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How the persuasiveness of statistical evidence compared to personal testimonials depends on the recipient's distance from the message issue

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Abstract

Statistical facts and personal testimonials (anecdotal evidence) are two common types of evidence used in health education, warning messages, and charitable appeals. While statistical evidence provides aggregated numerical information, messages that use anecdotal evidence typically describe an individual experience. Because research has not found a stable advantage of one type of evidence over the other, the literature has sought to identify moderators that predict when statistical or anecdotal evidence is more persuasive. This paper shows that the relative persuasiveness of statistical versus anecdotal evidence depends on the psychological distance between the message recipient and the message issue. An increase (decrease) in recipients' message-issue distance increases the relative persuasiveness of statistical (anecdotal) evidence. In addition, we show that message-issue distance determines how personally useful message recipients find statistical and anecdotal evidence. We also demonstrate that recipients' more abstract (concrete) thinking about the message issue prior to message exposure increases the persuasiveness of statistical (anecdotal) evidence. Based on our findings, we recommend that social marketers use statistical (anecdotal) evidence when the recipients' distance from the message issue is high (low) and the recipients' thinking about the message issue is abstract (concrete). Before deciding on the type of evidence, message designers may need to assess how abstract or concrete their target audience thinks about the message issue. The short measure used in Experiment 1b of this paper may be useful. It is adaptable to different message contexts and could easily be implemented in pretests to decide when to use statistical or anecdotal evidence.

1 | INTRODUCTION

Messages in health education, risk communication and charity advertising often use statistical evidence or personal testimonials to support their claims (Small et al., 2007; Zebregs et al., 2015). While statistical evidence provides aggregated numerical information, such

as “30% of U.S. cancer deaths can be attributed to tobacco use” (Truth Initiative, 2022), messages that use personal testimonials typically describe an individual's experience, such as “John, 54, long-term smoker, has been diagnosed with lung cancer” The literature has used various terms for the latter type of information, most commonly anecdotal evidence (Cox & Cox, 2001), narrative evidence (Ma &

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Nan, 2018), exemplars (Brosius & Bathelt, 1994), personal testimonials (De Wit et al., 2008), and identifiable lives (Slovic, 2007). This paper uses the term anecdotal evidence.

Numerous studies have compared the effectiveness of statistical and anecdotal evidence (see Freling et al., 2020 for a review). While some studies report an advantage of statistical evidence over anecdotal evidence (e.g., Hornikx, 2005), other studies report the opposite (e.g., Winterbottom et al., 2008). Because research has not observed a general advantage of one type of evidence over the other, the literature has sought to identify moderators that predict when statistical or anecdotal evidence is more persuasive (e.g., Freling et al., 2020). Surprisingly, in the search for explanations of when statistical or anecdotal evidence has a persuasive advantage, the literature has paid relatively little attention to the psychological distance of the message issue from the message receiver (Trope & Liberman, 2010). We use the term message issue to refer to the problem or appeal that the message raises. To support their appeals, messages may present statistical or anecdotal evidence. For example, a fundraising appeal for malnourished children in a particular country (message issue) may feature percentages of malnourished children in that country (statistical evidence) or a single child (anecdotal evidence). Thus, from the perspective of message designers, the choice of evidence type may be independent of the message issue. However, we argue that the effectiveness of anecdotal and statistical evidence depends on the psychological distance of the message issue from the message receiver, and their more concrete or abstract thinking about the message issue.

Drawing on the positive effects of construal-level fit (e.g., Dogan & Erdogan, 2020; Park et al., 2020; Reczek et al., 2018), we propose that messages that combine psychologically close message issues with anecdotal evidence and psychologically distant message issues with statistical evidence should be more persuasive than messages that combine close message issues with statistical evidence and distant message issues with anecdotal evidence. Ma and Nan (2018) and Kim and Nan (2019) put forward a very similar proposition. Their reasoning, and ours, is based on the arguments that recipients' message-issue distance is linked to constructing more high-level/low-level representations of the message issue (Soderberg et al., 2015; Trope & Liberman, 2010) and that statistical evidence tends to be high-level information (Hastall & Knobloch-Westerwick, 2013), while anecdotal evidence tends to be low-level information (Kim & Nan, 2019; Yan & Sengupta, 2013).

Relatively few studies have examined the moderating effect of recipients' message-issue distance on the effects of anecdotal and statistical evidence on behavior or behavioral intentions. Ma and Nan (2018) and Kim and Nan (2019) tested the interaction. However, Ma and Nan (2018) found no differences in the resulting intentions, and Kim and Nan (2019) did not show each of the absolute advantages they predicted. Thus, the empirical evidence for the expected interaction seems sparse, which may lead researchers to question the general proposition. Because the proposed interaction between evidence type and message-issue distance is theoretically convincing, this paper revisits and reexamines the effect. First, we will explain why the findings of Ma and Nan (2018) and Kim and Nan (2019) do not contradict

their rationale and ours, and how this research differs from previous studies.

Ma and Nan (2018) used an anecdotal message and a “non-narrative” message and found no differences in the resulting intentions. However, the “non-narrative” message used by Ma and Nan (2018) included details about the harmful effects of smoking. Yet, the interaction predicted here is based on the argument that anecdotal messages tend to be low-level information and statistical messages tend to be aggregated, high-level information. Thus, the “non-narrative” message used by Ma and Nan (2018) may have presented relatively concrete, low-level information rather than global, abstract information, and as such may have been inconsistent with the theoretical rationale the authors were testing. The present paper will use anecdotal and statistical evidence to test the rationale. Kim and Nan (2019) predicted that anecdotal messages would be more effective than nonnarrative messages in a close situation, while nonnarrative messages would be more effective than anecdotal messages in a distant situation. Kim and Nan (2019) found an interaction but did not show each of the absolute advantages they expected. We argue that such absolute advantages are desirable but not necessary to support the theoretical rationale because the manipulated psychological distance is relative. Figure 1 illustrates our reasoning. For example, imagine two donation appeals that depict individuals in need. One depicts individuals from the same country as the recipient, and the other depicts individuals from a different country. Typically, the psychological distance between the message and the recipient should be smaller in the first situation (same country) than in the second (foreign country). Closer/less distant, however, does not necessarily mean that the former message issue (same country) is perceived by the receiver as psychologically close in absolute terms, which may be required to result in low-level construal and the predicted absolute advantage of anecdotal over statistical evidence. For an illustration of the above

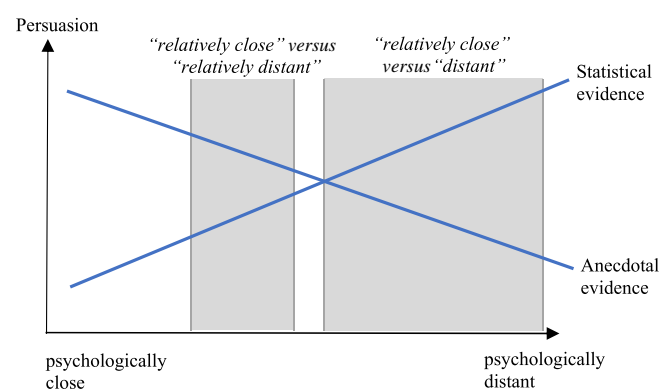


FIGURE 1 Prototypical effects of anecdotal and statistical evidence as a function of message-issue distance, as proposed in this research (in blue), and two examples of areas that might be considered with message issues of specific experiments (in grey). (As psychological closeness can be related to the personal relevance of the message issue, a main effect of psychological closeness on behavior or behavioral intentions may emerge, which is not illustrated in Figure 1).

example, see the right of the two gray areas in Figure 1. Therefore, we argue that the theoretical rationale proposed by Ma and Nan (2018) and Kim and Nan (2019) and in this paper is already supported if a statistical message, compared to an anecdotal message, is relatively more effective in a distant situation than in a close situation, and an anecdotal message, compared to a statistical message, is relatively more effective in a close situation than in a distant situation. Consequently, this research will propose relative advantages. In addition, this paper tests whether recipients' concrete/abstract thinking about the message issue moderates the persuasiveness of statistical and anecdotal evidence.

