the future audience of the letter might come from a need to reassure feelings of insecurity or anxiety about the future that the writer has, or to address external insecurities that one notices in a climate anxiety filled society (Caracciolo, 2022), or personal environment.

3.1.1 The main sub-themes

In the analysis of the letters there were reoccurring parts of these themes identified and categorised under various sub-themes. The most prominent sub-themes that were identified across themes were *Climate change*, *Deep ecology*, *Transhumanism*, *Personal life*, *Society and Hopeful attitude*. With these sub-themes all ranking within the top three of most mentioned sub-themes by participants across themes (See Table 1), they indicate the main context that participants were inclined to use in their theme description. Within the sub-theme *Climate change* participants used elements from climate change, such as temperature indications and tide indications, to describe that part of their letter. For the *Deep ecology* sub-theme, the elements consisted for example of a reconnection to nature and no unnecessary use of goods. The *Transhuman* sub-theme was typified by mention of new technologies and futuristic life improvements. Besides that, the sub-themes *Personal life* and *Society* were typified by elements from the personal life of the writer and elements such as the political landscape, respectively. Lastly, the sub-theme *Hopeful attitude* was a major sub-theme that was identified, but only with respect to the gap. This sub-theme indicated whether participants were hopeful, despite a gap (a remaining uncertainty) being present in the desired future of their description.

3.1.2 Remaining sub-themes

Sub-themes that were identified but did not end up being the most prominent across themes are *Climate change agency*, *Professional life*, and *Negativity*. The sub-theme climate change agency was included in the sub-theme scheme for the indication of agency by the writer of the letter could show an increased agency feeling towards climate change in the bridge or outcome themes. Thus, whenever an element of agency in combination with climate change was mentioned, this was identified too. For the *Professional life* sub-theme, elements concerning the completion of one's study programme or future jobs were used by writers. Lastly, the *Negativity* sub-theme was entirely not determined to be relevant beforehand but was identified nonetheless because in the letters that were analysed a lot of negativity was present, even though the assignment clearly and frequently stated to be concerning a desired future.

Table 1

Participant demographics

Sample characteristics	Total N	N *DE	N **TH	Total Freq	DE Freq	TH Freq
Total participants	30	12	18		40.0%	60.0%
Male	10	6	4	33.3%	60.0%	40.0%
Female	20	6	14	66.7%	30.0%	70.0%
Nationality						
Dutch	13	5	8	43.3%	38.5%	61.5%
German	9	3	6	30.0%	33.3%	66.7%
United Kingdom	2	1	1	6.7%	50%	50%

Italian	2	1	1	6.7%	50%	50%
Ukrainian	1	1	0	3.3%	100%	0%
Greek	1	1	0	3.3%	100%	0%
Dual identity	2	0	2	6.7%	0.0%	100%
Employment status						
Student	27	12	15	90.0%	45.5%	55.5%
Working student	3	0	3	10.0%	0.0%	100%
Highest Diploma Obtained						
Secondary school diploma	17	8	9	56.7%	47.1%	52.9%
Bachelor's degree	12	4	8	40%	33.3%	66.7%
Unspecified University degree	1	0	1	3.3%	0%	100%

3.2 Sensemaking: the climate changed future

To answer the first research question *How do participants make sense of the climate changed future?* a closer look will be taken at the individual sub-themes in order to answer out of which elements the future world of the participants consist.

3.2.1 Themes: Situation and Gap

As can be seen in table 2, the themes Situation and Gap both had equal amounts of letters addressing said theme (n=9) with an overlap being present in the sub-themes *climate change*, *personal life* and *society* and only differing in the sub-theme *hopeful attitude* attributed to the Gap theme and *climate agency* attributed to the Outcome theme. What follows are excerpts per sub-theme.

In the following quote, the theme Situation theme was identified by the participant's mentioning of the current year and a description of what is happening in the present. In doing this the participant used elements of climate change such as temperature indications and an explicit mention of the fact that climate change was "*a thing*". In this the participant shows us that he needs to describe the current climate situation (which is then the identified sub-theme) within his description of his desired future climate changed world.

During my years when i was living in 2022 i could actually feel mother earth warming up (...). Climate change was a thing and it got worse and worse by the year. – Letter 5, Dutch male

In the following quote, a German female indicates a Situation theme, and again with climate change elements, but in this excerpt the participant also indicates a personal state of mind. Here she does not only explain the climate situation, but rather explains her feelings towards this situation and gives some insight into her personal state of mind concerning the climate situation. In this sense the two sub-themes of *personal life* and *climate change* were identified.

But during your time I was 23 year old and I cared and was worried about the climate.
– Letter 16, German female

In the following quote a German female indicates a Situation theme where, thinking back on how life used to be in the present, she reflected on the way "*things are handled*" and saw the big responsibility that politics had. In this sense she indicated a societal element of the situational theme, where mere individuals were not chosen to "*handle things*", but this participant indicates the clear role of politics, so on a societal level, for things to be "*handled*".

Politics was more than ever in the responsibility to change the way things are handled.
– Letter 10, German female

In the following quote, by a Dutch female writer, the situational theme is clearly identified when she writes about a courageous journey that started *20 years ago*, clearly using the time horizon that was set in the assignment to refer to the present day. The sub-theme was then identified as *climate agency* as the writer clearly indicates that a *courageous journey fighting climate change* was set into motion 20 years ago, almost being the definition of climate agency, in showing some manner of action to combat climate change.

I reminded myself how much has changed since you started your courageous journey fighting climate change 20 years ago. – Letter 4, Dutch female

In the following quote, a Dutch female addresses the Gap theme in expressing uncertainty about their situation in the climate changed future. She expresses this in the first line of this excerpt with saying “*scared of what might go wrong in the future*” and continues with a reasoning of uncertainty throughout this excerpt. The sub-theme that was then identified is hopeful attitude, where the participant does not dismiss a positive outcome, but contrastingly says that she thinks people merely need time to “*fully relax into the idea of a utopian future*”, thereby indicating a hopeful attitude that over time this uncertainty will be resolved.

but are also scared of what might go wrong in the future. Everyone has seen so many bad things happen, that it will take some time for people to fully relax into the idea of a utopian future. – Letter 1, Dutch female

Noteworthy is that within the theme Outcome participants of the Transhuman condition dominated the distribution of the sub-themes, with 16 sub-theme occurrences across this theme, where the Deep Ecology condition only noted four instances of the situational theme. A similar pattern was distinguished in the Gap theme, where there are 22 sub-theme occurrences across this theme for the Transhuman condition and only two for the Deep ecology condition. Writers from the Transhuman condition were more frequently inclined to

write about both Outcome and Gap elements in their letters, having the desire to pronounce the current state of affairs and the insecurities that remain present in the future. In both themes the letters remained in low to moderate sub-theme diversity as within these letters the mention of diverse sub-themes remained below three per letter always.

