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Personal Testimonials and Empathy in Environmental Risk Communication—Their Effects on Reflective Thoughts, Risk Perception, and Behavioral Intentions

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Environmental risks related to climate change are on the rise worldwide. This study examines how empathy with personal testimonials of homeowners affected by such risks can stimulate reflective thoughts, risk perception, and intention to take protective measures. A sample of homeowners saw risk awareness videos about different types of environmental risks (storm, hail), with or without personal testimonials of homeowners affected by those risks. The stimulus videos were embedded on an information website for homeowners about environmental risks. Participants were asked to view the video, browse the website, and report their thoughts, feelings, and behavioral intentions. As expected, personal testimonials elicited higher levels of empathy, predicting higher levels of reflective thoughts, self- and other-related risk perception, intention to protect one's own home, and intention to share the information website with other homeowners.

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Because of climate change, extreme weather events are increasing worldwide. Environmental risks, such as storms, floods, and wildfires, are causing considerable damage to public infrastructures and private property (Contat et al., 2024). Individual stakeholders like homeowners are often unprepared, given large variations in knowledge, risk awareness, and motivation to implement protective measures (Jarnkvist, 2020; Meyer & Johann, 2025). To minimize avoidable damage, it is therefore important to raise awareness of extreme weather events and affordable protective measures.

This research examines how empathy elicited through personal testimonials of homeowners affected by environmental risks stimulates reflective thoughts, risk perception, and intentions to adopt protective measures and share information with other homeowners. Personal testimonials and empathy are relatively well researched in other domains of risk communication, like health messages (e.g., Campbell & Babrow, 2004; Luong & Moyer-Gusé, 2021; Shen, 2019). Yet their potential for environmental risk communication remains unexplored. We aimed to address this gap by focusing on empathy elicited by testimonials of persons affected by environmental risks.

To observe empathy effects in a naturalistic setting, we used risk-awareness videos embedded on the information website of the Federal Office of Civil Protection and Disaster Assistance (FOCPDA), a government agency in Germany. A sample of German homeowners was randomly assigned to view a website featuring either the original risk-awareness videos containing personal testimonials from homeowners affected by extreme weather events or an edited version in which those testimonials were removed. This enabled us to observe whether empathy elicited by personal testimonials stimulates reflective processing, risk perception, and behavioral intentions.

Information and Narrative Persuasion as Complementary Approaches to Risk Communication for Homeowners

The rising incidence of extreme weather events and resulting damage to property and danger to life (Contat et al., 2024) underscores the shared responsibility of homeowners, architects, and government agencies to implement protective measures (Meyer & Johann, 2025; Tempels, 2022). Homeowners are increasingly expected to contribute to diversified risk management strategies (Tempels, 2022) and reported heightened awareness after regional extreme weather events (Attems et al., 2020). Nevertheless, an "adaptation gap" (Meyer & Johann, 2025, p. 1) persists because of insufficient knowledge, motivation, and/or resources to implement protective measures (Jarnkvist, 2020; Meyer & Johann, 2025). Therefore, risk communication campaigns have begun to address homeowners as important stakeholders, aiming to inform them about environmental risks and affordable protective measures. An emerging line of research (Attems et al., 2020; Meyer & Johann, 2025) has found positive, but somewhat limited, effects of such information campaigns.

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Narrative Persuasion in Risk Communication

A possible complementary approach to closing homeowners' adaptation gap is based on narrative message elements that address recipients on an emotional level (Raile et al., 2022). The narrative persuasion approach has been developed in the context of health risk messages dealing with comparable gaps between abstract knowledge and nonimplementation of protective measures (Campbell & Babrow, 2004; Luong & Moyer-Gusé, 2021). As explained in the section on empathy, vicarious experience of risks through the perspective of persons affected by those risks can promote key outcomes of risk communication like risk awareness and behavioral intentions (Campbell & Babrow, 2004).

Moreover, narrative approaches can facilitate risk communication by mitigating defensive responses to perceived persuasive intent (Moyer-Gusé & Nabi, 2010; Shen, 2010a; Slater & Rouner, 2002). Persuasive risk messages often elicit reactance when perceived as threats to a recipient's freedom of opinion or action, resulting in anger, counterarguments, and message-inconsistent effects (Dillard & Shen, 2005). A prominent approach to circumvent reactance is entertainment education (Moyer-Gusé & Nabi, 2010; Slater & Rouner, 2002). If persuasive messages are embedded in entertainment narratives like movies and series, persuasive intent is less obvious. Moreover, if viewers are transported into the plot, counterarguments are diminished because cognitive resources are fully absorbed by processing the story (Moyer-Gusé & Nabi, 2010).

Persuasive Effects of Personal Testimonials

Personal testimonials represent an alternative approach to mitigating reactance. According to Cohen et al. (2025), "What is crucial is that testimonials involve testimony; that the story is told by someone who directly experienced or witnessed the events as they happened to themselves or to someone close" (p. 40). Unlike entertainment narratives, testimonials are often openly persuasive, yet reactance can be mitigated because persuasive intent is perceived as legitimate if it is motivated by authentic emotions, needs, and vulnerabilities expressed in an individuals' self-disclosure (Hecht et al., 2022; Uthappa, 2017; Watts et al., 2023). Self-disclosure of personal testimonials has been found to increase empathy, reflective thoughts (Hecht et al., 2022), perceived benevolence, trust, and message elaboration (Spence et al., 2020) while reducing reactance and counterarguing (Watts et al., 2023). These factors associated with self-disclosure of personal testimonials were found to promote message acceptance in the context of health messages (Cohen et al., 2025; Watts et al., 2023) and environmental communication (Spence et al., 2020). We aimed to extend this promising line of research on the role of personal testimonials by focusing specifically on testimonials from homeowners affected by environmental risks.

