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Persuasiveness of an emotional message addressing climate change: The effect of using an L1 or an L2

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Abstract

The main research topic of the current study is the difference in persuasiveness of an emotional message in a first (L1) or in a second language (L2). The research question which has been investigated is ‘does the use of an L1 or an L2 in emotional appeals addressing climate change have an effect on the persuasiveness of the message?’. As climate change is an urgent issue nowadays, it is a relevant topic of study on how people are best persuaded to act against global warming. To investigate this effect of language on persuasive communication, an experiment was conducted in the form of a questionnaire. The independent variable tested was ‘language’ with two levels: Dutch (L1) and English (L2). The dependent variables in this study were attitude, behavioural intention and perceived emotionality. Subjects were asked to read an emotional text in either their L1 (Dutch) or their L2 (English) about a farmer and his family who were a victim of climate change. After reading the text, they answered questions about their attitude towards climate change, their behavioural intention towards the proposed behaviour and the perceived emotionality of the text. A series of independent samples t-tests showed no significant effect of the emotional message in L1 (Dutch) and L2 (English) regarding attitude, behavioural intention and emotionality. An explanation of this result could be that participants already had strong attitudes and pre-made beliefs about climate change, which could have influenced the manipulation. However, future research is necessary to investigate the results to a deeper extent.

Key words: *emotionality, L1 and L2, persuasion, climate change communication*

Introduction

“If you talk to a man in a language he understands, that goes to his head. If you talk to him in his own language, that goes to his heart” (de Galbert, 2019). This quote, which is attributed to the famous Nelson Mandela, introduces the topic of this current study very well, as it talks about how using a native language could influence emotions differently in comparison to using a foreign language. Precisely, the topic of this study is going to focus on the concept of emotionality and persuasion in an L1 and L2. A first language (L1) is defined by Pavlenko (2012) as ‘a language or languages learned from birth, regardless of the speaker’s current proficiency’. A second language (L2) is defined as ‘a language learned after early childhood (ages 1-3) following the L1’ (Pavlenko, 2012). The differences between a first and a second language are a relevant subject of study: due to the globalising world, learning a second language is becoming more popular and, as a result, more

people become bilinguals, i.e. people who speak two languages (Scripnic, 2021). A quote by Doiz, Lasagabaster and Sierra (2013) confirms this phenomenon, as they state that ‘one of the main tools for globalisation is language’. Especially in higher education institutes, globalisation has caused English to be the universal lingua franca (Scholte, 2008), making it the most spoken language in the world in 2021 (Szmigiera, 2021). Thus, because of the growing number of bilinguals in the world, differences between native and foreign languages are an important topic to study. For the further development of the introduction, evidence will be given for the difference of L1 and L2 regarding emotionality, the main topic of this current study, followed by the explanation of some relevant theories about persuasive communication.

A study that provides evidence for perceived emotional charge of language is a study conducted by Dewaele (2008) about love. The study was comprised of an experiment in which participants, who spoke in total 77 different L1s, had to judge the emotional weight of the phrase ‘I love you’ in their native and foreign language. The results show that more than half of all the participants judged ‘I love you’ to have a bigger emotional weight in their native language in comparison to their second language. Statistical tests conducted in the study gave several explanations for this finding, including self-perceived language dominance of the subjects, level of socialisation in the L2 and the perception of their own oral ability in their L2. Even though this experiment was conducted with predominantly female, high-educated participants, the results are still interesting to take into account, as this could imply that human beings perceive greater emotion in their native language than in a foreign language.

The study by Dewaele (2008) provides evidence of the possible existence of a foreign language effect, since it shows that greater emotionality is perceived in someone’s L1 in comparison to their L2. According to Cipolletti, McFarlane and Weissglass (2016), the foreign language effect is ‘the activation of systematic reasoning processes by thinking in a foreign language’. This definition implies that the possibility exists that judgements are made more systematically in a foreign language than in a native language and thus that the difference in language evokes different actions, thinking patterns and decision making.

The latter with regard to the foreign language effect is investigated in a study conducted by Costa, Foucart, Hayawaka et. al. (2014). They conducted research on the differences of the decision making process in L1 and L2, but in the field of moral dilemmas. In their experiment, subjects had two decision-making options: a utilitarian one and a more emotional one. The participants options were two fictitious situations: either they pushed one heavy man before a train to save five others, which is the utilitarian decision, or they chose to not push the man because it is against someone’s morals to kill a person with your own hands, even though five others would then be killed. The

choice between the utilitarian option and the emotional one is relying on cognitive processes and reasoning, which could differ per language. The results of the study show that the respondents who had to make this choice in a foreign language, were more likely to push the man in front of the train and thus make a more utilitarian decision. The conclusion they took from these results is that a foreign language does reduce emotional reactivity, which then promotes cost-beneficial examinations and thus more utilitarian judgements. Accordingly, more emotional decisions were made in a first language.

The previous study by Costa, Foucart, Hayawaka et. al. (2014) treats a very moral concern, but it is interesting as well to see whether this reduced emotional response is applicable in situations where there is no moral dilemma involved. An example of a study that does not involve moral concerns, but did investigate how language affects decision making is one by Costa, Foucart, Arnon, Aparici & Apesteguia, 2014. The researchers were interested in to what extent language has an effect on decision making when facing a problem. The participants had to choose across ten lottery pairs, each of them having a larger or smaller gain/loss frame. This means that the participants chose between risking to lose a high prize, or to win a small one. The results of the study show that participants in the L2 condition were less risk averse than those in the L1 condition. The conclusion that can be taken from this result is that making a decision in an L2 reduces risk aversion, meaning that a choice is judged more objectively, and thus the highest expected value is more likely to be chosen. This study provides additional evidence that judgements are made more objectively in an L2, reducing the emotional significance of the problem. In this case, risk aversion may be connected to emotion, meaning that when an L1 is perceived as more emotional, risk aversion is logically being reduced when making choices in an L2.

In addition, research on code-switching is also a relevant topic of discussion, as it could provide evidence for L1 and L2 differences in emotional proximity with a language. In an experiment conducted by Bond and Lai (1986), 48 Chinese female undergraduates had to interview each other in either their L1 (Mandarin) or their L2 (English). The topics they had to discuss were both embarrassing as well as not embarrassing. The results of this study show that subjects found it harder to talk about embarrassing topics in their L1 compared to their L2. With these findings, the researchers argue that an L2 provides an emotionally distancing function in embarrassing situations, showing that with code-switching techniques, people can use their L1 to create more emotional proximity and their L2 to create more emotional distance. Therefore, this study provides evidence that bilinguals discuss emotionally embarrassing topics more easily in their L2 compared to their L1 as it creates more emotional distance towards the topic.

By now, various evidence has been provided that perceived emotionality in an L1 is greater than in an L2. However, the potential reasons for the difference in emotionality between L1 and L2 are not yet discussed. Previous research has investigated possible explanations, which could be variations in English proficiency (Eilola & Havelka, 2010) and age of English acquisition (Harris, 2004). Another explanation of the emotionality difference between L1 and L2 could lie in the Episodic Trace Theory by Hintzman (1986). This theory suggests that words which are experienced more regularly are composed of a larger number of episodic traces, i.e. every time a particular word is recalled, the number of episodic traces that is stored in the mind will become greater. Words with more episodic traces lead to more resonance of emotion. This results in a positive correlation between emotionality and how often a word has been recalled in a language. This theory suggests that people have encountered most words more often in their native language than in a second or foreign language and thus experience more emotionality in this L1. Taking this result to the concept of persuasion, it is likely that, for example, consumers encounter advertisements more often in their native language in comparison to a foreign language. Taking into account the theory of Episodic Trace, this would suggest that advertisements in a foreign language would be perceived as less emotional (and thus less persuasive) than advertisements in a native language, leaving an advantage for advertisers who target a local audience as they are likely to be more persuasive.