By explaining why the findings of the studies by Ma and Nan (2018) and Kim and Nan (2019) do not contradict their theoretical rationale, and by retesting the moderation with messages that align better with the theoretical explanation, our research contributes to theory and to a better understanding of the persuasiveness of anecdotal and statistical evidence. We explain and demonstrate that recipients' message-issue distance (Study 1a) and recipients' concrete/abstract thinking about the message issue (Study 1b) determine the effectiveness of anecdotal and statistical evidence. This paper also shows that message-issue distance determines how personally useful message recipients perceive statistical and anecdotal evidence to be (Study 2). This article is organized as follows. First, we describe the basic characteristics of anecdotal and statistical evidence. We then explain how the persuasiveness of statistical and anecdotal evidence should depend on the psychological distance of the message recipient from the message issue and on the recipient's concrete/abstract thinking about the message issue. In addition, we explain why the perceived usefulness of the information should mediate the effect. Subsequently, we present three experiments. Finally, we discuss the findings of our studies and provide suggestions for practice and future research.

2 | THE PERSUASIVENESS OF STATISTICAL AND ANECDOTAL EVIDENCE

Both statistical and anecdotal evidence have specific strengths, and both types of evidence can persuade message recipients (Freling et al., 2020). Statistical evidence consists of a large number of representative cases. As such, it is highly predictive and is often considered more informative than anecdotal information (Greene & Brinn, 2003; Hoeken & Hustinx, 2009). Anecdotal evidence is vivid, specific, and easily imagined, and can make an issue feel closer and more relevant to message recipients (De Wit et al., 2008; Zillmann & Brosius, 2012). Furthermore, identifiable victims (anecdotal evidence) are emotionally engaging, whereas statistical information does hardly evoke affect (Cox & Cox, 2001; Slovic, 2007). As a result, anecdotal information is processed less analytically than statistical evidence (Escalas, 2007; Slovic, 2007; Small et al., 2007) and generates fewer counterarguments (Kang et al., 2020; Slater & Rouner, 1996). Consistent with the specific strengths of each type of evidence, studies that have compared the persuasiveness of statistical and anecdotal evidence report mixed results. While some studies show an advantage of statistical

evidence over anecdotal evidence (e.g., Hoeken & Hustinx, 2009), other studies show the opposite (e.g., De Wit et al., 2008; Greene et al., 2010).

Because of the inconsistent findings, the literature has sought to identify moderators that may predict when statistical or anecdotal evidence is more persuasive. Research has suggested several moderators, including value congruency (Slater & Rouner, 1996), message framing (e.g., Cox & Cox, 2001), and personal relevance (e.g., Freling et al., 2020). For literature reviews, see Freling et al. (2020) and Lee and Feeley (2016). This paper examines a moderator that has received relatively little attention in the literature, namely, the psychological distance between the message recipient and the message issue. Below we explain how the effectiveness of anecdotal and statistical evidence should depend on the psychological distance of the message recipients from the message issue.

3 | HOW THE PERSUASIVENESS OF STATISTICAL AND ANECDOTAL EVIDENCE MAY DEPEND ON MESSAGE-ISSUE DISTANCE

3.1 | The moderating role of receivers' message-issue distance

3.1.1 | Theoretical explanations

Message issues may be more or less psychologically distant from the message recipient (Trope & Liberman, 2010). Examples of message issues that may evoke different levels of psychological distance include risks to self-versus others, consequences that will occur today versus years from now, and near versus far regions for donation appeals (Soderberg et al., 2015). According to Construal Level Theory, individuals tend to form high level, that is, general and abstract mental representations, when an issue is psychologically distant (Liberman & Trope, 1998). In contrast, when an issue is psychologically close, individuals tend to form low level, that is, specific and detailed mental representations. Many studies have shown the link between psychological distance and how concretely or abstractly individuals think about an event or object (e.g., Fujita et al., 2006; Liviatan et al., 2008; Wakslak et al., 2006, see Soderberg et al., 2015 for a meta-analysis).

The literature has also shown that information that aligns with consumers' high-level or low-level thinking is easier to process and more persuasive (Carter et al., 2020; Ein-Gar & Levontin, 2013; Han et al., 2016; Lee et al., 2010; Park et al., 2020; White et al., 2011). Thus, among message recipients who are confronted with a psychologically close message issue and engage in low-level thinking, supporting evidence that is specific and concrete should be more persuasive than supporting evidence that is global and on a superordinate level. Among recipients who are confronted with a psychologically distant message issue, supporting evidence that is global and superordinate should be more persuasive than evidence that is specific, low-level information.

Because anecdotal evidence describes the fate of a single individual, it tends to be specific, low-level information (Kim & Nan, 2019). In contrast, statistical evidence uses aggregated numerical information and is therefore global, high-level information (Hastall & Knobloch-Westerwick, 2013). For example, Soderberg et al. (2015, p. 526) describe “exemplars” and “situational information” (typically presented in anecdotal messages) as concrete, low-level descriptions of an event, and “aggregate information” (typically presented in statistical messages) as more abstract, high-level descriptions. Thus, in line with Ma and Nan (2018) and Kim and Nan (2019), we argue that messages that combine message issues that are psychologically close to the recipient with anecdotal evidence and message issues that are distant from the recipient with statistical evidence should create a construal-level fit and be more persuasive than messages that combine close message issues with statistical evidence or distant message issues with anecdotal evidence.¹ The above reasoning may implicitly suggest that message recipients first notice the message issue and then read the supporting evidence that the message provides. This temporal sequence may be true, but it is not relevant to our argument, which is based on the construal-level fit within the message. Our argument remains valid if the recipients of the message first read the anecdotal or statistical evidence and thereby become aware of the message issue. Not only the message issue, but also the type of evidence can determine the level of abstraction of the message recipient's thinking (Soderberg et al., 2015). Thus, when message receivers process anecdotal (statistical) evidence and engage in concrete (abstract) thinking, a close (distant) message issue raised by the message should be more construal-level congruent than a distant (close) issue.

In addition, if close message issues are more emotionally engaging than distant message issues (Abraham et al., 2023; Mühlberger et al., 2008; Williams et al., 2014), affective/narrative versus analytical processing (Escalas, 2007) may provide a related explanation for the interaction between evidence type and message-issue distance. Low versus high emotional engagement leads consumers to think more analytically (Blanchette, 2006; Freling et al., 2020). Compared to affective processing, analytical processing is more likely to elicit critical thinking, so persuasion requires strong arguments (Escalas, 2007). Because an anecdotal message presents only one exemplar, its predictive power is weak and it can be perceived as a relatively weak argument (Hoeken & Hustinx, 2009). Taken together, the tendency to

¹Our proposition is based on the argument that anecdotal evidence is concrete, low-level information, while statistical evidence is aggregated, high-level information. One reviewer pointed out that statistical evidence can be perceived as concrete information. For example, a probability of 25% means one in four people, which can be perceived as concrete when applied to a group of people. However, we argue that compared to exemplars, statistical information is at an aggregate level, more abstract, and more likely to evoke high-level thinking (Soderberg et al., 2015, p. 526). To further address this issue and potential concern, Experiment 1b of this paper tests whether recipients' more concrete/abstract thinking about the message issue (prior to exposure to the message) determines the persuasiveness of statistical and anecdotal evidence (see H1b). The positive effects of construal-level fit on persuasion have been repeatedly demonstrated (Carter et al., 2020; Ein-Gar & Levontin, 2013; Han et al., 2016; Lee et al., 2010; White et al., 2011). Thus, if recipients think concretely about the message issue and anecdotal evidence is relatively concrete information, then anecdotal evidence should be more persuasive than statistical evidence. If recipients think abstractly about the message issue and statistical evidence is relatively abstract information, then statistical evidence should be more persuasive than anecdotal evidence.

engage in analytical thinking should be higher for distant message issues, and here message recipients should be more likely to recognize that the informational value of an anecdotal message is weak. In contrast, when the message issue is close, recipients may be more likely to engage in affective processing and find an anecdotal message relatively meaningful because they are less likely to recognize its low informational value.