Table 2

Sensemaking themes with sub-theme descriptions and diversity/frequency of sub-themes in the sample

Sub-theme	N *(DE)	N **(TH)	Description
Type of Situation			Which sub-theme(s) dominated the letters
Climate change situation	75% (3)	50% (8)	The situation is primarily described using climate change elements
Societal situation	-	25% (4)	The situation is primarily described using societal elements
Climate agency situation	-	12.5% (2)	The situation is primarily described using climate agency elements
Personal life situation	25% (1)	12.5% (2)	The situation is primarily described using personal life elements
Diversity of Situation (N=9)			Letter-level sub-theme; the writer indicated a current situation (2022)
Low situation diversity	66.7% (2)	17.7% (1)	Only 1 situation is made specific
Moderate situation diversity	33.3% (1)	82.3% (5)	2 to 3 different situations are made specific
High situation diversity	0% (-)	0% (-)	4 different situations are made specific
Type of Bridge			Which sub-theme(s) dominated the letters
Climate change bridge	18.9% (7)	19.5% (15)	The bridges are primarily described using climate change elements
Deep Ecology bridge	21.7% (8)	10.4% (8)	The bridges are primarily described using deep ecology elements
Transhumanism bridge	5.4% (2)	16.9% (13)	The bridges are primarily described using transhuman elements
Personal life bridge	18.9% (7)	15.6% (12)	The bridges are primarily described using personal life elements
Professional life bridge	8.1% (3)	3.8% (3)	The bridges are primarily described using professional life elements
Societal bridge	13.5% (5)	9.1% (7)	The bridges are primarily describes using societal elements
Climate agency bridge	5.4% (2)	14.3% (11)	The bridges are primarily described using climate agency elements
Negative bridge	8.1% (3)	10.4% (8)	The bridges are primarily described using negative elements
Diversity of Bridge (N=25)			The writer indicated a bridge (a means towards the outcome)
Low bridge diversity	20% (2)	13.3% (2)	Only 1 bridge is made specific
Moderate bridge diversity	60% (6)	46.7% (7)	2 to 3 different bridges are made specific
High bridge diversity	20% (2)	40% (6)	4 or more different bridges are made specific

Type of Outcome		Which sub-theme(s) dominated the letters	
Climate Change outcome	25% (16)	21.6% (21)	The outcomes are primarily described using climate change elements
Deep Ecology outcome	18.8% (12)	5.2% (5)	The outcomes are primarily described using deep ecology elements
Transhumanism outcome	1.6% (1)	18.6% (18)	The outcomes are primarily described using transhuman elements
Personal Life outcome	31.3% (20)	20.6% (20)	The outcomes are primarily described using personal life elements
Professional Life outcome	3.1% (2)	4.1% (4)	The outcomes are primarily described using professional life elements
Societal outcome	15.6% (10)	19.6% (19)	The outcomes are primarily described using societal elements
Climate agency outcome	1.6% (1)	2.1% (2)	The outcomes are primarily described using climate agency elements
Negative outcome	3.1% (2)	8.2% (8)	the future outcome using predominantly negative elements
Diversity of Outcome (N=27)		The writer indicated an outcome (2042)	
Low outcome diversity	8.3% (1)	6.7% (1)	Only 1 outcome is made specific
Moderate outcome diversity	50% (6)	46.7% (7)	2 to 3 different outcomes are made specific
High outcome diversity	41.7% (5)	46.6% (7)	4 or more different outcomes are made specific
Type of Gap		Which sub-theme(s) dominated the letters	
Climate change gap	100% (2)	41% (9)	The gaps are primarily described using climate change elements
Personal life gap	0% (-)	4.5% (1)	The gaps are primarily described using personal life elements
Societal gap	0% (-)	4.5% (1)	The gaps are primarily described using societal elements
Hopeful attitude gap	0% (-)	50% (11)	The gaps are primarily described using an open attitude
Diversity of Gap (N=9)		The writer indicated a Gap (remaining uncertainty)	
Low gap diversity	0% (-)	12.5% (1)	Only 1 gap is made specific
Moderate gap diversity	100% (1)	87.5% (7)	2 to 3 different gaps are made specific
High gap diversity	0% (-)	0% (-)	4 different gaps are made specific

* Letters from the condition Deep Ecology

** Letters from the condition Transhumanism

3.2.2 Bridge theme and corresponding sub-themes

The diversity and distribution of the Bridge and Outcome themes were more pronounced than the above-mentioned Situation and Gap themes. One of the key elements of this research was to discover the way that participants would fill in the blank towards a future world. This included the description of the bridge towards said future. The bridge diversity and

distribution can be seen in Table 2 where two occurrences are noteworthy. Firstly, it can be seen that participants had a quite varied idea on how to construct the bridge towards the future, with a predominant inclination to write about sub-themes *climate change* (e.g., *variation in global temperature, change in sea level*), *respective cultural narratives* (e.g., *Deep ecology: sustainability, community living, satisfying basic needs only and Transhumanism: technological advances, enhancing the human state with technology*) and *personal life* (e.g., *family status, children*). We can also say that overall participants did not describe the sub-theme *professional life* in the form of a bridge very often with only an overall sub-theme frequency of six. To still get an idea of what this sub-theme (*professional life*) would constitute in a letter the following excerpt shows an example of such a sub-theme:

Personally, this has accelerated and further motivated your and my choice to pursue a career in Aircraft Engineering, as sustainable aviation has become one of the major challenges in personal transport and logistics. – Letter 11, Dutch male (Condition: Deep ecology).

At the same time the excerpt present above is an excellent example of how the priming of one cultural narrative does not mean that the writer of the letter would take many things away from this priming video. The Dutch male writer of letter 11 clearly mentioned Transhuman elements in a letter which was primed by a Deep ecology video, showing the inclination of preconceived notions about the future to shine through in writing this letter.

In Figure 3 an extensive letter is shown as an example of a highly diverse letter when it comes to the bridge theme. Within this letter multiple bridges can be identified such as a combination of a *climate change* and *personal life* bridge in line 3, where clearly personal and climate change elements can be seen used to form a bridge where the participant describes how she moved with her partner to avoid a consequence of climate change.

