



Now or never? Temporal framing in risk messages and the moderating effect of comparative optimism

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Abstract Risk messages inform consumers about relevant risks and typically recommend preventive behaviors such as being more physically active or taking out occupational disability insurance. Often, the appeals include some form of time reference, such as “find out about disability insurance *this month*” or “find out about disability insurance *this year*”. In general, the effects of such proximal compared to distal time references on compliance intention may be positive or negative, and we examine how the effects depend on consumers’ comparative optimism. In two studies in the context of occupational disability insurance, proximal temporal framing proved more effective than distal framing among comparative optimists but not among nonoptimists. We recommend that when targeting comparative optimists, risk message designers should use proximal temporal framing in their recommendations.

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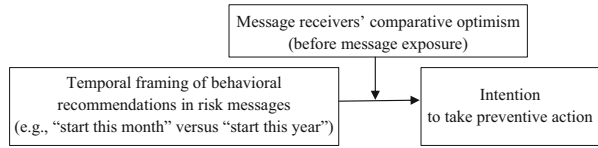
„Informiere dich noch heute“ oder „informiere dich dieses Jahr“: Wie wirken kürzere vs. längere Zeitbezüge in Verhaltensaufforderungen in Abhängigkeit des komparativen Optimismus der Zielpersonen?

Zusammenfassung Risikobotschaften informieren ihre Zielgruppen über relevante Risiken und geben üblicherweise Verhaltensempfehlungen, wie z.B. mehr Sport zu treiben oder sich gegen Berufsunfähigkeit oder Elementarschäden zu versichern. Solche Empfehlungen können Zeitbezüge enthalten, wie z.B. „informieren Sie sich noch *diesen Monat* über Berufsunfähigkeitsversicherungen“ oder „informieren Sie sich noch *dieses Jahr* ...“. Theoretische Überlegungen weisen darauf hin, dass die Wirkung von „nahen“ im Vergleich zu „fernen“ Zeitbezügen („diesen Monat“ versus „dieses Jahr“) positiv oder negativ sein könnte. Im vorliegenden Beitrag wird die Wirkung solcher Zeitbezüge auf die Verhaltensabsicht von Zielpersonen untersucht, unter besonderer Beachtung des moderierenden Effekts des komparativen Optimismus. Zwei Experimente im Kontext der Berufsunfähigkeitsversicherung zeigen, dass bei Zielpersonen, die komparativ optimistisch sind, nahe Zeitbezüge in Verhaltensempfehlungen zu einer höheren Verhaltensabsicht führen als ferne Zeitbezüge. Bei nicht optimistischen Zielpersonen zeigte sich dieser Vorteil nicht. Basierend auf den Ergebnissen dieser Studien, wird die Empfehlung abgeleitet, dass Risikobotschaften, die sich an optimistische Zielgruppen richten, in ihren Verhaltensempfehlungen nahe Zeitbezüge verwenden sollten.

1 Introduction

Risk messages inform consumers about relevant risks and typically recommend preventive behaviors such as being more physically active or taking out occupational disability insurance (e.g., Unger and Steul-Fischer 2020). Often, the appeals include some form of time reference, such as “find out about disability insurance this month” or “find out about disability insurance this year”. This paper uses the terms proximal and distal temporal framing to refer to such time references. To date, the literature on temporal framing has mainly distinguished between an emphasis on proximal versus distal consequences of a behavior (e.g., Kees 2011; Orbell and Hagger 2006; Unger and Steul-Fischer 2021) and every-day versus every-year frames (e.g., Chandran and Menon 2004). This article examines proximal versus distal time references included in behavioral recommendations.

