



**The effects of gain-loss and locality framed narratives on the intention
to engage in pro-environmental behavior to mitigate climate change**

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Abstract

Global temperatures have been rising at an unprecedented rate, affecting areas all around the globe. Although global warming is perceived as a top global threat by many, insufficient action is taken. Inciting behavior to mitigate climate change can be achieved by implementing adequate communication strategies, such as framing. The aim of this study is to examine the effects of gain-loss framing and locality framing on the intention to engage in pro-environmental behavior, hereby using narrative-based climate communication. This study was carried out by means of a 2 (gain vs. loss) by 2 (local vs. global) between-subjects design. 179 participants were randomly assigned to one of the conditions. The framing effects were controlled for emotional response and pre-existing climate concern. Results showed that loss framing lead to a higher fear response, but ultimately not to a greater overall emotional response or a higher intention. The results also showed that there was no higher intention to engage in pro-environmental behavior when using a local or global-frame, nor had a greater emotional reaction been found in either one of the conditions. No interaction effect was found between gain-loss framing and locality framing. Moreover, pre-existing concern did not have a significant effect on the level of intention. Altogether, this study shows no differences in the greatness of intention to engage in pro-environmental behavior between gain and loss-frames, or between local and global-frames.

Keywords: Gain-loss framing, locality framing, intention, climate change communication, concern, emotional response, narratives

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Introduction

Due to increased greenhouse gas emissions, the global temperature has been rising at an unprecedented rate (IPCC, 2021). Anthropogenic emissions caused temperatures to increase by 1.0 °C already and will most likely rise to 1.5 °C within the next thirty years (Fawzy et al., 2020). The rise in temperature has severe consequences for the health of humankind, economies, the security of food, as well as the existence of the natural world (Zakarya et al., 2015). There has been a scientific consensus about the anthropogenic nature of the climate change humankind is facing, to which evidence is found that humans are also in control of mitigating these effects (Cook et al., 2016). However, currently, not enough action is taken to prevent further rising of the global temperature (IPCC, 2021).

One reason insufficient action is taken is because climate change is often perceived as a distant threat, affecting not “our own lives” but “that of those living far away”, and not “now” but “in the future” (Leiserowitz et al., 2020). However, according to the latest report of the Intergovernmental Panel on Climate Change (2021), every inhabited area on earth is already affected by climate change. It is thus of utmost importance that the public is aware of the proximity of the threat and that they are concerned with the consequences.

Whether people will engage in pro-environmental behavior depends on their intention to do so. This can be explained by the Theory of Planned Behavior (TPB). The TPB states that intention is the most important factor in predicting one’s behavior (Ajzen, 1985). Because intention is the first step towards engaging in a particular behavior, it is measured in this study. Sufficient climate communication is necessary to incite the intention to engage in pro-environmental behavior. Nowadays, climate communication is often expository, and although this helps raise understanding among the public (Chadwick, 2017), it does not automatically increase pro-environmental behavior (Chadwick, 2017; Moser, 2016).

A communication method that is found to increase intentions (Pressgrove & Bowman, 2021; Hsiao et al., 2013) and to be more persuasive is storytelling (Gustafson et al., 2020; Jones & Peterson, 2017). Storytelling uses personal narratives to transfer information (Jones & Peterson, 2017). When exposed to narratives, recipients are less prone to being aware of the persuasive intent of the message, being less likely to counterargue it. This makes that narratives are found to be useful in

communicating messages that are often argued against (Dal Cin et al., 2004). Narratives are thereby easier to grasp than solely expository communication (Moezzi, 2017; Harris, 2019). Therefore, in this study, narratives are used to create stimuli for the experiment.

To achieve the desired effects, narratives need to be carefully curated. Valuable to consider is the frame in which the narrative is told. A frame in communication offers a certain meaning to what is being communicated, focussing on how it is presented to an audience (Chong & Druckman, 2007; Goffman, 1974), influencing how the message will be received by the recipient (Goffman, 1974). Framing can be done in a variety of different ways, such as gain-loss framing and locality framing. In this study, these two types of framing are further examined.

Gain framing insinuates that the message is framed positively, whereas loss framing suggests a negative frame (Spence & Pidgeon, 2010). For example, meat consumption has a direct impact on the increase of one's carbon footprint (loss-frame), whereas a reduced meat consumption directly decreases one's carbon footprint (gain-frame; Lacroix, 2018). Gain-loss framing derives from the Prospect Theory by Kahneman and Tversky (1979). The Prospect Theory states that there are perceived differences between losing and winning something. Here, losses are often assigned greater importance than gains. This can affect the human decision-making process because one might want to avoid feelings of pain caused by a loss.

Gain-loss framing can be an important factor in whether climate change information will incite action. Loss framing has been widely used in climate change communication because, according to the Prospect Theory, losses are often valued higher than gains (Kahneman & Tversky, 1979). Additionally, due to its negative nature, loss-frames have the tendency to provoke fearful emotions with recipients (Chadwick, 2017; O'Neill & Nicholson-Cole, 2009). These feelings of fear can increase climate change concern, which is linked to the intention to take pro-environmental action (Hart & Nisbet, 2012; Ajzen, 1985). However, loss framing can also result in hopelessness and indifference, working counteractively in engaging people in combating climate change (Hart & Nisbet, 2012; O'Neill & Nicholson-Cole, 2009). Gain framing is thought to be more engaging and effective in producing positive attitudes towards pro-environmental policies and behavior (Spence & Pidgeon, 2010). Thereby, the perceived severity of climate change grows (Spence & Pidgeon, 2010), which

increases the intention to engage in pro-environmental behavior (Chadwick, 2017; Moser, 2007). However, the effects of gain-frames are not found to be superior to loss-framed climate change communication because gain-frames have a reduced fear response and the recall of information is less sufficient (Spence & Pidgeon, 2010). Although gain and loss framing are opposites of each other, prior studies show that both could positively and negatively impact one's attitude towards pro-environmental behavior. Therefore, in this study, further research is done on the effects of gain and loss framing on climate change communication.

Besides gain-loss framing, messages can also be locality framed. Locality framing focuses on the presentation of local imagery and personally relevant information, framing it in a known context for the recipient (Altinay, 2017; Weber, 2010; Scannell & Gifford, 2011). This way of framing can be used in climate change communication because it illustrates the proximity of the issue. This proximity, driven by psychological closeness (Spence & Pidgeon, 2010), can increase the likelihood that one experiences negative emotions, such as fear, regarding losing their familiar environment (Brügger et al., 2016; Degeling & Koolen, 2021). A locally framed message could promote further emotional engagement with the issue because it increases the psychological closeness of the threat (Lorenzoni et al., 2007; Degeling & Koolen, 2021, Spence & Pidgeon, 2010). However, using a local-frame is also found to decrease the perceived severity of the consequences of climate change (Degeling & Koolen, 2021), suggesting that a global-frame would be the preferred option (e.g., Spence & Pidgeon, 2010; Altinay, 2017). Whether locally framed messages effectively incite action is unclear, since studies on it provide mixed results (e.g., Brügger, 2020; Schuldt et al., 2018; Brügger et al., 2016). Hence, in this study, further research is done on the effects of locality framing, and whether locality framing can be used in climate change communication to incite pro-environmental behavior.

In sum, the aim of this study is to examine the applicability of gain-loss framing and locality framing in climate change communication. This study will shed light on which framing methods are more suitable in this field of communication, since both types of framing are found to have mixed results in prior studies. The manipulation is carried out using narratives because of its persuasive abilities and the ability to increase the recipient's intention. As a dependent variable, intention to

engage in pro-environment behavior is investigated because intention is the first step towards behavior (Ajzen, 1985).

This study could provide insights into which communication strategies can be considered in communicating climate change. Those directly benefiting from improved climate communication strategies are governments and policymakers, since improved climate communication could enhance citizens' support regarding green policies. Additionally, it might increase the intention of the public to take individual action to mitigate climate change (Chadwick, 2017), which is of utmost importance to mitigate the effects of rising global temperatures. Therefore, in the study, the following research question will be answered:

RQ: What are the effects of gain-loss and locality framed narratives on the intention to engage in pro-environmental behavior to mitigate climate change?

Theoretical framework

Intention and behavior

The first step towards behavior is the intention to do so (Ajzen, 1991). However, whether behaviour is actually carried out is more complicated because habits play a significant role in behavioral manifestations (e.g., Lorenzoni et al., 2007). Often more is needed to change a behavior besides intention; one needs to be engaged with the subject (O'Neil & Nicholson-Cole, 2009). Engagement is a state where cognitive, affective, and behavioral components come together (Lorenzoni et al., 2007). High emotional responses (Gao et al., 2019) and concern for the subject (Lorenzoni et al., 2007) can increase the engagement. Therefore, in the following section, the importance of intention, emotional responses, and concern are discussed.

Intention

To mitigate climate change, people need to engage in pro-environmental behavior. However, behavioral changes do not happen without reason. Whether a person engages in certain behaviors depends on the intention to do so. In the Theory of Planned Behavior (TPB), Ajzen (1991) states that intention captures the essence of the motivation that influences a behavior. The intention indicates the likelihood of the execution of the behavior (Ajzen, 1991). On an individual level, this translates to

being “pleased”, “willing”, or “hoping” to perform a certain behavior (Gao et al., 2019; Perugini & Bagozzi, 2011). Here, a higher intention generally indicates a higher probability of the behavior.

When there is perceived behavioral control (i.e., “I am able to enact”), subjective norms that comply with the behavior (i.e., “Others agree with my behavior”), and a positive personal attitude towards the behavior (i.e., “My past experiences shape how I feel about this”), the likelihood further increases (see Figure 1 for the TPB model).

