Author note: This version of the manuscript contains minor differences to the final version accepted for publication in the *Journal of Risk Research*

Taking Responsibility: Self-Attribution for Risk Creation and its Influence on the Motivation to Engage in Risk Management Behaviors

ABSTRACT

Many risks (e.g., climate change, poor health, plastic pollution) can be the result of human behaviors. Although anthropogenic risk creation is rarely intentional, it is still possible that in many circumstances individuals will recognize some degree of personal responsibility for creating the risk and, therefore, may perceive a moral obligation to manage that risk (e.g., reducing carbon emissions, eating a low-fat diet, boycotting single-use plastics). However, the extent to which risk management behaviors are motivated by self-attribution for risk creation has received little empirical attention. To address this issue, a study was conducted in which participants responded to three scenarios (road safety, environmental, animal welfare) that each described a situation in which a particular risk developed and in which the participant's liability for creating the risk varied. Participants then responded to measures of self-attribution for risk creation, perceived risk, objective liability, guilt, moral standards and willingness to manage the risk. A multiple regression showed that the only significant predictor of the participant's willingness to manage the risk was self-attribution for risk creation. Moreover, further analysis showed that the positive relationship between self-attribution for risk creation and the willingness to manage the risk was moderated by perceived risk. Hence, individuals who accept greater responsibility for creating a risk may be more willing to engage in actions to manage that risk, and his/her willingness is also likely to increase as his/her perception of the risk increases. These findings provide new insights into the motivational forces underlying risk management behaviors and highlights important directions for future research and risk communication strategies.

KEYWORDS: responsibility; risk behaviors; risk creation; risk perception; self-attribution

1. INTRODUCTION

Humans create many risks. For example, the risk of climate change and ocean acidification has been attributed to the carbon emissions produced by burning fossil fuels, ecosystem damage has been associated with the pollution and habitat destruction caused by urbanization, and poor personal health is often linked to modifiable lifestyle behaviors (Intergovernmental Panel on Climate Change, 2014; Mokdad, Marks, Stoup & Gerberding, 2004; Travis, 2003). Clearly, risks attributable to humans can have far-reaching, long-lasting and/or catastrophic consequences. Therefore, identifying effective methods for managing and mitigating such risks is of paramount importance. However, developing a complete understanding of what motivates or inhibits individuals from engaging in behaviors that can help to prevent or manage the risks created by humans has been a long-standing and perplexing challenging for social scientists (Beck, 1984; Dawson & Johnson, 2017; De Groot & Steg, 2010; Rimal & Real, 2003; Weinstein, 1993).

Although the anthropogenic creation of risks is often unintentional, it is still possible that in many circumstances individuals will recognize some degree of personal responsibility for creating the risk and, therefore, may believe that they have some duty to manage that risk (e.g., reducing carbon emissions, using less single-use plastics, exercising more). This points towards the possibility that self-attribution for risk creation may play a key role in motivating important risk management behaviors. However, the potential relationship between risk creation and risk management behaviors has received little direct empirical attention. Nonetheless, as detailed below, some related research does provide some potential insights into this topic.

1.1. Acknowledging Responsibility for Risk Creation and Risk Management

In a comprehensive review of studies examining how individuals attribute responsibility to themselves for failures and successes, Miller and Ross (1975) found little evidence to suggest that individuals employ self-protective biases under conditions of failure. That is, the research indicated that individuals are generally willing to accept some responsibility for their part in an adverse outcome and are not particularly prone to employing defensive psychological processes (e.g., denial, blaming bad luck) to deflect responsibility or to protect their self-esteem. Moreover, Brewin and Shapiro (1984) found that self-attribution for adverse outcomes positively correlates with low self-esteem, and several other studies have shown that low self-esteem following an adverse outcome can often lead to an increase in the motivation to succeed or improve in the future (Baumeister & Tice, 1985). Taken together, this body of research points towards the possibility that individuals may generally be willing to accept his/her role in creating certain risks and, consequently, may experience negative affective states that subsequently motivate him/her to take action to address that risk.