A study by Puntoni, De Langhe and Van Osselaer (2009) tested this language (dis)advantage for the persuasiveness of advertisements. During an experiment, a group of native Dutch speakers and native French speakers (who were all trilingual in Dutch, French and English) were asked to fill in a booklet in English, after which they were presented with three French and three Dutch slogans. Subsequently, they had to rate the emotional intensity of the slogans. The results of the study show that slogans in subjects L2 were rated as less emotional than the slogans in subjects L1, meaning that the Dutch native speakers rated Dutch advertisements as more emotional, whereas the French native speakers rated the French advertisements as more emotional. The results of this study, together with the connection of emotion on persuasion shows that advertising in an L1 can be more persuasive and thus more effective.

In another study on persuasion conducted by Noriega and Blair (2008), 259 English-Spanish bilinguals had to evaluate two advertisements, either in Spanish or in English. After having seen the two ads, subjects had to fill in questions about their thoughts about the product and the advertisement, attitude towards the ad, attitude towards the brand and purchase intention. Afterwards, subjects also had to complete questions about their involvement with the product class of the advertisements. Results of this study show that native language advertisements elicit increased thoughts about concerns as family and home. These thoughts in turn led to higher purchase intention

measures and a more positive attitude towards the advertisement. Results of both studies (Puntoni, De Langhe & Van Osselaer, 2009; Noriega & Blair, 2008) are in line with the assumption that a target group is more likely to be persuaded in their L1, as this could elicit stronger emotionality and thus higher attitudes towards (in this case) an advertisement.

As evidence is provided for the role of emotionality and the opportunities of using an L1 or an L2 to increase persuasion in advertising, it is arguable that the same theory could apply for combating societal issues. A study by Dillard and Nabi (2006) was conducted to help the National Cancer Institute to investigate the relation between persuasion and emotion and how that affects messages about cancer detection messages as well as those for cancer prevention. After extensive research of existing theory and the role of emotion in persuasion, the authors argue that the use of different emotions in messages can provoke different reactions and thus have a different persuasive goal. For example, sadness can be used to show awareness to the consequences that it can bring when you fail to take cancer prevention action. Furthermore, disgust could help with evoking negative associations with behaviour that is seen as risky. In this way, the study of emotionality and persuasiveness in L1 and L2 can also be used to help solve societal problems and raise awareness in an effective manner. The subject of the current study will be climate change. As climate change is a severe societal issue, the previously mentioned studies could therefore also apply in the battle against it.

The reason for climate change as the societal issue is an increasing fear for, and awareness of the effects of climate change in the last few years, in which persuasive communication strategies towards such relevant societal issues are becoming more important. Due to persuasive communication to evoke behavioural change towards climate change, avoiding holidays by plane and other actions like consuming less meat and recycling waste have become the norm (Whitmarsh, Poortinga & Capstick, 2021). This fear towards global warming and climate change however is not unfounded, since the temperature on earth's surface was 0.98 degrees warmer in 2020, than in the 20th century. This warming up could cause a decrease in arctic ice, weather catastrophes such as tsunamis, storms and many more extremes (Jaganmohan, 2022). Therefore, it is important to investigate in which way persuasive communication towards climate change is most effective: only when you can persuade people to take action, there will be change.

There are multiple studies that have investigated what the most effective means of persuasion regarding climate change is. A study by Morris et al. (2019) investigated the persuasion of stories versus factual messages on climate change. In the study, participants were randomly assigned to read a pro-environmental text, which was either in the form of an informative description, or in the form of a story. After reading the text, participants had to fill in a questionnaire regarding whether they

would sign up for a particular pro-environmental organisation, if they wanted to participate in a follow-up survey, if they would recycle and whether they clean off their desk or not. The results of the study show that participants in the story condition were significantly more likely to perform all these previously mentioned actions. This indicates that the story condition, which is more emotional than the factual condition, is more likely to persuade participants to take action against climate change. These results are relevant for the present study, considering that an emotional narrative will be used to measure persuasion.

As a story condition is shown to be likely to persuade more than a factual message, other research has been conducted on which emotion this message should contain. An example of a study investigating the different emotions regarding climate change is the one by Bloodhart, Swim and Diccico (2019). During this experiment, subjects had to read two climate change communication statements in the form of a 'Clean Power Plan': a non-emotional version and a modified version containing either angry, fearful or sad emotions. After reading, the subjects had to describe the difference between the two and compare them. Results of this study show that the non-emotional messages were perceived as more irrational than the emotional ones. Likewise, the speaker of the emotional statement containing sadness was seen as more rational and caring than when conveying anger. Sadness and fear did not differ in terms of rationality and nurture. This rationality of the sad and fearful messages also increased the preference for these messages. These results imply that the use of sad, emotional messages can increase rationality and preference and thus might be more persuasive.

Other research supports these findings that sadness can be an effective emotion in persuasive communication: Labott, Martin, Eason and Berkey (1991) state that the emotion of sadness evokes sympathy from an audience. In addition, people who express sadness are perceived as likeable (Tiedens, 1998) and source likeability is in its place an important factor in persuasion (Roskos-Ewoldsen, Bichsel & Hoffman, 2002) which could imply that sadness is a suitable emotion to adopt for persuasive communication. As a result of this previous research about sadness as an effective persuasive emotion, the present study will use an emotional narrative which evokes sadness.

Thus, a substantial amount of research has been conducted on climate change communication; which emotions are the most effective for successful persuasive climate change communication (Bloodhart, Swim & Diccico, 2019; Labott, Martin, Eason & Berkey, 1991) and also whether persuasion was more effective in story or factual messages (Morris et al., 2019). However, all of these studies on climate change communication are only investigated in an L1. Furthermore, L1 and L2 differences have been found in various domains regarding emotionality, such as in emotional words and phrases Dewaele (2008), decision-making in moral dilemmas (Costa, Foucart,

Hayawaka et. al.,2014) and decision-making in problem solving (Costa, Foucart, Arnon, Aparici & Apestequia, 2014). Nonetheless, these studies lack the domain of persuasion in climate change communication, whilst theory suggests that communication regarding societal issues could take great advantage of using an L1 instead of an L2 (Puntoni, De Langhe and van Osselaer, 2009; Dillard and Nabi, 2006).

Considering this previous research, there can be found a research gap on the role of emotional appeals in L1 and L2, on the persuasion of climate change messages. Therefore, the research question that will be investigated is ‘does the use of an L1 or an L2 in emotional appeals addressing climate change have an effect on the persuasiveness of the message?’. The hypotheses that will be examined are:

- *H1: An emotional appeal in an L1 is perceived as more emotional than the same message in an L2*
- *H2: the use of an L1 in emotional appeals addressing climate change is more effective on the persuasiveness of a message than in an L2.*

The expectation for the outcome of the study, based on the theoretical framework that is provided above, is that both H1 and H2 will be accepted. Considering previous research, evidence has been provided that the use of an L1 provokes a greater emotional weight on messages and evokes more emotional reactivity. Furthermore, other studies have shown that stories are more persuasive than facts. Therefore, if persuasiveness is affected by emotion then it is highly expected that this will also be affected by L1 and L2, as various research shows that emotionality in an L1 is perceived higher than in an L2. In this case, it is expected that L1 is more emotional and thus more persuasive, meaning that the expected outcome of the study will confirm both H1 and H2.