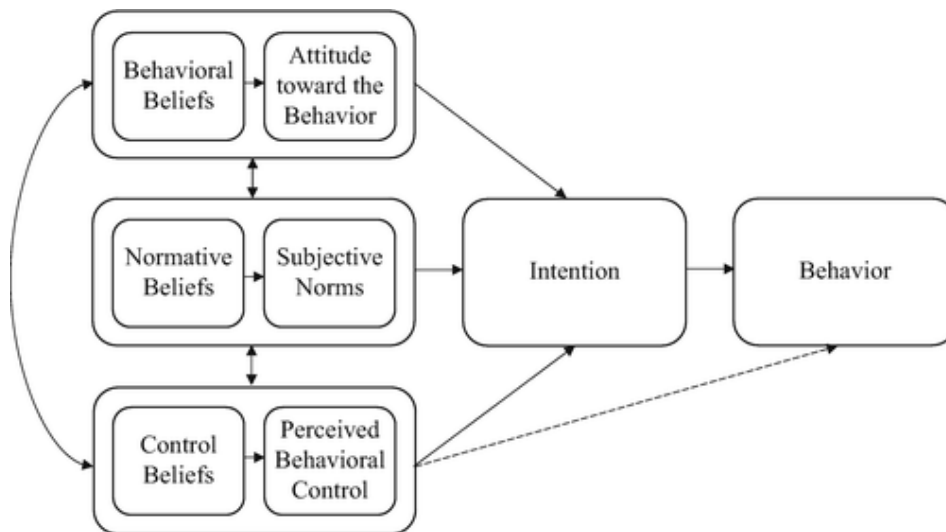


Figure 1. Model of the Theory of Planned Behavior. Ajzen, 2002.

However, the TPB has been criticized for viewing human behavior from an individualistic point of view, as well as perceiving decision-making as a rational process. The theory does not consider that decision-making processes are often not a conscious act, but determined by habit (Lorenzoni et al., 2007; Verplanken et al., 1997). A habit is defined as a fixed behavior that is shaped through previous experiences and what emerges as a response to certain stimuli (Andrews, 1903; Smith & Graybiel, 2016). An example of where the role of habits becomes apparent is with individual car use. A study among 321 university students showed that the actual car use was better explained by habit than by intention. Because the automatic associations between the scenario (i.e., commuting to university) and one’s options revolved primarily around routines instead of conscious decision-making

(Bamberg & Schmidt, 2003). Intentions can thus emerge, but behavioral outcomes are generally overshadowed by ingrained habits.

Nevertheless, intention is measured in this study as a dependent variable. Actual behavior is difficult to measure and behavior is nonetheless guided by intentions (Ouellette & Wood, 1998). In addition, to mitigate the effects of climate change, current habituated behaviors have to be replaced by greener alternatives, meaning habits are bound to be broken. It is therefore important that current habits are challenged and having the intention to engage in green behavior is the first step to do so.

Engagement and the role of emotions and concern

To counteract a habit, a person should have the intention to change their behavior. However, merely intention is not enough, one also needs to be actively engaged in the subject of matter (O'Neil & Nicholson-Cole, 2009). Engagement describes a personal state in which cognitive, behavioral, and affective aspects come together, creating a state of connection with the issue (Lorenzoni et al., 2007; Chadwick, 2017). Cognitive aspects refer to mental processes, such as reasoning, planning, knowledge acquiring and comprehension, and problem solving. The behavioral aspects comprise of one's behavior and affective aspects refers to one's emotional state (Gao et al., 2019). These aspects do not have to be present at the same time. For example, behavioral change can follow alterations in either one or both of the cognitive or affective aspects (Lorenzoni et al., 2007; Bem, 1967).

A change in one's affective and cognitive state can, therefore, incite behavioral change. In their study, Gao et al. (2019) show that the cognitive state is mediated by the affective state. Participants' awareness of recycled water was higher when they had a high emotional response. In turn, the emotional response contributes to the formation of behaviors and whether they are sustained over longer periods of time. Here, positive emotions are found to have a greater impact on whether behaviors are formed than negative emotions (Gao et al., 2019). The emotion of hope is found to further increase the level of engagement (Ojala, 2012). However, Gao et al. (2019) found no direct effect of positive emotions on intention, as opposed to negative emotions. Negative emotions affected participant's intentions significantly. In their research, however, they did not demonstrate that this increased intention also manifests itself in actual behavior (Gao et al., 2019). Nevertheless, negative emotions (e.g., fear) about the risks of climate change can help recipients process possible solutions

more thoroughly and increase the message persuasion (Meijnders et al., 2001; Nabi et al., 2018). For these reasons, climate change messages are often created to elicit emotional responses (Nabi et al., 2018; Chadwick, 2017). In the current study, emotional response is measured as a control variable because a heightened emotional response, negative or positive, in either one of the conditions, could clarify potential outcomes.

To stimulate engagement regarding climate change communication, it could be beneficial to link the message to personal concerns (Lorenzoni et al., 2007). Personal concerns comprise the concerns about the effects of climate change on an individual's personal life, also known as egoistic concerns (Stern et al., 1995). Concern about the effect climate change has on others (i.e., social-altruistic concern) plays an additional role in one's overall concern about the environment (Stern et al., 1995). In climate change communication, this can be used effectively by emphasising the message on, for example, reducing individual emissions or the threat climate change poses for one's own and other's health (Lorenzoni et al., 2007; Fransson & Gärling, 1999). Here, a higher level of concern is also linked to a greater intention to engage in pro-environmental behavior (Dienes, 2015; Hart & Nisbet, 2011). Therefore, concern is measured as a control variable in this study, helping to interpret the results more precisely.

Narratives

An increase in intention can be linked to the use of narratives (Dal Cin et al., 2004). The use of narratives lies close to the nature of humankind; the earliest evidence found of narratives dates back to prehistoric times (Dal Cin et al., 2004). In contemporary times, narratives are still omnipresent. From books, to television shows, advertisements, or gossip, all are communicated through stories. Narratives can be described as a way of communication in which a temporal series of occurrences are affected by the deeds of a particular character (Dahlstrom, 2014). They are found to have a beginning, middle, and end component, and present information describing a particular scene where a conflict is encountered and resolved (Hinyard & Kreuter, 2007; Fitzgerald & Green, 2017). However, there is no singular definition that is universally accepted among scholars, since narratives have been studied by a multitude of different disciplines (Hinyard & Kreuter, 2007).

Narrative persuasion

Narratives have been used continuously since ancient times because of their persuasive qualities. They can affect individuals in many ways (Dal Cin et al., 2004); they can influence emotions, beliefs, behaviors, and build cultural identities (Oatley & Gholamain, 1997; Green & Brock, 2000; Slater, 2002; Jacobs, 2002). Using narratives is found to be an effective strategy in persuading those with disagreeing opinions (Slater, 2002). In addition, Petty and Krosnick (1995) state that even strong attitudes can be influenced by the use of narratives. Strong attitudes are attitudes that are held with great confidence and are least receptive to change (Petty & Krosnick, 1995).

Recipients may be resistant towards a message, for example, because they know that the message's intent is to persuade them. Narratives are suited to reduce the level of resistance because they decrease the recipient's ability to counterargue the message (Dal Cin et al., 2004). The likelihood that a recipient will counterargue the message is increased when the message has clear persuasive intentions or when the message content poses a threat to the recipient's beliefs. Dal Cin et al. (2004) argue that narratives have a low perceived persuasive intent because people do not expect a story to be written with persuasive intentions, as opposed to non-narrative messages, such as rhetorical communications (e.g., political speeches), which are often meant to be overly persuasive (Dal Cin et al., 2004; Knowles & Linn, 2004). In overtly persuasive contexts, people are prone to avoiding information that does not align with their own views (Sweeney & Gruber, 1984). One might thus knowingly avoid messages with obvious contrasting ideas, however, with narratives, the underlying message may not be revealed until it is too late for the recipient to opt out (Dal Cin et al., 2004).

Using narratives in climate change communication could be beneficial for inciting behavioral change. Climate change is often perceived as a distant threat, however, with the use of narratives, the threat may become imminent. When implemented correctly, narratives can illustrate possible climate scenarios with an increased level of perceived realism (Dahlstrom, 2014). In addition, individuals whose beliefs are not in line with that of established climate scientists are less capable of counterarguing because of a lower perceived persuasive intent compared to non-narrative communication (Dal Cin et al., 2004). Consequently, the use of stories in climate communication, as opposed to merely factual information, is found to be useful for promoting pro-environmental

behavior (Morris et al., 2019). Narratives can help reduce the likelihood of counter argumentation and increase message persuasion. Therefore, in this study, narratives will be used to communicate the effects of climate change.

Framing

When using narratives with the intent of persuading the recipient, it might be valuable to consider using a particular frame. Framing refers to how the sender defines and constructs the information that is communicated. The sender can alter messages to the recipients' preferences, making it more persuasive than when a frame is not used (Chong & Druckman, 2007). For example, when participants were asked whether they were in favor of allowing a hate group rally, results differed depending on how the rally was justified using a particular frame. When the rally was framed using the preface "Given the importance of freedom of speech", 85% of the participants were in favor, whereas only 45% was in favor when it was framed with "Given the risk of violence" as a preface (Sniderman & Therault, 2004; Chong & Druckman, 2007, p. 104).

Framing can be explained by the Framing Theory (Goffman, 1974). Framing Theory states that how an individual perceives society can be described by a frame. This frame symbolizes a structure of their perceptions; it encloses the context of the individual's life. In communication, a frame can be described as the context in which the message is placed (Goffman, 1974). Framing Theory is useful for effectively applying communication strategies. Framing enables the sender to frame their message and shape the way it is presented to an audience, allowing the sender to emphasize particular issues. By emphasizing certain issues in a message, recipients can be influenced in their decision-making process (Goffman, 1974). Framing is commonly used when communicating ideologies or political issues, among which climate change (Spence & Pidgeon, 2010; Carvalho & Burgess, 2005; Nisbet, 2009).

Framing can be divided into two types: equivalence and emphasis framing. With equivalence framing the same information is used, however, it is presented in different ways. It thus leads recipients to interpret the information in a particular manner solely by how it is framed (Scheufele & Iyengar, 2014). Equivalence framing can be executed by the use of opposite wording, such as "positive" and "negative". For example, by increasing one's meat consumption, their carbon footprint

enlarges, negatively affecting climate change mitigation, whereas by decreasing meat consumption, one's carbon footprint declines, positively affecting climate change mitigation (Lacroix, 2018).

Emphasis framing, on the other hand, revolves around what aspects are accentuated (Jacoby, 2000). As opposed to equivalence framing, the message content in emphasis framing is thus different (Koch & Peter, 2017). For example, the same event might be covered differently by different broadcasters, hereby emphasizing other aspects of the same story and thus evoking dissimilar responses.