The effects of proximal compared to distal temporal framing on compliance intention may be positive or negative. For example, proximal temporal framing may make a recommendation appear more urgent and relevant to consumers than distal temporal framing (Chandran and Menon 2004; Zhao and Peterson 2017). On the other hand, proximal temporal framing may be more likely to evoke reactance (Dillard and Shen 2005). Hence, the effects of temporal framing may depend on moderators, and we argue that consumers’ comparative optimism is a moderator that is relevant for study in this context. Comparative optimism, which the literature also refers to as self-positivity bias (Menon et al. 2002), denotes the perception that one is less at risk than others (Chambers and Windschitl 2004; Harris and

Fig. 1 Effects that this research studies

Middleton 1994). Different target groups of risk messages may be characterized by varying levels of comparative optimism because comparative optimism varies within and across contexts and individuals (Gosselin et al. 2010; Harris et al. 2008; Helweg-Larsen and Shepperd 2001). Because risk messages typically communicate risks by depicting the negative life events of other individuals, the processing of such messages should depend on how message receivers relate to the risks faced by others. Hence, comparative optimism should affect the processing and interpretation of risk messages and potential signals of urgency or justifiable deferral they contain.

The literature on temporal framing has identified (other) moderators (e.g., Guan and So 2021; Kees 2010, 2011; Orbell and Hagger 2006; Pounders et al. 2015; Tangari et al. 2010; Unger and Steul-Fischer 2021; Waites et al. 2021; Zhao et al. 2015) but has not examined the moderating role of message receivers' comparative optimism. Previous research has studied the effects of temporal framing on risk perceptions and optimistic bias as dependent variables (e.g., Chandran and Menon 2004). The findings show that proximal compared to distal framing increases average self-risk estimates and decreases average comparative optimism (Chandran and Menon 2004). However, the findings do not reveal whom temporal framing affected to what extent because the decrease in *average* comparative optimism may have resulted from, for example, an increase in self-risk estimates solely among nonoptimists or solely among optimists. Thus, while we know that proximal temporal framing reduces average comparative optimism levels, we do not know how temporal framing affects consumers that are characterized by varying levels of comparative optimism. Hence, it remains unclear what to recommend when, for example, targeting comparative optimists.

This paper studies the moderating effect of consumers' comparative optimism on the effects of temporal framing (included in behavioral recommendations) on compliance intention. Fig. 1 illustrates the effects. We conduct two experiments in the context of occupational disability insurance. We use anecdotal risk messages because Kim and Nan (2019) suggest that temporal framing affects persuasion mainly through anecdotal message formats. We study negatively framed messages because Cox and Cox (2001) and Yu et al. (2010) demonstrate that negatively framed anecdotal messages are more effective than positively framed anecdotal messages. Our two studies demonstrate that comparative optimism is a relevant moderator of the effects of temporal framing on compliance intention.

2 Theory

2.1 The effects of temporal framing in negatively framed anecdotal messages

The following arguments suggest an advantage of proximal over distal temporal framing: compared to distal framing, proximal framing may make a risk and the recommended behavior appear to be closer (Kaju and Maglio 2018; Trope et al. 2007; Zwickle and Wilson 2014) as well as more urgent and relevant to consumers (So and Nabi 2013; Zhao and Peterson 2017), thereby increasing compliance intention. Zhu et al. (2018) show that perceived urgency may make following a recommendation more rewarding to consumers. Furthermore, previous research has demonstrated that messages that contain elements that are construal-level congruent rather than incongruent are easier to process and more effective (White et al. 2011). Combinations of concrete and proximal information as well as combinations of abstract and distal information are construal-level congruent, whereas, for instance, combinations of concrete and distal information are construal-level incongruent. Anecdotal messages describe a single person's fate and therefore provide specific and concrete information (Keller and Block 1997). Thus, a combination of anecdotal evidence and proximal information may be more construal-level congruent and more effective than a combination of anecdotal evidence and distal information. In addition, Chandran and Menon (2004) and de Bruijn and Budding (2016) show that when message framing is negative, proximal temporal framing is more persuasive than distal temporal framing, and this research studies negatively framed messages.