Empathy in Risk Communication

A key factor behind the persuasive appeal of narrative risk messages—whether in the form of entertainment narratives or personal testimonials—is empathy. Empathic responses to risk messages were found to predict message-consistent persuasion effects concerning various health risks, including smoking (Shen, 2010a), drunk driving (Shen, 2010a), skin cancer (Myrick & Oliver, 2015), HIV (Campbell & Babrow, 2004), and COVID-19 (Luong & Moyer-Gusé, 2021; Wong & Yang, 2021). Research on empathy in

environmental risk communication is only beginning to emerge and has mainly focused on empathy with nature (Kim & Cooke, 2021; Wang et al., 2023). Therefore, to theorize the potential role of personal testimonials and empathy in risk communication for homeowners, we consulted general research on empathy and its effects in other domains of risk communication.

Empathy, a Multidimensional Construct

The research literature on empathy is voluminous and has generated numerous definitional approaches (for an overview, see Cuff et al., 2016). Two core aspects appear in most definitions of empathy: cognitive and affective empathy.

Cognitive Empathy

Cognitive empathy refers to "the ability to understand another's feelings" (Cuff et al., 2016, p. 147). It involves mental simulation processes like perspective-taking and vicarious appraisal of another's situation. According to appraisal theories of emotions (Scherer, 2001; Wondra & Ellsworth, 2015), it is not the situation per se that elicits emotions, but a person's appraisal of the situation concerning their goals, needs, and concerns. For example, a rainy weather forecast may be sad news for a person hosting an outdoor event, but happy news for a farmer whose crops need water. Therefore, understanding others' emotions requires an understanding not only of the situation but also of the needs, concerns, and appraisals of the person involved (Shen, 2010a; Wondra & Ellsworth, 2015).

Affective Empathy

Affective empathy refers to "the activation and experience of affective reactions to others' experiences and/or expressions of emotions" (Shen, 2010a, p. 399). This affective component of empathy has been further differentiated into matching emotions and empathic concerns.

Matching Emotions

Empathy is often assumed to involve a matching, or at least a substantial similarity, between the emotions of an observer and those of the target (Cuff et al., 2016; Wondra & Ellsworth, 2015). Matching emotions can be elicited by an observer's matching appraisals of the situation or as a direct response to emotions expressed by the target of empathy (e.g., a crying person elicits sadness in an observer). Such direct elicitation of corresponding emotions has been labeled emotional contagion, mimicry (Wondra & Ellsworth, 2015), or, in the case of negative emotions, vicarious distress (Batson et al., 2015). Based on the valence of matching emotions, positive empathy has been distinguished from negative empathy (Andreychik & Migliaccio, 2015). While some authors consider matching emotions to constitute the definitional core of empathy (Cuff et al., 2016), others (e.g., Batson et al., 2015) have drawn attention to the counterproductive effects of vicarious distress on altruistic motivation. For example, observers were more inclined to leave an empathy-arousing situation without helping the target of empathy if they felt overwhelmed by vicarious distress (Batson et al., 2015).

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Empathic Concern

To account for the altruistic motivation typically associated with empathy (Batson et al., 2015), some definitions include empathic concern as an additional criterion or even as the core criterion of empathy. Empathic concern has been defined as "an other-oriented emotional response elicited by and congruent with the perceived welfare of someone in need" (Batson et al., 2015, p. 1). Other than matching emotions about the target's situation (typically a negative situation), empathic concern is an emotional response to the observer's relationship with the target (typically a positive relationship). Empathic concern is associated with positive feelings of closeness, warmth, and caring about others' well-being (Batson et al., 2015; Zickfeld et al., 2017). Other theoretically related concepts include sympathy (Eisenberg & Fabes, 1990), feeling moved (Bartsch et al., 2014), kama muta (Zickfeld et al., 2017), and associative empathy (Shen, 2010a).

Because of the complexity of appraisals involved in empathic concern and matching emotions (typically, a positive relationship with a person in a negative situation), affective empathy is usually characterized by mixed affect—that is, the simultaneous experience of positive and negative affective valence (Myrick & Oliver, 2015; Zickfeld et al., 2017).

In sum, empathy can be characterized as a multidimensional construct that involves cognitive empathy (understanding others' emotions through perspective taking and vicarious appraisal of their situation), matching emotions (feeling emotions that match another person's appraisal of the situation and their expression of emotions), and empathic concern (feeling emotions of interpersonal warmth, closeness, and concern for others' well-being).

Empathy-Eliciting Message Features of Personal Testimonials

Consistent with the multidimensional nature of empathy, research has identified cognitive and affective message factors that can stimulate empathic responses (Lankhuizen et al., 2022; Shen, 2019). A study on health messages (Shen, 2019) found that empathy was elicited by depictions of pain and suffering, close relationships, realism, vividness, emotional expression, character gaze, and background music. Personal testimonials are typically characterized by several of these empathy-eliciting content features, including vivid portrayals of pain and suffering, facial and vocal expressions of emotions, and direct gaze. Therefore, our first hypothesis was as follows:

H1: Information videos about environmental risks, including personal testimonials of homeowners affected by those risks, elicit higher levels of empathy (including cognitive empathy, matching emotions, and empathic concern) than information videos without testimonials.

Persuasive Effects of Empathy Appeals in Risk Communication

Persuasive effects of risk communication messages have been linked to all three components of empathy (Campbell & Babrow, 2004; Luong & Moyer-Gusé, 2021; Shen, 2010a). In the following sections,

we discuss their effects on reflective thoughts, risk perception, and behavioral intentions to derive further hypotheses on these outcomes.

Empathy Effects on Reflective Thoughts

As Campbell and Babrow (2004) argue, empathy can stimulate cognitive involvement as an important precursor of persuasion effects. In this study, we focus on a specific type of cognitive involvement that has been conceptualized as reflective thoughts, a "subtype of cognitive elaboration that is not primarily focused on arguments as in the original ELM but rather on the deeper meaning of narratives and related real-world issues" (Bartsch et al., 2025, p. 575). Reflective thoughts can link narrative media content to a broader context of meaning through thoughts about the self and others, real-world issues, and moral and psychological lessons (Bartsch et al., 2014). This narrative-specific type of cognitive elaboration is consistent with the role of personal testimonials as an empathy-eliciting message element. Research on eudaimonic media experiences (i.e., meaningful, moving, and thought-provoking experiences) has found effects of empathic responses on reflective thoughts in other domains like entertainment, political communication, and health communication (Bartsch et al., 2025; Hecht et al., 2022). In the following paragraphs, we discuss how different components of empathy contribute to such thought-provoking effects and how these insights are relevant in a risk communication context.