Emphasis framing has its roots in the sociological field of study, whereas equivalence framing derives from psychology research (Scheufele & Iyengar, 2014). In the current study, both equivalence (as gain-loss framing) and emphasis framing (as locality framing) are used to examine the effects on the intention to mitigate climate change.

Gain-loss framing

There are different forms in which equivalence framing can be presented. However, the most traditional form is gain-loss framing. Gain-loss framing refers to whether the outcome of the frame is phrased in terms of gains or losses. The message is inherently the same, yet the consequences take either a negative or positive turn (Tversky & Kahneman, 1981). Gain-loss framing is often demonstrated by the means of the Asian disease experiment by Tversky and Kahneman (1981). Here, the Asian disease outbreak was expected to kill 600 people. Participants were then given the choice between two treatments to combat the fictional disease, which were positively (i.e., "Saves 200 lives") or negatively framed (i.e., "400 people die"). Here, participants showed a significant preference towards the positively framed treatment. What this experiment shows is that even though the treatments had the same outcome, participants perceived them as different because of the frame in which the messages were put.

Although equivalence framing, in particular gain-loss framing, is perceived as the most traditional form of framing (Tversky & Kahneman, 1979; 1981), it has since taken on looser forms. Studies by Kim and Lee (2017) and Vafeiadis and Shen (2021) demonstrate how equivalence frames can be used to define similar starting points from which different directions are taken. In their study, Kim and Lee (2017) examine the effects of gain and loss-framed narratives regarding smokers in

different stages of quitting the habit. The stimuli described two situations; one where the main character quit smoking, the other where he continued smoking, both taking place over the course of 10 years. Vafeiadis and Shen (2021) take a similar approach to their materials, focussing on the long-term effects of sun exposure and sun damage prevention. Hence, both studies show that equivalence framing, and thus gain-loss framing, can be interpreted more loosely from its classical form, as long as the starting point of the frames is identical.

Loss framing might be preferred over gain framing for inciting behavior for the following reasons. First, losses are valued differently from gains. This can be explained by the Prospect Theory (Kahneman & Tversky, 1979). Prospect Theory expresses the psychological difference between gaining and losing; and how this affects the human decision-making process. Kahneman and Tversky (1979) state that losing something is often granted more importance than the gain of it, up to twice as much. For example, the satisfaction of being given fifty euros does not exceed the disappointment of having hundred euros and losing half of it. This phenomenon is called loss aversion and shows the asymmetric importance in the human experience between gains and losses (Tversky & Kahneman; 1981). Loss aversion increases the likelihood of risky behavior because of wanting to avoid the pain of losing (Tversky & Kahneman, 1992). Prospect Theory and loss aversion thus show the importance given to losses and the avoidance thereof.

Second, loss-frames are better suited because of the increase in negative emotions (e.g., fear, guilt, or anger) that revive after exposure to the message (Chadwick, 2017). Of all negative emotions, fear has been found to evoke the greatest behavioral change (Dillard & Nabi, 2006). Fear can be defined as an emotional state of discomfort which is triggered by threatening stimuli (Ruiter et al., 2014). Loss-frames are useful for increasing negative emotional arousal and thus might be for evoking behaviors.

Third, loss-frames are found to provoke systematic information processing (Liberian & Chaiken, 1992, Baron et al., 1994). Systematic information processing occurs when the recipient exerts cognitive effort into a task, actively devoting effort to comprehend and evaluate the information. With systematic information processing, the recipient focuses on the content of the message, assessing its validity with care (Chaiken, 1980). In contrast, when information is

heuristically processed, focus is put on salient aspects and mental shortcuts (Chaiken, 1980; Chaiken & Ledgerwood, 2011). Systematic information processing is therefore a facilitator for message persuasion. The increased message involvement that comes with systematic information processing causes a higher level of persuasion, contrary to a low involvement with heuristic processing (Chaiken & Eagly, 1976; Chaiken, 1980). Thus, the use of loss framing can be helpful in inciting systematic information processing, which is found to increase the message persuasion.

Given the reasons described above, researchers in the field of climate communication believe loss framing to be more effective in inciting pro-environmental behavior than gain framing, confirming the greater persuasive power of loss framing. Loss framing is therefore widely used in climate change communication. A study by Davis (1995) shows that loss-framed climate change messages, focussing on the losses to current generations if insufficient action is taken, have a greater impact than gain-framed messages on whether actions are taken to mitigate climate change. Thus, by framing climate change communication in terms of losses, it can provoke more pro-environmental behavior than when the focus is put on what would be gained (Hart & Nisbet, 2012; Ajzen, 1985). However, the negative nature of loss-frames in climate change communication is also found to result in hopelessness and indifference towards the issue, working counteractively towards inspiring pro-environmental behavior (Hart & Nisbet, 2012; O'Neill & Nicholson-Cole, 2009).

There is also research that suggests that gain framing is the more effective option in communicating climate change. However, the conditions in which gain-frames are favorable to loss-frames are dissimilar. First, the results of gain-frames in climate communication may differ depending on the message content. Gain-framed messages containing a higher uncertainty message are more likely to provoke intentions to engage in pro-environmental behavior than loss-framed messages will. High uncertainty messages comprise a higher level of ambiguity about the outcome, which is often the case in climate change science, and thus relevant for its communication (Morton et al., 2011). In their study, Morton and colleagues (2011) found that when messages with uncertain predictions about climate change were gain-framed, i.e., focusing on the events that would likely not happen when sufficient action was taken, participants felt as if the impact of their actions was more effective. For

this reason, they were more willing to follow through with these actions. Thus, when communicating the uncertain outcomes of climate change, a gain-frame should be used.

Second, according to Prospect Theory, gain framing would be the preferred option when behavioral outcomes are considered safe, i.e., a low level of risk, or a low perceived level of risk (Tversky & Kahneman, 1981; Banks et al., 1995; Hull, 2012). Study results regarding HIV testing showed that participants with a low-risk of carrying the virus were more inclined to get tested when the messages were gain-framed (Hull, 2012). With respect to climate change, people often perceive it as a distant threat (Leiserowitz et al., 2020). This might lower the level of perceived risk and thus influence one's willingness to take mitigating actions, suggesting that, in this situation, gain-framed messages might be the more effective option.. However, further research is needed to confirm this theory.

Furthermore, according to Spence and Pidgeon (2010), gain-framed messages are more likely to result in positive attitudes towards mitigating climate change. The positive attitude could be explained by a higher level of societal or personal efficiency, meaning that recipients believe they can contribute to the mitigation of the climate threat. This strengthens the acceptance and processing of climate change communication (Spence & Pidgeon, 2010), however, more research is needed to support this theory. The positive attitudes may also cause the climate threats to be perceived as more severe, which is favorable for accepting and processing emotionally or value-laden messages (Spence & Pidgeon, 2010; Witte, 1992; Witte & Allen, 2000; Moser, 2007). Thereby, the higher perceived severity of the issue helps to increase the likelihood of behavioral intentions (Spence & Pidgeon, 2010). Thus, the positive attitudes that emerge from gain-frames may have a positive influence on behavioral intention, but substantiation is still limited.

The current study examines whether gain or loss-frames are the preferred option in communicating climate change. Because substantiation on the benefits of gain-framing is limited and more research is needed to validate these findings, loss-framing is expected to be the preferred method in climate communication, as explained by i.a., Prospect Theory and loss aversion. Therefore, the following hypothesis is formulated:

H1: A loss-frame leads to a higher intention to engage in pro-environmental behavior than a gain-frame.

Locality framing

Locality framing is frequently used as a form of emphasis framing in climate communication. With locality framing, the emphasis lies on a particular location. For example, it emphasizes the consequences of climate change on a local or global level (Degeling & Koolen, 2021). Research shows that both local and global-frames are beneficial for communicating climate change, however, when they should be implemented differs.

Framing a message in a known context to the recipient (i.e., locally) can reduce the psychological distance (Spence & Pidgeon, 2010). The origins of psychological distance are found in the Construal Level Theory (CLT; Trope & Liberman, 2010). The CLT describes the relation between the psychological distance (i.e., spatial, temporal, hypotheticality, and social distances) and whether one experiences this as concrete or abstract. Here, a psychological close experience is in line with a concrete way of thinking, whereas a psychological distant experience induces abstract thinking. This can be of great importance because climate change is often perceived as a psychologically distant threat, affecting others in far distant places (Leiserowitz et al., 2020; Spence & Pidgeon, 2010), retaining the threat's abstractness. By increasing the perceived closeness of the issue, individuals are more likely to experience a higher level of emotional engagement to it (Lorenzoni et al., 2007) and they are prone to viewing the issue as more salient (Lorenzoni & Pidgeon, 2006). The perceived proximity, in turn, can increase individuals' level of anxiety regarding losing one's familiar environment (Brügger et al., 2016; Degeling & Koolen, 2021).

Locally framed communication also positively affects attitudes towards climate change mitigation (Scannell & Gifford, 2013). In their study, Scannell and Gifford (2013) showed that these attitudes improved because the local messages evoked a sense of personal relevance, and were therefore more persuasive than the global counterpart. The personal relevance of locality framing can be understood by place attachment. Place attachment occurs when a person forms "*emotional and cognitive bonds with a particular place*" (Scannell & Gifford, 2013, p. 66). Bonds can form through personal memories, cultural, religious, or communal importance, as well as with the possibilities for

belongingness (Manzo, 2005; Mazumdar & Mazumdar, 2004; Woldoff, 2002). A place can thereby become part of a person's identity (Proshansky, 1978). Thus, as explained by place attachment, local-frames are favorable in inducing personal relevance with the recipient.

Personal relevance enhanced the motivation and ability to process information. In line with work by Rayner and Malone (1997), the local-frame is perceived as more tangible (Rayner & Malone, 1997; Scannell & Gifford, 2013). Additionally, the use of local imagery in locality framing increases the personal meaning of an issue that was before viewed as a distant threat (O'Neill and Nicholson-Cole, 2009, O'Neill & Hulme, 2009). Hence, locally framed messages are therefore found to be beneficial for inciting behavioral change regarding the mitigation of climate change.