3.1.2 | Previous findings

Ma and Nan (2018) and Kim and Nan (2019) have examined the effect of evidence type on behavioral intentions as a function of message-issue distance. We discussed both experiments in the Section 1. Kim and Nan (2019) found the proposed interaction but had predicted absolute advantages that their study did not reveal. The nonnarrative message that Ma and Nan (2018) used may not have been high-level information. Furthermore, the study asked nonsmoking students to imagine that either their best friend (close situation) or an average student (distant situation) smoked and to report their intentions to persuade the other person to quit. It is possible that this manipulation of psychological distance did not result in different thinking styles, since 69% of participants reported not having a close friend who smokes. Therefore, as argued earlier, the findings of Kim and Nan (2019) are consistent with the proposed interaction, and the findings of Ma and Nan (2018) do not challenge the proposed effect. Research by Ledgerwood et al. (2010) showed that temporal distance increases the weight consumers place on aggregate compared to individualized information about a product's effectiveness, which is consistent with the moderating effect predicted here. Ledgerwood et al. (2010) did not use anecdotal messages such as those studied here (describing a person's fate). However, the messages are related to the evidence types tested here and to the theoretical reasoning of this paper. Although Yan and Sengupta (2013) did not examine behavioral intentions, their findings are consistent with our rationale because they showed that consumers' reliance on statistical (anecdotal) information increased (decreased) with psychological distance. The meta-analysis by Freling et al. (2020) did not explicitly consider message-issue distance, but its findings are consistent with and related to the interaction proposed in this paper. Freling et al. (2020) report that anecdotal evidence proved more persuasive than statistical evidence when personal relevance and emotional engagement were high, whereas statistical evidence proved more persuasive when personal relevance was low. The personal relevance of a message issue can be related to psychological distance, as closer message issues may feel more relevant to individuals than distant message issues (Soderberg et al., 2015).

3.1.3 | Hypotheses

We propose a hypothesis about the relative effectiveness of statistical versus anecdotal evidence (and vice versa), depending on the psychological distance of the message recipient from the message issue. This research examines psychological distance in relative terms because,

for example, a “less distant” message issue is not necessarily close in absolute terms and therefore may not result in an absolute advantage of anecdotal over statistical evidence (see Figure 1). We propose:

H1a. *Recipients' message-issue distance moderates the effect of evidence type on compliance intention such that the relative persuasiveness of statistical evidence (compared to anecdotal evidence) increases with increasing message-issue distance, and the relative persuasiveness of anecdotal evidence (compared to statistical evidence) increases with decreasing message-issue distance.*

Along with Ma and Nan (2018) and Kim and Nan (2019), we have suggested that construal-level fit is a relevant explanation for why recipients' message-issue distance moderates the persuasiveness of statistical and anecdotal evidence. Thus, under the assumption that statistical (anecdotal) evidence is relatively abstract (concrete) information, the recipients' abstract/concrete thinking about the message issue is the actual explanatory variable of the theoretical rationale proposed here. Positive effects of construal-level fit on persuasion have been repeatedly demonstrated (Carter et al., 2020; Ein-Gar & Levontin, 2013; Han et al., 2016; Lee et al., 2010; White et al., 2011). If recipients think concretely about the message issue and anecdotal evidence is concrete information, then anecdotal evidence should be more persuasive than statistical evidence. If recipients think abstractly about the message issue and statistical evidence is abstract information, then statistical evidence should be more persuasive than anecdotal evidence. We propose:

H1b. *Recipients' concrete versus abstract thinking about the message issue moderates the effect of evidence type on compliance intention such that the persuasiveness of statistical evidence (compared to anecdotal evidence) increases with more abstract thinking, and the persuasiveness of anecdotal evidence (compared to statistical evidence) increases with more concrete thinking about the message issue.*

3.2 | The mediating role of the perceived usefulness of the message information

Message-issue distance may determine how personally useful message recipients perceive statistical and anecdotal evidence to be. The perceived usefulness of message information is, of course, subjective and context-dependent (DeLorme et al., 2009; Schwarz, 2010). When message information aligns with consumers' high-level or low-level thinking, it should be processed more fluently and less critically than when it does not (Cesario et al., 2004; Schwarz, 2004). For example, although a statistical message may be perceived as informative in principle, the perception of how personally useful such information is to the recipient at a given time may depend on the recipient's situational mindset. Similarly, while anecdotal evidence may be perceived as easy to imagine in principle, the perception of how personally

useful such anecdotal information is to the recipient at a given time may depend on the recipient's mindset. A combination of close message issues with anecdotal evidence, as well as a combination of distant message issues with statistical evidence, should make the message “feel right” to the recipient (Cesario et al., 2004), evoke less critical thinking, and make the message feel more personally useful (Ledgerwood et al., 2010; Schwarz, 2004). Furthermore, when a message is processed more analytically due to greater message-issue distance, recipients are more likely to recognize that a single exemplar (anecdotal evidence) is not a strong argument and may perceive the message as less useful than a statistical message. Taken together, the perceived usefulness of statistical versus anecdotal evidence should depend on recipients' message-issue distance. Since the perceived usefulness of the information provided by a message determines persuasion (Schwarz, 2010), perceived usefulness should mediate the effects of evidence type and message-issue distance on intentions. We propose:

H2a. *The perceived usefulness of statistical evidence (relative to anecdotal evidence) increases with increasing message-issue distance and the perceived usefulness of anecdotal evidence (relative to statistical evidence) increases with decreasing message-issue distance.*

H2b. *The effect of evidence type on behavioral intentions is mediated by the perceived usefulness of the message, and the effect of evidence type on the perceived usefulness of the message is moderated by message-issue distance (moderated mediation).*

4 | EMPIRICAL STUDIES

This paper presents three experiments. Study 1a tests H1a, Study 1b tests H1b and Study 2 tests H1a, H2a, and H2b. Figure 2 illustrates the effects tested in Experiment 1a.

4.1 | Experiment 1a

4.1.1 | Method

Stimuli and design

The study used a 2 (distance: same country vs. foreign country) × 2 (evidence type: statistical vs. anecdotal) between-subjects design. The messages asked for donations and described a project to support vacation homes for children with cancer—either in Germany (same

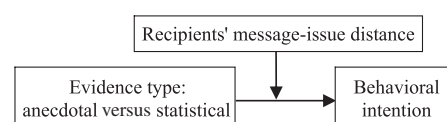


FIGURE 2 Effects studied in Study 1a.

country) or in Japan (foreign country). The study was conducted in Germany. We chose Japan because Germany and Japan are comparable in terms of their health care systems and the number of children with cancer (Globocan, 2012). The statistical evidence message reported how many new cases of childhood cancer are diagnosed each year. The anecdotal message told the story of a little girl with cancer. Appendix A shows the messages.

Procedure and sample

The study was programmed in the online survey software Unipark (www.unipark.com). The link to the online questionnaire was distributed by an online panel provider in Germany. The study randomly assigned participants to one of the messages. Because the panel provider administered the sample, we do not have information on response rates within the panel. Participants ranged in age from 17 to 88 ($M_{\text{age}} = 28$). The study included a control question asking in which country the project was located. Because the country (Germany or Japan) acted as a distance manipulation, we excluded participants who were unable to answer this question correctly (43), resulting in a final sample of 394 individuals. Overall, 44% of the sample was female, and the average age was 28. Three hundred sixty-eight individuals (93%) were German (16 individuals did not report their nationality, six were from Austria, one from Switzerland, and one was French). Overall 46% were employed or self-employed, 2% were homemakers, 39% were students, 5% indicated "other," and 7% refused to report their occupation. Overall 47% of respondents had donated within the past 12 months.

Measures

We asked participants if they had donated in the past 12 months (yes = 47%). Furthermore, we asked participants: "Have you ever donated for a cancer-related project or organization?" (yes = 19%) because involvement with cancer-related projects is likely to determine individuals' intentions in the context of this study. After message exposure, we measured receivers' intention to donate with the item "How likely are you to donate to the project described?" (1 = very unlikely, 7 = very likely). The manipulation check of psychological distance read "I feel closely related to the children in ..." [Japan or Germany] (1 = not at all, 7 = strongly). In addition, the study measured descriptive statistics and included a few questions not related to this article.

4.1.2 | Results

Manipulation check

Participants in the close condition expressed that they felt more closely related to the children than participants in the distant condition ($M_{\text{close}} = 3.47$; $M_{\text{distant}} = 1.96$; $t = 9.91$, $p = .000$). Thus, the distance manipulation was successful.

Covariate

Whether participants had donated to a cancer-related project in the past indicated their past behavior and involvement with cancer-related projects. Overall, 19.3% of participants reported having donated to a cancer-related project prior to the study. Because prior behavior was likely to determine donation intentions in this study, and the percentages differed across the four experimental groups (e.g., anecdotal message, close condition: 16%, statistical message, close condition: 25%), we controlled for the variable "previous donations to cancer-related projects" in our analysis and included it as a covariate. Below, we first report the relevant model with the covariate and then, for transparency, the model without the covariate.