Matching Emotions and Cognitive Resource Allocation

Dual-process models of message processing, such as the limited capacity model of motivated mediated message processing (Lang, 2006), assume that allocation of cognitive resources to media messages can be motivated by affective factors: Emotional arousal increases motivational activation and allocation of cognitive resources; negative valence signals to the organism that important concerns are at stake and that careful information processing is required; and the coactivation of positive and negative valence (mixed affect) can stimulate cognitive integration efforts (Lang, 2006). Consistent with this reasoning, affective factors associated with empathy, like arousal and negative or mixed affective valence, were found to predict higher levels of reflective thoughts and information seeking about issues addressed in entertainment and narrative news formats (Bartsch et al., 2025; Bartsch & Angerer, 2021; Schneider et al., 2025). In a risk communication context, Campbell and Babrow (2004) similarly argue that emotional concordance "signals that the message is relevant and meaningful on some level" and "triggers additional cognitive processing" (p. 163). This effect of matching emotions on reflective thoughts was proposed as an explanatory mechanism of risk perception, but was not measured in their study.

Cognitive Empathy and Social Learning

Based on social learning theory (Bandura, 1971), Campbell and Babrow (2004) further argued that empathic perspective taking, identification, and understanding can lead to vicarious learning experiences. Through empathic perspective taking, message recipients can reflect on the causes and consequences of situations and behavioral choices without experiencing the situation themselves. Thus, attitudes and behavioral intentions can be formed not only based on a person's own lived experience but also based on reflective thoughts that link the characters' experiences to their own life. Indirect evidence of the role of

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cognitive empathy and vicarious learning comes from research on HIV prevention (Campbell & Babrow, 2004) and skin cancer prevention (Myrick & Oliver, 2015). Again, the assumed role of reflective thoughts as a mediator of empathy effects on risk perception was not measured.

Empathic Concern and Prosocial Responses

Empathic concern for others' well-being can also stimulate reflective thoughts. According to the extended elaboration likelihood model (E-ELM; Slater & Rouner, 2002), empathy can prompt individuals to shift their perspective from self-related concerns to concerns for others. While the original elaboration likelihood model (ELM; Petty & Cacioppo, 1986) assumes that cognitive elaboration is prompted by the relevance of issues to individuals' own concerns, the E-ELM (Slater & Rouner, 2002) adds that empathic concern for the well-being of characters in a story can have similar involvement effects. The empathy-attitude model (Batson et al., 1997) suggests that this line of reasoning can be extended through the transfer of empathic concern from story characters to the broader social group affected by the issue portrayed. Consistent with this reasoning, research on eudaimonic media effects has found that empathic concern is associated with higher levels of reflective thoughts and prosocial changes in attitudes and behavioral intentions toward social groups affected by the issue (Bartsch et al., 2018; Hecht et al., 2022). Examples of prosocial effects of empathic concern in risk communication include effects on avoidance of drunk driving (Shen, 2010a), acceptance of lockdown measures during the COVID-19 pandemic (Wong & Yang, 2021), and vaccine advocacy behavior (Luong & Moyer-Gusé, 2021). However, the mediating role of reflective thoughts that link empathic concern for story protagonists to the situation of others affected by the issue has not yet been empirically examined in the context of risk communication.

To summarize, different components of empathy have been theoretically linked to reflective thoughts. While the role of reflective thoughts as a mediator of empathy effects has been examined in other domains, it remains understudied in a risk communication context. To address this gap, we examined the following hypothesis:

H2: Empathy with homeowners affected by environmental risks (a composite variable including cognitive empathy, matching emotions, and empathic concern) predicts higher levels of reflective thoughts about the issue.

Empathy Effects on Risk Perception

Risk perception is a key outcome in risk communication. It concerns the perceived probability and severity of event consequences, combined with a sense of personal vulnerability for oneself and/or others (Campbell & Babrow, 2004; Luong & Moyer-Gusé, 2021; Wilson et al., 2019). Consistent with this appraisal profile, measures of risk perception often include an affective component of fear and related emotions like anxiety, worry, and concern (Wilson et al., 2019). General measures of empathy (Campbell & Babrow, 2004) and specific measures of empathic fear (Myrick & Oliver, 2015) have been found to predict risk perception in the context of health communication. In an environmental context, empathy for vulnerable others has been linked to other-related risk perception (Bec & Becken, 2021). Therefore, we assumed that

H3: Empathy with homeowners affected by environmental risks predicts higher levels of self-related risk perception.

H4: Empathy with homeowners affected by environmental risks predicts higher levels of other-related risk perception.

Furthermore, we assumed that learning and appraisal processes involved in risk perception would be reinforced by the stimulating effect of empathy on reflective thoughts, as assumed in H2. Therefore, we expected that

H3a: Empathy has an indirect effect via reflective thoughts on self-related risk perception.

H4a: Empathy has an indirect effect via reflective thoughts on other-related risk perception.

Empathy Effects on Behavioral Intentions

Risk perception is usually associated with motivation to protect oneself and others from perceived risk (Wilson et al., 2019). This logic is inherent in appraisal theories of emotions, which assume that appraisals of emotion-eliciting situations are typically followed by appraisals of coping potential that assess a person's behavioral options and self-efficacy (Scherer, 2001). Risk messages can support appraisals of coping potential by providing information about protective measures. Such a positive outlook can foster a sense of self-efficacy, hope, and motivation to act among message recipients (Adams et al., 2022). As Campbell and Babrow (2004) argue, empathy for a person affected by an issue can stimulate all parts of this complex social learning process, which involves reflective thoughts on the issue, risk perception, learning about protective measures, and motivation to implement such measures. Therefore, we assumed that

H5: Empathy with homeowners affected by environmental risks predicts higher levels of behavioral intention to take protective measures.