Methodology

Materials

The independent variable that was tested in this study is ‘language’ with two factors L1 (Dutch) and L2 (English). The independent variable was tested via an emotional appeal regarding climate change in either the participant’s L1 or L2. In this case, the L1 of all the participants was Dutch and the L2 was English. The main aspect of an emotional appeal is that it does not try to evoke a functional need, but rather affection towards a message (Leonidou & Leanidou, 2009). The emotional appeal in the present study was presented in a text which tried to evoke affection towards a fictitious person

who experienced a fictitious scenario regarding climate change, together with recommendations on how subjects can help in the battle against global warming. In table 1 the two texts are shown.

Table 1: Materials

English condition (L2)	Dutch condition (L1)
<p>My name is Daan. I am 37 years old, and I am the father of two joyful boys. My wife Tessa and I own a potato farm in beautiful South Limburg in the Netherlands. We inherited the farm in early 2018 after my father died. Ever since, we have had to face terrible weather challenges.</p>	<p>Mijn naam is Daan. Ik ben 37 jaar oud en vader van twee vrolijke jongens. Mijn vrouw Tessa en ik zijn eigenaar van een aardappelboerderij in het mooie Zuid-Limburg in Nederland. Wij hebben de boerderij begin 2018 geërfd na het overlijden van mijn vader. Sindsdien hebben we te maken gehad met verschrikkelijke uitdagingen door het weer.</p>
<p>In the summer of 2018, it was incredibly hot and sunny, and it rained less than ever before – a horrible time to grow potatoes. Because of that, our family’s farm severely suffered. The severe drought killed most of the harvest, and with awfully little rain, groundwater was scarce. Watering the plants was hopeless. We lost half of our harvest and thus our most important income source. We could not pay our bills.</p>	<p>In de zomer van 2018 was het ongelooflijk heet en zonnig, en het heeft nog nooit zo weinig geregend - een verschrikkelijke tijd om aardappelen te verbouwen. Daardoor heeft de boerderij van onze familie zwaar geleden. De ernstige droogte doodde het grootste deel van de oogst, en met akelig weinig regen was grondwater schaars. Water geven aan de planten was hopeloos. We verloren de helft van onze oogst en dus onze belangrijkste inkomstenbron, waardoor we onze rekeningen niet konden betalen.</p>
<p>As we slowly recovered, the next tragedy hit in 2021. Monstrous rainfalls in Limburg, Belgium, and Germany led to disastrous floods. We feared for our lives and evacuated the farm to stay with Tessa’s mother in Utrecht. The flood destroyed the fields, causing massive losses in the harvest. Our dearly loved home and cherished belongings are ruined forever. A few days later, a sad message from Germany hit me. My childhood friend Luuk, who had moved to Western Germany, was overwhelmed by the flood. His house was swept away by the forceful stream of a usually peaceful creek, drowning his wife and daughter.</p>	<p>Terwijl we langzaam herstelden, sloeg in 2021 de volgende tragedie toe: monsterlijke regenval in Limburg, België en Duitsland leidde tot rampzalige overstromingen. We vreesden voor ons leven en evacueerden de boerderij om bij Tessa's moeder in Utrecht te gaan logeren. De overstroming heeft de velden verwoest, waardoor enorme delen van de oogst verloren zijn gegaan. Ons geliefde huis en onze dierbare bezittingen zijn voor altijd geruïneerd. Een paar dagen later kreeg ik een triest bericht uit Duitsland: het huis van mijn jeugdvriend Luuk, die naar West-Duitsland is verhuisd, was overspoeld door de overstroming. Zijn huis werd weggevaagd door de krachtige stroom van een gewoonlijk rustige beek, waardoor zijn vrouw en dochter verdronken.</p>

These catastrophes are the result of global warming. Our lifestyle activities release enormous amounts of CO₂ which disturbs the usual balance between sunshine and rain. This leads to higher global temperatures, melting polar ice caps, and rising sea levels. More dreadful droughts, storms, and floods will cause families like mine or Luuk's to lose our homes, income, and loved ones.

Deze catastrofes zijn het gevolg van de opwarming van de aarde. Door onze levensstijl komen enorme hoeveelheden CO₂ vrij, waardoor het gebruikelijke evenwicht tussen zonneschijn en regen wordt verstoord. Dit leidt tot hogere temperaturen op aarde, smeltende ijskappen en een stijgende zeespiegel. Meer vreselijke droogtes, stormen en overstromingen zullen ervoor zorgen dat gezinnen zoals het mijne of dat van Luuk hun huis, inkomen en geliefden verliezen.

This is how you can help:

Dit is hoe je kunt helpen:

1) Instead of flying to your next beach vacation, consider travelling by train. Trains are much more environmentally friendly. Or start small by taking the bike or bus to university or work rather than driving by car.

1) In plaats van vliegen naar je volgende strandvakantie, kun je overwegen met de trein te reizen. Treinen zijn veel milieuvriendelijker. Of begin klein en neem de fiets of de bus naar de universiteit of het werk in plaats van rijden met de auto.

2) Next time you go shopping at the supermarket, consider buying local and seasonal foods. Eating fresh food coming right from your neighborhood is very environmentally friendly. The strawberries and tomatoes don't have to travel from far away, exotic countries and, therefore, fewer harmful gases are released.

2) Als je de volgende keer boodschappen gaat doen in de supermarkt, overweeg dan om lokaal en seizoensgebonden voedsel te kopen. Het eten van vers voedsel dat rechtstreeks uit je buurt komt is zeer milieuvriendelijk. De aardbeien en tomaten hoeven niet uit verre, exotische landen te komen en daardoor komen er minder schadelijke gassen vrij.

3) Lastly, try to eat less meat and drink less milk. You can help the environment by not eating animals like cows, pigs, and chickens, or by not drinking cow milk and eating animal products like eggs and cheese. Raising animals for food releases immense amounts of CO₂ that harm our beautiful earth. Eating more vegetarian and vegan meals helps with this.

3) Tot slot, probeer minder vlees te eten en minder melk te drinken. Je kunt het milieu helpen door geen dieren te eten zoals koeien, varkens en kippen, of door geen koemelk te drinken en geen eieren en kaas te eten. Het houden van dieren voor voedsel produceert immense hoeveelheden CO₂ die onze mooie aarde schaden. Meer vegetarische en veganistische maaltijden eten helpt daarbij.

The original text was first created in English (L2), after which it was checked and translated by two native Dutch speakers and checked by a native English speaker. It is therefore analysed and approved on similarity and grammar. The English (L2) emotional text contains 120 emotional words, retrieved from the paper by Warriner, Kuperman and Brysbaert (2013). In this paper, the researchers created a list of 14.000 English words and classified them by three components of emotions: valence, arousal

and dominance. For this current study, only the degrees valence and arousal are taken into account regarding word choice. The mean of arousal in the Warriner paper was 4.21, hence emotional words higher than this number were considered. In addition, the mean of valence was 5.06 with an SD of 1.68. Only words with either high or low valence were taken into account which meant the words with a mean higher than $M + SD$ or words that had a mean lower than $M - SD$. Eventually, a list of words was created of which the text could be constructed. The list of words, together with the corresponding means on valence and arousal can be found in appendix A.

Subjects

A total of 144 participants took part in the experiment of which 67 met all the selection criteria and finished the questionnaire. Participants who did not give consent, were under 18 years old and did not comprehend the message were excluded from the experiment. The 67 participants that were included in the experiment had a mean age of 23,8 (SD = 6,7; range = 19 - 58). The mean age of participant's English acquisition was 10,2 (SD = 2,48; range = 4 - 18). The most frequent level of education was University level (70,1%), followed by HBO (Higher Vocational Education, 19,4%), MBO (Intermediate Vocational Education, 6,0%) and High School (4,5%). In total, 20 males and 47 females participated in the experiment and the mean score of English proficiency on the Lex TALE test was 79.83 (SD = 12.29; range = 46.25). In addition, a Pearson's Chi-square test showed that participants were equally distributed amongst conditions of gender ($\chi^2(1) = .087, p = .768$) and education level ($\chi^2(3) = 2,08, p = .55$). In addition, three independent samples t-tests showed an equal distribution of the characteristics age ($t(64.43) = .030, p = .976$), age of English acquisition ($t(61.75) = .113, p = .910$), and English proficiency ($t(62.47) = 1.88, p = .065$).