One negative affective state that might increase the willingness to engage in risk management behaviors is the feeling of guilt. According to a review by Baumeister, Stillwell and Heatherton (1994), studies have shown that guilt motivates individuals to avoid transgressions, minimize inequities and make decisions that are aimed at rectifying departures from moral standards. Other studies have also found that feelings of guilt can make individuals adopt more cautious strategies in risky conditions (Mancini & Gangemi, 2003, 2004), and Ferguson and Branscombe (2010) found that the willingness to engage in climate change mitigation behaviors was highest among individuals who experienced a sense of 'collective guilt' based on his/her perceived responsibility for creating climate change. Collectively, this literature indicates that if an individual experiences a sense of guilt as a result of self-attribution for risk creation, then that individual may become more motivated to take action to limit his/her involvement in the risk creation process and to mitigate the resultant risk.

1.2. Avoiding Responsibility for Risk Creation and Risk Management

In contrast to the abovementioned literature, there are also research findings that indicate individuals can also be reluctant to acknowledge the role that he/she may have played in creating a risk or, thereafter, may not be willing to accept responsibility for instigating risk management actions. For example, a study by Shaw and McMartin (1977) found that participants were often motivated to adopt blame-avoidance strategies (e.g., identifying causes beyond his/her control) for the potential or realized adverse outcome from a severe accident. Relatedly, several studies have provided supporting evidence for the "defensive-attribution hypothesis", which asserts that the more severe/adverse an outcome the more willing individuals become to assign responsibility to others (Burger, 1981).

A wealth of evidence also supports the well-documented "diffusion of responsibility" phenomena, in which individuals become much less inclined to take responsibility for problems when there are other individuals present/involved who could take responsibility (Mynatt & Clifford, 1975). As documented in research by Wallach, Kogan and Bem (1964), individuals often become more willing to take risks and avoid risk management actions when in larger groups (something known as a 'risky shift') because personal accountability is diffused across the other group members. Relatedly, Guttman and Salmon (2004) have argued that individuals can often justify or rationalize risk creation when it becomes part of socially accepted behaviors. For example, a person may not be particularly concerned about producing CO_2 when he/she commutes to work by car because millions of other people do the same every day. Hence, there is also empirical evidence that indicates individuals may not always be willing to accept responsibility for their role in risk creation or, thereafter, for adopting mitigation actions.

1.3. Risk Perceptions and Taking Responsibility for Risk Creation and Risk Management

Some of the abovementioned evidence indicates it is plausible that an individual's willingness to engage in risk management behaviors may be influenced by the degree to which he/she acknowledges his/her responsibility for creating that risk. However, it is also well established that risk perceptions play a central role in motivating risk management behaviors (Brewer, Weinstein, Cuite & Herrington, 2004; Janz & Becker, 1984; Slovic, 1999; van der Plight, 1998; Weinstein, 1993). For example, individuals who perceive a higher risk from sun exposure are more motivated to use sunscreen (Eiser & Arnold, 1999), individuals who are concerned about a particular disease are more likely to obtain a vaccination (Brewer et al. 2007), and the fear of terrorism can motivate individuals to avoid modes of transport that might be targeted by terrorists (Gigerenzer, 2006). Hence, while it is possible that the extent to which an individual is motivated to manage a risk could be influenced by the extent to which he/she deems himself/herself responsible for creating that risk, it is also likely to be influenced by his/her level of concern about the risk that has been created. The relationship between these three variables (self-attribution for risk creation; risk perception; willingness to engage in risk management behaviors) is clearly one that merits further consideration.

On one hand, it logical to assert that in order for an individual to attribute risk creation to themselves, he/she must first perceive the situation to be one that does actually involve a risk. That is, the risk is first perceived and then attribution follows. Therefore, as depicted in Figure 1 (Model 1), one might expect self-attribution for risk creation to have a moderating effect on the well-documented positive relationship between risk perceptions and risk management behaviors. On the other hand, it is also plausible that an individual might attribute the creation of a risk to himself/herself and, thereafter, assess (consciously or unconsciously) whether to engage in risk management behaviors based on the perceived magnitude of the risk. Thus, as depicted in Figure 2 (Model 2), one could also expect risk perceptions to have a moderating effect on the potential relationship between self-attribution for risk creation and

risk management behaviors. The present study was conducted to test these two plausible models and to determine the extent to which self-attribution for risk creation influences the willingness to adopt risk management behaviors.