Nevertheless, the use of locality framing comes with impediments. The consequences of climate change on a local scale are viewed as less severe than the consequences for distant areas (Degeling & Koolen, 2021). Meaning that although climate change might be viewed as a more salient issue when local-frames are used, the issue itself is perceived as less urgent, working counteractively in inciting individual pro-environmental behavior. In addition, a global-frame enhances the perceived social benefits of the mitigation of climate change. Social benefits are the gains acquired on a societal level and are viewed as more important than personal benefits (Spence & Pidgeon, 2010). An example of social benefits with respect to climate change would guaranteeing the well-being of vulnerable communities that would otherwise be seriously threatened if climate change persists, e.g., those living in areas that will be severely affected. Using global-frames is thus favorable for establishing a sense of urgency, as well as increased social benefits.

The usability of the CLT, which is often used to explain the positive effects of locality framing, is not limitless and that results of studies relying on this theory may be reductive (Brügger, 2020). A growing body of studies state that by reducing the psychological distance, the personal relevance of the issue, as well as actions taken, do not automatically increase (e.g., Brügger, 2020; Schuldt et al., 2018; Brügger et al., 2016). Also, the use of a local-frame is only effective when the message contains personally relevant artifacts, such as familiar surroundings, people, or attributes with symbolic meanings. Furthermore, if one finds the actions that need to be taken to mitigate climate change unacceptable, ineffective, or infeasible, behavior will not follow. If not implemented with care,

locality framing can also cause increased scepticism towards climate change and the threat it poses (Brügger et al., 2016). Altogether, a locality frame cannot be used indiscriminately.

In this study, the effects of locality frames on the intention to engage in pro-environmental behavior are investigated. As discussed above, the assumption of an increased personal relevance through a decreased psychological distance may be an overestimation of this theory. Local-frames can decline the threat's level of urgency, working counteractively in evoking behavioral change. For these reasons, the second hypothesis is formulated:

H2: A global-frame leads to a higher intention to engage in pro-environmental behavior than a local-frame.

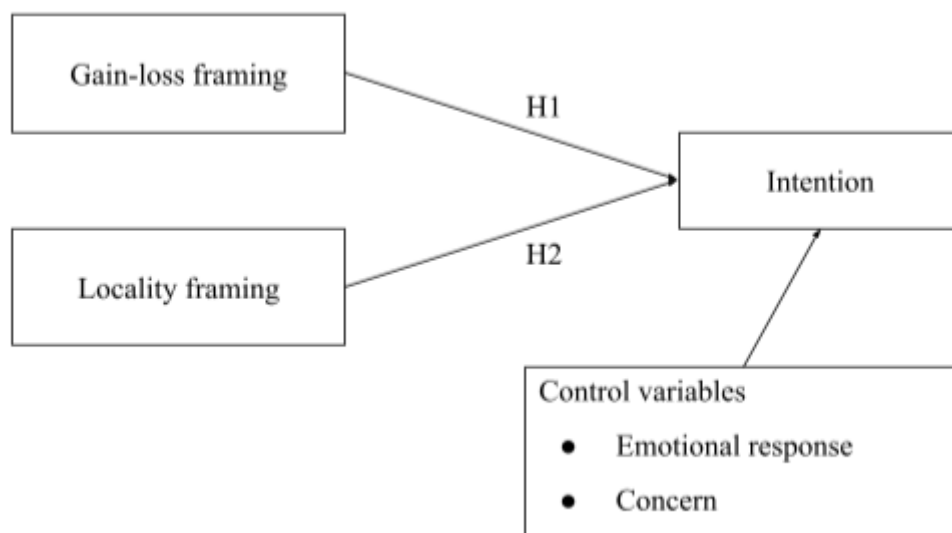


Figure 2. Conceptual model of the current study.

Method

Design

To test the effects of locality framing and gain-loss framing on the intention to engage in pro-environmental behavior, an online experiment with a 2x2 between-subjects design was conducted. Two independent variables, locality (local vs. global) and gain-loss (gain vs. loss) framing, were included in the study. The dependent variable measured was the intention to engage in pro-environmental behavior to mitigate climate change. Two control variables were measured: concern and emotional response (fear and hope) with regards to climate change.

Participants

As explained later on, for the independent variable locality, it was important that participants of this study resided (i.e., live, work, or study) in the Netherlands. There were no further requirements for participation in this study. The online experiment was carried out by 196 participants. Data of 17 participants was excluded from the dataset, because they did not complete the survey ($N = 14$), did not consent to participate in the study ($N = 2$), or did not reside in the Netherlands ($N = 1$). Thus, data from 179 participants were included in the final sample. Of the participants, 67.6% identified as female ($N = 121$), 31.8% as male ($N = 57$), and 0.6% identified as other ($N = 1$). Participants' age ranged from 16 to 79, with a mean age of 31.33 years old ($SD = 13.95$). Of the participants, 171 had a Dutch nationality and eight participants had a different nationality; i.e., Italian ($N = 3$), Belgian ($N = 1$), British ($N = 1$), Greek ($N = 1$), Bulgarian ($N = 1$), and Surinamese ($N = 1$). However, these participants stated they resided in the Netherlands and were therefore of added value to this study, and thus included in the dataset. Of the participants, 91.1% ($N = 163$) indicated currently studying or having graduated from a university or university of applied sciences (i.e., bachelor, pre-master, master, and PhD), 8.9% had a secondary education ($N = 14$) or vocational secondary education ($N = 2$).

Materials

The experiment contained four conditions to which participants were randomly assigned. Each condition held four short narratives that were manipulated regarding locality and gain-loss framing, thus, 16 different narratives were composed. Narratives, as opposed to expository communication, were used because of a higher message persuasion and a lower likelihood of counter argumentation (Dal Cin et al., 2004). The narratives were approximately 100 words long and could thus be classified as micro-fiction (Nelles, 2012).

The materials comprised a textual narrative. These narratives portrayed the story of how extreme weather conditions affected daily life and could decrease the quality of life of either the Dutch (local-frame) or global population (global-frame), and how contemporary climate change mitigation actions could affect the outcomes (gain-loss framing). The storyline took place in the year 2050, a point in time when it is speculated that global temperatures have reached 1.5 °C warming (Fawzy et al., 2020). The narratives portrayed conditions in the Netherlands or on a global scale over the course

of approximately one year. The first narrative took places in the beginning of the year (i.e., February) and described a flood, followed by a narrative about a heat wave that took place in spring (loss-frame) or summer (gain-frame), this continued into the third narrative, which described a forest fire, closing with a narrative about a severe autumn storm.

The narratives were based on the experimental materials from a study by Spence and Pidgeon (2010), which extracted information from the IPCC 2007 report, stating possible climate change effects. These materials comprised information extracts and images and were manipulated with regards to sentiment (gain-loss framing) and locality framing. Examples of such information extracts were *“By mitigating climate change, we can prevent further increases in winter floods in maritime regions and flash floods throughout Europe”* (gain-framed) and *“The warming trend and spatially variable changes in rainfall have affected people all over Britain”* (local-framed) (Spence and Pidgeon, 2010, p. 664). To fit the aim of the current study, several alterations were performed. Firstly, the statements were transformed from informational statements to first-person narratives. A first person-perspective was chosen because this has a higher possibility of sparking behavioral change (Lipsey et al., 2020). Secondly, the local-frame was altered from the United Kingdom to the Netherlands, and their distant-frame (i.e., Europe) became a global-frame. Lastly, in their study, Spence and Pidgeon used imagery to support the narrative. However, this study merely focused on textual narratives. This way, it can be stated with certainty that the effect comes from the textual narrative, as opposed to either the textual or visual component, or a combination thereof.

The materials used were manipulated regarding gain-loss and locality framing. With respect to the gain-loss framing, the gain-framed narrative described a scenery in which climate change was successfully combated. Here, global temperatures did not rise above the critical threshold of 1.5 °C, the tipping point often used for irreversible climate change catastrophes (Pattyn et al., 2018). Hence, it showed the positive outcomes of contemporary climate change mitigation actions and what destructive events were averted. The loss-framed narrative described a scenery in which insufficient action was taken. Here, global temperatures rose above 1.5 °C, negatively affecting the quality of life of those living in these circumstances. The loss-framed narrative focused on severe weather conditions and their catastrophic impact. Per narrative, three to five references to a positive or negative outcome were

made. Examples of such references in the gain condition were “millions of euros damage” and “not regularly”, whereas references in the loss condition were “billions of euros damage” and “regularly”. The gain and loss-framed conditions were announced by an introductory text, noting that the narratives described a scenario in which either sufficient or insufficient action was taken to mitigate climate change.

The locality manipulation affected the location in which the narrative occurs. Here, a local and global-framed narrative were used. The locally framed narrative was located in the Netherlands and was presented as references to “the Netherlands” and “Dutch”. However, no particular region was mentioned, because this could negatively influence the proximity of the narrative for participants who resided in other regions of the Netherlands. On the other hand, globally framed narratives were made clear by the use of “global”, “around the world” and “worldwide”. Here, per narrative, at least one locality reference was made. Examples of narratives used in the study are shown in Appendix A.

Instrumentation

The dependent variable, intention to engage in pro-environmental behavior to mitigate climate change, was measured with 10 items. These items were based on the “green behavior” scale, which states the tendency of a person’s engagement in pro-environmental actions (Hartmann et al., 2016; Bruner, 2019). The scale items were adjusted to fit the current study, and were measured using a 5-point Likert scale (1 = Completely disagree, 5 = Completely agree). Examples of such items were “*I aim to purchase organic food*”, and “*I am to vote for a political party because of its environmental stance*”. The scale reliability of the items was good, Cronbach’s $\alpha = .86$. See Appendix C for all items.

The control variable concern was measured to indicate participants’ level of environmental concern prior to the experiment. Measuring concern could help interpret the outcomes of this study more clearly by demonstrating whether the level of environmental concern was similar among conditions prior to reading the narratives, or whether it was at all present prior to the experiment. A significant part of environmental concern derives from the concern about climate change effects on oneself (egoistic) and others (social-altruistic) (Stern et al., 1995). For this reason, the statements used to measure environmental concern primarily focused on the self and others. For example, “*I consider climate change a threat to my home environment*”. One additional item by Helm et al. (2018) was

added, focussing on one's biospheric concern: concern about the existence of the natural world (Stern et al., 1995). In total, six items were used with a 5-point Likert scale (1 = Completely disagree, 5 = Completely agree). Reliability of the scale items was good, Cronbach's $\alpha = .82$. Appendix C holds all items.