Test of H1a

We performed analysis of covariance (ANCOVA) with donation intention as dependent variable, issue distance and evidence type as independent variables and prior cancer-related donations as covariate. Evidence type had no significant main effect ($F(1, 389) = .36$, $p = .551$, partial $\eta^2 = .001$). The main effect of issue distance was significant ($F(1, 389) = 27.93$, $p = .000$, partial $\eta^2 = .067$). Individuals were more likely to donate when donation recipients were from the same country. This negative main effect of distance is not surprising because donors tend to prefer charities working in their own country (Chapman et al., 2022; Herzenstein & Posavac, 2019). As expected, the issue distance by evidence type interaction was significant ($F(1, 389) = 4.51$, $p = .034$, partial $\eta^2 = .011$). Furthermore, the effect of the covariate (previous behavior) was significant; respondents who had previously donated to a cancer project were more likely to donate ($F(1, 389) = 29.10$, $p = .000$, partial $\eta^2 = .070$). Table 1 shows the mean values and estimated marginal means (EMM), Figure 3 illustrates the negative main effect of distance and the interaction effect between evidence type and distance. Consistent with H1a, the interaction effect shows that an increase in message-issue distance increased the relative persuasiveness of statistical evidence, while a

Issue distance	Evidence type	Means (SD)	EMM (SE)	N
Close condition	Anecdotal evidence	2.97 (1.57) ^{a**}	3.00 (.13) ^{c,d**}	102
	Statistical evidence	2.68 (1.50) ^{b*}	2.63 (.14) ^{c,e*}	94
Distant condition	Anecdotal evidence	2.00 (1.20) ^{a**}	1.99 (.13) ^{d**}	105
	Statistical evidence	2.18 (1.29) ^{b*}	2.20 (.14) ^{e*}	93

Note: Means with equal superscripts are significantly different at the level of .10 (at least), if they are additionally marked with *, they are significant at $p < .05$, if they are additionally marked with **, they are significant at $p < .01$.

*At $p < .05$. **At $p < .01$.

TABLE 1 Compliance intention across the conditions of Experiment 1a, means and estimated marginal means (EMM).

decrease in message-issue distance increased the relative persuasiveness of anecdotal evidence. The findings provide support for H1a.

For transparency, we report the findings of an ANOVA without the covariate. Again, evidence type had no significant main effect ($F(1, 390) = .14, p = .705, \text{partial } \eta^2 = .000$). The main effect of issue distance was significant ($F(1, 390) = 27.07, p < .001, \text{partial } \eta^2 = .065$). The issue distance by evidence type interaction was marginally significant at $p < .10$ ($F(1, 390) = 2.80, p = .095, \text{partial } \eta^2 = .007$). Note that the model controlling for past behavior (ANCOVA) should provide more reliable estimates of the effects than the model without the covariate because past behavior (the covariate) affected donation intentions and was not evenly distributed across the experimental groups.

Pairwise comparisons

We did not propose an absolute advantage of statistical evidence over anecdotal evidence in the distant condition or an absolute advantage of anecdotal evidence over statistical evidence in the close condition because, for example, “less distant” is not necessarily close (see Figure 1). Nevertheless, we report pairwise comparisons. In the close condition, anecdotal evidence tended to be more persuasive than statistical evidence at $p = .056$ ($EMM_{\text{anecdotal evidence}} = 3.00; EMM_{\text{statistical evidence}} = 2.63, F(1, 389) = 3.68$). In the distant condition, statistical evidence was slightly more persuasive than anecdotal evidence but the difference was not significant ($EMM_{\text{anecdotal evidence}} = 1.99; EMM_{\text{statistical evidence}} = 2.20, F(1, 389) = 1.18, p = .278$). An absolute advantage of statistical evidence over anecdotal evidence in the distant condition would require high-level or analytical thinking. However, it is possible that the children suffering from cancer evoked compassion in the recipients, which may have resulted in low-level construal, even in the relatively distant condition. In addition, a threatening subject such as cancer may evoke negative emotions, which may lead to relatively concrete, low-level construal even in the distant condition (Labroo & Patrick, 2009).

4.1.3 | Discussion of Experiment 1a

The interaction effect suggests that the effectiveness of anecdotal and statistical evidence depends on message-issue distance. Furthermore, anecdotal evidence was more effective than statistical evidence only in the close situation ($p = .056$), but not in the distant situation.

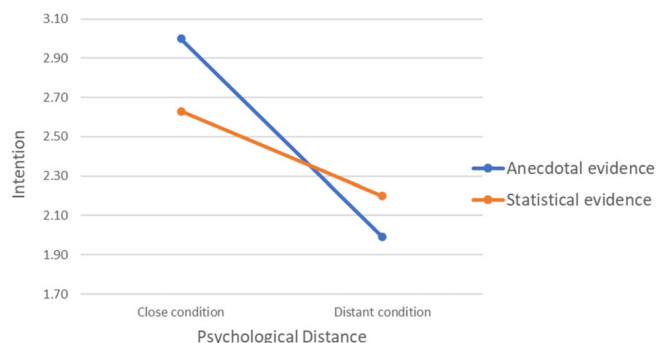


FIGURE 3 The effects of anecdotal and statistical evidence on intentions dependent on message-issue distance (Experiment 1a).

In the distant situation, statistical evidence was as effective as anecdotal evidence (and tended to be more effective).

We cannot exclude the possibility that the interaction effect between evidence type and issue distance in Experiment 1a was also driven by similarity and identification, since the effectiveness of the anecdotal message was much higher in the close than in the distant situation. The literature has demonstrated that anecdotal messages are more persuasive when the protagonists are similar to the recipients (De Graaf, 2014; Praxmarer-Carus & Wolkenstoerfer, 2018), and message recipients are more likely to identify with a person from their own country than with a person from a foreign country. However, the theoretical reasons why we expect the effectiveness of anecdotal and statistical evidence to depend on message-issue distance are more general (see Section 3) and are neither dependent on nor limited to protagonist similarity effects. To avoid such potential similarity and identification effects, Experiment 2, which also tests H1a, manipulates the recipients' message-issue distance as a temporal distance. Thus, similarity and identification will not be able to explain a potential interaction effect between evidence type and message-issue distance in Experiment 2.

4.2 | Experiment 1b

This experiment tests H1b and examines whether recipients' concrete/abstract thinking about the message issue moderates the persuasiveness of statistical and anecdotal evidence (see Figure 4). This study does not manipulate message-issue distance but measures how abstractly/concretely individuals think about the message issue prior to message exposure. The experiment focuses on individuals' issue-specific thinking. While individuals may have a chronic tendency to think more abstractly or more concretely (Hong & Lee, 2010; Vallacher & Wegner, 1989), mental representations should also vary within individuals and across events, for example, because the event may be psychologically closer or further away from the individual (Liviatan et al., 2008; Soderberg et al., 2015; Wakslak et al., 2006). While chronic tendencies and issue-specific construal levels should be related, individuals' concrete/abstract thinking about the message issue should be more influential in explaining the persuasiveness of anecdotal and statistical evidence and is the focus of this study.

4.2.1 | Method

Stimuli and design

The study manipulated the type of evidence (statistical vs. anecdotal) and measured participants' concrete/abstract thinking about the

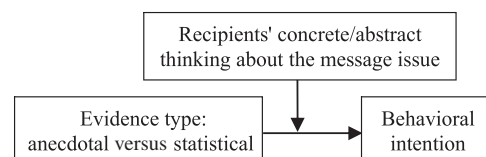


FIGURE 4 Effects studied in Study 1b.

message-issue prior to exposure to the message. The context of the study was tick-borne encephalitis and the messages recommended vaccination for individuals living in a risk area (several federal states and districts in Germany are risk areas). The statistical message reported cases of tick-borne encephalitis and the like, and the anecdotal message told the story of a student who was infected by a tick bite. Appendix B shows the messages.