Furthermore, we expected that the effects of empathy on reflective thoughts (assumed in H2) and on self-related risk perception (assumed in H3) would indirectly reinforce such behavioral intentions (Campbell & Babrow, 2004). Therefore, we assumed that

H5a: Empathy has an indirect effect via reflective thoughts and self-related risk perception on behavioral intentions to take protective measures.

With other-related risks, appraisals of coping potential are assumed to follow a similar logic, but with the safety and well-being of others in mind (Wondra & Ellsworth, 2015). Different types of behavioral intentions have been examined in the context of other-related risks, including adherence to lockdown measures (Wong & Yang, 2021), vaccine advocacy behaviors (Luong & Moyer-Gusé, 2021), and information sharing (Myrick & Oliver, 2015). Concerning environmental risks for homeowners, sharing information is an important way to protect others. Therefore, we assumed that

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H6: Empathy with homeowners affected by environmental risks predicts higher levels of behavioral intention to share information with other homeowners.

Again, we expected that the effects of empathy on reflective thoughts (assumed in H2) and on other-related risk perception (assumed in H4) would indirectly reinforce such behavioral intentions (Myrick & Oliver, 2015). Therefore, we assumed that

H6a: Empathy has an indirect effect via reflective thoughts and other-related risk perception on behavioral intentions to share information with other homeowners.

Finally, based on the effect of personal testimonials on empathy assumed in H1 and the effects of empathy assumed in H2–H6, we expected total and indirect effects of personal testimonials on the mediating and dependent variables:

H7: Information videos about environmental risks, including personal testimonials of homeowners affected by those risks, elicit higher levels of reflective thoughts (H7a), self-related risk perception (H7b), other-related risk perception (H7c), intention to take protective measures (H7d), and intention to share information with other homeowners (H7e) than information videos without testimonials.

The conceptual model, including all hypotheses, is displayed in Figure 1.

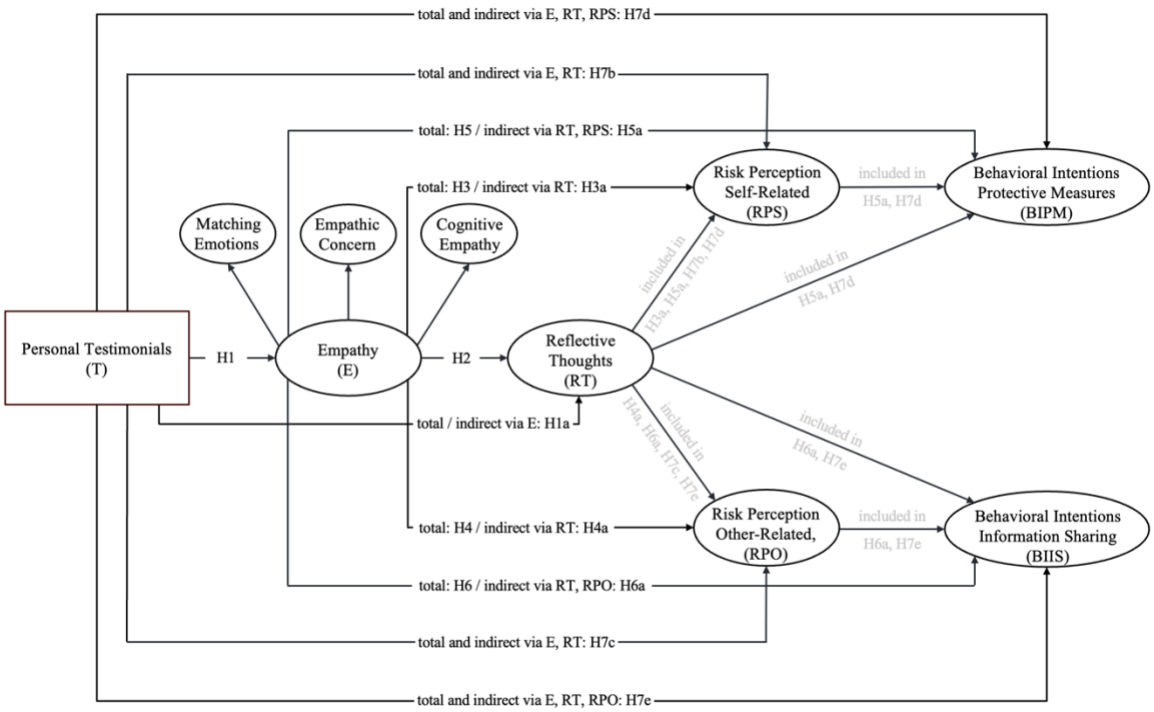

Figure 1. Conceptual model.

Note. This model integrates direct, indirect, and total effects assumed in the hypotheses.

Method

Stimuli and Pretest

To test our hypotheses in a naturalistic setting, we used risk-awareness videos about environmental risks (storm and hail) embedded on the information website for homeowners of the Federal Office of Civil Protection and Disaster Assistance (FOCPDA, n.d.). The original videos included factual information about environmental risks, personal testimonials of homeowners affected by those risks, and information about protective construction measures. A control condition was created by removing the testimonials. The videos, produced by a professional video journalist, were designed for general audiences. According to the ethical guidelines of the authors' universities, institutional review was not required for conducting research using this type of material with samples of participants aged 18 and older.

The stimulus videos were about four to five minutes long (hail with testimonials: 00:04:56; hail without testimonials: 00:04:26; storm with testimonials: 00:04:27; storm without testimonials: 00:03:51). In the testimonial condition, the videos included a compilation of short testimonial statements from several affected homeowners. The statements were short and emotional, describing their experience of extreme weather events, such as storms and hails, and the damage caused by these

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events. The videos were pretested with an independent sample of homeowners (N = 286, 154 male, 131 female; age 18–76, M = 46.10, SD = 14.71; 81.1% higher education). Pretest measures included empathic responses (cognitive empathy, matching emotions, and empathic concern) and additional measures of reactance and self-efficacy that were not part of our hypotheses. As explained in the section on testimonial effects, we expected that personal testimonials would not elicit reactance. The message element designed to increase self-efficacy—the information about protective constructional measures—was identical in both conditions and was presented factually. Therefore, we did not expect effects of personal testimonials on reactance or self-efficacy and pretested the stimuli on these measures to avoid potential confounds.