The second control variable, emotional response, was measured by computing an average score based on fear and hope. Statements that measured fear were based on the emotions "fearful", "overwhelmed", and "anxious", whereas hope was based on "hopeful", "optimistic", and "inspired" (Feldman & Hart, 2018; Nabi & Keblusek, 2014). To measure the emotional response, six statement-items were used. These statements described environmental statements in relation to either one of the emotions mentioned above. For example, "*After reading the texts I feel optimistic about climate change*". All were measured on a 5-point Likert scale, ranging from "Not at all" to "Very". However, the reliability of the scale was questionable, with a Cronbach's α of .62. The scale was improved by deleting one item (i.e., "inspired"), thereby increasing Cronbach's α to .75, which is considered an acceptable reliability score. See Appendix C for the items.

Besides measuring the intention to engage in pro-environmental behavior, participants were asked whether they resided in the Netherlands, as well as their age, gender, nationality, and level of education. See Appendix C for all instrumental items.

Procedure

The online experiment was created using Qualtrics' survey software. The materials and questionnaire were in Dutch because this study focussed on locality framing in the Netherlands. Recruitment of participants was done by distributing the experiment on social media (LinkedIn, Instagram, WhatsApp, and Facebook) and SurveyCircle, and by snowball sampling. Participants entered the online experiment through a web link.

At first, the course of the experiment was clarified. Participants were briefed on what they could expect; the approximate duration of the experiment, that they were asked to read and study the materials, and were asked to answer a set of questions. Participants' consent to take part in the study was asked. The informed consent form stated that participation was voluntary and that they could opt out at any given moment. See Appendix B for the informed consent form. Participants who declined

consent were automatically guided to the final page, thanking them for considering taking part in the online experiment.

After consent was given, participants could continue to the first set of questions. Prior to the experiment, demographic information was enquired. Here, if participants stated they did not live, work, or study in the Netherlands, they were automatically guided to the last page of the experiment, since the data would not be of added value to the study. Second, participants were asked to answer questions about their current level of concern regarding climate change and its effects. Thereafter, participants were randomly assigned to one of four conditions. Here, they were asked to read and study the narratives. To ensure that participants read the narratives thoroughly, a minimum of 20 seconds was enacted per narrative. Only after these 20 seconds could they continue to the next narrative. Afterwards, participants were asked to answer questions about their intention to change their behavior to mitigate climate change. Lastly, participants' emotional response to the stimuli was measured. After completing the questionnaire, participants were led to the final page of the online experiment. Here, they were thanked for their participation and informed that this was the end of the experiment.

Results

The statistical results are disclosed in the following section. To start with, the manipulation check is discussed, subsequently the effects of gain-loss framing and locality framing on intention are argued, and finally, the control variables emotional response and concern are discussed.

Manipulation check

To identify whether the locality framing was manipulated successfully, a manipulation check was performed. This check demonstrates whether participants were aware of the condition they were exposed to. Participants had to indicate whether the narratives they read were placed in the Netherlands, globally, or that they didn't know. The data was analyzed by means of a Chi-square test. Participants were exposed to the local condition ($N = 88$) or global condition ($N = 91$). However, not all participants had properly grasped the condition they were assigned to. The manipulation check variable held outcomes that were correct (i.e., participants' answers correlated with the conditions they

were in) or incorrect (participants' answers were the opposite of the exposed condition or they did not know what condition they were exposed to). Only one participant from the global condition indicated not knowing the condition she was exposed to. In the local condition, no participants filled in that they did not know which condition they were exposed to. The analysis revealed that 96.6% of the participants in the local condition ($N = 85$) judged the manipulation correctly, whereas only 73.6% ($N = 67$) of the participants exposed to the global condition successfully judged their manipulation. They thus indicated that the narrative had taken place in the Netherlands, even though that was not the case. Hence, the manipulation check was successful, but the results of this study should be interpreted with some caution because exposure to the global condition was judged less accurately than the local condition.

Main analysis

To test the effects of gain-loss framing and locality framing on the intention to engage in pro-environmental behavior to mitigate climate change, a factorial ANOVA was performed. Assumptions of normality (see Appendix D for all z-scores) and homogeneity of variances ($F(3, 175) = 0.46, p = .710$) were met. Levene's test was used throughout the results to indicate the homogeneity of variances. The factorial ANOVA showed no significant main effect of gain-loss framing on intention, $F(1, 175) = 0.04, p = .836, \eta_{\text{partial}}^2 < .001$. Intention was not significantly higher for gain framing ($M = 3.60, SD = 0.62$) than for loss framing ($M = 3.65, SD = 0.63$). Hence, H1 was not supported, meaning that loss framing did not lead to a higher intention to engage in pro-environmental behavior than gain framing. The factorial ANOVA also did not show a significant main effect for the effect of locality framing on intention, $F(1, 175) = 0.23, p = .630, \eta_{\text{partial}}^2 = .001$. Locality framing ($M = 3.64, SD = 0.62$) and global framing ($M = 3.62, SD = 0.63$) did not differ significantly. Thus, H2 was not supported, meaning that global framing did not lead to higher intentions to mitigate climate change than local framing. Finally, no interaction effect was found, $F(1, 175) = 1.40, p = .238, \eta_{\text{partial}}^2 = .008$ (see Table 1). See Appendix E for a descriptive overview of all items used to measure intention.

Table 1*Descriptives for intention (means and standard deviations)*

		<i>M</i>	<i>SD</i>
Local	Gain	3.56	0.68
	Loss	3.72	0.55
Global	Gain	3.65	0.56
	Loss	3.59	0.69

Emotional response

In this study, emotional response was measured as a control variable. The emotional response score was an overall score of the level of the response, it thus did not indicate a specific emotion. Another factorial ANOVA was performed to test whether the level of emotional response differed within and between gain-loss framing and locality framing. Assumptions of normality (see Appendix D) and homogeneity of variances ($F(3, 175) = 0.24, p = .867$) were both met. No significant main effect was found with regards to gain-loss framing, $F(1, 175) = 3.56, p = .061, \eta_{\text{partial}}^2 = .020$. The emotional response caused by gain framing ($M = 3.03, SD = 0.43$) was thus not significantly different from that of loss framing ($M = 3.15, SD = 0.48$). Nor was a significant main effect found for locality framing, $F(1, 175) = 1.42, p = .234, \eta_{\text{partial}}^2 = .008$. The emotional response from a local-frame ($M = 3.04, SD = 0.48$) was not significantly different from a global-frame ($M = 3.13, SD = 0.44$). For the interaction effect, no significant result was found, $F(1, 175) = 2.48, p = .117, \eta_{\text{partial}}^2 = .014$.

A closer look at emotional response was taken by running another two factorial ANOVAs, parting the emotional response variable into two separate variables, measuring either the emotion fear or hope. The assumption of normality was not met for fear since some skewness was found in the gain condition (z-score_{skewness} = -2.27). Also, for hope, some skewness was found in the gain conditions (z-score_{skewness} = 2.49) and skewness and kurtosis was found in the loss condition (z-score_{skewness} = 4.21, z-score_{kurtosis} = 2.16). See Appendix D for all z-scores. The ANOVA is fairly robust against the

violation of the assumption of normality, but the outcomes may not be completely reliable. The assumption of homogeneity of variances was met for both fear ($F(3, 175) = 0.42, p = .743$) and hope ($F(3, 175) = 0.18, p = .909$).

For hope, results showed no significant main effect for gain-loss framing ($F(1, 175) = 1.64, p = .202, \eta_{\text{partial}}^2 = .009$) or locality framing ($F(1, 175) = 1.88, p = .172, \eta_{\text{partial}}^2 = .011$), and no interaction effect was found ($F(1, 175) = 1.97, p = .163, \eta_{\text{partial}}^2 = .011$). For fear, a main effect was found for gain-loss framing ($F(1, 175) = 7.38, p = .007, \eta_{\text{partial}}^2 = .040$), here, loss-frames elicited more fear than gain-frames (see Table 2 for descriptives). No main effect was found for locality framing ($F(1, 175) = 9.94, p = .997, \eta_{\text{partial}}^2 < .001$), nor was an interaction effect found ($F(1, 175) = 0.36, p = .811, \eta_{\text{partial}}^2 < .001$).

Table 2

Descriptives for emotional response (fear)

		<i>M</i>	<i>SD</i>
Fear	Gain	3.49	0.84
	Loss	3.82	0.73

Climate change concern

Pre-existing climate change concern was measured on a 5-point Likert scale and had a mean score of 3.92 ($SD = 0.64$). Scores ranged from 1.83 to 5.00, with a mode of 4.00, showing that participants were noticeably concerned with climate change prior to the experiment.

To demonstrate whether participants' pre-existing concern affected the results of the factorial ANOVA for the level of intention, an ANCOVA was performed. The assumption of normality was violated, showing some skewness for concern in the loss (z-score_{skewness} = -2.38) and global condition (z-score_{skewness} = -2.58). See Appendix D for all z-scores. The ANCOVA is fairly robust against the violation of the assumption of normality, but the outcomes may not be completely reliable. The assumptions of homogeneity of variance ($F(3, 175) = 0.23, p = .873$) and homogeneity of regression slopes (see Table 3) were met. There was no main effect found for gain-loss framing after controlling

for concern, $F(1, 174) < 0.01$, $p = .951$, $\eta_{\text{partial}}^2 < .001$, nor was there an effect found for locality framing, $F(1, 174) = 0.01$, $p = .941$, $\eta_{\text{partial}}^2 < .001$. The results also did not show an interaction effect for gain-loss framing and locality framing whilst controlling for concern, $F(1, 174) = 2.40$, $p = .123$, $\eta_{\text{partial}}^2 = .014$. Thus, controlling for concern did not change the results of the factorial ANOVA.