However, the following arguments suggest an advantage of distal over proximal temporal framing: proximal framing may be more likely to evoke reactance than distal framing because consumers may feel pressured by shorter time horizons, thereby decreasing compliance intention (Dillard and Shen 2005). Furthermore, consumers may sense a feeling of inconvenience when confronted with short time horizons, which may also decrease compliance intention (Swain et al. 2006). In line with this, research on time-limited promotions reports positive and negative effects of time restrictions (e.g., Swain et al. 2006). However, reactance and perceived inconvenience should be stronger when a promotion expires, which is typically not the case in risk messages: if a message recommends quitting smoking this week, consumers can still quit next week.

Taken together, the arguments suggest that in negatively framed anecdotal messages, proximal framing may have an advantage over distal temporal framing. However, since opposing effects are possible, we do not propose hypotheses on the main effect of temporal framing.

2.2 The moderating effect of comparative optimism

Risk messages typically communicate risks by depicting the negative life events of other individuals, for example, a single protagonist or a population. An example of the former is: "Marc 52, long-term smoker suffers from lung cancer ...". An example of the latter is: "Approximately one-third of youth smokers will eventually die from a tobacco-related disease" (Truth Initiative 2021). This paper does not study

differences between anecdotal and statistical messages, and our studies will focus on anecdotes. Relevant to this research is the argument that how message receivers relate to the risks faced by others should affect the processing of risk messages and the signals of urgency or justifiable deferral they contain. Distal temporal framing may signal low relevance (Zhao and Peterson 2017), and this signal should be particularly strong among comparative optimists. The belief that “it will not affect me that badly” constitutes the mindset of comparative optimists (Chambers and Windschitl 2004). Since individuals are more likely to process information that confirms their pre-existing hypotheses (Nickerson 1998), comparative optimists are more likely to interpret and use a long time horizon as a signal of low relevance and a confirmation of low concern than nonoptimists. Furthermore, comparative optimists may find a risk message that uses proximal framing more interesting than one that uses distal framing because the signaled urgency differs from their evaluation of the risk (Teeny et al. 2020). Moreover, since comparative optimists perceive their levels of risk to be lower than those depicted in the message, they should be less involved in processing the included information than nonoptimists and less motivated to do so (Harris et al. 2008), which may have the following consequences. Temporal frames may constitute peripheral cues (Meyers-Levy and Maheswaran 1992) related to urgency, and peripheral cues are more influential when involvement is low than when it is high (Petty and Cacioppo 1986). In addition, construal-level congruency (which should be prevalent when anecdotal evidence is combined with proximal temporal framing) should be more relevant among comparative optimists than among nonoptimists because the ease of processing is more influential when the motivation to process a message is low than when it is high (Schwarz 2004). Finally, comparative optimists may be less likely than nonoptimists to experience reactance when confronted with proximal temporal framing rather than distal temporal framing. Since a risk message should be less alarming to them, their tendency to experience reactance should be lower (Erceg-Hurn and Steed 2011).

Taken together, with increasing consumer optimism, an (increasing) disadvantage of distal temporal framing compared to proximal temporal framing should apply. We propose the following:

H1 Comparative optimism moderates the effect of temporal framing on compliance intention in negatively framed anecdotal messages:

- a) Among comparative optimists, proximal temporal framing is more effective than distal temporal framing.
- b) The advantage of proximal temporal framing over distal temporal framing decreases with decreasing consumer optimism.

3 Experiment 1

3.1 Method

We manipulated temporal framing and used two (proximal versus distal) negatively framed anecdotal messages that described the risk of poverty due to becoming permanently unfit for work and recommended disability insurance for students. Both messages contained the same narrative about a student who, due to severe illness, became permanently unfit for work and suffered poverty. In the proximal temporal frame condition, the message recommended “Your to-do for this month: find out about disability insurance for students”, and the distal condition read “Your to-do for 2020: ...” (the study was conducted in November 2019). The messages contained only text. Appendix 1 shows the messages.