To pretest the stimulus videos, we conducted a 2 (personal testimonials: present vs. absent) × 2 (type of risk portrayed: storm vs. hail) univariate analysis of variance (ANOVA) on the pretest variables. The pretest revealed a significant main effect of personal testimonials on empathy, $F(1,282) = 15.47$, $p < .001$. The stimulus videos with testimonials elicited higher levels of empathy (M = 2.86, SD = 0.58) than the videos without testimonials (M = 2.60, SD = 0.48). There was no significant main effect of the type of risk, $F(1,282) = .69$, $p = .408$, and no significant interaction effect of testimonial and type of risk, $F(1,282) = .88$, $p = .349$, indicating that the main effect of testimonials on empathy did not depend on the type of natural risk portrayed in the videos.

Concerning the additional pretest variables, we found no main or interaction effects of personal testimonials and type of risk on reactance (personal testimonial: $F(1,281) = .75$, $p = .387$; type of risk: $F(1,281) = 1.08$, $p = .299$; interaction: $F(1,281) = .03$, $p = .870$). As expected, ratings of reactance were generally low across all conditions (M = 1.65, SD = 0.88, on a five-point scale), indicating that neither the informational content of the risk awareness videos nor the personal testimonials elicited substantial-level reactance.

We also found no main or interaction effects of personal testimonials and type of risk on self-efficacy (personal testimonial: $F(1,274) = 2.35$, $p = .127$; type of risk: $F(1,274) = .19$, $p = .662$; interaction: $F(1,274) = .25$, $p = .615$). Ratings of self-efficacy were above the midpoint of the five-point scale (M = 3.21, SD = 1.25), suggesting that all versions of the videos were moderately effective in promoting self-efficacy.

Sample and Procedure

The main study was conducted with N = 809 homeowners in Germany (426 male, 383 female; age 30–50, M = 41.10, SD = 5.99; 56.7% higher education) who were recruited via an online access panel and received a small financial reward for their participation. Participants were randomly assigned to see one of the four risk-awareness videos embedded on a mirrored version of the FOCPDA website. Participants were asked to view the video, browse the website at their convenience, and report their thoughts, feelings, and behavioral intentions.

Measures

Demographics

The survey asked participants to provide basic demographic information (age, gender, and education).

Empathy

Following exposure to the stimulus video, three components of state empathy were measured: Cognitive empathy was measured using the scale of Shen (2010b; four items, e.g., "I can understand what the persons were going through in the video," α = .90; *M* = 4.23, SD = 0.69). Matching emotions were measured using three items ("fearful," "worried," and "alarmed," α = .90; *M* = 2.71, SD = 1.06), akin to risk-related emotions in Wilson et al.'s (2019) research. Empathic concern was measured using the feeling moved scale (Bartsch et al., 2014; three items: "moved," "tender," and "poignant," α = .89; *M* = 2.58, SD = 1.10). The response scale for measures of empathy ranged from 1 = "completely disagree" to 5 = "completely agree." Combined, the three facets of empathy formed an internally consistent scale. Therefore, a composite index of empathy was calculated for the pretest (α = .85; *M* = 2.74, SD = 0.55). For the main study, empathy was modeled as a second-order factor, estimated from the three first-order factors: matching emotions, empathic concern, and cognitive empathy. All other variables were modeled as first-order factors.

Reflective Thoughts

Reflective thoughts were measured using an adapted version of the reflective thoughts scale (Bartsch et al., 2014; four items, e.g., "The video was thought-provoking," "The video inspired me to think about the issue," α = .94; *M* = 3.78, SD = 0.95) on a response scale from 1 = "completely disagree" to 5 = "completely agree."

Risk Perception

Measures of risk perception were derived from Wilson et al.'s (2019) research and covered two key components: perceived probability and perceived severity of consequences, for self-related and other-related risk respectively: "How do you estimate the probability that your home [the homes of your family and friends] will be affected by the natural risks portrayed in the video?" and "How severe do you estimate the possible damage caused by these natural risks in your region [the regions where your family and friends live]?" (self-related risk: α = .74; *M* = 3.26, SD = 0.89; other-related risks α = .90; *M* = 3.33, SD = 0.89). The response scale for risk perception ranged from 1 = "very low" to 5 = "very high."

Behavioral Intentions

Behavioral intentions to take protective measures were measured using four items, including low-cost measures (e.g., "How likely is it that you will seek additional information to protect your home from

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natural risks?") and high-cost measures (e.g., "How likely is it that you will commission constructional measures to protect your home from extreme weather events?"). Exploratory analyses revealed that results for behavioral intentions did not differ between high- and low-cost measures. Moreover, the four items formed an internally consistent scale (α = .90; *M* = 2.84, SD = 1.06). Therefore, behavioral intentions to take protective measures were modeled as a first-order factor, including low-cost and high-cost measures. Behavioral intention to share information with other homeowners was measured using the item, "How likely is it that you will recommend the information website you have seen to family and friends?" (*M* = 3.09, SD = 1.24). The response scale for behavioral intentions ranged from 1 = "very unlikely" to 5 = "very likely."

Additional Pretest Measures

Reactance was measured using three items (Hastall & Sukalla, 2013; e.g., "It annoys me that the video tries to dictate my actions," α = .89; *M* = 1.66, SD = 0.88; 1 = "completely disagree" to 5 = "completely agree"). Self-efficacy was measured with the item "How confident are you that you can implement or commission measures to protect your home from extreme weather events?" (*M* = 3.21, SD = 1.25; 1 = "not confident at all" to 5 = "very confident").

Data, measures, and additional online materials are openly available on the project's Open Science Framework page.[2]

Results

Preliminary Analyses

First, we analyzed zero-order correlations between the three components of empathy, reflective thoughts, self-related risk perception, other-related risk perception, and behavioral intentions. As reported in the Online Appendix (Table A1), all variables were positively and significantly correlated, as expected, with moderate to large correlations.