Design

The design of the study was between-subjects with one independent variable with two levels: Dutch (L1) and English (L2). As the experiment was designed as between-subjects, all participants were exposed to only one level of the independent variable. This design was chosen in order to reduce the chance that the participants would find out about the purpose of the study. In total, 38 of the participants were assigned to the L1 (Dutch) condition and 41 to L2 (English) condition.

Instruments

The dependent variables that were tested are attitude towards climate change, behavioural intention towards the proposed behaviour and perceived emotionality of the message. The instrument that was used for this study is a questionnaire, which was presented in the subjects' L1 (Dutch). Both attitude

and behavioural intention were measured with questions using a 7-point Likert scale as answer option, based on the research paper by Dijkstra and Goedhart (2012). For both dependent variables, the questions and answer options were in Dutch (L1) to ensure that only the language of the stimuli is a factor of manipulation.

The dependent variable attitude was measured among six questions, with the scale having a range of ‘strongly disagree’, ‘disagree’, ‘slightly disagree’, ‘neutral’, ‘slightly agree’, ‘agree’, and ‘strongly agree’. The questions, based on the paper by Dijkstra and Goedhart (2012) for attitude were: ‘People should care more about climate change’, ‘climate change should be given top priority’, ‘people worry too much about climate change’, ‘climate change is a threat to the world’, ‘the seriousness of climate change has been exaggerated’, and ‘it is annoying to see people do nothing for the climate change problems’. The reliability of ‘attitude towards the message’ comprising six items was good: $\alpha = .82$.

Regarding behavioural intention, six questions were formulated to measure this variable based on the paper by Fishbein and Ajzen (2011). The questions were: ‘I have the intention to follow the behaviour as described in the message’, ‘I will follow the behaviour described in the message’, ‘I am willing to follow the behaviour as described in the message’, ‘I plan to follow the behaviour as described in the message’, ‘I am not willing to change my lifestyle in order to counter global warming and climate change’ and ‘I will do everything I can to reduce the adverse effects on the climate’. The reliability of ‘behavioural intention towards the proposed behaviour’ comprising six items was high: $\alpha = .89$.

The last dependent variable measured was perceived emotionality, tested with one question: ‘this message is...’, with answer options ranging from ‘non-emotional’ to ‘emotional’ on a 7-point semantic differential scale.

Before participants had filled in the questions measuring the dependent variables, they answered questions regarding whether they were younger or older than 18 years old, their native language and whether they spoke English. After reading the materials, subjects were exposed to a comprehensibility check and after answering questions regarding the dependent variables, they were presented a LexTALE test to measure their English proficiency, followed by demographic questions regarding the exact age, gender, level of education and age of English acquisition. See appendix A for a complete overview of the questionnaire.

Procedure

The snowball sampling method was used to approach participants. The experiment was conducted in the form of an online survey, signifying that the participants could take part at any location. The

subjects were approached via social media and word of mouth to take part in the experiment, no rewards or other incentives were used to attract potential participants. The survey was completed individually. Before starting the survey, the participants were shown an introduction screen in which they were told that the experiment would take around 10 minutes, as well as that answers would stay anonymous. Subjects were told that they would read a text regarding climate change, followed by an evaluation of the text, finalised by an evaluation of the English proficiency and demographic information. After finalising the experiment, the subjects were not debriefed about the aim of the experiment. External factors such as distraction and loss of focus may have played a role, as the participants conducted the experiment in a non-controlled location. In an attempt to reduce this problem from having great impact, the participants were told how long the experiment would take on average. In this way, subjects were prepared to focus for a certain time slot. On average, after excluding some outliers for this calculation only, it took participants around 8 minutes to finish the survey.

Statistical treatment

To answer the research question and thus test the hypotheses, a series of independent two-sample t-tests was conducted with 'language' as independent variable and 'attitude', 'behavioural intention' and 'emotionality' as dependent variables. To measure the internal consistency of the dependent variables, two Cronbach's alpha tests were assessed. For the variables attitude and behavioural intention, the answers were converted to values on a 7-point scale, after which the mean of the items was taken to create a single variable for later analysis.

Results

The research question examined was 'does the use of an L1 or an L2 in emotional appeals addressing climate change have an effect on the persuasiveness of the message?' An independent samples t-test showed no significant effect of the emotional message in L1 (Dutch) and L2 (English) regarding attitude ($t(64,99) = 1.79, p = .078$), behavioural intention ($t(64,71) = 1.63, p = .109$) and emotionality ($t(64,63) = 1.10, p = .274$). Even though no significant effect was found, the English (L2) means were higher than the Dutch ones (L1) for all dependent variables. Table 2 shows the corresponding means and standard deviations.

Table 2. Mean and standard deviation for dependent variables attitude, behavioural intention and emotionality

	Dutch (L1)	English (L2)
	n = 35	n = 32
	M (SD)	M (SD)
Attitude	5,49 (0.93)	5,88 (0.85)
Behavioural intention	4,64 (1,06)	5,06 (1,04)
Emotionality	5,46 (1,09)	5,75 (1,08)

Conclusion & Discussion

The aim of the present study was to examine whether a persuasive, emotional message regarding climate change is more effective in a first (Dutch, L1) or a second language (English, L2). Results showed that the use of an L1 or an L2 in a persuasive, emotional message regarding climate change has no effect on the attitude towards climate change, as well as the behavioural intention towards the proposed behaviour and perceived emotionality. These conclusions indicate that H1 and H2 were both rejected, as (H1) the use of an L1 in emotional appeals is not more effective on the persuasiveness of a message than in an L2, and (H2) an emotional appeal is not perceived as more emotional in an L1 than in an L2. The results therefore show that no foreign language effect has been found with regard to the study's emotional appeal about climate change.

The study conducted by Dewaele (2008) about love did find a foreign language effect on the perceived emotionality of the sentence 'I love you' in L1 and L2. The majority of participants in this study who did report that they felt 'I love you' to be stronger in their L2 also reported to be maximally proficient in this other language. In the present study, the great majority of participants had a high proficiency of English as well, which could explain why no significant effect was found between perceived emotionality of the two texts in L1 and L2. In addition, the sentence 'I love you' could have had a greater perceived emotional weight as it appeals to you personally, whereas the text about climate change is about a family the participants were not familiar with. The same explanation could hold for perceived emotionality which has also been discussed in the study of Bond and Lai (1986), where participants were more likely to talk about embarrassing topics in their L2 than in their L1 as a result of creating emotional proximity and/or distance. When people talk about themselves in an embarrassing situation they need to open up and therefore be vulnerable and emotional. As this embarrassment might be perceived as more emotionally close than the text about climate change, it

could be an explanation of why the study by Bond and Lai (1986) did find an effect of L1/L2 on emotionality and the current study did not.

The two previously discussed studies on perceived emotionality (Bond & Lai, 1986; Dewaele, 2008) both used emotionally close stimuli ('I love you' and embarrassing topics) for their experiments, whereas the current study used less emotionally close materials. This difference might indicate that emotional proximity could play a role in the difference of perceived emotionality. Another explanation of the contrasting results on perceived emotionality could be a difference in L2 proficiency.