Three hundred ninety-seven students (51% male, average age 24.8) were randomly assigned to either the proximal or the distal condition. Individuals who were covered by disability insurance were screened out and could not participate. Before participants saw the message, comparative optimism was measured with two items adapted from Menon et al. (2002). The items read: “I believe that I am [1 = very unlikely, 11 = very likely] to become permanently unfit for work before reaching retirement age” and “I believe that an average student is [1 = very unlikely, 11 = very likely] to become permanently unfit for work before reaching retirement age”. The difference between the two perceptions (other risk—own risk) indicates individuals’ comparative optimism. The following items measured compliance intention: “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, 9 = very likely; $r = 0.71$). As a manipulation check, we measured how time critical the participants perceived the recommended behavior to be (1 = not at all, 7 = highly). In addition, the study measured sex and age. Moreover, the study was part of a larger project and contained additional components that are not related to this article.

3.2 Findings

Participants perceived the recommendation to be more time critical when they saw the proximal temporal framing than when they saw the distal temporal framing ($M_{\text{proximal}} = 4.80$, $M_{\text{distal}} = 4.54$, $t(395) = 1.69$, $p = 0.046$ one-tailed).

We perform our analyses with the metric optimism variable (other risk—own risk). However, for an overview, we report the mean values of compliance intention, depending on comparative optimism and temporal framing. For this illustration, we divided the respondents into the following three groups: One group consists of comparative optimists, that is, individuals who indicated their levels of risk to be lower than those of other students ($n = 135$), the second group contains participants who assessed their levels of risk and those of other students as the same ($n = 162$), and a third group contains comparative pessimists because they perceived their levels of risk to be higher than those of others ($n = 100$). Fig. 2 illustrates the mean values and suggests that temporal framing affected compliance intention only among comparative optimists.

Fig. 2 Study 1: Mean Values of Compliance Intention Across the Groups (SD, Group Size)

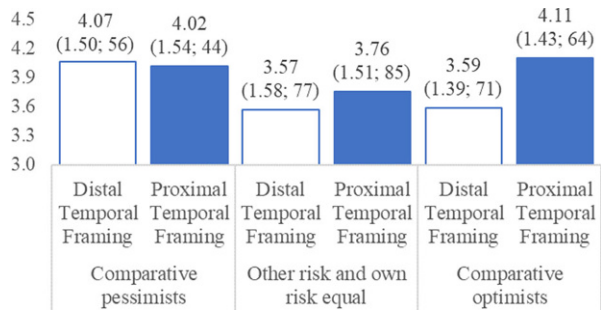
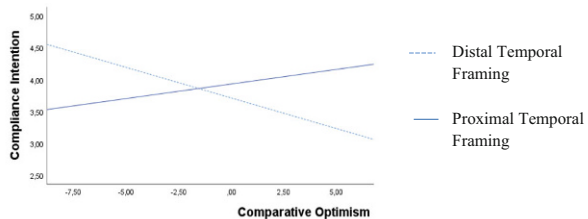


Table 1 Effects of Comparative Optimism and Temporal Framing on Compliance Intention (study 1)

	<i>b</i>	<i>SE</i>	<i>t</i>	<i>p</i>
Intercept	3.712	0.105	35.48	0.000
Temporal Framing	0.220	0.150	1.46	0.145
Comparative Optimism	-0.096	0.055	-1.75	0.081
Temporal Framing × Comparative Optimism	0.142	0.085	1.67	0.097