[Insert Figure 1 and Figure 2 about here]

2. MATERIALS AND METHODS

2.1. Participants

A sample of 173 adult participants was recruited online via the academic research platform *www.prolific.ac* and each participant was paid £1.00 (Palan & Schitter, 2018; Peer, Brandimarte, Samat & Acquisti, 2017). To be eligible for this study, participants had to have (i) UK residency (ii) English as a first language (iii) a minimum prolific.ac approval rating of 98% (iv) already completed at least 50 prolific.ac studies. Nineteen participants were excluded for failing an "instructional manipulation check" (IMC) and six participants were excluded for providing insufficient or dubious data. This left a final sample of 148 participants, consisting of 111 women and 37 men (Oppenheimer, Meyvis & Davidenko, 2009). The final sample's mean age was 40.5 (*SD* = 11.0) and 72 participants were educated to degree level or higher.

2.2. Measures and Procedure

The purpose of the study was to assess the more generic, rather than context-specific, role that self-attribution of risk creation might play in motivating risk management behaviors. To achieve this aim, the study employed risk-related scenarios from three different domains. Participants read the scenarios and then answered questions in response. The data obtained was then aggregate to provide an assessment of the general influence of self-attribution on willingness to engage in risk management behaviors. The three scenarios, which were designed specifically for this study and which had been revised following a preliminary test study (N = 119), are described below.

One scenario described a ‘road safety’ scenario in which the participant was asked to imagine that he/she had recently given a close friend a ride in their car and that the journey had resulted in a collision which caused the friend to suffer a serious neck injury. The scenario explained that in order for the friend to make a full recovery from the injury it was essential that he/she undertook a course of physiotherapy treatment at a cost of £3,000. Hence, the scenario described the risk that a friend of the participants would not recover from the neck injury unless essential physiotherapy treatment was paid for. In order to manipulate the extent to which the participant considered himself/herself to be responsible for creating this risk, two versions of the scenario were created. The ‘higher responsibility’ version of this scenario explained that the participant had been fully aware that the front passenger seatbelt in their car was defective and that, despite knowing this, the participant had decided to give their friend a ride in their car and to not make the friend aware that he/she was wearing a defective seatbelt. The ‘lower responsibility’ version of this scenario simply explained that the participant had no knowledge that the seatbelt was defective. The higher responsibility and lower responsibility scenarios consisted of 373 and 344 words, respectively (see Appendix for full details of the scenarios).

Another scenario described an ‘environmental protection’ scenario in which the participant was asked to imagine that he/she had recently been clearing out some old plastic containers from his/her garden shed and that the toxic liquid inside one of containers subsequently ended up pouring into a nearby stream, causing serious pollution to the local ecosystem. The scenario explained that in order for the local Environmental Protection Charity to rectify the damage to the ecosystem they would need to raise £3,000 to cover the costs of the essential clean-up operation. Hence, the scenario described the risk that the local ecosystem would not recover from the severe harm caused by the toxic liquid unless the clean-up operation was funded by donations. Again, in order to manipulate the extent to which the participant

considered himself/herself to be responsible for creating this risk, two versions of the scenario were created. The ‘higher responsibility’ scenario explained that the participant had decided against taking the container of toxic liquid to the local waste management center for disposal and, instead, had chosen to pour the liquid into the small stream running past the bottom of his/her garden. The ‘lower responsibility’ scenario explained that the participant had decided to take the container of toxic liquid to the local waste management center for disposal but, before they had chance to do this, the container was accidentally knocked into the stream by a neighbor. The higher responsibility and lower responsibility scenarios consisted of 456 and 497 words, respectively (see Appendix).

The third scenario described an ‘animal welfare’ scenario in which the participant was asked to imagine that he/she had recently looked after a neighbor’s pet dog while the neighbor was on holiday. The scenario explained that, while in the participant’s care, the dog suffered a heart attack and, subsequently, needed an essential life-long drug treatment that would cost the neighbor £3,000. Hence, the scenario described the risk that the dog would die unless the life-long drug treatment was funded. The ‘higher responsibility’ version of this scenario explained that the participant had neglected to care for the dog as instructed by the neighbor and, specifically, had failed to give the dog a medication that had already been prescribed to prevent it having a heart attack. The ‘lower responsibility’ version explained that the participant had made every effort to care for the dog as instructed, but that the dog had refused to take the prescribed medication. The higher responsibility and lower responsibility scenarios consisted of 323 and 322 words, respectively (see Appendix).