Furthermore, the studies about communicating in an L1 or L2 on persuasion (Puntoni, De Langhe & Van Osselaer, 2009; Noriega & Blair, 2008) found that the use of an L1 is perceived as more emotional and thus more persuasive. An explanation of the difference in results between those two studies and the current one might be that in these studies, new advertisements were used as their stimuli. The participants went into the experiment blank without being able to form pre-made beliefs about the ads. Without having pre-made beliefs about the advertisements, participants were likely to be persuaded more by the stimuli's language. However, climate change is a subject which is very familiar to most people and as a consequence, there could be a high probability that participants' attitude and behavioural intention already were created before being exposed to the stimuli. In addition, the existence of pre-made beliefs could imply that participants did not find it necessary to read the whole text properly, as they might have already formed an opinion about the subject without reading the whole text.

Limitations of the study can be found in the materials and thus the stimuli. As mentioned before, subjects were exposed to a problem of which they could have already formed attitudes and behavioural intentions about. This could have been the cause that the manipulation did not cause the participants to change attitudes. In addition, the emotional text used sadness as evoked emotion, however another emotion or a mix of emotions might have been more persuasive. Another limitation has to do with the participants and the way in which the experiment was conducted. The subjects were predominantly highly educated, young adults. In general, this societal group might have a significantly different view on the topic compared to other age groups or differently educated ones. Their engagement and pre-made beliefs might differ with that of other societal groups and it therefore might be the case that they had stronger pre-made beliefs about the subject. Furthermore, the experiment took place via an online questionnaire, which brings risks of distraction and concentration losses as it was conducted in a non-controlled environment. This could be problematic because as a result, participants could not have read the text properly which could have made the experiment less reliable.

Future research could improve on the emotionality aspect, concerning the most effective kind of emotional message. The current study used sadness as emotion, but other emotions such as hope or fear might be considered in the future study about climate change communication. Furthermore, future research could be done with a variety of participants, such as lower educated, younger or older participants who might have a different general opinion about climate change. In addition, future research could do the experiment in a controlled environment to reduce noise and improve reliability. Follow-up studies could also take into account English proficiency as an independent variable, as research has shown that this might have affected the results. A substantial amount of theory suggests that an L1 is perceived as more emotional than an L2, it is likely to suggest that the more familiar someone is with a language, the more emotional it might be perceived. A higher proficiency of a language can imply a higher familiarity with it as well, which might also make the inclusion of proficiency in an L2 a good reason to take into account. Furthermore, future studies could also investigate possible explanations for the unforeseen results found in this study, which are the finding that no foreign language effect was found, but also that a trend was found in the opposite direction. Another example for follow-up research on the effect of L1 and L2 on climate change communication could be the use of a different element of climate change. The formation pre-made beliefs on a more controversial or arguable element of climate change might be interesting to study. Finally, future research could investigate the effects of emotional proximity on emotion and persuasion in an L1 and L2, as discussed before.

Ultimately, this study has shown that attitudes, behavioural intentions and perceived emotionality of a message regarding climate change did not change depending on whether an L1 or an L2 was used. The results of this study open up a new area of focus regarding climate change communication studies, but also for studies about other societal relevant subjects. On the topic of persuasion, the results can be useful for non-profit companies who promote climate change actions, as they can consider focussing on other aspects of their campaigns besides language. If language makes no difference, it could open up a new focus point, for example which emotion the message should contain for which target group. In general, the study of climate change is ever evolving, as this is a problem which is not yet solved and becomes more and more important. Studies like these contribute to finding the right way to communicate and persuade the public about climate change.

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Appendix A

I. Emotional words categorized on corresponding valence and arousal

Emotional words (Valence, Arousal)
Father (6.88, 3.68*)
Joyful (8.21, 5.55)
Wife (6.7, 4.21)
Beautiful (7.61, 5.71)
Inherit (7.11, 4.35)
Farm (6.22*, 3.05*)
Die (1.67, 6.9)
Terrible (2.1, 4.39)
Challenge (5.95*, 5.25)
Summer (7.5, 5.48)
Incredible (7.59, 6.35)
Sunny (7.95, 5.38)
Rain (6.58*, 3.29*)
Horrible (2.33, 5.95)
Family (7.25, 4.35)
Severe (3.21, 5.43)
Suffer (2.05, 4.5)
Severe ()
Kill (1.81, 6.81)
Harvest (6.57*, 3.75*)
Awful (2.28, 4.86)
Plant (7.05, 3.94*)
Hopeless (2.2, 4.52)
Lose (3.59*, 5.43)
Important (6.82, 4.71)
Pay (6.23*, 4.42)
Recover (6.4*, 4.42)
Tragedy (2.11, 6.8)
Hit (3.95*, 5.48)
Monstrous (3.43*, 5.9)
Disaster (1.71, 6.35)
Flood (2.76, 5.31)
Fear (2.93, 6.14)
Life (6.68*, 5.59)
Evacuate (3.4*, 5.17)
Mother (7.53, 4.73)
Destroy (2.67, 5.16)
Loss (2.9, 5.2)
Loved (7.65, 5.59)
Home (7.48, 3.78*)
Cherished
Ruin (2.32, 5.4)
Sad (2.1, 3.49*)

Message (6.18*, 3.81*)

Childhood (6.65*, 3.73*)

Friend (6.79, 4.29)

Overwhelmed (2.8, 4.9)

Forceful (3.7*, 5.36)

Stream (6.9, 4.35)

Peaceful (8, 4.38)

Drown (2.33, 5.35)

Daughter (6.73*, 5)

Catastrophe (2.7, 5.64)

Lifestyle (5.95*, 5.52)

Enormous (5.68*, 5.05)

Sunshine (8.14, 5.32)

Dreadful (2.6, 4.5)

Income (6.26*, 3.82*)

Help (6.95, 4.29)

Fly (6.06*, 4.9)

Beach (7.21, 5.1)

Vacation (8.53, 5.22)

Travel (7.89, 5.55)

Train (6.36*, 4.05*)

Environmental (5.5*, 6.05)

Friendly (7.84, 4.27)

university (6.95, 4.24)

Drive (6.5*, 4.19*)

Car (6.63*, 4.04*)

Shop (5.89*, 4.76)

Supermarket (6.37*, 4.65)

Local (6.77, 3.8*)

Seasonal (6.58*, 4.3)

Food (7.52, 4.69)

Eat (7.1, 4.38)

Fresh (6.67*, 2.35*)

Neighbourhood (6.09*, 4.05*)

Strawberry (7.25, 4.05*)

Tomatoes (6.25*, 3.82*)

Exotic (7.55, 6.9)

Harmful (2.29, 4.89)

Meat (6.62*, 4.3)

Drink (6.67*, 5.19)

Milk (6.74, 2.33*)

Environment (6.7, 3.45*)

Animal (7.06, 4.3)

Immense (5.48*, 5.85)

Harm (1.91, 5.9)

Beautiful (7.61, 5.71)

Earth (6.83, 5.04)

Meal (7.05, 4.85)

*Words that do not match the criteria entirely but were necessary to include in order to create a running text.

II. Questionnaire

Start of Block: Introduction

Introduction Beste deelnemer,

Op deze pagina nodigen wij u uit tot het deelnemen aan een vragenlijst met betrekking tot klimaatverandering. Het meedoen en invullen van de vragenlijst zal ongeveer 10 minuten duren. Bij deze willen wij u garanderen dat uw ingevulde antwoorden anoniem zullen zijn en ook zo behandeld zullen worden. Uw antwoorden zullen binnen het departement Taal en Communicatie van de Radboud Universiteit vertrouwelijk gebruikt worden ten behoeve van het beantwoorden van de onderzoeksvragen van onze bachelorscriptie.