Another, perhaps even more complex example of a transhuman sub-theme bridge can be found in lines 8-9 “*thanks to... relatively well.*”. Here the writer started their sentence out writing a *transhuman* bridge, which later morphed into a *climate change* and *societal* bridge, through the respective mention of “*flourishing technologies*” and “*rise of climate-aware activists/politicians*”. This shows how varying sub-themes were sometimes combined by participants in order to express the Bridge in a more wholistic way, combining many elements in merely one or two sentences, adding to the wholistic conceptualisation of the way towards their climate changed future, yet also making this description quite complex.

3.2.3 Outcome theme and corresponding sub-themes

To take a closer look at some examples of the Outcome theme, another letter will be used. Figure 4 presents another letter, letter 8, in which the outcome of the future climate changed situation is delineated by a participant. In lines 2-5 there are immediately two outcomes that can be distinguished. Firstly, a *deep ecology* outcome “*this year... and fuel*” and a *societal* outcome “*We have... natural disasters*”. Within this example it can be observed that a description of the outcome can be very visual and vary a lot, with descriptions of the future situation varying across domains, for which the sub-themes were created, in an attempt to map all the contexts. Another example of an outcome in Letter 8 can be seen in lines 12-14 where the outcome *Deep ecology* can be found. Here the writer has made use of deep ecological elements to create the outcome of the future world “*But we...in nature*”. Here the most prominent elements are concerned with sustainability and respect for nature, both of which are elements from the deep ecological narrative.

Figure 3

A letter with high Bridge diversity. Letter 1 - Dutch female.

1 Dear me from the past, it's me from the future.

2 It is the year 2042 and I am living with my family in the North East of the Netherlands, just below
 3 Assen. I remember moving here 15 years ago with my partner in order to be above the sea level.
 4 Climate change was starting to become more and more relevant over the years, and we wanted to
 5 make sure we were out of harm's way (or at least as much as possible). Over the past 20 years, a lot
 6 has changed. Climate change happened. Big time. Lots of species of animals have gone extinct and
 7 are never coming back. Many homes were destroyed, and the country's climate is still unstable. But,
 8 thanks to the flourishing of techonoligies, the rise of climate-aware politicians and climate change
 9 activists, we've managed to adapt relatively well. There are still a lot of people who fell victim to the
 10 consequences of climate change and the world is definitely not perfect, but for the time being it
 11 looks like it's getting better. I have changed a lot as well over the past 20 years. Back then, when I
 12 was a student, I was interested in sustainability and got a master's degree in environmental
 13 psychology, but wasn't acting as sustainable as I good. As the situation got worse, I became more
 14 active in activist groups and decided to live as sustainable as I good. I moved to a small village to the
 15 south of Groningen with my partner, grew my own food, bought everything I needed locally, ethically
 16 and sustainably. I started a family with my partner and raised our children to be aware of
 17 sustainability and climate change. By the time we had children, there was no other option but to
 18 raise them with this mindset. Climate change was starting to effect us and the people around us.
 19 Summers were extremely hot and dry, winters had never been as cold before. Rains got heavier and
 20 heavier, flooding towns all along rivers and oceans. Large parts of the country became uninhabitable.
 21 But, eventually, things changed for the better. As the situation became more pressing, more funding
 22 was made available for climate change mitigation and adaptation. The world make an effort, and it
 23 has worked well so far. Techonologies were developed and mass behavioural changes were
 24 enforced. Even though a lot of people suffered (and people are still suffering from the aftermath),
 25 things are looking up. Even now, as I am writing this letter, I feel relieved and proud of us. Us being
 26 Dutch people, environmentally aware people, and humans in general. The people around me are
 27 hopeful, but cautiously. Everyone is happy climate change seems under control, but are also scared
 28 of what might go wrong in the future. Everyone has seen so many bad things happen, that it will take
 29 some time for people to fully relax into the idea of a utopian future. To me in the past: keep hope
 30 and stay strong. Fight for what you believe and trust others. You will only get to this future if we can
 31 solve problems together, as a species. It will get better, we just need some time, teamwork,
 32 willpower and creativity.

Figure 4

A letter with high Outcome diversity. Letter 8 - Greek Female

1 Dear present self,

2 We survived. We are going through the year 2042, and we survived. This year nature loves us
3 because we love her. The trees are green, and the birds sing louder than ever. We smell roses and
4 eucalyptus and not oil and fuel. We have peace—no war, no lost human beings, and no natural
5 disasters. Rain and snow come at the right time. Heat and sun do the same thing. Dear present self,
6 you are happy now. You are in a clean environment full of oxygen. You are reading a book, wearing a
7 dress, and lying on the grass while your child and dog are running in nature. Your husband is at
8 home, making you cookies and not in the war, praying for his life. He is using his car to go and bring
9 wood for the night, and his vehicle works with energy, not with fuels that pollute the environment. I
10 choose a bike and not a car, I work primarily from home, and my office is close to the house. I know. I
11 know it wasn't easy to be who you are today. The present is full of discomfort, anxiety, war, and
12 pollution. But we all, all the present self, decided that we could live better. We agreed that we would
13 not use cars anymore that pollute the environment. We decided that we would not throw our trash
14 in nature. We agreed that there are many ways to solve a problem, but war is. We decided that we
15 could be happy. You can be satisfied. You can do it if you want to be happy and live heavily. In 2042
16 we made it. Twenty years after, we managed to evolve as humans.

17 Dear present self,

18 Here we are happy. Follow my advice. I promise you that here nature loves us and help us. Love
19 nature and the people. The most important thing we have today is our world.

20

21 With love,

22 Your future self.

3.2.4 Structured sensemaking model representation

Per conditions participants were primed by a different narrative video, one Deep Ecology and one Transhumanism. Per condition participants wrote their letter of the future after this priming. In figures 5 and 6 there is an entire letter presented which delineates the motions of the model in both conditions. With the motions of the model, the consecutive structure of Situation, Bridge, Outcome, and possible Gap is meant. In Figure 5 the main points of a Deep ecology letter are clearly present in lines 15 – 31, where the writer starts with explaining the situation and continues with mentioning bridges concerning Deep ecology elements. Eventually in lines 30 and 31 the writer decided to conclude with an outcome on a more societal level. These paragraphs show how a letter can be formatted with the current model, going from a situation to a means towards the future (the bridge) and ending with a conclusion in the form of the outcome.