Each scenario was carefully designed to ensure that it described circumstances in which the risk of an adverse outcome (i.e., failure to recover from serious neck injury, permanent damage to ecosystem, death of dog) could be mitigated by risk management actions that could be funded, partly or in full, by the participant. More specifically, each scenario ended with the

sentences "*You now contemplate whether you should help to pay for the cost of* (risk management action X). *However, you are conscious that money has been quite tight for you recently and paying the whole £3,000 would wipe out your entire savings*." The latter sentence was included to focus the participant's mind on the common reality of having to think seriously about the extent to which one can afford to give away money to assist others. In addition, the three scenarios were designed to have parity in terms of the participant's risk management response options (i.e., contribute £0 - £3,000) so that the response data could be aggregated across scenario domains.

The study was administered online and each participant was randomly assigned to read two of the three scenarios. Participants first read a higher (lower) responsibility scenario from one of three domains and then read a lower (higher) responsibility scenario from one of the other two domains. The order of the two scenarios was randomized to address the potential for order effects.

After reading each scenario, participants first used a scale ranging from £0 to £3,000 to state how much they would be willing to pay of the £3,000 risk management costs. To measure perceived risk, participants used (i) an 11-point scale (0 = not at all worried; 10 = extremely worried) to indicate the extent to which they were worried that the risk would not be mitigated if the risk management action was not completed, and (ii) an 11-point scale (0 = impossible; 10 = certain) to indicate the likelihood that the potential adverse outcome would be realized if the risk management actions was not completed. To measure self-attribution for creating the risk, participants used (i) an 11-point scale (0 = not at all responsible; 10 = entirely responsible) to indicate the extent to which he/she held a subjective belief that he/she was responsible for creating the risk, and used an 11-point scale (0 = not at all guilty; 10 = extremely guilty) to indicate the extent to which he/she felt guilty about the risk that had been created. As a means of checking that the higher (lower) responsibility version of each scenario had successfully

manipulated the participant to believe that, from an objective perspective, he/she was more (less) responsible for creating the risk, participants were also asked to use an 11-point scale (0 = not at all liable; 10 = entirely liable) to indicate the extent to which a law court would deem him/her liable for creating the risk. Participants also completed a 10-item scale to measure 'state guilt' (i.e., the extent to which an individual currently feels a generalized sense of guilt) and a 15-item scale to measure 'moral standards' (i.e., the extent to which the individual is concerned with distinctions of right and wrong according to his/her conscience) (Jones, Schratter & Kugler, 2000). The former scale was employed to control for the possibility that the participant's responses were influenced by the extent to which he/she felt a general sense of guilt around the time of participation. The latter scale was employed to control for the possibility that the responses were influenced by the extent to which each participant was, more generally, concerned with upholding moral standards and demonstrating ethical behaviors. All items on both scales used a five-point response scale (1 = Strongly disagree; 2 = Disagree; 3 = Undecided; 4 = Agree; 5 = Strongly agree).

3. RESULTS

Table I shows the mean (standard deviation) scores for each of the main response items completed by the participants. The mean liability score for each of the three scenarios was significantly greater in the higher (cf. lower) responsibility versions (road safety: $t(82.30) = 4.28$, $p < 0.001$. environmental protection: $t(86.45) = 5.09$, $p < 0.001$. animal welfare: $t(86.90) = 8.92$, $p < 0.001$), indicating that the responsibility manipulation was successful. The mean score on the state guilt scale was 2.69 ($SD = 0.78$) and was 3.21 ($SD = 0.45$) on the moral standards scale.

(Insert Table I about here)

The responses from the three scenarios were merged to form one dataset. The two items used to measure perceived risk were combined to form one scale labelled as 'overall perceived risk' (M = 7.38, SD = 1.75, Cronbach's α = 0.7) and the two items used to measure self-attribution for risk creation were combined to form one scale labelled 'self-attribution' (M = 6.98, SD = 1.97 Cronbach's α = 0.8).

A forced entry linear regression was performed to assess the extent to which self-attribution for risk creation influenced the willingness to adopt risk management behaviors. The outcome variable was willingness to pay, and the predictor variables were overall perceived risk and self-attribution, with state guilt and moral standards included as control variables. The correlations and coefficients are shown in Tables II and III respectively. While a strong positive correlation was identified between perceived risk and willingness to pay, the regression analysis identified self-attribution as the only significant predictor of willingness to pay, which accounted for 25% of the variance.