Procedure and sample

The link to the online questionnaire was posted on the platform of a large student community in Germany. Participants received no compensation. The study randomly assigned participants to one of the messages, and the questionnaire was completed by 361 individuals. Because the German government's vaccine agency (RKI), and therefore German health professionals, recommend vaccination only for people living in a risk area (Robert Koch Institute, 2024), the messages did not apply to 94 participants who knew they did not live in a risk area. Since the vaccine is not recommended for them and the message recommendation did not apply to them, they had to be excluded from the study. The final sample consisted of 267 individuals (38.2% male, the average age was 24). As one vaccination is not sufficient and the vaccine needs to be boosted every 5 years, participants who had already been vaccinated against tick-borne encephalitis were not excluded (40% reported having been vaccinated).

Measures

Before we could ask participants how concretely/abstractly they thought about the message issue, we had to state the message issue. Participants read the following brief information: "Tick bites can infect humans with diseases such as tick-borne encephalitis, which can cause inflammation of the meninges and brain." To measure how concretely/abstractly participants thought about the message issue, we adapted a self-report item from Venus et al. (2019). The item read "When I think about tick bites and the potential dangers they pose, I tend to have ... concrete details in mind (= -4); ... in mind what it could mean for me in general (= +4). Participants responded on a 9-point rating scale. We chose this item, suggested by Venus et al.

(2019), for two reasons. First, it focuses on the core of the construct of interest (Bergkvist & Rossiter, 2007), which can be described as follows: Whereas low-level representations of events contain contextualized details, high-level representations of events achieve abstraction by omitting secondary details and focusing on their generalized meaning (Trope et al., 2007). Second, the short self-report measure may be useful in practice. It does not require coding of participants' open-ended responses, such as the linguistic category model (Semin & Fiedler, 1991), which involves controversy over how to interpret the terms expressed by individuals (Burgoon et al., 2013). And (if it explains the persuasiveness of anecdotal and statistical evidence) it could easily be used to pretest campaigns and decide when to use statistical or anecdotal evidence (see Section 5). After exposure to the message, we measured participants' intentions to get vaccinated with the item "How likely are you to get vaccinated?" (1 = very unlikely, 9 = very likely). The study also measured descriptive statistics, asked whether participants lived in a risk area, whether they had been vaccinated, and a few other questions not related to this article.

4.2.2 | Results

Covariate

Whether participants had been vaccinated against tick-borne encephalitis before taking part in our study indicates their general acceptance of vaccines. In the group that saw the statistical evidence, 44% had been vaccinated; in the anecdotal group, 36% had been vaccinated. We report the results with and without controlling for this variable (covariate).

Test of H1b

As the moderator was measured on a rating scale, we ran model 1 of Hayes' (2018) PROCESS macro to test H1b. Evidence type was the independent variable (statistical evidence = 0, anecdotal evidence = 1), concrete/abstract thinking about the message issue was the moderator (-4 = concrete; +4 = abstract), and vaccination intention was the dependent variable. Table 2 shows the findings. As

TABLE 2 Model 1 of Hayes' (2018) PROCESS macro (Experiment 1b).

	Model with covariate				Model without covariate			
	<i>b</i>	SE	<i>t</i> (262)	<i>p</i>	<i>b</i>	SE	<i>t</i> (263)	<i>p</i>
Constant	4.148	.256	16.18	.000	5.364	.243	22.07	.000
Evidence type (EvT)	.350	.310	1.130	.260	.118	.350	.336	.737
Concrete/abstract thinking (CL)	.145	.091	1.588	.114	.107	.103	1.037	.310
EvT × CL	-.391	.130	-3.001	.003	-.394	.147	-2.672	.008
Covariate	2.724	.314	8.675	.000	-	-	-	-
Conditional effects of evidence type at values of CL								
	Value of CL	Effect	SE	<i>p</i>	Value of CL	Effect	SE	<i>p</i>
16th percentile	-2.12	1.178	.441	.008	-2.12	.952	.498	.057
84th percentile	3.00	-.822	.460	.079	3.00	-1.064	.527	.044

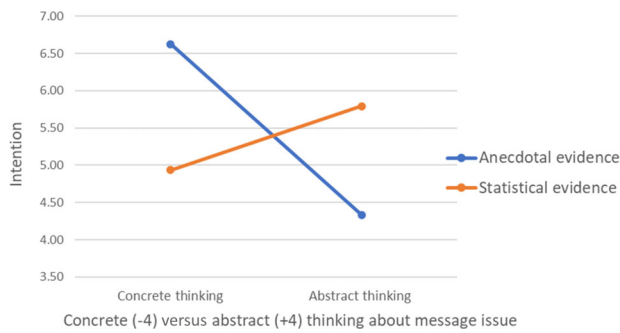


FIGURE 5 The effects of anecdotal and statistical evidence on intentions dependent on recipients' concrete/abstract thinking about the message issue (Experiment 1b).

expected, the interaction effect between evidence type and concrete/abstract thinking was significant. When individuals thought concretely about the message issue, the anecdotal message was more effective than the statistical message; when individuals thought abstractly about the message issue, the statistical message was more effective than the anecdotal message. In the model with the covariate, the moderator values defining Johnson-Neyman significance regions were $-.82$ (35.2% below, 64.8% above) and 3.50 (93.3% below, 6.7% above). In the model without the covariate, the Johnson-Neyman significance regions were -2.28 (15.7% below, 84.3% above) and 2.85 (80.9% below, 19.1% above). The findings provide support for H1b. Figure 5 illustrates the interaction. As expected, Experiment 1b shows that the persuasiveness of statistical and anecdotal evidence depends on recipients' concrete/abstract thinking about the message issue.

4.3 | Experiment 2

Experiment 2 studies H1a, H2a and H2b.

4.3.1 | Method

Stimuli and design

The study used a 2 (temporal distance: this month vs. next year) \times 2 (evidence type: statistical vs. anecdotal) between-subjects design. The messages described the risk of poverty due to becoming permanently unfit for work. In Germany, where the study was conducted, becoming unfit for work without private insurance often causes significant financial problems. Since government payments in such cases are low, a significant income gap results in families losing their standard of living and often their homes, ending up in relative poverty. If individuals become unfit for work as students, the government payment is even lower. In addition, the earlier individuals take out insurance, the lower the premium they have to pay. Thus, for students, thinking about the personal need for disability insurance is reasonable and customized policies for students are available in Germany. Our messages addressed students and recommended occupational disability insurance for students. In the close condition, the message recommended

“Your to-do for this month: find out about disability insurance for students”, the distant condition read “Your to-do for 2020: ...” (the study was conducted in 2019). The statistical messages presented the likelihood of a 20-year-old person of becoming permanently unfit for work before retirement age and information on insufficient government payments. The anecdotal message portrayed a student who became permanently unfit for work and suffered poverty. Appendix C shows the messages.

Procedure and sample

The online study was programmed in the survey software SoSci Survey (www.sosicisurvey.de). We used the crowdsourcing platform Clickworker and invited students to participate in the online study because our messages were targeted to students. Participants received a common monetary compensation (1.30 Euro) and were randomly assigned to one of the conditions. Because workers can choose their projects, we have no information on response rates. Individuals who were already covered by disability insurance could not participate. The study contained attention checks and participants who provided incorrect answers were screened out. The sample consisted of 681 participants. Forty-six percent of the participants were female, and the average age was 25.

Measures

We measured compliance intention with the items: “How likely are you to follow the recommendation that the message provided?” and “How likely are you to obtain disability insurance in the near future?” (1 = very unlikely, 7 = very likely; $r = .73$). We measured perceived usefulness by asking participants how useful and meaningful they thought the message information was (1 = not at all, 7 = strongly; $r = .60$). For additional insight into message perception, we measured how informative the message was perceived to be (1 = not at all informative, 7 = very informative) and how easy to imagine because being informative is a typical advantage of statistical evidence (Greene & Brinn, 2003; Hoeken & Hustinx, 2009), and being easy to imagine is a typical advantage of anecdotal evidence (Cox & Cox, 2001; De Wit et al., 2008). We measured perceived ease of imagination with the items: “The message was ... very difficult/very easy to imagine” and “not at all vivid/very vivid” (1 = very difficult to imagine/not at all vivid, 7 = very easy to imagine/very vivid; $r = .61$). Furthermore, we measured how time critical participants perceived the recommended behavior to be (1 = not at all, 7 = highly) and whether participants noticed the timelines that the recommendations contained: “The message recommended to obtain the information ... within this month or before 2020; within six months; or in the course of 2020.” Moreover, the study measured descriptive statistics and included a few questions not related to this article.