Deelname

Deelname is vrijwillig en het is dan ook te allen tijde mogelijk om de vragenlijst af te breken en te stoppen met het invullen. Hiermee beloven wij u ook dat uw data gewist zal worden en niet gebruikt zal worden in het onderzoek. Als u besluit om de vragenlijst wel naar voltooidheid in te vullen, zal de data na afronding van de scriptie alsnog ook gewist worden uit het systeem.

Instructies

In de vragenlijst zal eerst aan u gevraagd worden om nauwkeurig een tekst te bestuderen met betrekking tot klimaatverandering. Hierna volgen enige vragen ter evaluatie van de tekst, gevolgd door een korte evaluatie met betrekking tot uw Engels niveau. Afsluitend vragen wij nog enige demografische informatie. Op iedere pagina zal nogmaals de gevraagde opdracht/informatie staan ter verduidelijking.

Contact

Voor nu willen we u hartelijk bedanken voor het lezen van de benodigde informatie en het deelnemen aan onze vragenlijst. Bij vragen en/of opmerkingen over het doel, de data of andere zaken kunt u een email sturen naar Teun.Kemmerling@ru.nl.

Hartelijk dank,

Nina van Loosen
Mynorka Daza Quintero
Iris de Boer
Imke Swinkels
Jelle van Dongen
Moritz Hofstede
Teun Kemmerling

Consent Ik geef toestemming tot het gebruiken van mijn antwoorden.

Ja

Nee

Skip To: End of Survey If Consent = Nee

Page Break

Requirements Om ervoor te zorgen dat wij de correcte doelgroep bereiken volgen hier drie korte vragen ter evaluatie daarvan:

Full Age Hoe oud bent u?

- Onder 18
- 18 of ouder

Skip To: End of Survey If Full Age = Onder 18

Native Language Wat is uw moedertaal?

- Nederlands
- Nederlands plus een andere taal
- Anders

Skip To: End of Survey If Native Language = Nederlands plus een andere taal

Skip To: End of Survey If Native Language = Anders

English proficiency Spreekt u Engels?

- Ja
- Nee

Skip To: End of Survey If English proficiency = Nee

End of Block: Introduction

Start of Block: Introduction to messages

Message Intro U wordt nu gevraagd een korte tekst over klimaatverandering te lezen en deze te beoordelen. Dit duurt ongeveer 2-3 minuten, dus neem de tijd en lees de tekst grondig door. Nadat u de tekst hebt gelezen, wordt u gevraagd een aantal vragen in te vullen. Dit zal ongeveer 3 minuten duren.

End of Block: Introduction to messages

Start of Block: Message 1: emotional - English

EN emotional My name is Daan. I am 37 years old, and I am the father of two joyful boys. My wife Tessa and I own a potato farm in beautiful South Limburg in the Netherlands. We inherited the farm in early 2018 after my father died. Ever since, we have had to face terrible weather challenges.

In the summer of 2018, it was incredibly hot and sunny, and it rained less than ever before – a horrible time to grow potatoes. Because of that, our family’s farm severely suffered. The severe drought killed most of the harvest, and with awfully little rain, groundwater was scarce. Watering the plants was hopeless. We lost half of our harvest and thus our most important income source. We could not pay our bills.

As we slowly recovered, the next tragedy hit in 2021. Monstrous rainfalls in Limburg, Belgium, and Germany led to disastrous floods. We feared for our lives and evacuated the farm to stay with Tessa’s mother in Utrecht. The flood destroyed the fields, causing massive losses in the harvest. Our dearly loved home and cherished belongings are ruined forever. A few days later, a sad message from Germany hit me. My childhood friend Luuk, who had moved to Western Germany, was overwhelmed by the flood. His house was swept away by the forceful stream of a usually peaceful creek, drowning his wife and daughter.

These catastrophes are the result of global warming. Our lifestyle activities release enormous amounts of CO₂ which disturbs the usual balance between sunshine and rain. This leads to higher global temperatures, melting polar ice caps, and rising sea levels. More dreadful droughts, storms, and floods will cause families like mine or Luuk’s to lose our homes, income, and loved ones.

This is how you can help:

- 1) Instead of flying to your next beach vacation, consider travelling by train. Trains are much more environmentally friendly. Or start small by taking the bike or bus to university or work rather than driving by car.
- 2) Next time you go shopping at the supermarket, consider buying local and seasonal foods. Eating fresh food coming right from your neighborhood is very environmentally friendly. The strawberries and tomatoes don't have to travel from far away, exotic countries and, therefore, fewer harmful gases are released.
- 3) Lastly, try to eat less meat and drink less milk. You can help the environment by not eating

animals like cows, pigs, and chickens, or by not drinking cow milk and eating animal products like eggs and cheese. Raising animals for food releases immense amounts of CO₂ that harm our beautiful earth. Eating more vegetarian and vegan meals helps with this.

End of Block: Message 1: emotional - English

Start of Block: Message 2: factual - English

EN factual The Netherlands is the second biggest exporter of agricultural produce in the world, amounting to 17.5% of Dutch exports and 10% of the Dutch economy and employment. Produce worth €65 billion is exported annually. The sector employs approximately 660.000 people, including 50.000 vegetable and fruit farmers who are affected by the consequences of global warming.

In mid-2018, temperatures increased to up to 38.2°C, and only 105 milliliters of precipitation fell over three months, less than 50% of the average. This negatively affected the agricultural sector. A drought causes decreased crop performance due to nutrient-deficient soil, and rainfall is crucial for groundwater collection. 2018 left farmers with no resources to water the crops. Potato farmers were especially affected, as their wages were reduced by 56% due to the drought.

Three years later in 2021, another extreme weather event affected Southern Netherlands and Western Germany. In mid-July, some regions observed a precipitation of up to 241 l/m² in 22 hours. Creeks and rivers overflowed; for instance, the Maas River in Limburg reached a flux of 3168 cubic meters per second, 20 times more than the average. Water levels peaked and were 50% higher than in the previous year. The flood demolished properties, with damage costing approximately €400 million in the Netherlands and around €10 billion in Germany. In Germany and Belgium, around 200 people passed away.

These are consequences of extreme weather events due to global warming. Human activity emits extensive amounts of greenhouse gases, increasing the global temperature. Scientists estimate a 3°C increase by 2100. This leads to melting polar ice caps, sea levels rising, and increased water vapor in the atmosphere. Consequently, water availability becomes less predictable, causing droughts, storms, and floods.

These are measures to prevent this:

- 1) Take public transportation. Trains emit less CO₂ than planes. A flight from London to Edinburgh releases 193kg CO₂ per passenger while a train between the two cities emits 87% less, namely 24kg CO₂ per passenger. Moreover, commuting 32km by train rather than by car reduces 9kg CO₂ daily.
- 2) Consume regional and seasonal products. Acquiring produce that is manufactured regionally and seasonally emits fewer greenhouse gases than acquiring produce from foreign countries. Products supplied from abroad are transported long distances to stores and can emit up to 20 times more CO₂ than regional produce.
- 3) Consume fewer animal products. Consuming animal products emits large amounts of greenhouse

gases. Global emission due to livestock amounts to 7.1 Gigatons CO₂ yearly, 14.5% of all anthropogenic greenhouse gas emissions. Moreover, consuming oat milk compared to cow milk produces 80% less greenhouse gases and 60% less energy.

End of Block: Message 2: factual - English

Start of Block: Message 3: emotional - Dutch

NL emotional Mijn naam is Daan. Ik ben 37 jaar oud en vader van twee vrolijke jongens. Mijn vrouw Tessa en ik zijn eigenaar van een aardappelboerderij in het mooie Zuid-Limburg in Nederland. Wij hebben de boerderij begin 2018 geërfd na het overlijden van mijn vader. Sindsdien hebben we te maken gehad met verschrikkelijke uitdagingen door het weer.