In Figure 6 a letter from a German male is presented where a clear structure concerning the model is also present within the Transhuman condition. In Lines 3 – 5 a Situation is delineated where the writer thinks back to the current day and watching climate change new on a broadcast. Then the writer continues with some bridges in lines 7 – 14 where the transhuman elements really shine through in his vocabulary and words such as “quantummechanics” and “genetic manipulations” which all work towards a Transhuman inspired desired future. Finally, the writer goes into detail on the Outcome of these bridges in lines 23 – 27 where a Transhuman outcome is delineated.

What these structured pieces from both conditions show is that the structure from the sensemaking model was used by young people participating in this research to structure the way that they imagine a future climate changed world. In this structure participants were encouraged to look at their present situation and to search for a means towards the outcome with the help of contextual elements.

Figure 5

A letter from the Deep Ecology condition. Letter 24 – Dutch male

1 Dear world,

2 I am William, born in the Netherlands but currently writing this letter from my home in Sweden, 2042.

3 I know this sounds rather extraordinary, but please hear what I have to say.

4 I live with my wife and two children in a house surrounded by forest. It is a lively forest and a healthy
5 forest. The air is clean and full of animals, yet this forest is a bit different from that in Sweden in your
6 time, since climatic vegetation zones have shifted. The boreal forests that once were typical of this
7 area, had to make place for temperate forests as temperatures rose and seasons changed. Active
8 management was needed to realise species once typical of central Europe, to fully settle themselves
9 here. My home country lost some of their wars on water and had to give back some of the land won
10 from the sea. This, and one other factor, caused overpopulation in the Netherlands, and since I never
11 had that much affinity with the Netherlands to start with, I decided to move. I am currently working on
12 different ecosystem restoration projects in Europe, focussed on rewilding and habitat restoration.
13 Seeing the natural world as an ally, instead of an enemy seemed to work wonderfully to combat the
14 rough edges of climate change.

15 As you probably are aware, climate change is one of the, if not the one, biggest problems you
16 currently face. I remember that I for instance, was very worried at certain times about where our world
17 was heading. As this letter already proves, we are still alive. Yet, drastic changes in societal structure
18 and behaviour have been necessary for this to happen. During the last two decades, with a lot of
19 political trouble, some nations finally managed to take the problem seriously and actually do
20 something about this. There was an enormous decrease in intensive farming and nature finally got the
21 rights it deserved. Because of the vacated farmland, an area the size of Poland in your time, made
22 place for wilderness to re-emerge. Amazing projects with amazing people managed to reintroduce lost
23 key-stone species such as the european bison and wolves. This vital understanding of how ecosystems
24 work, is one of the key features that saved us from extinction.

25 The second was one that overlaps with this, being the drastic change in the perspective on the
26 consumeristic society that you live in. Instead of going on shopping sprees, people now repair
27 clothing, instead of All-You-Can-Eat, we now have communities growing their own produce and
28 collectively deviding this. Travel has become cleaner than ever, allowing people to see their loved
29 ones, but also the world and why it is important to protect it.

30 Yes, the world has changed, but humans for the better. Instead of focussing on work and succes,
31 people are living more intentionally with what they buy and how they spent time. I wrote this letter for
32 people feeling hopeless about the future, but also as a sign that it is possible, if people change their
33 ways. On the counterside, it took until 2029 for actual changes in behaviour, while in that time
34 623.478 species went extinct, desertification made the countries around the mediterranean, southern
35 USA, Africa and Asia uninhabitable, which in turn caused climate refugees in a number no war you
36 know has yet manage to cause. People displaced from their homes and memories. And that was if they
37 even got away, because due to weather extremes and poverty, a lot of people lost their lives.

38 Think, how long is it until you forget about that new piece of clothing that you bought? and then how
39 do you look back on that one afternoon spent with friends picknicking? What is after a year more
40 important, those connections or that new hoodie? Would you rather have the option to breathe clean
41 air everyday, or would you rather buy a few new piece of clothing that you will forget about after a
42 few weeks anyway?

43

44 Wake up people, turn your social media off for a week and see what is really important in your life. It
45 is not to late yet, but the sooner the better.

46 Please, Act.

Figure 6

A letter from the Transhuman condition. Letter 9 – German male

1 Dear Brother,

2 I am writing you this message as I know for a fact that in my current year 2042 you have long passed.
 3 I wanted to talk to you about the serious climate change debate we two had in 2021. I remember
 4 how we imagined the future will look like when we watched some news of climate activists sitting on
 5 the streets to block vehicles in Germany. You would wonder how much has changed since then. Cars
 6 are mainly electric or at least some kind of it. They use electromagnetic Monopoles, that we only
 7 have been theorising about in 2020. No normal person had heard about such at that time and even
 8 in scientific societies their existence was only theorised as they might have been a first result of the
 9 "big bang". However, a young genius in China came up the idea of how to bring quantomechanics
 10 and Einstein's theory about relativity together. The interesting fact was that she was herself, a made
 11 genius, designed by China's programmes of genetical manipulations. In 2025 they finally identified
 12 which genetical components might be beneficial for evolving a superintelligence and figured out how
 13 to manipulate the genetical factors. The first generation of super intelligent people came out by
 14 2026.

15 However, as China was always scared about climate change due to Myanmar and potential refugees,
 16 they told those people to work on the problem and within a couple of years climate change was
 17 solved. It was the biggest economical transformation in the whole human history implemented in the
 18 last years and what is even more interesting, is that it worked...No doubt there is a bright future
 19 ahead of us, but I fear I will not live as long to see it. They have brought some extra-terrestrial
 20 microbiological live forms from the mid galaxy to earth and apparently is uses phosphor for its
 21 nourishment. Unfortunately, I am one of a few people who got infected by it and now I am kind of at
 22 the edge of surviving as is dissolves my DNA structure like I am Aleksiejewicz Legasow in 1986.

23 I am thinking about transforming my mind into a mind box (that's what they call the quantum
 24 computer boxes for uploading you mind) but no one has figured out whether it will actually be me
 25 when I will be uploaded or just a copy. Interestingly they could solve such complicated problems like
 26 quantomechanics but cannot solve a philosophical problem from the 18th century...some things
 27 seem to stay hidden from the human mind haha. By the way, if you are asking yourself how we
 28 invented technology to visit the mid of the galax I can tell you we did not. They simply send a mission
 29 back in time to the location of where they believed the WOW signal from the 1970s was coming
 30 from. The related crew send a rocked back to earth and it reached us by 2041. Guess who part of was
 31 the visiting a fist team the spaceship? Correct, me! Well, no matter how good our transhumanism
 32 programmes become, sooner or later time surpasses us all at a certain point.