4.3.2 | Results

Manipulation check and message perceptions

Within the two anecdotal messages, participants perceived the “Your to-do for 2020”-message as less time critical than the “Your to-do for

TABLE 3 Compliance intention across the conditions of Experiment 2, means (analysis of covariance [ANOVA]) and estimated marginal means (ANCOVA).

Issue distance:	Evidence Type:	Means (SD) ANOVA	EMM (SE) ANCOVA	N ANOVA	N ANCOVA
Close condition	Anecdotal evidence	3.94 (1.49)	4.00 (.12) ^b	193	168
	Statistical evidence	3.75 (1.56)	3.76 (.13)	144	136
Distant condition	Anecdotal evidence	3.72 (1.50)	3.71 (.11) ^{a,b}	204	183
	Statistical evidence	3.97 (1.54)	4.02 (.13) ^a	140	127

Note: Means with equal superscripts are significantly different at the level of .10. Group sizes are lower in the ANCOVA because 67 participants did not report their income.

this month”-message but this difference did not show within the statistical messages. However, participants noticed the different time horizons. In the close condition, 68% of the respondents indicated that the message recommended to act within this month or before 2020. In the distant condition, 91% of the respondents indicated that the message recommended to act in the course of the following year ($\chi^2(2) = 194.07; p = .000$). Thus, the manipulation of temporal distance was successful.

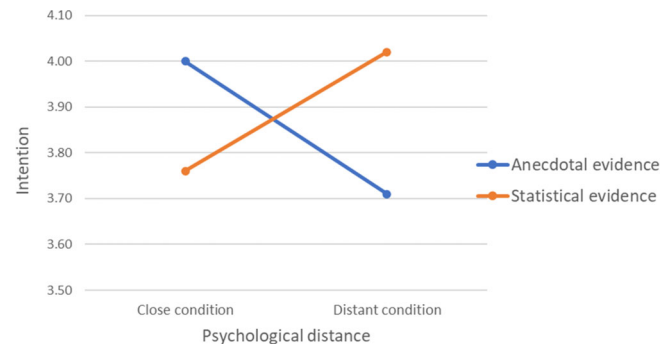
Consistent with previous research (e.g., Hoeken & Hustinx, 2009), the statistical message was found to be more informative than the anecdotal message ($F(1, 677) = 20.39, p = .000$). Also consistent with previous research (Cox & Cox, 2001; De Wit et al., 2008), the anecdotal message was perceived as easier to imagine than the statistical message ($F(1, 677) = 13.32, p = .000$). Both perceptions did not depend on message-issue distance (no interaction effect).

Covariate

Income determines whether individuals can afford disability insurance and increases their motivation to protect current and future income (Stastika, 2011, 2022). Income was not evenly distributed among the four experimental groups. For example, of the group that had seen the statistical message in the close condition, 41.2% reported a relatively high income of over 1000 Euro per month, while of the group that had seen the statistical message in the distant condition, only 31.5% reported a relatively high income of over 1000 Euro per month. Therefore, we controlled for income in our analysis and included it as a covariate. For transparency, we will also report the model without the covariate.

Test of H1a

We performed ANCOVA with compliance intention as dependent variable, issue distance and evidence type as independent variables, and income as covariate. The main effects of temporal distance ($F(1, 609) = .02, p = .898, \text{partial } \eta^2 = .000$) and evidence type ($F(1, 609) = .09, p = .771, \text{partial } \eta^2 = .000$) were insignificant. The issue distance by evidence type interaction was significant at $p = .030$ ($F(1, 609) = 4.76, \text{partial } \eta^2 = .008$). The effect of income was significant ($F(1, 609) = 10.54, p = .001, \text{partial } \eta^2 = .017$). Table 3 shows the means values and EMM.² The findings provide support for H1a. Consistent with Experiment 1a, the relative persuasiveness of anecdotal

**FIGURE 6** The effects of anecdotal and statistical evidence on intentions dependent on message-issue distance (Experiment 2).

versus statistical evidence depended on recipients' message-issue distance. Figure 6 illustrates this interaction.

For transparency, we also report the findings of the ANOVA without the covariate. Again, the main effects of temporal distance ($F(1, 677) = .00, p = .986, \text{partial } \eta^2 = .000$) and evidence type ($F(1, 677) = .09, p = .763, \text{partial } \eta^2 = .000$) were insignificant. The issue distance by evidence type interaction ($F(1, 677) = 3.47, \text{partial } \eta^2 = .005$) was marginally significant at $p = .063$. Note that the model controlling for income (ANCOVA) should provide more reliable estimates of the effects than the model without the covariate because income (the covariate) affected intentions and was not evenly distributed across the experimental groups.

Pairwise comparisons

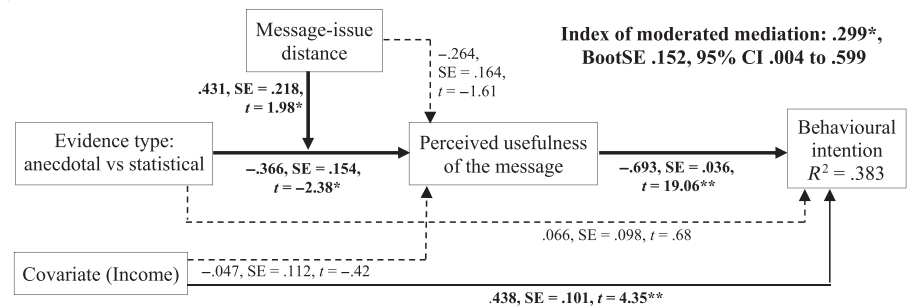
Although we did not propose absolute advantages, we report pairwise comparisons. In the distant condition, statistical evidence tended to be more persuasive than anecdotal evidence at $p = .081$ ($\text{EMM}_{\text{statistical evidence}} = 4.02; \text{EMM}_{\text{anecdotal evidence}} = 3.71, F(1, 609) = 3.06$). In the close condition, anecdotal evidence tended to be more persuasive than statistical evidence, but the difference was not significant ($\text{EMM}_{\text{anecdotal evidence}} = 4.00; \text{EMM}_{\text{statistical evidence}} = 3.76, F(1, 609) = 1.79, p = .181$). The pairwise comparisons show the expected direction but are not significant at the 5% level. It is possible that the temporal manipulation of message-issue distance resulted in relatively small differences in perceived psychological distance. Disability insurance may be a distant topic for most students, and being asked to do something about it this month (as opposed to within a year) may not bring the issue psychologically close to the recipients (see Figure 1).

²Because 67 participants did not report their income, the degrees of freedom and group sizes are lower in the ANCOVA than they were in the ANOVA.

TABLE 4 Receivers' perceptions of the messages across conditions (Experiment 2).

Issue distance:	Evidence Type:	Means (SD)			
		Perceived informativeness	Perceived ease of imagination	Perceived usefulness (Mediator)	
Close condition	Anecdotal evidence	4.63 (1.58)	5.11 (1.47)	4.81 (1.30)	193
	Statistical evidence	5.10 (1.54)	4.70 (1.35)	4.78 (1.39)	144
Distant condition	Anecdotal evidence	4.79 (1.46)	5.02 (1.44)	4.68 (1.35)	204
	Statistical evidence	5.38 (1.41)	4.62 (1.40)	5.04 (1.30)	140
Combined	Anecdotal evidence	4.71 (1.52)	5.06 (1.45)	4.74 (1.33)	397
	Statistical evidence	5.24 (1.48)	4.66 (1.38)	4.91 (1.35)	284

FIGURE 7 Model 7 of Hayes' (2018) PROCESS macro (statistical evidence = 0, anecdotal evidence = 1, temporally distant = 0, temporally close = 1). * $p < .05$; ** $p < .01$



Test of H2a and H2b

First, the ANCOVA (see test of H1a) was performed with perceived usefulness as the dependent variable instead of intention. The only significant effect in this model was the issue distance by evidence type interaction ($F(1, 609) = 3.93, p = .048, \text{partial } \eta^2 = .006$). The finding shows that the perceived usefulness of anecdotal and statistical evidence depends on receivers' message-issue distance and supports H2a. No other effect was significant. The effect of evidence type on perceived usefulness was $F(1, 609) = 1.93, p = .166, \text{partial } \eta^2 = .003$, the effect of message-issue distance was $F(1, 609) = .20, p = .654, \text{partial } \eta^2 = .000$, and the effect of income was $F(1, 609) = .18, p = .673, \text{partial } \eta^2 = .000$. The EMM and mean values in the distant condition were: $EMM_{\text{statistical evidence}} = 5.06$; $M_{\text{statistical evidence}} = 5.04$; $EMM_{\text{anecdotal evidence}} = 4.70$; $M_{\text{anecdotal evidence}} = 4.68$. The EMM and mean values in the close condition were: $EMM_{\text{statistical evidence}} = 4.80$; $M_{\text{statistical evidence}} = 4.78$; $EMM_{\text{anecdotal evidence}} = 4.86$; $M_{\text{anecdotal evidence}} = 4.81$. Table 4 shows the mean values of the perceived usefulness of the message information across the conditions. In addition, Table 4 shows the mean values of the two additional message perceptions that the study measured.