In de zomer van 2018 was het ongelooflijk heet en zonnig, en het heeft nog nooit zo weinig geregend - een verschrikkelijke tijd om aardappelen te verbouwen. Daardoor heeft de boerderij van onze familie zwaar geleden. De ernstige droogte doodde het grootste deel van de oogst, en met akelig weinig regen was grondwater schaars. Water geven aan de planten was hopeloos. We verloren de helft van onze oogst en dus onze belangrijkste inkomstenbron, waardoor we onze rekeningen niet konden betalen.

Terwijl we langzaam herstelden, sloeg in 2021 de volgende tragedie toe: monsterlijke regenval in Limburg, België en Duitsland leidde tot rampzalige overstromingen. We vreesden voor ons leven en evacueerden de boerderij om bij Tessa's moeder in Utrecht te gaan logeren. De overstroming heeft de velden verwoest, waardoor enorme delen van de oogst verloren zijn gegaan. Ons geliefde huis en onze dierbare bezittingen zijn voor altijd geruïneerd. Een paar dagen later kreeg ik een triest bericht uit Duitsland: het huis van mijn jeugdvriend Luuk, die naar West-Duitsland is verhuisd, was overspoeld door de overstroming. Zijn huis werd weggevaagd door de krachtige stroom van een gewoonlijk rustige beek, waardoor zijn vrouw en dochter verdronken.

Deze catastrofes zijn het gevolg van de opwarming van de aarde. Door onze levensstijl komen enorme hoeveelheden CO₂ vrij, waardoor het gebruikelijke evenwicht tussen zonneshijns en regen wordt verstoord. Dit leidt tot hogere temperaturen op aarde, smeltende ijskappen en een stijgende zeespiegel. Meer vreselijke droogtes, stormen en overstromingen zullen ervoor zorgen dat gezinnen zoals het mijne of dat van Luuk hun huis, inkomen en geliefden verliezen.

Dit is hoe je kunt helpen:

1) In plaats van vliegen naar je volgende strandvakantie, kun je overwegen met de trein te reizen. Treinen zijn veel milieuvriendelijker. Of begin klein en neem de fiets of de bus naar de universiteit of het werk in plaats van rijden met de auto.

2) Als je de volgende keer boodschappen gaat doen in de supermarkt, overweeg dan om lokaal en seizoensgebonden voedsel te kopen. Het eten van vers voedsel dat rechtstreeks uit je buurt komt is zeer milieuvriendelijk. De aardbeien en tomaten hoeven niet uit verre, exotische landen te komen en

daardoor komen er minder schadelijke gassen vrij.

3) Tot slot, probeer minder vlees te eten en minder melk te drinken. Je kunt het milieu helpen door geen dieren te eten zoals koeien, varkens en kippen, of door geen koemelk te drinken en geen eieren en kaas te eten. Het houden van dieren voor voedsel produceert immense hoeveelheden CO₂ die onze mooie aarde schaden. Meer vegetarische en veganistische maaltijden eten helpt daarbij.

End of Block: Message 3: emotional - Dutch

Start of Block: Message 4: factual - Dutch

NL factual Nederland is de op één na grootste exporteur van landbouwproducten ter wereld, goed voor 17,5% van de totale Nederlandse export en 10% van de Nederlandse economie en werkgelegenheid. Jaarlijks wordt voor 65 miljard euro aan producten geëxporteerd. De sector biedt werk aan ongeveer 660.000 mensen, waaronder 50.000 groente- en fruitboeren die worden getroffen door de gevolgen van klimaatopwarming.

Medio 2018 liepen de temperaturen op tot 38,2°C en viel er slechts 105 milliliter neerslag in drie maanden tijd, minder dan 50% van het gemiddelde. Dit had een negatieve invloed op de landbouwsector. Een droogte veroorzaakt verminderde gewasprestaties als gevolg van een voedingsarme bodem, en regenval is cruciaal voor grondwaterwinning. In 2018 hadden de boeren geen middelen om de gewassen te besproeien. Vooral aardappelboeren werden getroffen, wat te zien is in hun lonen die met 56% daalden door de droogte.

Drie jaar later, in 2021, werden Zuid-Nederland en West-Duitsland opnieuw getroffen door extreme weersomstandigheden. Half juli viel er in sommige regio's tot 241 l/m² neerslag in 22 uur. Kreeken en rivieren overstroomden, en zo bereikte de Maas in Limburg een debiet van 3.168 kubieke meter per seconde, 20 keer meer dan het gemiddelde. Het waterpeil bereikte een hoogtepunt en lag 50% hoger dan in het voorgaande jaar. De overstroming vernielde eigendommen met schade van ongeveer 400 miljoen euro in Nederland en ongeveer 10 miljard euro in Duitsland. In Duitsland en België zijn ongeveer 200 mensen om het leven gekomen.

Dit zijn de gevolgen van extreme weersomstandigheden als gevolg van klimaatopwarming. Menselijke activiteiten stoten grote hoeveelheden broeikasgassen uit waardoor de temperatuur op aarde stijgt. Wetenschappers schatten een stijging met 3°C tegen 2100. Dit leidt tot smeltende poolkappen, een stijgende zeespiegel en meer waterdamp in de atmosfeer. Als gevolg daarvan wordt de beschikbaarheid van water minder voorspelbaar, met droogtes, stormen en overstromingen tot gevolg.

Dit zijn maatregelen om dit te voorkomen:

1) Neem het openbaar vervoer. Treinen stoten minder CO₂ uit dan vliegtuigen. Bij een vlucht van Londen naar Edinburgh komt 193 kg CO₂ per passagier vrij, terwijl een trein tussen de twee steden 87% minder uitstoot, namelijk 24 kg CO₂ per passagier. Bovendien stoot het woon-werkverkeer van 32 km met de trein dagelijks 9 kg minder CO₂ uit dan met de auto.

2) Consumeer regionale en seizoensproducten. De aankoop van producten die regionaal en seizoensgebonden zijn geproduceerd, stoot minder broeikasgassen uit dan de aankoop van producten uit het buitenland. Producten die vanuit het buitenland worden geleverd, worden over lange afstanden naar de winkels vervoerd en kunnen tot 20 keer meer CO2 uitstoten dan regionale producten.

3) Consumeer minder dierlijke producten. Het consumeren van dierlijke producten stoot grote hoeveelheden broeikasgassen uit. De wereldwijde uitstoot door de veeteelt bedraagt 7,1 gigaton CO2 per jaar, 14,5% van alle antropogene broeikasgasemissies. Bovendien produceert de consumptie van havermelk in vergelijking met koemelk 80% minder broeikasgassen en 60% minder energie.

End of Block: Message 4: factual - Dutch

Start of Block: comprehensibility check

Comprehensibility Beantwoord de vraag door het bolletje aan te kruisen dat uw mening het beste weergeeft. Aangezien we geïnteresseerd zijn in uw eerste indruk, zijn er geen foute antwoorden.

	Helemaal mee oneens	Mee oneens	Enigszins mee oneens	Neutraal	Enigszins mee eens	Mee eens	Helemaal mee eens
Ik begreep de boodschap die de tekst probeert over te brengen volledig.	<input type="radio"/>						

End of Block: comprehensibility check

Start of Block: Dependent Variables

Attitude Gelieve er rekening mee te houden dat u tijdens het invullen van de vragenlijst niet kunt terugkeren naar de tekst.

Deel 1: Houding

Beantwoord de vragen door het bolletje aan te kruisen dat uw mening het beste weergeeft. Aangezien we geïnteresseerd zijn in uw eerste indruk, zijn er geen foute antwoorden.