[Insert Table II about here]

[Insert Table III about here]

Moderation analysis using the SPSS macro PROCESS (Hayes, 2012) was performed to test the extent to which Model 1 and Model 2 each provided an accurate representation of the potential relationships between perceived risk, self-attribution for risk creation, and willingness to engage in risk management behaviors. To test Model 1, an analysis was performed with overall perceived risk as the independent variable, willingness to pay as the dependent variable, and self-attribution as the moderator. The analysis identified an interaction between overall perceived risk and self-attribution (b = 25.08, 95%CI [1.98, 48.18], t = 2.15, p = 0.04). However, the simple slopes analysis did not identify a significant moderation effect for self-attribution on the relationship between overall perceived risk and willingness to pay.

Specifically, whether self-attribution was at the low level (b = 2.24, 95%CI [-84.05, 88.52], t = 0.05, p = 0.96), the mean level (b = 51.73, 95%CI [-42.53, 145.99], t = 1.09, p = 0.28), or the high level (b = 101.23, 95%CI [-19.12, 221.58], t = 1.66, p = 0.10) there was a non-significant positive relationship between overall perceived risk and willingness to pay. In other words, as perceived increased so did the willingness to manage the risk, but this relationship was not moderated by self-attribution for creating the risk.

To test Model 2, an analysis was performed with self-attribution as the independent variable, willingness to pay as the dependent variable, and overall perceived risk as the moderator. Again, the same interaction between overall perceived risk and self-attribution was identified. However, in contrast to the analysis for Model 1, the simple slopes analysis identified a significant moderation effect for overall perceived risk on the relationship between self-attribution and willingness to pay. Specifically, when overall perceived risk was at the low level, self-attribution had a positive relationship with willingness to pay (b = 244.44, 95%CI [155.63, 333.26], t = 5.44, $p < 0.001$). When overall perceived risk was at the mean level, the positive relationship between self-attribution and willingness to pay increased further (b = 288.24, 95%CI [214.17, 362.32], t = 7.70, $p < 0.001$). When overall perceived risk was at the high level, the positive relationship between self-attribution and willingness to pay increased even further (b = 332.04, 95%CI [252.40, 411.68], t = 8.24, $p < 0.001$). In other words, as self-attribution for creating the risk increased so did the willingness to manage the risk and, notably, the effect of self-attribution on willingness was strengthen as perceived risk increased. The simple slopes for Model 1 and Model 2 are illustrated in Figures 3 and 4.

[Insert Figure 3 about here]

[Insert Figure 4 about here]

4. DISCUSSION

The present study has confirmed the well-documented positive relationship between perceived risk and the willingness to adopt risk management behaviors. More notably, the study provides new evidence that indicates self-attribution for risk creation can play a central role in motivating risk management behaviors. More specifically, the results suggest that this positive relationship between self-attribution and willing to adopt risk management behaviors can be moderated by perceived risk. Hence, individuals who accept greater responsibility for creating a risk may be more willing to engage in actions to manage that risk, and that his/her willingness is also likely to increase as his/her perception of the risk increases. Therefore, in many circumstances, it may be that for an individual to have a high level of willingness to engage in risk management behaviors, it is important for him/her to perceive (i) the risk as relatively high and (ii) to be aware that he/she played some part in creating the risk.

Consistent with the findings of the systematic review by Miller and Ross (1975), the participants in the present study were very willing to accept personal responsibility for risk creation. However, in contrast to some of the aforementioned literature (e.g., Ferguson and Branscombe), the present study also found that feelings of guilt were not associated with the participant's willingness to adopt risk management behaviors. While this may seem surprising, some risk perception studies have also found that guilt does not play a strong role in motivating risk management behaviors. For example, Smith and Leiserowitz (2014) found that feelings of guilt were only weakly associated with policy support for action to tackle global warming. Likewise, in an assessment of emotional reactions to contemporary hazards (i.e., nuclear waste, mobile phones, terrorism, genetically modified food), Sjoberg (2007) found that affective states such as worry and fear related to perceived risk and policy support, but that guilt did not.

In trying to determine how these findings might be best utilized by risk communicators who wish to encourage specific risk management behaviors, there could be many merits in helping individuals in the target audience to recognize his/her (possible) role in creating the

risk, but there may also be little value in seeking to evoke feelings of guilt. Notably, research has shown that risk communications that aim to elicit guilt (so called "guilt appeals") can result in defensive reactions that inadvertently cause the audience to dismiss or ignore the intended message (Liberman & Chaiken, 1992; see also Guttman & Salmon (2004, p. 544). Thus, care would clearly be needed in designing risk messages that sensitively and carefully highlight how the target audience may be responsible for risk creation, but which do not make the audience feel as if they are being judged or persecuted in a way that might elicit feelings of guilt.