Table 3

Descriptives for the assumption of homogeneity of regression slopes

	<i>F</i>	<i>p</i> -value	Partial Eta Squared
Gain-loss	1.76	.187	.010
Gain-loss * Concern	1.83	.178	.011
Locality	0.39	.534	.002
Locality * Concern	0.38	.537	.002
Gain-loss * Locality * Concern	1.23	.270	.007

Discussion

The aim of this study was to examine whether the intention to engage in pro-environmental behavior would increase when using gain-loss and locality framing in climate change communication. In particular, the effects of gain-loss and locality framing were investigated by means of narrative based communication, controlled for concern and emotional response.

Findings and theoretical implications

Gain-loss framing

No significant difference in intention was found between gain and loss framing, meaning that participants in loss-framed conditions did not report a significantly higher intention to engage in pro-environmental behaviors than those in gain-framed conditions. The first hypothesis, stating that loss-framed messages would be favorable for inciting intention to engage in pro-environmental, was thus not supported.

The hypothesis was based on previous research that showed that the use of loss-frames was more effective than gain-frames. The Prospect Theory states that losses are often valued higher than gains. This loss aversion translates into the decision-making process by the avoidance of situations that might cause pain or discomfort (Kahneman & Tversky, 1979; 1981). When experiencing negative emotions, especially fear, it is found to be more favorable for evoking behavioral change (Dillard & Nabi, 2006). In addition, loss-frames are found to help with systematic information processing (Lieberman & Chaiken, 1992, Baron et al., 1994), which can increase the message persuasion (Chaiken & Eagly, 1976; Chaiken, 1980). It is for these reasons that loss-frames are often used when communicating climate change.

As stated above, no significant differences were found between gain and loss-frames, despite the expectation that loss-frames would be preferred in communicating climate change with regards to inciting intention. An explanation for not finding a significant difference could be that participants viewed both gain and loss-frames as rather negative scenarios. In both conditions, the narratives described the effects of climate change, varying in severity for the gain and loss-frame. Before reading the narratives, participants were notified that the story they were about to read described the consequences of climate change when sufficient (gain-frame) or insufficient (loss-frame) action was taken to mitigate climate change. However, the consequences in the gain-framed condition might still have been perceived as severe. For example, in the gain-framed narratives, there were still natural disasters described, such as fires and floods. This may have increased the likelihood that, regardless of the announcement prior to the narratives, gain-frames were perceived as loss-frames.

Another reason for the missing effect might be the demographic characteristics of the participants and their pre-existing concern about climate change. Of the Dutch population, 70% perceives climate change as a top global threat, of which the rate among women (73%) is higher than among men (67%; Poushter & Huang, 2019). In this study, most participants were Dutch and female, and there was a fairly high average for pre-existing concerns about climate change. It may be that participants were thus more likely to view gain-frames as negatively framed narratives because their general reaction to climate-related communication is expected to be alarming or pessimistic. Thus,

non-significant results are possibly explicable because the gain-frames were perceived as loss-frames due to demographic characteristics and pre-existing concern of participants.

Locality framing

There was no significant difference in level of intention between the local-framed and global-framed conditions. The second hypothesis, stating that global-frames would lead to a higher intention to engage in pro-environmental behavior, is thus not supported by the results.

This hypothesis was based on research showing that local-frames were often used indiscriminately. Research on locality framing therefore also showed mixed results of the effects on behavioral change. Local-frames can decrease the psychological distance one experiences (Spence & Pidgeon, 2010), making the issue of climate change more concrete (Leiserowitz et al., 2020). Local-frames can thereby help increase the personal relevance of the message through place attachment, which may cause a greater message persuasion (Scannell & Gifford, 2013). However, an increasing body of studies also argues that a reduced psychological distance does not automatically increase personal relevance or stimulate behavioral change (Brügger, 2020; Schuldt et al., 2018; Brügger et al., 2016).

As mentioned above, no significant difference was found between local and global-frames. The manipulation check may partially explain the non-significant results. The manipulation check measured whether participants were aware of the condition they were exposed to. It showed that participants in the global condition were less aware of the condition they were placed in. Only 73.6% of the participants in the global condition correctly indicated this condition, as opposed to 96.6% in the local condition. An explanation might be that participants who were placed in the global condition attributed the consequences of the global scenario to their own local environment (Degeling & Koolen, 2021). The narratives used in the global condition specified that the effects of climate change occurred globally, however, it was not specified where the main character was located. It may be that participants thus projected their own environment onto the narrative. As participants were required to reside in the Netherlands, it may well be that this was the location they had in mind while participating in the experiment. Because a local-frame was attributed to the global-frame, it may have decreased the psychological distance. As stated above, a decreased psychological distance does not imply an

increase in personal relevance or assure the intention to change one's behavior (e.g., Brügger, 2020).

Hence, the non-significant results may be the outcome of the attribution of local-frames to global-framed narrative.

Emotional response

Emotional response was measured as a control variable and could demonstrate if there were differences in the level of emotional response between the conditions. A significant difference was not found in the intensity of the emotional response, meaning that neither one of the conditions evoked a greater emotional response. Nevertheless, the results showed that there was almost a significant difference between gain and loss framing, where loss-frames caused a greater emotional response than gain-frames.

Further analysis showed that when emotional response was divided into a hopeful and fearful response, a significant effect was found for gain-loss framing. Loss-frames appeared to induce a greater fear response than gain-frames. This is in line with prior research, stating that, when exposed to loss-framed messages, one might experience an increase in negative emotions (Chadwick, 2017). Experiencing a heightened fear response to the consequences of climate change can help to process solutions to mitigate the effects more thoroughly, as well as increase the message persuasion (Meijnders et al., 2001; Nabi et al., 2018). Fear is linked to an increased possibility of behavioral change compared to other negative emotions (Dillard & Nabi, 2006). However, this heightened fear response did not translate into a higher intention. A reason for that might be that a too high a fear response can prevent a change in behavior; one may experience indifference or hopelessness regarding climate change (Hart & Nisbet, 2012; O'Neill & Nicholson-Cole, 2009). It may thus be that the high fear response worked counteractive in inciting intention to engage in pro-environmental behavior.

Differences within intention

The results of this study are interesting in the sense that neither gain framing, nor loss framing, and neither local framing, nor global framing were deemed as more favorable for inciting intention to engage in pro-environmental behavior. What this study does show is that some behavioral intentions were thought of as more favorable than others.

A closer look at the outcomes of all framing conditions reveals that participants had the least intent to take part in demonstrations against companies that damage the environment, followed by the intent to take part in environmental organizations themselves. What distinguishes these items from the other items is the level of active participation. It may well be that participants were in fact motivated to change their behavior, but these behaviors were thought of as unattainable. This is in line with research by Brügger et al. (2016), who argue that to translate intention into behavior, the behaviors in question first need to be determined as acceptable, effective, or feasible, otherwise action will not follow. However, to say this with more certainty, more research is needed into why these intentions did not emerge.

Behavioral intentions that scored highest in all framing conditions were the intention to purchase energy-saving equipment, to switch to sustainable products, to vote for a political party because of their environmental policy, and to change one's behavior for environmental reasons. The former two statements tell something about participants' sustainable purchase intention. What is particularly interesting here is that these items scored relatively high, whereas other items in the survey referring to purchasing fast-moving consumer goods (e.g., paper or household products), scored rather low. Possibly, participants are open to switch to sustainable alternatives, however, these fast-moving consumer goods are not the ones they would like to purchase. Future research could show exactly where the need for sustainable consumption lies. Additionally, it may be that the high score for the intention to purchase energy-efficient equipment was mediated by alternative reasons, such as decreasing electricity expenses. These perceived benefits are found to be positively related to one's attitude, which could influence the purchase intention (Srivastava & Mahendar, 2018). However, results of the current study cannot further support this proposition, more research is therefore needed.

The item stating the intention to change one's behavior for environmental reasons suggests participants are overall willing to change their behavior. Interestingly, this score shows a fairly higher mean than the overall mean of all items. This could suggest that participants are either overestimating to what extent they intend to change their behavior, or the items used to measure intention do not quite cover the aspects on which people would like to change their behavior, thus resulting in a lower overall score.

The high score on the last item, to vote for a political party because of their environmental policy, can be explained by the participant's gender and level of education. Women are generally more environmentally concerned (Davidson and Freudenberg, 1996; Poushter & Huang, 2019) and are more likely to vote for green political parties (Campbell & Shorrocks, 2021). Simultaneously, a higher level of education often aligns with a greater concern for climate change, which, as well as gender, could guide political preferences (Asim & Todd, 2010; Campbell & Shorrocks, 2021). As most participants were highly educated and female, high scores for the intention to vote environmentally are very well explicable.

Limitations and future research

Several limitations were encountered in this research. Firstly, the manipulation check demonstrated that the global condition was judged less accurate than the local condition, which lowered the internal validity of this study. Future studies examining locality framing by means of narratives should consider emphasizing artifacts that are relevant in either personal environments (i.e., local-frames) or surroundings that are less personally relevant (i.e., global-frames). A study by Brügger et al. (2016) argued that the use of personally relevant artifacts, such as recognizable surroundings or attributes with symbolic meanings, could increase the effectiveness of local-frames. An interesting path of research would be to examine the use of personal environments versus non-personal environments on the perceived location of a narrative. In elaboration of this research suggestion, the effects of locality framing on intention to engage in pro-environmental behavior could then again be measured.

Second, intention was measured once after participants were exposed to all the narratives in their condition. It is therefore unclear whether particular narratives might have had a greater or lesser effect on intention. In this study, each narrative focussed on different consequences of climate change, i.e., floods, droughts, forest fires, and storms. It may be that participants' intention to engage in pro-environmental behavior would have been greater after exposure to a narrative describing a scenario with a greater personal relevance. For example, participants living near water could be prone to reacting differently to the narrative about floods than participants who live further away from water. In future research, this limitation could be managed by focusing the local narratives on one specific

location and recruiting participants merely in this area. In the global condition, similar consequences should be described, as to match the local narratives.

Third, the sample was mostly female. Prior research argues that women are more concerned with the effects of climate change (Davidson and Freudenberg, 1996; Poushter & Huang, 2019) and are more likely to engage in pro-environmental behavior (Vicente-Molina et al., 2018). The overall means of intention were relatively high, which might indicate that participants were already concerned with enacting pro-environmental behavior. With the majority of participants identifying as female, it is difficult to say whether these outcomes can be generalized to the larger population. Therefore, in future research, it is advised to recruit an equal number of men and women.