Effects of Personal Testimonials on Empathy

Main and interaction effects of the stimulus conditions on empathy were analyzed by conducting a 2 (personal testimonials: absent vs. present) × 2 (type of risk: storm vs. hail) univariate analysis of variance (ANOVA, see Online Appendix, Table A2). As expected in H1, the presence of personal testimonials in the video had a significant main effect on empathy, $F(1,789) = 8.61$, $p = .003$. Consistent with the pretest, the main and interaction effects of the type of risk portrayed were not significant, suggesting that the effect of personal testimonials on empathy could be generalized across both types of risks. The main effects of testimonials were also significant for the three sub-facets of empathy: cognitive empathy, $F(1,782) = 5.13$, $p = .024$, matching emotions, $F(1,787) = 4.33$, $p = .038$, and empathic concern, $F(1,786) = 7.76$, $p = .005$, with no significant main or interaction effects for the type of risk. Thus, the effect of personal testimonials on empathy predicted in H1 was supported for all sub-facets of empathy and for the composite index.

[2] https://osf.io/ychgr/overview?view_only=36c67d096fed41329444ef9e6a51f98b

However, mean differences of empathy between the conditions with personal testimonials (M = 3.35, SD = 0.75) and without testimonials (M = 3.19, SD = 0.75) were relatively small.

Effects of Personal Testimonials and Empathy on Reflective Thoughts, Risk Perception, and Behavioral Intentions

To test our hypotheses on the effects of personal testimonials and empathy on the mediating and dependent variables, we estimated a structural equation model using the original items, with the presence versus absence of personal testimonials as the exogenous variable, empathy as a second-order factor, and all other variables as first-order factors. In addition to the hypothesized effects, we modeled correlations between self- and other-oriented risk perception as well as between behavioral intentions to take protective measures and to share information with other homeowners. Age, gender, and education were controlled for on all first-order factors. We obtained robust full-information maximum likelihood (MLR) estimates using the R package *lavaan* (version 0.6-17; Rosseel, 2012) and calculated Monte Carlo-simulated confidence intervals (n = 200,000 trials) to assess the indirect and total effects (Preacher & Selig, 2012). Overall, the model showed a satisfactory fit to the data, robust χ^2 = 905.36, df = 275, p < .001, χ^2/df = 3.29, robust CFI = .952, robust RMSEA = .057, 90% CI of robust RMSEA [.053, .061], SRMR = .064. The full model, including the obtained estimates, is depicted in Figure 2.

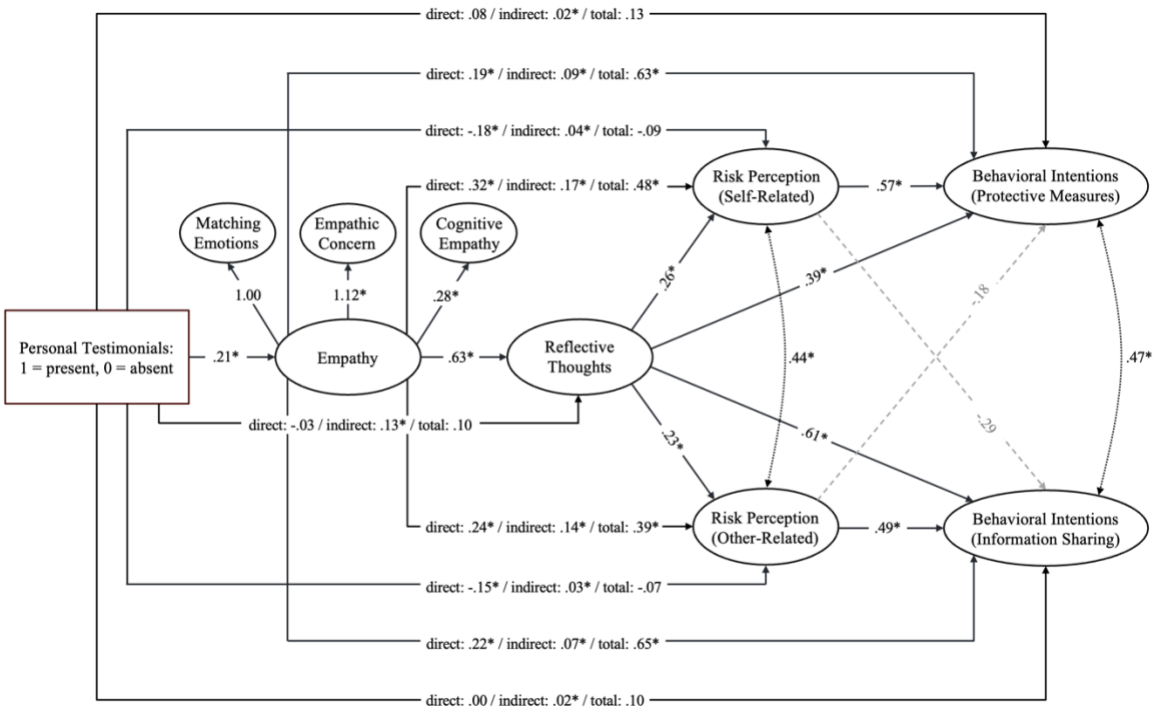

Figure 2. Structural equation model.

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Note. Unstandardized coefficients are reported, controlling for age, gender, and education. Significant effects (95% CI not including 0) are marked with asterisks (*); confidence intervals are reported in the main text and in Tables 1 and 2.

Direct, indirect, and total effects are reported in Tables 1 and 2. Details of the measurement model are documented in the analysis script and output in the Online Appendix.[3]

Empathy Effects

As assumed in H2, empathy with homeowners affected by environmental risks had a significant direct effect on reflective thoughts about the issue, b = .63, SE = .05, 95% CI [.536, .715]. As predicted in H3, empathy had a significant total effect on self-related risk perception, b_{total} = .48, SE = .04, 95% CI [.398, .563]. H3a assumed an indirect effect of empathy on self-related risk perception via reflective thoughts, which was supported as well, $b_{indirect}$ = .17, SE = .03, 95% CI [.109, .223]. As assumed in H5, empathy had a significant total effect on behavioral intentions to take protective measures, b_{total} = .63, SE = .05, 95% CI [.533, .727]. Furthermore, as predicted in H5a, empathy had an indirect effect on behavioral intentions via reflective thoughts and self-related risk perception, $b_{indirect}$ = .09, SE = .04, 95% CI [.013, .186].