Both the regression and moderation analysis performed in the present research have indicated that the willingness to engage in risk management behaviors is influenced more by self-attribution for risk creation than by risk perceptions. One potential criticism of this finding could the influence of self-attribution was only greater because this particular variable was manipulated, whereas risk perceptions was not manipulated. Hence, it could be argued that the level of variance in the sample's risk perceptions may have been too low to identify the stronger effect that such perceptions might have on risk behaviors. However, a defense to this criticism is that the mean values for self-attribution (M = 6.98, SD = 1.97) and risk perceptions (M = 7.38, SD = 1.75) were similar and, notably, had very similar standard deviations. In other words, perceived risk naturally varied across the sample in much the same way as self-attribution varied because of the manipulation. Thus, it seems that in situations in which variance in self-attribution of responsibility is approximately equivalent to variance in risk perceptions, self-attribution is likely to have the greatest influence on the willingness to engage in risk management behaviors. Nonetheless, some caution should be exercised in generalizing this relationship to all contexts and situations. There are probably numerous circumstances in which an individual will have played no part in creating a risk (e.g., potential terrorist attacks, natural disasters), but his/her risk perceptions alone will still have a substantial influence on his/her willingness to support and adopt risk management behaviors. Indeed, this is supported

by evidence showing that higher levels of involuntary exposure to risk are generally associated with higher levels of perceived risk and, in separate studies, that higher risk perceptions are associated with an increased desire for risk management actions (Brewer et al., 2004; Slovic, Fischhoff & Lichtenstein, 1985).

4.1. Limitations and Future Directions

Clearly, the present research is not without its limitations and, therefore, there remains much scope to develop a better understanding of the relationships between self-attribution for risk creation, risk perceptions and risk management behaviors. One obvious limitation to the current study was that it relied upon hypothetical scenarios. While the use of such scenarios allowed (i) certain key variables to be controlled and carefully manipulated and (ii) for parity to be achieved in the risk management responses options, there is uncertainty regarding the extent to which the same results would be evident in naturalistic contexts. Another limitation is that the participant's risk management behaviors were only measured using 'willingness to pay' and, therefore, it is not clear how numerous other types of risk management behaviors (e.g., changing consumptions behaviors, voting for certain political parties, buying insurance) might be influenced by self-attribution for risk creation. In addition, the study employed a UK sample that was comprised of 75% females. Given that gender and national culture have both been found to have an influence on risk perceptions (Dake, 1992; Flynn, Slovic, & Mertz, 1994), there is the possibility that different results might be obtained in a study using a sample from outside the UK and with a different gender balance. Moreover, the study focused on *personal*, rather than *group/collective* responsibility for risk creation, so it is not clear whether self-attribution would be as influential when responsibility for risk creation is distributed more widely. Future studies could address all of these limitations, and should aim to examine the extent to which different risk communication approaches can motivate risk management behaviors by drawing the target audience's attention towards any role that they may have

played in creating the risk. Furthermore, given that the present results suggest self-attribution for risk creation plays a key role in motivating risk behaviors, self-attribution should be included in future studies that examine the relationship between risk perceptions and risk behaviors.

4.2. Conclusion

Developing a better understanding of what motivates individuals to engage in risk management behaviors remains a pressing goal in the effort to mitigate the extant range of anthropogenic risks that can threaten humans, other life forms and the natural environment. The present study indicates that self-attribution for risk creation is one factor that may play a key role in motivating risk management behaviors. An important implication of this finding is that specific individuals (i.e., those who have actually been involved in the risk creation process) could become more motivated to manage risks in a wide variety of domains (e.g., social, organizational, interpersonal, environmental) if they are sensitively encouraged to recognize the part that they have played in the risk creation process. Hence, risk communications that carefully highlight the target audience's role in the risk creation process, but which do not adopt a persecutory tone or provoke feelings of guilt, could be effective at motivating important risk management behaviors. However, one of the challenges for such risk communications might be that, in an increasingly interconnected and globalized world, there may be numerous reasons for individuals to form the view that the responsibility for the risk creation is diffused or to perceive the responsibility for risk management as belonging to other individuals or groups (e.g., businesses, governments, nations). Hence, there appears to be a need for both (a) more research on the relationship between self-attribution for risk creation and willingness to manage the risk and (b) new lines of research on the role that risk communicators might play in helping certain individuals to understand and acknowledge the role that they have played in creating specific risks.