We estimated model 1 from Hayes’ (2013) PROCESS macro with temporal framing (0=distal; 1=proximal) as the independent variable, comparative optimism (other risk—own risk) as the metric moderating variable, and compliance intention as the dependent variable. Table 1 reports the effects. The main effect of temporal framing on compliance intention is not significant ($p=0.145$). Comparative optimism has a marginally significant negative main effect on compliance intention ($p=0.081$). The expected interaction effect between temporal framing and comparative optimism is marginally significant ($b=0.142$, $t(393)=1.67$, $p=0.097$). The Johnson-Neyman technique reveals that compliance intention is significantly increased (at the 5% level) by proximal (vs. distal) temporal framing only at values of comparative optimism of 0.645 and above (JN=0.645, 66% below). At lower moderator values, no significant effect of temporal framing shows. Thus, temporal framing did not affect nonoptimists (including pessimists). Only among comparative optimists was proximal temporal framing significantly more effective than distal temporal framing. The findings support H1a and b. Fig. 3 illustrates the conditional effect of temporal framing on compliance intention at different values of consumers’ comparative optimism.

Fig. 3 Conditional Effect of Temporal Framing on Compliance Intention at Values of Consumers’ Comparative Optimism (study 1)



3.3 Discussion of study 1

The findings show that a shorter time horizon included in the recommendation increased the reported likelihood of performing the behavior among comparative optimists. Because the time reference included in the compliance intention measure was vague, study 1 measured how likely respondents were to perform the behavior but to a lesser extent whether comparative optimists in the proximal group would perform the behavior sooner than those in the distal group. To complement study 1, study 2 tests how comparative optimism affects the likelihood of performing a behavior if individuals are asked to perform it within a longer or shorter time span. Thus, the compliance intention measures of study 2 contain the respective time horizons.

4 Experiment 2

4.1 Method

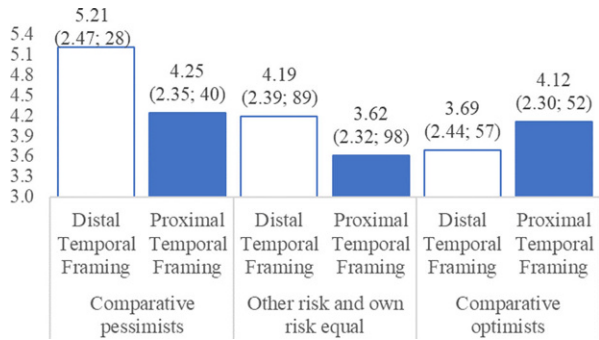
We conducted a second study in the same context but with a different manipulation of temporal framing. Before message exposure, study 2 asked participants how likely they were to request an offer for disability insurance “within the next six weeks” (proximal group) versus “within the next six months” (distal group). We examine whether the reactions to the shorter compared to the longer time periods differ between comparative optimists and nonoptimists. Study 2 used a similar anecdotal message as study 1 but focused on disability insurance for working individuals. The two groups saw the same message, which did not contain a time reference. Appendix 2 shows the message.

Participants were recruited via an online panel provider. Three hundred sixty-four participants (56% male, ages 20–45, average age 32.1, 84% employed) were randomly assigned to either the proximal or the distal condition. Again, individuals who were covered by disability insurance were screened out. We measured comparative optimism with two items (see study 1, the comparison other was an average person of the same age and occupation). Participants’ ex ante intention to request an offer for disability insurance was measured with one item that contained the temporal framing manipulation (see above, 1 = very unlikely, 9 = very likely). Compliance intention was measured with two items ($r=0.92$). The items contained the same time horizon as the respective ex ante measure used in the group. The items were “How likely are you to concern yourself with disability insurance within the next six weeks (six months)?” and “How likely are you to request an offer for disability insurance within the next six weeks (six months)?” (1 = very unlikely, 9 = very likely). In addition, the study contained components that are not related to this article.

4.2 Findings

Fig. 4 illustrates the mean values of compliance intention. For the illustration, we again divided the respondents into three groups (see study 1).

Fig. 4 Study 2: Mean Values of Compliance Intention Across the Groups (SD; Group Size)



With the compliance intention measures used in study 2, the two groups that were not optimistic expressed a higher likelihood of performing the behavior when the time span was larger, which is highly intuitive. The option to perform an action within six months compared to six weeks gives consumers more time and includes the option of performing the action within six weeks. Thus, the reported likelihood of performing the action should be higher in the distal group than in the proximal group—except when mentioning a shorter period increases the behavior’s relevance and attractiveness (Zhu et al. 2018). The latter effect seems to have occurred among comparative optimists. Only comparative optimists indicated a higher likelihood of performing the action within six weeks than within six months. Among comparative optimists, the same pattern found in study 1 was observed.