33 At least I got to know that we are really not alone in the universe which is giving me some
 34 satisfaction. I told you, we are not alone. However, I need to see a microbiologist now regarding my
 35 disease. Unbelievable that they put me in quarantine as I though we abandoned that stuff in 2023
 36 with covid. Guess I was wrong haha.

37 In deep love,

38 Your Brother

39 Jannik

3.3 Sensemaking: Similarities and differences between conditions

In order to answer the second research question *How do the two cultural narratives play a role in their future-oriented sensemaking?* the results of the two conditions are compared. Firstly, the matter of negativity within these letters needs to be addressed, for the *Letters from the future* assignment clearly states that participants are to write a letter to the relative past of their ‘desired’ future. Yet, it still occurred numerous times that participants felt the need to include negative elements in their letters. The participants in the Transhuman condition noted more negative sub-themes in both the Bridge (DE N=3, TH N=8) and the Outcome (DE N=2, TH N=8) themes than the participants in the Deep ecology theme.

In the description of the situation, the writers in the Deep ecology condition wrote a lot about climate change (75%) and their personal life (25%), whereas in the Transhuman condition writers mostly chose to include climate change (50%) and societal (25%) elements in lot in their description of the situation.

Within the theme of the bridge, writers in both conditions mentioned climate change (18.9%) elements and their respective cultural narrative (DE (21.7%) or TH (16.9%)) quite frequently, with both of these sub-themes ending up as the two most mentioned contexts. For the Deep ecology condition the Deep ecology sub-theme was most mentioned, then the climate change sub-theme came in second. For the Transhuman condition this was reversed, where the most mentioned sub-theme was climate change and the Transhuman sub-theme came in second. The personal life element came in third for both conditions (DE (18.9%) & TH (15.6%)), showing a persistence in personal life being a very important context for writers to mention in their letters.

In terms of the Outcome theme both conditions again report quite similar frequencies. In the Deep ecology condition writers indicate personal life (31.3%) element most often, followed by climate change (25%). And for writers in the Transhuman condition this was again reversed, with climate change (21.6%) coming out on top and personal life (20.6%)

coming in second. Ranking third was the sub-theme Deep ecology (18.8%) for the Deep ecology condition and the Societal (19.6%) sub-theme for the Transhuman condition, although the Transhuman (18.6%) sub-theme did follow very closely behind the societal sub-theme in frequency.

In the Gap theme the only sub-theme that was identified in the Deep ecology condition letters was climate change (100%). For the Transhuman condition the most identified sub-themes were (1) Hopeful attitude (50%), (2) Climate change (41%), (3) Personal life (4.5%) / (3) Societal (4.5%).

For the theme Situation this means that a description of the present-day world was mostly done within a context of climate change, explaining the world of today in light of climate change. Next to that, for the Bridge this means that climate change was also the most important context to use to describe the means towards the future, indicating a bridge towards their future using elements such as temperature indications and polar situations. The second most important contextual element per condition for the bridge were the respective cultural elements, which was expected, seeing as the cultural narrative was provided especially to make the unknown about the future a more tangible concept for the writers of the letters.

For the Outcome this means that again the climate change element and the personal life elements were the most important part for the writers of letters in both conditions. The outcome, or the desired future, that participants described was thus most pronounced in a climate change and personal context. To tell the future audience about the future of the world concerning climate change was the objective of the assignment, but the personal element of the outcome was entirely up to participants to use or not use. The fact that they did use personal elements in such a pronounced manner indicates that in this imagined future, having an idea of one's own personal life is quite important for the writers in this sample.

The Gap (mention of remaining uncertainty) theme in this sample was less prevalent than the Bridge and the Outcome elements, still within this theme participants within this sample from the Transhuman condition indicated the gap most frequently. When they did indicate this gap, they were very frequently hopeful about the uncertainty that remained as can be seen in the following quote, where even though negative elements as a result of climate change are mentioned, the writer indicates hope for the future:

“As a result, we have had to surrender our nature. Because there is little left of animals and plants. This is something for museums these days. But solutions will probably be found for this in the future” – Letter 3 Dutch female

Overall, the most important contextual element for the Transhuman conditions appeared to be Climate change, coming in as the first most important sub-theme in the first three themes only coming in as the second most important sub-theme in the Gap theme, after the hopeful attitude sub-theme. Within the Deep ecology condition climate change was also important, always remaining in the top two of most important sub-themes, only coming in second in the Bridge and Outcome themes after the Deep ecology and Personal life sub-themes, respectively.

4. Discussion

4.1 The sensemaking model

Firstly the first research question will be answered, how participants make sense of a climate changed future, and possible explanations and limitations will be identified and discussed. Secondly the same will be done for the second research question regarding how the two cultural narratives (DE and TH) play a role in participants' future-oriented sensemaking. What will follow after that is a final general conclusion and practical implications of the current research.

In this research, the first research question that was presented was how participants make sense of a climate changed future. Overall, of the four elements of the sensemaking model, participants described most frequently the Bridge towards the future and the Outcome of the future, whereas the Situation and Gap elements were only minimally referred to. This means that participants made sense of the climate changed future most, by envisioning this future pathway towards such a future and by then taking this conceptual step towards this actual future. A conceptual reason for minimal referral to the Situation and Gap themes could be that within future-oriented thinking, the step of imagining the present situation and all that which you do not yet know or are left uncertain are not primarily described. In comparison with other research that focused on short (5-year) and long term (50-year) futures (Chiu, 2012), participants in the current research showed the ability to imagine a distant future and elaborate on their own lives as well as on the broader world, in line with the 50-year condition (Chiu, 2012). The Situation theme is described as containing the history and experiences of person that lie in the present or past (Dervin 1983), this is not an essential feat of futures thinking which is to primarily focus on imagining future lives and retrieving knowledge of the world to imagine things that might happen (Schacter et al., 2008; Szpunar, 2010). In this line of reasoning, thinking about the current situation is only useful when retrieving knowledge about the world to use within thinking about the future, and would thus be less represented

than the Bridge and Outcome themes. The Gap theme is similarly not represented within futures thinking, but occurs in the letters as a by-product of the unknown elements within the climate changed futures.