DECLARATION OF INTEREST STATEMENT

No financial interest or benefit that has arisen from the direct application of this research and there are no conflicts of interest to declare.

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TABLES

Table I. Mean (standard deviations) scores for participant's responses to questions about each scenario.

	Scenario					
	Road safety		*Environmental protection*		*Animal welfare*	
Level of responsibility portrayed in scenario	Lower	Higher	Lower	Higher	Lower	Higher
Amount willing to pay in £s	1662.88 (903.30)	2006.78 (1014.61)	1090.79 (1052.72)	1893.78 (1194.37)	412.08 (733.90)	1971.84 (1061.17)
Worry	8.51 (1.85)	8.57 (2.06)	7.09 (2.75)	7.96 (2.62)	6.98 (2.26)	8.26 (2.35)
Likelihood	6.43 (2.64)	7.20 (2.67)	6.15 (2.69)	6.86 (2.63)	7.16 (2.38)	7.41 (2.69)
Guilt	7.96 (2.50)	9.53 (1.12)	7.98 (2.33)	9.00 (2.44)	5.80 (3.55)	9.02 (2.01)
Self-attribution for risk creation	5.60 (3.31)	8.13 (2.27)	5.30 (2.99)	9.18 (2.20)	2.12 (2.68)	8.43 (2.33)
Objective liability	6.06 (3.60)	8.57 (2.09)	6.30 (2.85)	8.94 (2.20)	1.34 (2.34)	6.65 (3.53)

Table II. Correlations between assessed variables (N = 147, using listwise deletion)

	1	2	3	4	5
1. Willingness to pay	1				
2. Overall perceived risk	.354**	1			
3. Self-attribution	.475**	.569**	1		
4. State guilt	-.043	-.034	.006	1	
5. Moral standards	-.250*	.264*	.293**	-.010	1

* $p < 0.01$; ** $p < 0.001$

Table III. Regression of assessed variables on willingness to pay (N = 147, using listwise deletion)

	Willingness to pay
Overall perceived risk	.105
Self-attribution	.383*
State guilt	-.040
Moral standards	.110
R^2	.248
F	11.72*

* $p < 0.001$

Coefficients are standardized Beta coefficients. Variance inflation factor (VIF) and tolerance statistics showed no evidence of multicollinearity.

FIGURES

Figure 1. Model 1: The positive relationship between risk perceptions and the willingness to engage in risk management behaviors is moderated by self-attribution for risk creation.

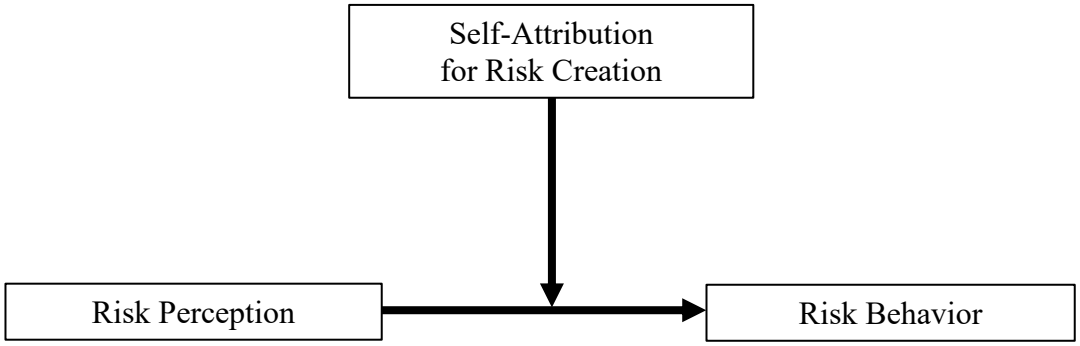

Figure 2. Model 2: The positive relationship between self-attribution for risk creation and the willingness to engage in risk management behaviors is moderated by risk perceptions.