As assumed in H4, empathy had a significant total effect on other-related risk perception, b_{total} = .39, SE = .04, 95% CI [.302, .466]. The indirect effect of empathy on other-related risk perception via reflective thoughts predicted in H4a was significant as well, $b_{indirect}$ = .14, SE = .03, 95% CI [.084, .201]. As assumed in H6, empathy had a significant total effect on behavioral intention to share information with other homeowners, b_{total} = .65, SE = .06, 95% CI [.538, .762]. Moreover, as predicted in H6a, empathy had a significant indirect effect on behavioral intentions via reflective thoughts and other-related risk perception, $b_{indirect}$ = .07, SE = .04, 95% CI [.007, .147].

[3] https://osf.io/ychgr/overview?view_only=36c67d096fed41329444ef9e6a51f98b

Table 1. Direct, Indirect, and Total Effects of Empathy on Reflective Thoughts, Risk Perception, and Behavioral Intentions.

		b		95% CI	
		SE		LL	UL
E → RT					
(H2)	direct effect	0.63*	.05	.536	.715
E → RT → RPS					
	direct effect	0.32*	.05	.219	.413
(H3)	total effect	0.48*	.04	.398	.563
(H3a)	indirect effect	0.17*	.03	.109	.223
E → RT → RPO					
	direct effect	0.24*	.05	.145	.341
(H4)	total effect	0.39*	.04	.302	.466
(H4a)	indirect effect	0.14*	.03	.084	.201
E → RT → RPS → BIPM					
	direct effect	0.19*	.06	.063	.314
(H5)	total effect	0.63*	.05	.533	.727
(H5a)	indirect effect	0.09*	.04	.013	.186
E → RT → RPO → BISI					
	direct effect	0.22*	.07	.082	.367
(H6)	total effect	0.65*	.06	.538	.762
(H6a)	indirect effect	0.07*	.04	.007	.147

Note. E: empathy, RT: reflective thoughts, RPS: risk perception (self-related), RPO: risk perception (other-related), BIPM: behavioral intention to take protective measures, BISI: behavioral intention to share information. *b*: unstandardized coefficients, controlling for age, gender, and education. * 95% CI not including 0. *SE*: Huber-White robust standard errors. CI: for indirect and total effects: Monte Carlo confidence intervals (*n* = 200,000 trials). *N* = 809.

Testimonial Effects

As assumed in H1 and consistent with the ANOVA results, personal testimonials had a significant direct effect on empathy, b = .21, SE = .07, 95% CI [.075, .347]. H7a assumed a total effect of personal testimonials on reflective thoughts and an indirect effect of personal testimonials on reflective thoughts via empathy. The indirect effect was significant, b_{indirect} = .13, SE = .04, 95% CI [.047, .220], but the total effect was not significant. H7b predicted a total effect of personal testimonials on self-related risk perception and an indirect effect via empathy and reflective thoughts. A similar pattern emerged for H7a, with a significant indirect effect, b_{indirect} = .04, SE = .01, 95% CI [.012, .062], but a nonsignificant total effect. H7d predicted a total effect of personal testimonials on behavioral intentions to implement protective measures and an indirect effect via empathy, reflective thoughts, and self-related risk perception. Again, the indirect effect was significant, b_{indirect} = .02, SE = .01, 95% CI [.002, .046], but the total effect was not.

H7c assumed a total effect of personal testimonials on other-related risk perception and an indirect effect on other-related risk perception via empathy and reflective thoughts. The indirect effect was

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significant, $b_{indirect}$ = .03, *SE* = .01, 95% CI [.009, .055], but the total effect was not. H7e predicted a total effect of personal testimonials on behavioral intention to share information with other homeowners and an indirect effect via empathy, reflective thoughts, and other-related risk perception. A similar pattern emerged with a significant indirect effect, $b_{indirect}$ = .02, *SE* = .01, 95% CI [.001, .037], and a nonsignificant total effect. Thus, H7a–e were partially supported.

Table 2. Direct, Indirect, and Total Effects of Personal Testimonials on Empathy, Reflective Thoughts, Risk Perception, and Behavioral Intentions.

		b	*SE*	95% CI	
				LL	UL
T → E					
(H1)	direct effect	0.21*	.07	.075	.347
T → E → RT					
	direct effect	−0.03	.06	−.150	.083
(H7a)	total effect	0.10	.07	−.036	.232
(H7a)	indirect effect	0.13*	.04	.047	.220
T → E → RT → RPS					
	direct effect	−0.18*	.06	−.292	−.0.07
(H7b)	total effect	−0.09	.07	−.217	.042
(H7b)	indirect effect	0.04*	.01	.012	.062
T → E → RT → RPO					
	direct effect	−0.15*	.06	−.257	−.035
(H7c)	total effect	−0.07	.06	−.194	.049
(H7c)	indirect effect	0.03*	.01	.009	.055
T → E → RT → RPS → BIPM					
	direct effect	0.08	.06	−.042	.201
(H7d)	total effect	0.13	.07	−.020	.273
(H7d)	indirect effect	0.02*	.01	.002	.046
T → E → RT → RPO → BISI					
	direct effect	0.00	.07	−.141	.148
(H7e)	total effect	0.10	.09	−.069	.273
(H7e)	indirect effect	0.02*	.01	.001	.037

Note. T: testimonial, E: empathy, RT: reflective thoughts, RPS: risk perception (self-related), RPO: risk perception (other-related), BIPM: behavioral intention to take protective measures, BISI: behavioral intention to share information. *b*: unstandardized coefficients, controlling for age, gender, and education. * 95% CI not including 0. *SE*: Huber-White robust standard errors. CI: for indirect and total effects: Monte Carlo confidence intervals (*n* = 200,000 trials). *N* = 809.