Participants in both the Deep ecology and the Transhuman conditions preferred using climate change and personal life elements to make sense of the means toward this future and the way that such a future is made up. These sub-themes are quite literally linked to the topic of the current research, where participants were primed and instructed to think about the topic of climate change and their place in a future climate changed world. The topic of climate change in conjunction with such a future imagination task is still quite novel, although we can compare it to other futures imagination studies with differing content (Sools, 2020; 2022), where this method was also used to obtain future-oriented thought. From this we can observe that within all these futures thinking studies participants are in fact able to clearly envision a future world of at least 20 years in the future, regardless of the specific topic of interest (e.g., climate change). Furthermore, studies where the sensemaking model was used to explore cultural elements of people's lives (Foreman-Wernet & Dervin, 2011; 2017) have not investigated the combination of this sensemaking model and futures thinking tasks. This combination thus showed that with use of the sensemaking model, a clear new way of conceptualising the envisioning of a climate changed future has opened up. This conceptualisation immediately pertains to the sensemaking structure of the model, where it helped researchers clearly understand the sensemaking process that participants went through and added in clarifying the steps participants took in how they arrived at their climate changed futures and what these futures looked like. Clarifying these elements participants used and steps they took, will inform further research on how to facilitate futures thinking with this sensemaking model.

Within the current research the mention of negativity was present frequently. In comparison to another futures thinking study that was done (Hänninen, et al., 2022), the persistence of negativity in creative writing assignments where the clear objective is to write about a desired future is also observed. In the study by Hänninen, et al. (2022) the researchers identified two storylines with a negative ending. The first one that was identified was named *persisting problems*, which delineates this problem of persisting negative thoughts in a hypothetical desired future world. Secondly *safety through technology* was identified as having a negative ending, as these technological stores all reflected on dehumanisation. In their research the participants were not intentionally negatively primed, although thinking about the future inherently makes one think of both the positive and the negative, and thus the idea that this was the sole reason for negativity being present in the letters of the current research can be disregarded, though it might play a part. Even though the research by Hänninen et al. (2022) concerns a post-corona future and not a climate changed future, we can identify similarities such as the presence of negativity and recognise the pattern of persistent negativity that remains an important aspect for participants to describe within their letters, perhaps adding to the reality of their descriptions.

Moreover, the current research was administered as an online research, and not under physical supervision by a researcher. In a situation where participants fill in the questionnaire online, the researchers are not present to answer questions immediately when they arise for the participants. Even though the email addresses of the researchers were provided in case of questions, this method is much more indirect. In this respect, the participants who might have had questions while writing the letter regarding the negative point of view or the inclination towards negativity in their letters could not immediately be addressed.

Another important element that was identified in just over one third of the letters was the inclination to console the audience of the letters. Consolations in the letters often consisted

of addressing pressing matters concerning climate change worry that the writer is dealing with in the present. Through this letter the author then consoled the audience, reassuring feelings of insecurity about the current climate state of the world and that which is still to come, typifying the increasing climate anxiety in our society today (Caracciolo, 2022). Within the sensemaking model, the Gap theme was defined as all descriptions of that which is still uncertain to the individual in this climate changed future. With ‘consoling audience’ being identified in a substantial number of letters it could be that this is how participants tried to counter the remaining distressing uncertainty within their letters on a psychological rather than a practical level. The possibility that this consolation of the audience was a counter to distressing uncertainty was not investigated in-depth as it was not one of the main aims of the current research. However the sub-theme that was identified within the Gap theme termed *hopeful attitude gap* does show promise in countering worry where Ojala (2007) argues that pro-climate change actions are taken by young people due to the interaction between hope and worry. These elements could hold interesting questions for future research where the Gap theme is investigated more in-depth, where uncertainty-counters like ‘consoling audience’ are more accurately defined and identified. Practically speaking the Gap could be investigated more in future research through specific mention of the unknown within the futures writing assignment (or different intervention) and a broader (or more specified) operationalisation of the Gap theme.

A possible limitation which might have contributed to this negativity is the current sample, which consists of only academic young people, and is thus not representative for the general population. The attitude towards climate change might be different for non-academic educated people and thus could have influenced (positively or negatively) the degree of negativity in the current results. This is however a much-debated limitation as there are considerable studies disagreeing on the role that educational level plays in climate change

concern and perception. Hornsey et al. (2016) and Lee et al. (2015) indicate that a higher educational level predicts a stronger concern towards climate change, yet, for example, Melis et al. (2014) and Rhead et al. (2018) indicate that level of education is not an indicator of climate change concern in UK populations. Even though negativity towards climate change is not the same as climate change concern, it does show that the influence of educational level on the topic of climate change perception (and negativity or positivity is inherent to one's perception) is much debated.

Further research could answer questions regarding the further applicability of this model and the relevance of the sub-themes (such as personal life and society) that were identified in the current research over topics other than climate change. Moreover, the way that the sensemaking model, the futures writing assignment and the topic of climate change were all addressed in the current research could also be further developed in future research, where the elements of the sensemaking model that were left to the side in the current research could be included, the Gap and Situation themes could be analysed in more detail through focussed analysis on the parts that were still described, a focus group which would go into the limited description of these themes and why these were meagrely described, or another method altogether.

4.2 Deep ecology and Transhumanism

In answer to the second research question, elements of the Deep ecology narrative (e.g., sustainability, community living, satisfying basic needs only) were mentioned relatively more often than the Transhuman elements (e.g., technological advances, enhancing the human state with technology), although in both conditions the respective cultural narrative (e.g., people in the TH narrative described TH elements most) was dominant. In other words participants in the Deep ecology condition strayed less from their narrative than participants in the Transhuman condition strayed from theirs. This could mean that the Deep ecology narrative is more present in society and part of what people imagine a desired future to be like

in a climate changed future, rather than Transhumanism. Even after priming participants with one of these cultural narrative videos, this difference in the frequency of Deep ecology elements in the letters remain, which would suggest some sort of preconceived notion of the Deep ecology narrative as belonging to this future. An explanation for such a preference could lie within the academic background of participants, which was not included in this research. In line with a more technological academic background or a more ecological academic background participants could hold more preconceived notions about ways to imagine the future. In this sense one could say more on the way that participants are more inclined towards a Deep ecological way of thinking or a more Transhuman way of thinking, in line with their academic preference. Alternatively, a specific line of reasoning within Deep ecological thinking offers an explanation as to why this point of view might be more ingrained in the individual. As is delineated by many Deep ecological thinkers (Besthorn, 2012; Naess, 1973), the individual does not experience things on an individual level, but rather the environment lives within the individual and therefore has an intrinsic sense of connectedness to all that lives. Within this line of reasoning, the individual would have an intrinsic connection to the natural world, which could result in affinity with the Deep ecology narrative. This is a big element of the Deep ecology narrative and not of the Transhuman narrative, which externalises its developmental processes to technology.