	Helemaal mee oneens	Mee oneens	Enigszins mee oneens	Neutraal	Enigszins mee eens	Mee eens	Helemaal mee eens
Mensen zouden zich meer moeten bekommeren om klimaatverandering.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Klimaatverandering moet de hoogste prioriteit krijgen.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mensen maken zich te veel zorgen over klimaatverandering.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Klimaatverandering is een bedreiging voor de wereld.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
De ernst van klimaatverandering is overdreven.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Het is vervelend om te zien dat mensen niets doen voor het probleem van klimaatverandering.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Page Break

Behavioral intention Deel 2: Gedragsintentie

Beantwoord de vragen door het bolletje aan te kruisen die uw mening het beste weergeeft. Aangezien we geïnteresseerd zijn in uw eerste indruk, zijn er geen foute antwoorden.

	Helemaal mee oneens	Mee oneens	Enigszins mee oneens	Neutraal	Enigszins mee eens	Mee eens	Helemaal mee eens
Ik heb de intentie om het in de boodschap beschreven gedrag te volgen.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ik zal het in de boodschap beschreven gedrag volgen.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ik ben bereid het in de boodschap beschreven gedrag te volgen.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ik ben van plan het in de boodschap beschreven gedrag te volgen.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ik ben niet bereid mijn levensstijl te veranderen om de opwarming van de aarde en de klimaatverandering tegen te gaan.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ik zal alles doen wat ik kan om de nadelige effecten jegens het klimaat te verkleinen.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Page Break

Emotionality Deel 3: Waargenomen emotionaliteit

Deze boodschap is:

	1	2	3	4	5	6	7	
niet- emotioneel	<input type="radio"/>	emotioneel						

End of Block: Dependent Variables

Start of Block: LexTALE

Lextale This test consists of about 60 trials, in each of which you will see a string of letters. Your task is to decide whether this is an existing English word or not. If you think it is an existing English word, you click on "yes", and if you think it is not an existing English word, you click on "no".

If you are sure that the word exists, even though you don't know its exact meaning, you may still respond "yes". But if you are not sure if it is an existing word, you should respond "no".

In this experiment, we use British English rather than American English spelling. For example: "realise" instead of "realize"; "colour" instead of "color", and so on. Please don't let this confuse you.

This experiment is not about detecting such subtle spelling differences anyway. You have as much time as you like for each decision. This part of the experiment will take about 5 minutes.

	No	Yes
Platery	<input type="radio"/>	<input type="radio"/>
Denial	<input type="radio"/>	<input type="radio"/>
Generic	<input type="radio"/>	<input type="radio"/>
Mensible	<input type="radio"/>	<input type="radio"/>
Scornful	<input type="radio"/>	<input type="radio"/>
Stoutly	<input type="radio"/>	<input type="radio"/>
Ablaze	<input type="radio"/>	<input type="radio"/>
Kermshaw	<input type="radio"/>	<input type="radio"/>
Moonlit	<input type="radio"/>	<input type="radio"/>
Lofty	<input type="radio"/>	<input type="radio"/>
Hurricane	<input type="radio"/>	<input type="radio"/>
Flaw	<input type="radio"/>	<input type="radio"/>
Alberation	<input type="radio"/>	<input type="radio"/>
Unkempt	<input type="radio"/>	<input type="radio"/>
Breeding	<input type="radio"/>	<input type="radio"/>
Festivity	<input type="radio"/>	<input type="radio"/>
Screech	<input type="radio"/>	<input type="radio"/>

Savoury	<input type="radio"/>	<input type="radio"/>
Plaudate	<input type="radio"/>	<input type="radio"/>
Shin	<input type="radio"/>	<input type="radio"/>
Fluid	<input type="radio"/>	<input type="radio"/>
Spaunch	<input type="radio"/>	<input type="radio"/>
Allied	<input type="radio"/>	<input type="radio"/>
Slain	<input type="radio"/>	<input type="radio"/>
Recipient	<input type="radio"/>	<input type="radio"/>
Exprate	<input type="radio"/>	<input type="radio"/>
Eloquence	<input type="radio"/>	<input type="radio"/>
Cleanliness	<input type="radio"/>	<input type="radio"/>
Dispatch	<input type="radio"/>	<input type="radio"/>
Rebondicate	<input type="radio"/>	<input type="radio"/>
Ingenious	<input type="radio"/>	<input type="radio"/>
Bewitch	<input type="radio"/>	<input type="radio"/>
Skave	<input type="radio"/>	<input type="radio"/>
Plaintively	<input type="radio"/>	<input type="radio"/>
Kilp	<input type="radio"/>	<input type="radio"/>

Interfate	<input type="radio"/>	<input type="radio"/>
Hasty	<input type="radio"/>	<input type="radio"/>
Lengthy	<input type="radio"/>	<input type="radio"/>
Fray	<input type="radio"/>	<input type="radio"/>
Crumper	<input type="radio"/>	<input type="radio"/>
Upkeep	<input type="radio"/>	<input type="radio"/>
Majestic	<input type="radio"/>	<input type="radio"/>
Magrity	<input type="radio"/>	<input type="radio"/>
Nourishment	<input type="radio"/>	<input type="radio"/>
Abergly	<input type="radio"/>	<input type="radio"/>
Proom	<input type="radio"/>	<input type="radio"/>
Turmoil	<input type="radio"/>	<input type="radio"/>
Carbohydrate	<input type="radio"/>	<input type="radio"/>
Scholar	<input type="radio"/>	<input type="radio"/>
Turtle	<input type="radio"/>	<input type="radio"/>
Fellick	<input type="radio"/>	<input type="radio"/>
Destription	<input type="radio"/>	<input type="radio"/>
Cylinder	<input type="radio"/>	<input type="radio"/>

Censorship	<input type="radio"/>	<input type="radio"/>
Celestial	<input type="radio"/>	<input type="radio"/>
Rascal	<input type="radio"/>	<input type="radio"/>
Purrage	<input type="radio"/>	<input type="radio"/>
Pulsh	<input type="radio"/>	<input type="radio"/>
Muddy	<input type="radio"/>	<input type="radio"/>
Quirly	<input type="radio"/>	<input type="radio"/>
Pudour	<input type="radio"/>	<input type="radio"/>
Listless	<input type="radio"/>	<input type="radio"/>
Wrought	<input type="radio"/>	<input type="radio"/>

End of Block: LexTALE

Start of Block: Demographics

Exact Age Wat is uw leeftijd?

Gender Wat is uw geslacht?

- Mannelijk
 - Vrouwelijk
 - Niet-binair / derde geslacht
 - Zeg ik liever niet
-

Education level Wat is uw huidige of hoogst behaalde opleidingsniveau?

- Middelbare school
 - MBO
 - HBO
 - WO
-

Q28 Vanaf welke leeftijd bent u (ongeveer) begonnen met het leren van Engels?

End of Block: Demographics

Appendix B. Statement of own work

Sign this Statement of own work form and add it as the last appendix in the final version of the Bachelor's thesis that is submitted as to the first supervisor.

Student name: Imke Swinkels

Student number: s1045325

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- a. I hereby declare that I am familiar with the faculty manual (<https://www.ru.nl/facultyofarts/stip/rules-guidelines/rules/fraud-plagiarism/>) and with Article 16 "Fraud and plagiarism" in the Education and Examination Regulations for the Bachelor's programme of Communication and Information Studies.
- b. I also declare that I have only submitted text written in my own words
- c. I certify that this thesis is my own work and that I have acknowledged all material and sources used in its preparation, whether they be books, articles, reports, lecture notes, and any other kind of document, electronic or personal communication.

Signature:



Place and date: Nijmegen, 13-06-22