Again, we report pairwise comparisons. In the temporally distant condition, statistical evidence was perceived as more useful than anecdotal evidence ($F(1, 609) = 5.68, p = .017$). In the temporally close condition, the difference between the perceived usefulness of statistical and anecdotal evidence was not significant ($F(1, 609) = .18, p = .673$). These results are consistent with our reasoning. Since anecdotal information has little informational value, it is unlikely to be perceived as more meaningful than statistical information, even in the close condition. It is important to note that it was only in the distant

condition that individuals found anecdotal evidence less useful than statistical evidence.

Second, the ANCOVA that tested H1a was repeated with intentions as the dependent variable, and perceived usefulness was included as an additional covariate. In this model, only income ($F(1, 608) = 17.81, p < .001, \text{partial } \eta^2 = .028$) and the perceived usefulness of the information ($F(1, 608) = 326.87, p < .001, \text{partial } \eta^2 = .350$) had a significant effect on intentions. No other effect or interaction was significant. The findings indicate mediation and provide support for H2b. In addition, model 7 of Hayes' (2018) PROCESS macro was performed to report the index of moderated mediation (statistical evidence = 0, anecdotal evidence = 1, temporally distant = 0, temporally close = 1). Figure 7 illustrates the model and the effects.³ The index of moderated mediation was significant at $p < .05$ (Index: .299, BootSE .152; 95% CI: .004 to .599). The findings support H2b.

5 | DISCUSSION

5.1 | Summary and theoretical contribution

We predicted that the relative persuasiveness of statistical (versus anecdotal) evidence would increase with increasing psychological

³A comparison of the ANCOVA with perceived usefulness as the dependent variable and Model 7 of Hayes' (2018) PROCESS macro (Figure 7) shows that the main effect of evidence type on perceived usefulness is nonsignificant in the ANCOVA ($F(1, 609) = 1.93, p = .166$) but significant in Model 7 ($t = -2.38, p = .018$). On average, statistical evidence tended to be perceived as more useful than anecdotal evidence, most likely because it is more informative. More relevant to this research: The perceived usefulness depended on message-issue distance. Only in the distant condition was statistical evidence perceived as more useful than anecdotal evidence.

distance of the message issue from the message receiver, and that the relative persuasiveness of anecdotal (versus statistical) evidence would increase with decreasing distance. Experiment 1a manipulated spatial distance and Experiment 2 temporal distance, and both experiments showed the expected interaction at $p < 5\%$. Although we did not propose absolute advantages, we reported pairwise comparisons. The pairwise comparisons in the Experiments 1a and 2 were not significant or only marginally significant at 10%. However, we have explained that an absolute advantage of statistical evidence over anecdotal evidence (in the distant situation) and of anecdotal evidence over statistical evidence (in the near situation) is not necessary to support our theoretical rationale, and Figure 1 illustrates our arguments. Our Experiments (1a and 2) and the study by Kim and Nan (2019) yield very similar findings. Looking at the pairwise comparisons of the three studies (Experiments 1a, 2, and the study by Kim & Nan, 2019), the overall picture is as follows: Only when the message issue was relatively close (not when it was distant) did anecdotal evidence tend to be more effective than statistical evidence in each of the three studies, but the absolute advantage was significant only in our Experiment 1a (at $p = .056$). Only when the message issue was relatively distant (not when it was close) did statistical evidence tend to be more effective than anecdotal evidence in each of the three studies. The absolute advantage was marginally significant in our Experiment 2 (at $p = .081$), and possibly in the study by Kim and Nan (2019).⁴ Taken together, the significant interaction effects in our studies and the study by Kim and Nan (2019), combined with the trends seen in pairwise comparisons, suggest that the effectiveness of anecdotal and statistical evidence depends on recipients' message-issue distance.

This research focused on the moderating effect of message-issue distance on the persuasiveness of statistical and anecdotal evidence, and we mainly explained the moderation with construal-level fit. Therefore, the actual explanatory variable of the theoretical rationale proposed here is the recipients' abstract/concrete thinking about the message issue. Experiment 1b showed that recipients' more concrete/abstract thinking about the message issue determines the persuasiveness of statistical and anecdotal evidence. When individuals thought concretely about the message issue (prior to message exposure), anecdotal evidence was more persuasive than statistical evidence. When individuals thought abstractly about the message issue, statistical evidence was more persuasive than anecdotal evidence. Experiment 1b showed absolute advantages, possibly because it did not manipulate distance (as in Experiments 1a and 2), but measured how abstractly/concretely individuals thought about the message issue.

Although Experiment 1b did not test whether message-issue distance moderates the persuasiveness of anecdotal and statistical evidence via its effect on recipients' concrete/abstract thinking, it provides some additional support for our theoretical rationale and the idea of the more abstract (concrete) character of statistical (anecdotal) evidence. Previous research has demonstrated a robust link between

psychological distance and construal level (Soderberg et al., 2015). Hence, message-issue distance should typically trigger the above effect. However, low or high psychological distance does not guarantee abstract or concrete thinking (Abraham et al., 2023; Yan et al., 2016). Consequently, and if construal-level fit is a major process driving the effect, recipients' abstract/concrete thinking about the message issue may better explain the persuasiveness of anecdotal and statistical evidence than message-issue distance. The former should be more likely than the latter to result in a construal-level fit when recipients are confronted with abstract or concrete information (see Section 5.3).

We proposed that the perceived usefulness of the message information mediates the effect of evidence type and message-issue distance on intentions. Experiment 2 tested the moderated mediation and demonstrated that message-issue distance determines how personally useful message recipients perceive anecdotal and statistical information to be. Only in the distant condition did individuals find anecdotal evidence less useful than statistical evidence. Experiment 2 also measured how informative and easy to imagine the messages were perceived to be. In contrast to the perceived usefulness of the message information, these two message perceptions did not depend on message-issue distance (a main effect of evidence type showed but no interaction). This finding is intuitive. Statistical evidence may generally be perceived as more informative than anecdotal evidence, and anecdotal evidence should be easier to imagine than statistical evidence, but the perception of how personally useful such information is to the recipient at any given time should depend on the recipient's situational mindset.

5.2 | Managerial implications

To support their appeals, messages may present statistical or anecdotal evidence, and from the perspective of message designers, the choice of evidence type may be independent of the message issue. This research has shown that the effectiveness of anecdotal and statistical evidence depends on the psychological distance of the message issue from the message receiver and the receiver's more concrete/abstract thinking about the message issue. Based on our findings, we recommend that social marketers use statistical evidence when message issues are psychologically distant from message recipients and when message recipients tend to think abstractly about the message issue. We recommend anecdotal evidence when message issues are psychologically close to message recipients and when message recipients tend to think concretely about the message issue. However, an increase (decrease) in message-issue distance does not necessarily mean that the message is psychologically distant (close) and leads to an absolute advantage of statistical (anecdotal) evidence. Although we have argued that when manipulating distance, relative advantages are sufficient to support the theoretical rationale, the lack of absolute advantages limits the recommendations we can make for practice and raises the question of when a particular message issue is close (distant) and leads to low-level (high-level) thinking. In order to

⁴Kim and Nan (2019, p. 411) only report mean differences that are significant at $p < .05$. However, in the distant situation, the mean (intention) for the nonnarrative message was 4.90 and the mean for the narrative message was 4.50, which could be different at $p < 10\%$.

apply the above recommendation, it is crucial to know whether a particular message issue elicits high-level or low-level thinking. However, for many message issues, the psychological distance and concrete/abstract thinking of recipients can be difficult for message designers to predict. For example, while a fundraising appeal for drug-addicted women in a city might be expected to be relatively close to the female residents of that city, their potential sense of having nothing in common with such women may result in a high psychological distance. Similarly, a threatening message issue such as cancer may lead to relatively concrete, low-level construal, even in a relatively distant situation (Labroo & Patrick, 2009). Thus, before deciding on the type of evidence, message designers may need to assess what kind of thoughts (high-level or low-level) the message issue evokes in representatives of their target audience. The self-report measure used in Experiment 1b could be a start and useful for social marketers. In Experiment 1b, the measure explained when the anecdotal or the statistical message was more persuasive. In addition, the measure is adaptable to different message issues, short, and could easily be implemented in pretests to decide when to use statistical or anecdotal evidence (see Section 5.3).