Within the current research, the number of participants that signed up but did not complete the survey (and therefore did not provide data) was quite high, with 41 research sign ups, but only 30 letters that could be analysed. This could also be a side effect of this research being administered online, where participants did not have the research setting to keep them motivated to complete the entire assignment. For future research involving such a letter writing assignment, advantages and disadvantages of having the research task being performed in a physical setting rather than an online setting should be considered.

Alternatively it was observed that relatively speaking a lot of participants from the Deep ecology condition opted out after signing up for the research, which is a reason why the number of participants in conditions vary. This may have happened because of the Deep ecology content, or because of another reason altogether

Another important point concerning both conditions is that within the analysis of the letters the researcher was aware of the condition that a certain letter belonged to, meaning that the researcher was not entirely unbiased when identifying the themes nor during the identification of the sub-themes. To counter this idea that the researcher was biased, it should be noted that the coding schemes concerning both narratives were set up beforehand and specifically used during the reading and analysing of the letters. These schemes were directly derived from the narratives themselves and were thus an accurate representation of these narratives.

It could be argued that the fact that participants were primed for this research by a cultural narrative video limited creativity of the writers to fit the cultural model that was presented to the participants. However, participants were creative in their invention of solutions to current-day problems and difficulties, this is in line with Chiu (2012), who indicated that an increase in temporal distance within future thinking can facilitate an increased sense of creative thinking. Limiting creativity through priming was not the intention, and as far as can be said upon analysing the letters, also did not markedly occur as we can take participants who strayed from their cultural narrative as an indication of the fact that participants were not limited by the priming with cultural narratives, but that it only assisted participants in imagining their desired future.

Participants in both conditions also express a certain degree of negativity, which was more pronounced in the Transhuman condition than in the Deep ecology condition, in both the Bridge theme and the Outcome theme. An explanation for this difference between

condition could be that Transhumanism searches for the solution outside of humanity, and within technology, believing that this should be found extrinsic from humanity. This could mean that this fosters a belief that the solution cannot be found within humanity, as Deep ecology does believe this to be found within humanity and humanity's capacity for change and restructuring of norms and values. Participants were primed by a cultural narrative video, but also by the message that climate change has progressed, although the cultural narratives were presented as narratives with a solution, the initial message was an inherently negative one. This could be a reason why negative elements were present within various letters, even when the assignment stated that the letter was supposed to be on a *desired* future. It is not to say that negativity being present in the letters is wrong, it is part of a correct representation to also depict the negative aspects of a future climate changed world. The fact that this negativity was present in such a great number of letters was merely striking for a *desired* future world assignment, although thinking about a climate changed world would always include an inherent realisation of the consequences of climate change which, as addressed before, are not necessarily positive.

In future research this establishment of Deep ecology elements within the mind of young people could be researched through a focus on analysing climate changed future imaginations, without participants being primed with the Deep ecology narrative. Elements of this narrative could then be used in the analysis of all letters seeing if they prevail more than elements of other possible future narratives such as Transhumanism or relevant others.

5. Conclusion

Within this research the Letters from the Future approach was used to ask participants to look beyond the boundaries set by the past and present and take a closer look at their future climate changed world. Inherent to the task was the idea that participants would

have to imagine a world not yet in existence and thus use their imagination to their full capabilities. The resulting letters helped to further understand the way that young people look at the future and make sense of a climate changed future.

With the regard to the themes we can see that participants in the current sample wrote often on elements which are identified as belonging to the Bridge and Outcome themes of the sensemaking model, and relatively little on the elements which fit in the Situation and Gap themes. In this sense the writers showed in their description of the future using the Letters from the Future approach, that they frequented the description of the means towards (Bridge) such as future and the description of the eventual future (Outcome). Secondly with regard to the sub-themes, in these description of the Bridge and the Outcome, participants described their personal life in combination with climate change most. For example, describing the way they live with the changed climate (mental level), how they live with their partner and what their living arrangements look like.

All of these sub-themes were consequently informed by the cultural narratives which they were primed with, informing this imagined future with either sustainable and eco conscious thought (Deep ecology) or futuristic and advanced-technological thought (Transhumanism). Even though letters in both conditions had elements that strayed from the respective cultural narrative to the other, still the primed narratives remained of greater influence on the participant's contextualisation. Which means that the cultural narrative videos show some promise in educating young people on the respective elements that could inform a climate changed future. Yet, it must be noted that the participants in the Transhuman condition showed more not-primed interest in the Deep ecology narrative, than Deep ecology participants showed in the Transhuman narrative. This could mean that young people in the Transhuman condition were more preconceived in their notions towards Deep ecology elements in life or had an inclination for some other reason altogether. We can conclude that

the young people in the current sample were noticeably influenced by either Deep ecology or Transhumanism and therefore contributed to the future-oriented sensemaking process of these participants.

In a more practical sense, the results of this research could inform young people on the way towards making sense of the uncertain climate future. Questions such as dealing with personal life in a climate changed world or how to envision such a future along pathways that are informed by Deep ecology and Transhuman elements could help with informing and initiating thought concerning this topic for young people. In this sense, people will be able to make sense of and reason about the consequences of climate change in the future and create an image of what this could mean for them. The sensemaking model has proven to be able to give a structured and wholistic analysis-framework from where the sensemaking process can be analysed. This framework could in the future be used as a practical tool in structuring a sensemaking assignment, rather than merely a tool for analysis. As young people are going to have to face the uncertain climate change future, this framework could be used in primary and secondary schools to inform learners and stimulate the sensemaking process for this even younger generation. Doing this could stimulate thought and perhaps even entice positive agency towards this global issue.

As mentioned early on in this research, the consequences of climate change seem to be inevitable, although what this will look like exactly is still inherently uncertain, consequences will be felt. Informing young people on how to go through the sensemaking process concerning climate change could prove pivotal for this generation. If this process of sensemaking is not explored and stimulated enough, young people might find themselves utterly unprepared for what the future might hold in terms of climate change. On the upside, proper preparation might just be what this generation needs to make sense of and take control over their future.

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Appendix A Questionnaire**Writing a Letter from the Future (Part 1)**

Start of Block: Welcome and thank you for participating in this study. On the following pages yo

Q3 Welcome and thank you for participating in this study.

This study is about how people envision their own preferred future in the context of climate change.