Conclusion

This study examined whether gain-loss framing and locality framing in narrative based climate communication would affect recipients' intention to mitigate climate change. Results showed that there was no difference in level of intention between gain and loss framing. These results may be explained by a rather negative perception of the gain-framed narratives, due to a high level of pre-existing concern. In addition, neither gain, nor loss-frames evoked a greater overall emotional reaction. However, a closer examination revealed that loss-frames showed a higher fear-response than gain-frames. No difference in intention was found between local and global-framed narratives, which might be explained by the outcomes of the manipulation check. Participants were less aware of the global-frame than they were of the local-frame, and they may have attributed their own local environment onto the global-frame. Even though no effects were found for gain-loss framing and locality framing on intention, this study still shed light on which intentions were perceived as most and least appealing. Taking part in demonstrations against companies that damage the environment, and taking part in environmental organizations, were deemed least attractive. Participants were most willing to purchase energy-saving equipment, switch to sustainable products, vote for a political party because of their environmental policy, and to change their behavior for environmental reasons. With this study's limitations in mind, a valuable addition was made to existing research on climate communication and the effects of gain-loss and locality framing on the intention to engage in pro-environmental behavior.

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Appendices

Appendix A

Materials

Introduction conditions. U krijgt een introductie en vier korte verhalen te zien. Lees deze aandachtig. De navigatieknop om door te gaan naar het volgende verhaal verschijnt automatisch na 20 seconden. Na deze 20 seconden kunt u op de pagina blijven zolang dit nodig is. Na het lezen van de verhalen wordt u gevraagd een aantal vragen te beantwoorden.

Introduction narratives. De gemiddelde temperatuur op aarde is al met 1.0 °C opgewarmd en zal hoogstwaarschijnlijk in 2050 zijn gestegen tot minstens 1.5 °C. Om de ernst van de effecten van klimaatverandering te beperken zijn de acties die vandaag de dag genomen worden van groot belang.

Gain: De volgende korte verhalen schetsen een beeld van de effecten van klimaatverandering wanneer er **voldoende** actie is ondernomen om de gemiddelde temperatuur te beperken tot 1.5 °C opwarming.

Loss: De volgende korte verhalen schetsen een beeld van de effecten van klimaatverandering wanneer er **onvoldoende** actie is ondernomen om de gemiddelde temperatuur te beperken tot 1.5 °C opwarming.

Narratives

Narrative 1. Overstroming (flood)

Gain/Local:

“Het heeft nog nooit zo hard geregend” zeg ik zachtjes terwijl ik naar buiten kijk. Het is het jaar 2050, begin februari om precies te zijn. Al een **paar dagen** komt de regen op verschillende plekken in **Nederland** met bakken uit de hemel vallen. Vanmorgen heb ik nagedacht om zandzakken te halen voor in de tuin, **maar ik denk niet dat ik die nodig zal hebben**. De kans dat het water verder komt dan de oprit is **klein**. Op meerdere plaatsen in **Nederland** staat het water inmiddels wel al een stuk hoger maar het lijkt er ook op dat de regen de komende dagen zal **afnemen**.

Loss/Local:

“Het heeft nog nooit zo hard geregend” zeg ik zachtjes terwijl ik naar buiten kijk. Het is het jaar 2050, begin februari om precies te zijn. Al een **paar weken** komt de regen op verschillende plekken in **Nederland** met bakken uit de hemel vallen. Vanmorgen heb ik nagedacht om zandzakken te halen voor in de tuin, **ik denk namelijk dat we die nodig zullen hebben**. De kans dat het water verder komt dan de oprit is **groot**. Op meerdere plaatsen in **Nederland** staat het water inmiddels wel al een stuk hoger en het lijkt er ook op dat de regen de komende dagen zal **toenemen**.

Gain/Global:

“Het heeft nog nooit zo hard geregend” zeg ik zachtjes terwijl ik naar buiten kijk. Het is het jaar 2050, begin februari om precies te zijn. Al een **paar dagen** komt de regen op verschillende plekken **rondom de wereld** met bakken uit de hemel vallen. Vanmorgen heb ik nagedacht om zandzakken te halen voor in de tuin, **maar ik denk niet dat ik die nodig zal hebben**. De kans dat het water verder komt dan de oprit is **klein**. Op meerdere plaatsen **wereldwijd** staat het water inmiddels wel al een stuk hoger maar het lijkt er ook op dat de regen de komende dagen zal **afnemen**.

Loss/Global:

“Het heeft nog nooit zo hard geregend” zeg ik zachtjes terwijl ik naar buiten kijk. Het is het jaar 2050, begin februari om precies te zijn. Al een **paar weken** komt de regen op verschillende plekken **rondom de wereld** met bakken uit de hemel vallen. Vanmorgen heb ik nagedacht om zandzakken te halen voor in de tuin, **ik denk namelijk dat we die nodig zullen hebben**. De kans dat het water verder komt dan de oprit is **groot**. Op meerdere plaatsen **wereldwijd** staat het water inmiddels wel al een stuk hoger en het lijkt er ook op dat de regen de komende dagen zal **toenemen**.

Narrative 2. Hittegolf (Heatwave)**Gain/Local:**

Na wekenlange regen wilde ik niks liever zien dan een helderblauwe hemel, zo een waar geen wolkje aan te bekennen is. We zijn iets verderop in het jaar, het is **augustus** en er is de afgelopen tijd geen

druppel regen gevallen. In de tuin waait het stof van de grond af. De temperaturen zijn hoog, de aarde voelt droog en het gras kleurt geel: de *eerste* hittegolf dit jaar is een feit. *Ik denk dat het bij deze ene hittegolf blijft.* Al jaren blijft het aantal hittegolven in *Nederland* namelijk *stabiel*.

Loss/Local:

Na wekenlange regen wilde ik niks liever zien dan een helderblauwe hemel, zo een waar geen wolkje aan te bekennen is. We zijn iets verderop in het jaar, het is *juni* en er is de afgelopen tijd geen druppel regen gevallen. In de tuin waait het stof van de grond af. De temperaturen zijn hoog, de aarde voelt droog en het gras kleurt geel: de *tweede* hittegolf dit jaar is een feit. *Ik denk niet dat het bij deze tweede hittegolf blijft.* Al jaren blijft het aantal hittegolven in *Nederland* namelijk *toenemen*.

Gain/Global:

Na wekenlange regen wilde ik niks liever zien dan een helderblauwe hemel, zo een waar geen wolkje aan te bekennen is. We zijn iets verderop in het jaar, het is *augustus* en er is de afgelopen tijd geen druppel regen gevallen. In de tuin waait het stof van de grond af. De temperaturen zijn hoog, de aarde voelt droog en het gras kleurt geel: de *eerste* hittegolf dit jaar is een feit. *Ik denk dat het bij deze ene hittegolf blijft.* Al jaren blijft het aantal hittegolven op *globaal niveau* namelijk *stabiel*.

Loss/Global:

Na wekenlange regen wilde ik niks liever zien dan een helderblauwe hemel, zo een waar geen wolkje aan te bekennen is. We zijn iets verderop in het jaar, het is *juni* en er is de afgelopen tijd geen druppel regen gevallen. In de tuin waait het stof van de grond af. De temperaturen zijn hoog, de aarde voelt droog en het gras kleurt geel: de *tweede* hittegolf dit jaar is een feit. *Ik denk niet dat het bij deze tweede hittegolf blijft.* Al jaren blijft het aantal hittegolven op *globaal niveau* namelijk *toenemen*.

Narrative 3. Bosbrand (forest fire)

Gain/Local:

In de verte zie ik grote rookwolken boven de bomen uitkomen, de lucht kleurt rood en er dwarrelt wat as neer als zwarte sneeuw. De droge zomermaanden eisen hun tol en *sommige delen Nederlands* bosgebied hebben het zwaar te verduren in de vlammenzee die al dagen woekert. Bosbranden komen gelukkig *niet met grote regelmaat* voor in *Nederland*. Brandweerwagens rijden af en aan en lijken het *onder controle te hebben*. Ik heb bericht gekregen dat ik de omgeving *niet hoeft te verlaten* en *wacht de situatie nu rustig af vanuit huis*.

Loss/Local:

Overal waar ik kijk zie ik grote rookwolken boven de bomen uitkomen, de lucht kleurt rood en as dwarrelt neer als zwarte sneeuw. De droge zomermaanden eisen hun tol en *grote delen Nederlands* bosgebied hebben het zwaar te verduren in de vlammenzee die al dagen woekert. Bosbranden komen tegenwoordig *met grote regelmaat* voor in *Nederland*. Brandweerwagens rijden af en aan maar ze lijken het *niet onder controle te krijgen*. Ik heb bericht gekregen dat ik de omgeving *moet verlaten*. *Ik pak snel wat ik nodig heb en trek de voordeur achter me dicht*.

Gain/Global:

In de verte zie ik grote rookwolken boven de bomen uitkomen, de lucht kleurt rood en er dwarrelt wat as neer als zwarte sneeuw. De droge zomermaanden eisen hun tol en *wereldwijd* hebben *sommige delen* bosgebied het zwaar te verduren in de vlammenzee die al dagen woekert. Bosbranden komen *wereldwijd* gelukkig *niet met grote regelmaat* voor. Brandweerwagens rijden af en aan en lijken het *onder controle te hebben*. Ik heb bericht gekregen dat ik de omgeving *niet hoeft te verlaten* en *wacht de situatie nu rustig af vanuit huis*.

Loss/Global:

Overal waar ik kijk zie ik grote rookwolken boven de bomen uitkomen, de lucht kleurt rood en as dwarrelt neer als zwarte sneeuw. De droge zomermaanden eisen hun tol en *wereldwijd* hebben *grote delen* bosgebied het zwaar te verduren in de vlammenzee die al dagen woekert. Bosbranden komen *wereldwijd met grote regelmaat* voor. Brandweerwagens rijden af en aan maar ze lijken het *niet onder*

controle te krijgen. Ik heb bericht gekregen dat ik de omgeving moet verlaten. Ik pak snel wat ik nodig heb en trek de voordeur achter me dicht.