5.3 | Limitations and recommendations for future research

We explained the moderating effect of message-issue distance with construal-level fit. However, our studies do not explicitly test whether message-issue distance moderates the persuasiveness of the evidence types via its effect on recipients' concrete/abstract thinking about the message issue. Although our studies support our theoretical rationale, some of the processes remain a black box and our studies cannot prove them. Future studies could manipulate issue distance, then measure issue-specific construal levels, and then provide participants with anecdotal or statistical evidence. Such studies could test whether recipients' issue-specific construal levels mediate the moderating effect of message-issue distance. Furthermore, because low or high psychological distance does not guarantee concrete or abstract thinking (Abraham et al., 2023; Yan et al., 2016), future research could also examine when message-issue distance affects the persuasiveness of anecdotal and statistical evidence. It is possible that the effect only occurs if the message-issue distance determines the concrete/abstract thinking of the recipient. Relatedly, future studies could examine what other processes (beyond construal-level fit) might explain the moderation. For example, future studies could take into account the tendency of recipients to think analytically.

To make decisions about evidence type, message designers need to know whether a message issue is likely to elicit low-level or high-level thinking. Thus, future research may provide practitioners with tools to help them assess whether a message issue is likely to elicit low-level or high-level thinking in their target audience. The short measure used in Experiment 1b may be a starting point because it can be adapted to different contexts and is easy to use in practice. Future

research could validate and test the predictive power of this measure or provide alternative measures that are useful in practice.

In terms of recommending when to use anecdotal or statistical evidence, this paper focused on the effects of message-issue distance and the concrete/abstract thinking of recipients. However, construal-level fit is not the only mechanism that contributes to persuasion; it is one mechanism among others that can increase message effectiveness. For example, characteristics of the message receiver, such as scepticism or optimistic bias, may confound the effects of message-issue distance. If a sceptical message recipient denigrated the facts presented in statistical evidence and was less likely to generate such counterarguments when confronted with anecdotal evidence (Slater & Rouner, 1996), then anecdotal evidence may be more effective for him or her even when the distance from the message issue is high. Relatedly, Nan (2007), Labroo and Patrick (2009), and White et al. (2011) suggested that negative framing results in lower levels of abstraction than positive framing. Thus, receiver attitude (Slater & Rouner, 1996) and message framing may affect the issue distance by evidence type interaction. Future research may consider message framing (Dardis & Shen, 2008; Jang & Chu, 2022; Praxmarer-Carus et al., 2022) and receiver characteristics such as scepticism (Praxmarer-Carus & Wolkenstoerfer, 2018; Slater & Rouner, 1996).

We did not study combinations of anecdotal and statistical evidence (Allen et al., 2000; Nan et al., 2015), which future research may include. Studies could examine whether message-issue distance affects how much recipients use anecdotal and statistical evidence when given a choice within the message. Furthermore, we measured compliance intentions immediately after message exposure. Future research testing the proposed interaction could measure intentions at delayed time intervals (Baesler & Burgoon, 1994). In addition, future research could examine actual behavior rather than compliance intentions.

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CONFLICT OF INTEREST STATEMENT

The authors declare no conflicts of interest.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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APPENDIX A

The messages that Experiment 1a used.

Close	
Anecdotal	Statistical
<p>Anna, 4, from Munich, is suffering from cancer. Our vacation homes in Germany offer the required care and resources, where she and her family can recover their strengths after their stay in hospital. Your donation helps heal</p>	<p>Every year 1.800 kids under the age of 15 are diagnosed with cancer in Germany. Our vacation homes in Germany offer the required care and resources, where these kids and their families can recover their strengths after their stay in hospital. Your donation helps heal</p>
Distant	
Anecdotal	Statistical
<p>Ayumi, 4, from Kyoto, is suffering from cancer. Our vacation homes in Japan offer the required care and resources, where she and her family can recover their strengths after their stay in hospital. Your donation helps heal</p>	<p>Every year 1.800 kids under the age of 15 are diagnosed with cancer in Japan. Our vacation homes in Japan offer the required care and resources, where these kids and their families can recover their strengths after their stay in hospital. Your donation helps heal</p>

APPENDIX B

The messages that Experiment 1b used.

Anecdotal	Statistical
<p>Lukas, 24, student, had a relaxing afternoon with friends in the park. Sunbathing, relaxing, and playing a bit of football...</p> <p>In the morning, he noticed a tick on his groin. He had it removed and that seemed to be the end of it.</p> <p>Nine days later, Lukas developed a fever and a headache. The tick had infected him with the tick-borne encephalitis virus and Lukas had meningitis. He was admitted to hospital, but his condition worsened. When the infection spread to his brain, Lukas' condition became critical. Lukas survived, but he uses a wheelchair because the infection has paralyzed his legs. His ability to concentrate has also been affected. Lukas has dropped out of university and his career dreams have faded into the distance.</p> <p>Protect yourself from tick bites and the diseases they can transmit!</p> <p>The Robert Koch Institute recommends vaccination for people living in areas at risk of TBE. It provides reliable protection for about 5 years. The vaccination would have protected Lukas. Ask your doctor for more information!</p>	<p>It is estimated that 10 million people in Germany are bitten by ticks every year. Ticks can be found almost anywhere there are plants, including gardens and parks.</p> <p>Ticks can transmit the tick-borne encephalitis (TBE) virus to humans. Depending on the region, up to 5% of ticks carry the TBE virus. TBE can cause severe inflammation of the meninges, brain and spinal cord. Meningitis (inflammation of the meninges) with encephalitis (inflammation of the brain) leaves one in five people (20%) with permanent damage. This often takes the form of paralysis or problems with memory and concentration.</p> <p>3% of people use a wheelchair after developing the disease. 2% of cases are fatal. Adults and young adults are more likely to develop severe cases than children.</p> <p>Protect yourself from tick bites and the diseases they can transmit!</p> <p>The Robert Koch Institute recommends vaccination for people living in areas at risk of TBE. It provides reliable protection for about 5 years. Ask your doctor for more information!</p>

Note: Male participants saw the male version of the anecdote ("Lukas") and female participants saw the female version of the anecdote ("Lea").

APPENDIX C

The messages that Experiment 2 used.

Anecdotal	Statistical
<p>Not getting disability insurance early on puts your financial existence at risk.</p> <p>Stefan's story: Stefan was only 24 and a student when, unexpectedly, he became severely ill. Due to the disease, Stefan became permanently unfit for work. Presumably, he will never be able to work normally. Because he was a student, he is not eligible for minor governmental disability pension payments. Unfortunately, Stefan had not taken out disability income insurance for students that would have afforded him monthly benefits. Stefan's future is uncertain, and his financial existence is at risk.</p>	<p>Not getting disability insurance early on puts your financial existence at risk.</p> <p>In Germany, 2.8 Mio. young people are studying. The probability of a 20-year-old of becoming permanently unfit for work before retirement age is 43%. In 90% of the cases, a severe disease is the cause.</p> <p>If students get permanently unfit for work, they are not eligible for the governmental pension payments of 38% of one's last income. If students have not taken out disability income insurance, they do not receive monthly benefits from an insurance. If they become unfit for work their future is uncertain, and their financial existence is at risk.</p>
<p>Close condition Your to-do for this month: find out about disability insurance for students</p>	<p>Close condition Your to-do for this month: find out about disability insurance for students</p>
<p>Distant condition Your to-do for 2020: find out about disability insurance for students</p>	<p>Distant condition Your to-do for 2020: find out about disability insurance for students</p>

Note: The study was conducted in November 2019. Male participants saw the male version of the anecdote ("Stefan") and female participants saw the female version of the anecdote ("Stefanie").