Discussion

Our study aimed to examine the role of personal testimonials and empathy in environmental risk communication. Personal testimonials are a common message element in other domains of risk communication, but theoretical and empirical understanding of their persuasive effects are only beginning

to emerge (Cohen et al., 2025; de Wit et al., 2008; Hecht et al., 2022; Watts et al., 2023). A recent line of research suggests that self-disclosure of testimonials affected by an issue can be openly persuasive and disarming at the same time because self-disclosure is typically perceived as a legitimate attempt at persuasion if it comes from a place of authentic emotions, needs, and vulnerabilities that elicit empathy (Hecht et al., 2022; Uthappa, 2017; Watts et al., 2023).

To extend this promising line of research, we considered the effects of risk communication videos for homeowners on damage from extreme weather events, such as storms and hails, and on protective construction measures. Information videos were shown either with or without testimonials from homeowners affected by the issue. This allowed us to examine the influence of personal testimonials and empathy on reflective thoughts, risk perception, and behavioral intentions. Testimonial effects were examined in a naturalistic setting using risk awareness videos for homeowners published by the FOCPDA on the agency's information website. This approach had advantages in terms of ecological validity, but it was also associated with limitations concerning the experimental operationalization of testimonial effects because of small effect sizes.

The correlational part of our model was fully supported. As expected, empathy was a significant predictor of reflective thoughts, self-related risk perception, and intention to take protective measures. Empathy also emerged as a significant predictor of other-related risk perception and intention to share information with other homeowners. Thus, all total effects of empathy assumed in H2–H6 and corresponding indirect effects assumed in H3a–H6a were supported.

Support for the experimental part of our model concerning the effects of testimonials as a specific empathy-eliciting message feature was mixed, however. The indirect effects of personal testimonials on the mediating and dependent variables predicted in H7a–e were significant, while the corresponding total effects were not significant. According to Hayes (2022), an absence of total effects does not undermine the validity of indirect effects (pp. 122–125). From a theoretical perspective, indirect effects are of particular relevance, as they reflect the causal chain of effects assumed in the conceptual model.

From a practical perspective, however, total effects are also relevant because they reflect the net effect of message elements represented in the experimental conditions. In our study, the net effect of personal testimonials on reflective thoughts, risk perception, and behavioral intentions was not significant. This can be partly explained by the small size of the effect of the testimonial condition on empathy. With such a small effect of the experimental factor on the key predictor variable, it was difficult to observe significant total effects on the dependent variables. On the upside, this means that information videos about damage caused by storms and hails elicited substantial empathy with homeowners affected by these issues, even without personal testimonials. On the downside, the added value of personal testimonials was small. The testimonial statements in our stimulus videos were relatively short (about 30 seconds) compared with informational message elements (about four minutes) and were compiled from several homeowners. Longer testimonial statements of a single person might allow more time for empathy and persuasion effects to unfold.

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Another possible explanation for nonsignificant total effects is that the theoretically expected effects of the experimental factor (positive indirect effects via empathy) can be cancelled out by negative indirect effects via unobserved confounding variables. In our study, unexpected negative effects of personal testimonials on self- and other-related risk perception emerged when the positive effects of testimonials via empathy and reflective thoughts were statistically controlled. We can only speculate about possible unobserved confounding variables. For example, a lack of perceived similarity with the testimonials might have undermined perceived vulnerability (Moyer-Gusé & Nabi, 2010), such that the positive effects of testimonials on risk perception via empathy were cancelled out. To fully harness the potential of personal testimonials, possible confounding variables need to be identified and controlled.

Limitations

Overall, the advantages of using naturalistic stimulus materials came with limitations concerning the magnitude of empathy effects observed. Given the small effect of the testimonial condition on empathy, the lack of independent experimental manipulation of other mediating variables, and the nonsignificant total effects on the mediating and dependent variables, causality needs to be interpreted with caution. For example, we cannot rule out a reverse causal effect of preexisting risk perceptions and behavioral intentions on empathy for homeowners affected by the issue, or a general confounding influence of issue involvement on the variables in our model.

To substantiate the present results, personal testimonials with stronger empathy effects are needed. Instead of short testimonial statements compiled from several homeowners, longer testimonial narratives of a single person might be used. It is important to note, however, that in Shen's (2019) study, effects of message features on empathy were generally small compared with empathy effects of individual factors like trait empathy, perceived similarity with the characters, and perceived message sensation value. Such individual factors could be analyzed as moderators or tailored to amplify the effects of message factors (e.g., by matching testimonials to participants' social features).

Further limitations concern the measurement of self-reported behavioral intentions to implement protective measures and to share information with other homeowners. Behavioral intentions are valid predictors of behavior (Ajzen, 1991); nevertheless, it is important to complement such measures with behavioral observation or self-report of actual behavior at follow-up. Moreover, our measurement of matching emotions was limited to fear and worry, consistent with the focus of risk communication on these emotions (Myrick & Oliver, 2015; Wilson et al., 2019). It would be worthwhile to include other negative and positive emotions, considering that empathy with positive emotions can promote prosocial behavior (Andreychik & Migliaccio, 2015) and self-efficacy (Adams et al., 2022).

Conclusion

With these limitations in mind, our findings add to a growing line of evidence concerning the role of empathy as a promising factor in risk communication. Our findings suggest that empathy effects can be generalized from health communication (Campbell & Babrow, 2004; Luong & Moyer-Gusé, 2021; Myrick &

Oliver, 2015; Shen, 2010a) to other domains of risk communication, such as environmental risks, where persuasive effects of empathy are less well researched (Kim & Cooke, 2021; Wang et al., 2023).

Our findings also add to an emerging line of research on the persuasive effects of personal testimonials (Cohen et al., 2025; Hecht et al., 2022; Watts et al., 2023), which can be openly persuasive and disarming at the same time, because authentic self-disclosure is typically perceived as a legitimate form of persuasion. Given the prevalence and popularity of personal testimonials on social media, it seems important to further explore their effects in risk communication and other domains of persuasive communication.

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