Narrative 4. Storm

Gain/Local:

Het is herfst, de wind giert door de bomen en takken slaan met harde slagen tegen het keukenraam aan. Keer op keer schrik ik en hoop dat de bomen voor het huis staande blijven. Ondertussen hoor ik op het journaal dat verschillende gebieden door heel *Nederland* maatregelen moeten nemen om de schade te beperken. Aan de kust zijn ze met man en macht bezig de *kwetsbaarste panden te beschermen* tegen de forse wind en het opkomende tij. Landinwaarts ligt alles stil, wachtend tot de storm over is. Er is in *Nederland* al voor *miljoenen euro's aan schade* gemeld.

Loss/Local:

Het is herfst, de wind giert door de bomen en takken slaan met harde slagen tegen het keukenraam aan. Keer op keer schrik ik en hoop dat de bomen voor het huis staande blijven. Ondertussen hoor ik op het journaal dat verschillende gebieden door heel *Nederland* serieuze maatregelen moeten nemen om de schade te beperken. Aan de kust zijn ze met man en macht bezig *alle panden te beschermen* tegen de forse wind en het opkomende tij. Landinwaarts ligt alles stil, wachtend tot de storm over is. Er is in *Nederland* al voor *miljarden euro's aan schade* gemeld.

Gain/Global:

Het is herfst, de wind giert door de bomen en takken slaan met harde slagen tegen het keukenraam aan. Keer op keer schrik ik en hoop dat de bomen voor het huis staande blijven. Ondertussen hoor ik op het journaal dat verschillende gebieden op *mondiaal niveau* maatregelen moeten nemen om de schade te beperken. Aan de kusten zijn ze met man en macht bezig de *kwetsbaarste panden te beschermen* tegen de forse wind en het opkomende tij. Landinwaarts ligt alles stil, wachtend tot de storm over is. Er is *wereldwijd* al voor *miljoenen euro's aan schade* gemeld.

Loss/Global:

Het is herfst, de wind giert door de bomen en takken slaan met harde slagen tegen het keukenraam aan. Keer op keer schrik ik en hoop dat de bomen voor het huis staande blijven. Ondertussen hoor ik op het journaal dat verschillende gebieden op *mondiaal niveau* serieuze maatregelen moeten nemen om de schade te beperken. Aan de kusten zijn ze met man en macht bezig *alle panden* te beschermen tegen de forse wind en het opkomende tij. Landinwaarts ligt alles stil, wachtend tot de storm over is. Er is *wereldwijd* al voor *miljarden euro's aan schade* gemeld.

Appendix B***Informed consent***

Beste deelnemer,

Bij voorbaat dank dat u deelneemt aan dit onderzoek. Dit online experiment maakt deel uit van mijn masterscriptie waarbij ik mij focus op communicatie met betrekking tot klimaatverandering. In deze questionnaire zult u een aantal vragen beantwoorden over zaken rondom dit onderwerp. Daarnaast zal u verschillende korte verhalen lezen over de effecten van klimaatverandering, waarna uw mening gevraagd wordt. Uw deelname wordt zeer gewaardeerd.

Deelname aan dit online experiment is volledig vrijwillig. Terugtrekken uit het onderzoek kan op ieder gegeven moment. Met de gegevens van dit onderzoek wordt vertrouwelijk omgegaan. Daarnaast worden deze volledig geanonimiseerd. Het online experiment neemt circa 10 minuten in beslag. Bij vragen of opmerkingen over het onderzoek kunt u contact opnemen door te mailen naar: s.m.c.eijsink@tilburguniversity.edu.

Suzanne Eijsink

Masterstudent Communicatie- en Informatiewetenschappen, Tilburg University

Door hieronder aan te geven dat u akkoord gaat bevestigt u uw vrijwillige deelname aan het onderzoek. Daarbij geeft u op deze manier toestemming aan de onderzoeker voor het gebruik van de gegevens die tijdens dit onderzoek verzameld worden. U bent op de hoogte dat u op ieder gegeven moment uit het onderzoek kunt stappen zonder hiervoor een reden op te hoeven geven.

Gaat u akkoord met uw deelname aan dit onderzoek?

- Ik ga akkoord
- Ik ga niet akkoord

Appendix C

Demographics

1. Ik woon, werk en/of studeer in Nederland.
 - Correct
 - Niet correct *(verlaat automatisch experiment na dit antwoord)*
 2. Wat is uw leeftijd?
[]
 3. Wat is uw geslacht?
 - Man
 - Vrouw
 - Anders
 - Zeg ik liever niet
 4. Welke nationaliteit heeft u?
 - Nederlands
 - Belgisch
 - Duits
 - Anders, namelijk..
[]
 5. Wat is uw hoogst gegoten of huidige opleidingsniveau?
 - Basis onderwijs
 - Middelbaar onderwijs
 - Bachelor HBO
 - Master HBO
 - Bachelor WO
 - Master WO
 - Anders, namelijk..
[]
-

Intention to engage in pro-environmental behavior

In hoeverre bent u het eens met de volgende stellingen na het lezen van de vier verhalen?

1. Ik streef ernaar om papieren producten (toiletpapier, keukenpapier, etc.) te kopen gemaakt van gerecycled papier.
2. Ik streef ernaar om milieuvriendelijke huishoudproducten te kopen (afwasmiddel, wasmiddel, etc.).
3. Ik streef ernaar om biologisch eten te kopen.
4. Ik streef ernaar om energiezuinige huishoudelijke apparaten aan te schaffen.
5. Ik streef ernaar om deel te nemen aan demonstraties tegen bedrijven die schade aanrichten aan het milieu.
6. Ik streef ernaar om deel te nemen aan milieuorganisaties (vrijwilligerswerk, donaties of lidmaatschap).
7. Ik zou een petitie tekenen voor ecologische redenen.
8. Ik streef ernaar om over te stappen naar duurzame producten om bij te dragen aan een beter milieu.
9. Ik zou mijn gedrag aanpassen voor milieuredenen.
10. Ik zou voor of tegen een politieke partij stemmen vanwege het milieubeleid.

5-point Likert scale (1 = Sterk mee oneens, 2 = Oneens, 3 = Neutraal, 4 = Eens, 5 = Sterk mee eens)

—

Concern

Geef aan in welke mate u het eens bent met de stelling.

1. Ik zie klimaatverandering als een bedreiging voor mijn thuisplek
2. Ik zie klimaatverandering als een bedreiging voor de maatschappij waarin ik leef
3. Ik zie klimaatverandering als een bedreiging voor het welzijn van anderen
4. Ik zie klimaatverandering als een bedreiging voor de gezondheid van de mens
5. Ik zie klimaatverandering als een bedreiging voor het voortbestaan van flora en fauna
6. Ik zie klimaatverandering als een bedreiging voor mijn persoonlijke leven

5-point Likert scale (1 = Sterk mee oneens, 2 = Oneens, 3 = Neutraal, 4 = Eens, 5 = Sterk mee eens)

—

Emotional response

In hoeverre bent u het eens met de volgende stellingen?

1. Na het lezen van de teksten voel ik mij **optimistisch** over klimaatverandering.
2. Na het lezen van de teksten **vrees** ik voor klimaatverandering.
3. Na het lezen van de teksten voel ik mij **hoopvol** over klimaatverandering.
4. Na het lezen van de teksten voel ik mij **angstig** over klimaatverandering.
5. Na het lezen van de teksten voel ik mij **geïnspireerd** met betrekking tot klimaatverandering.
6. Na het lezen van de teksten voel ik mij **overweldigd** door klimaatverandering.

5-point Likert scale (1 = Helemaal niet, 2 = Niet, 3 = Neutraal, 4 = Enigszins, 5 = Erg)

Appendix D**Table 1***Z-scores for skewness and kurtosis*

		<i>Z-score Skewness</i>	<i>Z-score Kurtosis</i>
Intention	Gain	-1.70	0.78
	Loss	0.11	0.60
	Local	-1.28	1.06
	Global	-0.28	-0.72
Emotional response	Gain	-0.35	-0.20
	Loss	1.72	0.81
	Local	1.32	1.36
	Global	0.70	0.09
Emotional response: Fear	Gain	-2.27	0.36
	Loss	-0.64	1.46
Emotional response: Hope	Gain	2.49	0.35
	Loss	4.21	2.16
Concern	Gain	-1.89	0.62
	Loss	-2.38	1.66
	Local	1.61	0.42
	Global	-2.58	1.59

Appendix E**Table 1.1***Descriptives for intention items (gain-loss framing)*

		<i>M</i>	<i>SD</i>
Item 1	Gain	3.70	0.10
	Loss	3.79	0.09
Item 2	Gain	3.78	0.09
	Loss	3.70	0.10
Item 3	Gain	3.48	0.11
	Loss	3.58	0.09
Item 4	Gain	3.99	0.09
	Loss	4.03	0.09
Item 5	Gain	2.26	0.11
	Loss	2.48	0.13
Item 6	Gain	2.92	0.11
	Loss	2.89	0.12
Item 7	Gain	3.87	0.10
	Loss	3.85	0.11
Item 8	Gain	4.11	0.08
	Loss	4.10	0.08
Item 9	Gain	4.08	0.08
	Loss	4.07	0.08
Item 10	Gain	3.88	0.11

	Loss	4.00	0.11
--	------	------	------

Table 1.2*Descriptives for intention items (locality framing)*

		<i>M</i>	<i>SD</i>
Item 1	Local	3.72	0.10
	Global	3.77	0.10
Item 2	Local	3.77	0.09
	Global	3.71	0.10
Item 3	Local	3.66	0.10
	Global	3.40	0.10
Item 4	Local	4.01	0.85
	Global	4.01	0.92
Item 5	Local	2.35	0.12
	Global	2.38	0.12
Item 6	Local	2.88	0.12
	Global	2.93	0.11
Item 7	Local	3.79	0.10
	Global	3.93	0.10
Item 8	Local	4.13	0.08
	Global	4.08	0.08
Item 9	Local	4.08	0.08

	Global	4.07	0.07
Item 10	Local	3.88	0.12
	Global	4.00	0.10