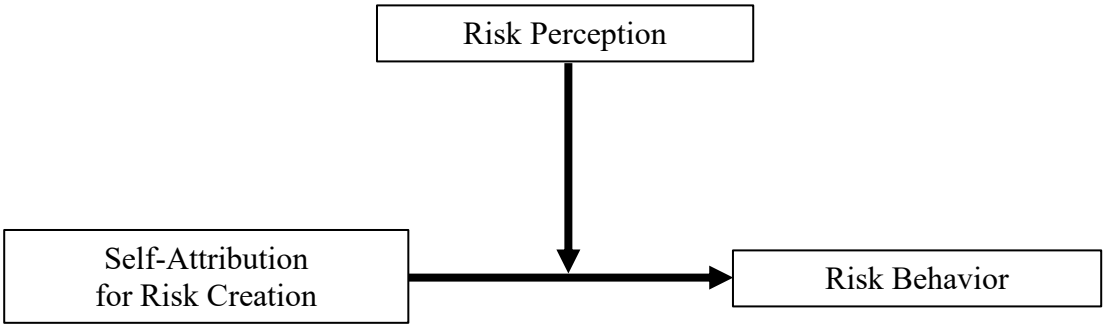

Figure 3. A simple slopes model depicting the effect of self-attribution for risk creation on the relationship between the perceived risk and the willingness to adopt risk management behaviors.

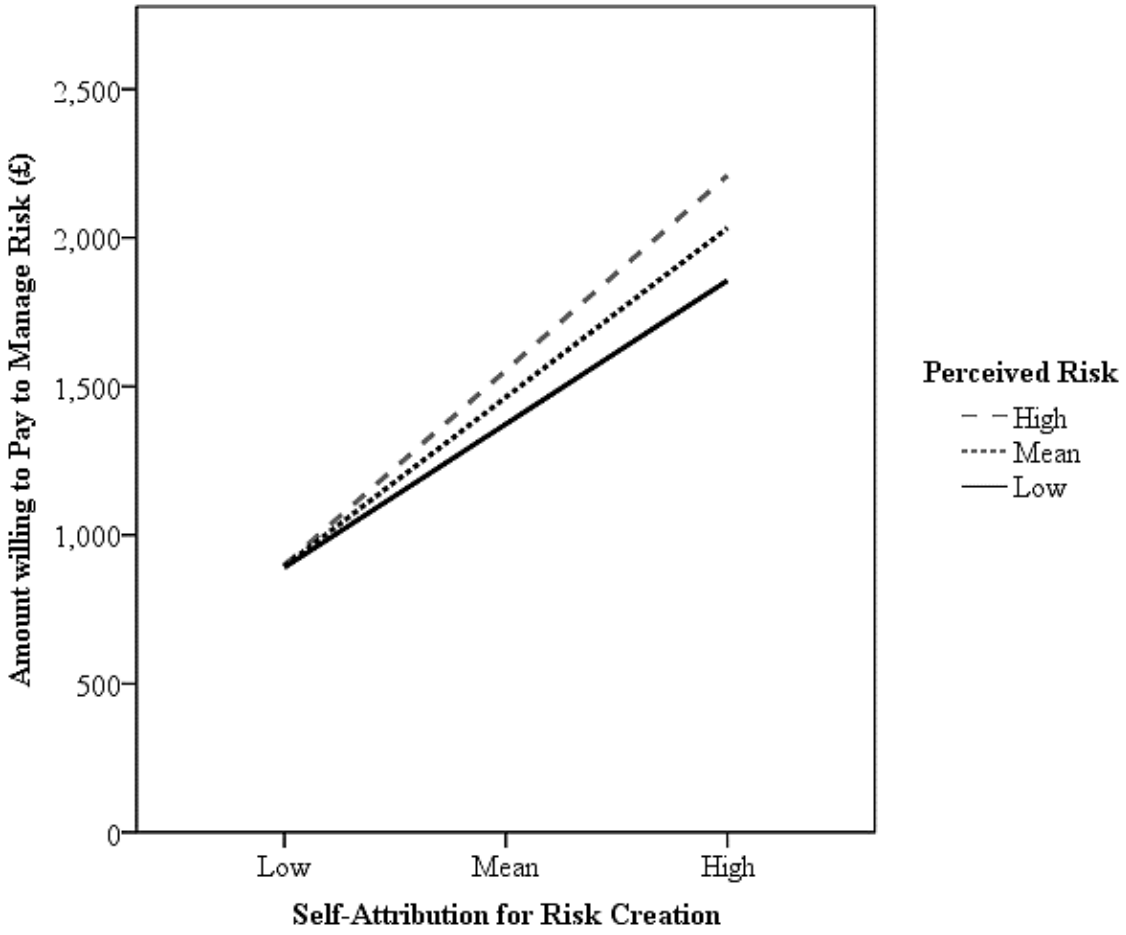

Figure 4. A simple slopes model depicting the effect of perceived risk on the relationship between self-attribution for risk creation and the willingness to adopt risk management behaviors.