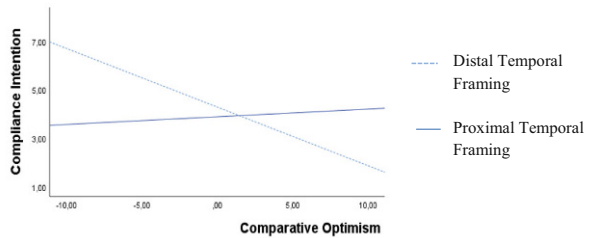
Again, we estimated model 1 from Hayes’ (2013) PROCESS macro (see Table 2). We included participants’ ex ante intention to request an offer for the insurance as a covariate. Again, the main effect of temporal framing is insignificant ($p=0.199$). Comparative optimism has a negative main effect on compliance intention ($p=0.000$). The interaction effect between temporal framing and comparative optimism is significant ($b=303, t(359)=2.803, p=0.005$).

The Johnson-Neyman technique reveals a negative effect of proximal (compared to distal) temporal framing at the 5% level among consumers who are pessimistic ($JN=-0.49, 18.68\%$ below) and a positive effect when comparative optimism is relatively high ($JN=3.23, 98\%$ below; at the 10% level the JN is 2.44, 93% below). The findings provide support for H1b and, when optimism is relatively high, for H1a. Fig. 5 illustrates the conditional effect of temporal framing on compliance intention at values of consumers’ comparative optimism.

Table 2 Effects of Comparative Optimism and Temporal Framing on Compliance Intention (study 2)

	<i>b</i>	<i>SE</i>	<i>t</i>	<i>p</i>
Intercept	1.869	0.189	9.91	0.000
Temporal Framing	-0.236	0.182	-1.29	0.199
Comparative Optimism	-0.293	0.076	-3.87	0.000
Temporal Framing × Comparative Optimism	0.303	0.108	2.80	0.005
Covariate: Ex-Ante Intention	0.684	0.038	18.21	0.000

Fig. 5 Conditional Effect of Temporal Framing on Compliance Intention at Values of Consumers' Comparative Optimism (study 2)



5 Discussion

The literature has shown that optimistic bias is context related (e.g., Harris et al. 2008; Shepperd et al. 2015) and, for example, related to age and sex (e.g., Masiero et al. 2018). Thus, target groups in risk communication may be characterized by varying levels of comparative optimism. Previous research has shown that proximal temporal framing decreases average comparative optimism levels (Chandran and Menon 2004) but has not examined whether temporal framing affects consumers that are characterized by varying levels of comparative optimism to a similar degree. This paper adds to the literature by demonstrating that the effects of temporal framing on compliance intention depend on consumers' comparative optimism. Temporal framing included in behavioral recommendations (study 1) affected comparative optimists but not nonoptimists. Distal temporal framing showed a disadvantage relative to proximal temporal framing among comparative optimists but not among nonoptimists. Study 2 used a stricter compliance intention measure and asked participants how likely they were to perform the recommended behavior within “six weeks” compared to “six months”. Among comparative pessimists, distal temporal framing resulted in higher values. This finding is intuitive because the likelihood of performing an action within six months compared to six weeks includes the option of performing the action within six weeks and is less challenging. However, when comparative optimism was relatively high, the shorter time horizon resulted in a higher likelihood of performing the action. Longer time horizons compared to shorter horizons seem to reassure comparative optimists; proximal temporal framing seems relevant for making a protective behavior appear more relevant and rewarding to them. This paper suggests that when targeting comparative optimists, risk message designers should use proximal temporal framing in their appeals. For example, the recommendation “Find out about disability insurance this month” should be more effective than “Find out about disability insurance this year”. We cannot provide recommendations for nonoptimists.