You will be asked to:

1. watch a video (5 minutes)
2. write a letter about your own future life inspired by the video (20-30 minutes)
3. answer some short questions (5 minutes)

End of Block: Welcome and thank you for participating in this study. On the following pages yo

Start of Block: Block 1

Q1 Please download and read the following document:

[Information sheet letters from the future imagining a preferred personal life in uncertain climate futures](#)

- I have read and consent to the information provided in the PDF (1)

End of Block: Block 1

Start of Block: Block 1

Page Break

Q13 Please provide informed consent by answering the following 6 questions.

Q1.1 I have read and understood the study information in the PDF or it has been read to me. I have been able to ask questions about the study and my questions have been answered to my satisfaction.

Please email s.j.thomson@student.utwente.nl or t.h.voost@student.utwente.nl for any questions.

Yes (1)

No (2)

Q1.2 I consent voluntarily to be a participant in this study and understand that I can refuse to answer questions and I can withdraw from the study at any time, without having to give a reason.

Yes (1)

No (2)

Q1.3 I understand that the information I provide will be used for research purposes only.

Yes (1)

No (2)

Q1.4 I understand that personal information collected about me that can identify me (only your e-mail address, if you decide to provide this) will not be shared beyond the study team.

Yes (1)

No (2)

Q1.5 I agree that my information can be quoted in research outputs, however identifiers will not be shared beyond the study team.

Yes (1)

No (2)

Q1.6 I agree to joint copyright of the submitted letter from the future data to Sophie Thomson, Teun Voost and Dr. Anneke Sools.

Yes (1)

No (2)

End of Block: Block 1

Start of Block: Default Question Block

Deep Ecology You will now be invited to watch two short videos. After watching them, please indicate that you actually watched the entire video at the bottom of this page.

I have watched the full videos (1)

Transhumanism You will now be invited to watch two short videos. After watching them, please indicate that you actually watched the entire video at the bottom of this page.

I have watched the full videos (1)

End of Block: Default Question Block

Start of Block: Block 3

Q3.1 Now that you have watched the instruction video, it is time to write your Letter from the Future with the kind of world depicted in the video in the back of your mind. Here are some reminders on what to write. Try not to worry about spelling, sentence structure, or grammar but simply write anything that comes to your mind. Remember the letter is written from the perspective of the future to an audience in the present. Please try to envision the future in detail and write as much as you like. Use your imagination: This is your chance to shape the future!

We recommend that you use a fake name to refer to yourselves and others as we want to protect your and others' privacy.

You are 20 years in the future. Climate change has progressed and is now a reality. Imagine your own preferred or desired future life in that climate change future. Keep the future developments as depicted in the video in mind while writing.

Who is the recipient in the present you are addressing the letter to? (your present self, another group or person) What does the preferred future look, feel and smell like? (you, others, the world around you) What is the desired situation you find yourself in? How did you get to this future? (What actions lead to this future? What is the path to this future?) What message from the future would you like to give to the recipient reading the letter in the present day ?



Q3.1 Please write your letter here.

End of Block: Block 3

Start of Block: Block 4

Q23

Thank you very much for submitting your letter to the future.

As a final step, we would like to invite you to answer 5 questions about your background and 8 questions about the tasks you participated in (video watching and letter writing).

Q4.1 What is your age?

Q4.2 What is your gender?

Q4.3 What is your nationality?

Q4.4 What is your employment status? (Working, self-employed, student etc.)

Q4.5 What is the highest diploma you have obtained?

Page Break

Q14 Questions about the letter assignment

Q4.6 Where did you write the letter?

Q4.7 Did you understand the instructions when writing the letter?

- Yes (1)
- No (2)
- Partially (please detail below) (3)

Q4.8 Do you have any further comments on the process of letter writing?

Page Break

Q38 Other questions

Q4.9 Which video did you watch? (Video 1)

- Deep Ecology (5)
- Transhumanism (6)

Q4.10 Please answer the following questions on the video of the perspective you saw (transhumanism or deep ecology)?

0 10 20 30 40 50 60 70 80 90 100

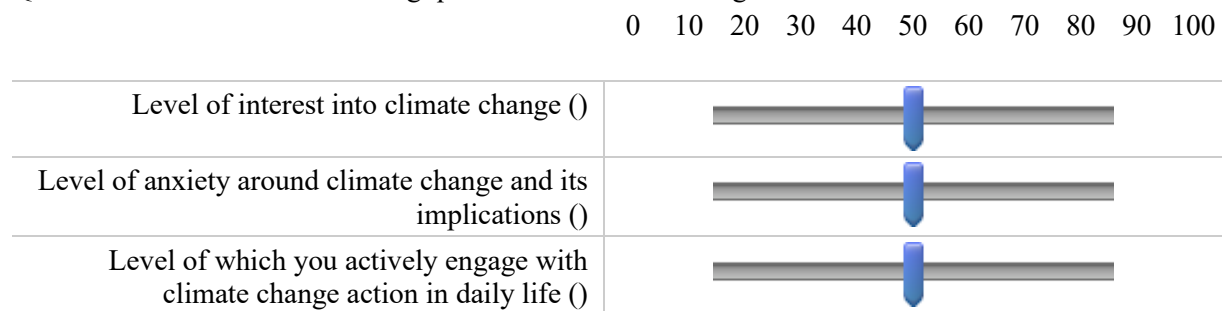
Level of understanding ()	
Level of identification with this perspective ()	
Level of pleasure while watching the video ()	
Level you had the video in mind while writing the letter ()	

Q4.11 When watching the video, did you gain any new insights

Yes (please briefly outline this below) (1)

No (2)

Q4.12 Please answer the following questions on climate change.



Page Break

Q4.13 There is a follow-up part of the research which is voluntary. This follow-up will involve a focus group whereby participants will share their letters and reflect on the writing process and the visions for the future.

For students recruited through SONA, you will get credits for doing this.

Are you willing to participate in a focus group? If so, please provide your e-mail address.

Q4.14 I would like to be informed on the results of the study and be sent a copy of the final thesis.

Yes (provide email address) (1)

No (2)

End of Block: Block 4

Start of Block: Thank you for completing the research!

Appendix B Research Poster

Imagining a preferred personal life in uncertain climate futures



Are you between the ages of 18 and 28 and are you interested in participating in psychological research investigating uncertain climate futures? In this research you will imagine a future where climate change is a reality and then write a letter from the future to the present. This exercise is very reflective and relaxing. It could help you imagine what the future could hold and how to find meaning in the future. You can participate in this research online and it should only take about 35 minutes.

SCAN THE QR CODE TO LEARN MORE OR PARTICIPATE...