6 Limitations and future research

This research has several limitations. The studies were conducted in only one context. Furthermore, we studied only anecdotal messages and did not distinguish different consequence types that risk messages may communicate. For example, Unger

and Steul-Fischer (2021) demonstrate that temporal framing interacts with the consequence type that a message communicates. Future research may test whether our findings hold for other contexts and consequence types. In addition, we studied only negative framing, but the effects may be different for positively framed risk messages (Chandran and Menon 2004). Our studies compared the effects of proximal and distal time references included in recommendations but did not use control groups. Furthermore, we did not examine mediating variables. Future research may explore how relevant (Zhao and Peterson 2017), interesting (Teeny et al. 2020), easy to process (White et al. 2011), and rewarding (Zhu et al. 2018) comparative optimists perceive proximal versus distal recommendations compared to nonoptimists. Moreover, we measured comparative optimism before message exposure but did not repeat the measurement after message exposure. Future studies may measure comparative optimism before and after message exposure. Finally, we used compliance intention as our dependent variable, and we did not observe real behavior. Future studies may observe real behavior to strengthen the external validity of the findings.

7 Appendix

7.1 Appendix 1: Stimuli that study 1 used

Table 3 shows the stimuli.

Male participants saw the male version of the anecdote (the name of the protagonist was “Stefan”), female participants saw the female version of the anecdote (with “Stefanie”).

The messages were translated from German.

Table 3 The messages that study 1 used

Distal temporal framing	Proximal temporal framing
Not getting disability insurance early on puts your financial existence at risk.	
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	
<i>Your to-do for 2020:</i>	<i>Your to-do for this month:</i>
<i>find out about disability insurance for students</i>	<i>find out about disability insurance for students</i>

7.2 Appendix 2: Stimuli that study 2 used

In study 2, the temporal framing manipulation was part of the measures (see study 2, Method). The two groups saw the same message, which did not contain a time reference (Table 4).

Male participants saw the male version of the anecdote (the name of the protagonist was “Stefan”), female participants saw the female version of the anecdote (with “Stefanie”).

Table 4 The message that study 2 used

Message	Translation
 <p>Hier hat Stefan(36) bis vor Kurzem noch gearbeitet- bis er berufsunfähig wurde.</p> <p>„Leider hatte ich mich nicht abgesichert.“</p> <p>Berufsunfähigkeit nicht abzusichern heißt: Existenz gefährden</p> <p>Stefans Geschichte: Stefan ist erst 36 - und seit Kurzem durch einen Unfall berufsunfähig. Eine Berufsunfähigkeitsversicherung, die eine monatliche Rente bezahlen würde, hatte er nicht abgeschlossen. Mit dem Geld vom Staat kann er nun nicht einmal seine bisherige Miete bezahlen. Stefan weiß nicht, wie es finanziell weitergehen soll.</p> <p>„Leider hatte ich mich nicht abgesichert.“</p> <p>Informationen zur Berufsunfähigkeitsversicherung erhalten Sie bei einem Versicherungsunternehmen Ihrer Wahl sowie unter www.gdv.de</p> <p>DIE DEUTSCHEN VERSICHERER</p>	<p>This was Stefan’s (36) workplace—before he became permanently unfit for work. “Unfortunately, I had not protected my income against disability.”</p> <p>Not getting disability insurance puts your financial at risk.</p> <p>Stefan’s story: Stefan is only 36. Only recently did he become permanently unfit for work due to an accident. Because he had not taken out disability income insurance, he cannot receive monthly benefits. With the disability pension he gets from the government, he is not even able to pay his rent. Stefan does not know how to proceed financially. “Unfortunately, I had not protected my income against disability.”</p> <p>Get more information about disability insurance from your preferred insurance partner or at www.gdv.de</p>

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