

A flood risk oriented dynamic protection motivation framework to explain risk reduction behaviours

Response to the anonymous reviewer's comments in the interactive discussion: nhess-2019-120

Nbr.	Page/line	Reviewer 1	Author's response
1	/	This is a well-written manuscript, providing adequate details and good scientific quality. The results and conclusions are clear, concise and focused enough. The manuscript is discussing the motivations behind the adoption of protective actions by the public with the novel idea of combining PMT with TTM to deal with the non-homogeneity of population. The manuscript is worth publishing as it clearly adds to the knowledge in the field of risk perception and protective behaviors, in the wider topic of flood risk mitigation. I recommend accepting the manuscript with minor revisions, provided in the following list:	We thank the Reviewer very much for his/her numerous suggestions and comments. We addressed all the comments made that helped to improve the manuscript.
2	2/23-25	It is important to note that in the region and possibly elsewhere, it has been found that laymen think of flooding as a man-made or man-caused phenomenon rather than a natural one (Lara et al. 2010 and Diakakis et al. 2018).	We inserted a sentence and included the literature references: "This may be related to fact that people perceive flooding as a man-made phenomenon rather than a natural one, for example in the Mediterranean region (Diakakis et al., 2018; Lara et al., 2010)."
3	3/15-17	Although it can be understood, there is a logical leap, that may be hard for the reader to understand. Why this categorization allows us to identify the key issues to improve communication with people in each stage? It is not well connected with the previous phrase. I would	We inserted a sentence to better explain the connection between PMT-TTM and our research question: "Combining PMT with TTM will help to deal with the non-homogeneity of the population, who is not equally ready to adopt protective actions, and to better understand the respective motivations in order to reduce some of the uncertainty in predicting flood risk behaviour This framework allows us

		recommend to describe it in a bit more detail as it is a very crucial part of the manuscript (i.e. setting the objectives).	to further identify the key issues to improve communication with people in each stage.”
4	3/25-27	This seems to be an important argument, to make your case (to build the problem presentation). It is in the right direction. So, I would recommend adding more literature here. I recommend literature that states that there is no link between risk perception and actual adoption of mitigation measures.	We included the recommended literature in a couple of sentences: “For example, Siegrist and Gutscher, (2006) found that even though people living in areas with higher levels of designated risk had higher risk perceptions than people living in areas of no flood risk, there was no difference in prevention behaviour between the groups. Other studies that were conducted in flooding areas documented an overall low level of preparedness and observed no relationship between risk perception and preparedness (Diakakis et al., 2018; Kreibich et al., 2005; Takao et al., 2004).»
5	6/26	I think the parentheses should not include the author. The authors should keep the parenthesis only for the year in Amponsah et al. 2018	Done.
6	6/28	the word damage repeats.	Removed.
7	6/30-32	The diversion may have played a role in people’s perception. There have been cases where inhabitants of areas that see public flood protection works are influenced in their thinking to a degree. There could be a question on the survey on that or to measure that. If it there hasn’t been a question, maybe it could be acknowledged by the authors as a limitation of the current research, stating that the current survey did not examine the influences of significant flood protection measures separately.	We agree with the Reviewer. In the survey we asked participants how much they agreed with statements whether protection works eliminate the possibility of serious damages or whether they give a sensation of security. However, these questions were not specifically related to the implementation of the flood diversion system. Thus, we inserted a sentence at the end of the manuscript which acknowledges the limitation: “We examined the motivations of people to undertake risk reduction behaviours, but did not analyse the influences of significant flood protection measures (such as the flood diversion system) separately.”
8	8/30	family status (especially the presence of young children) has been correlated with protective behaviors and risk perception in previous works. I assume it was not surveyed. Given the	Thanks for this valuable comment. Unfortunately, we did not survey the family status of participants, but will do so in future surveys!

		<p>numerous other factors that were examined the manuscript has a lot of merit and value for publishing. In future surveys, though I recommend being included. If the family status was surveyed in the present study, then I would like to see how it is correlated.</p>	
9	Figure 4	<p>In the caption, does the word “likelihood” refers to absolute likelihood or reported-likelihood by the respondents of the survey? If it is the latter, then it should probably be revised to “reported-likelihood”. At the moment it is a little confusing for the reader</p>	<p>We re-worded the caption: “Results indicating the percentage of responses in each category of the Likert-scale for each risk reduction measure.”</p>
10	10/11-12	<p>Sentences not perfectly clear. Please elaborate further or make sentence simpler.</p>	<p>We removed the sentence and replaced it by a simpler one.</p>
11	11	<p>In general, in the discussion section, it could be of value to mention in more detail what did you find regarding “experience” of respondents. The literature clearly shows that perception is correlated with experience and that the latter is an important factor. Currently is not discussed adequately.</p>	<p>We found no effect of experience as we stated in the last paragraph of the discussion. We added a bracket “(experience, trust and socio-demographics)” to name the covariables and make it more clear. We also added some sentences on previous research. “Concerning experience with floods and natural hazards, most studies found that risk perceptions and mitigation behaviours correlate with experience (Bubeck et al., 2012), even though some exceptions exist (Takao et al., 2004). Likewise, trust was also found by previous research to have direct and indirect effects on flood preparedness intentions (e.g., Terpstra, 2011).”</p>
12	11/29	<p>The way you describe the findings in the last paragraph, what comes in mind is a simple concept of “risk personalization” or the phrase “it won’t happen to me”. This has been noted in the literature. For example Gissing et al. 2016, clearly states that people ignored warnings and went around barricades and</p>	<p>We added some sentences here (including the reference) to acknowledge the concept and that not everything can be explained: “Similarly, other research observed that people do not protect themselves even though the protective behaviour would be very easy to adopt. Gissing et al. (2016) observed that motorists ignored warnings and drove into flood waters despite an obvious risk of death. The authors list numerous motivations such as underestimating or not understanding the risk,</p>

		drove into flooded areas, even though protective behavior would mean something very simple such as a d-tour. I think this concept has to be acknowledged in the discussion to a limited extent, in the sense that not everything can be projected or explained. There will always be a factor such as the failure to “personalize risk”, even though this manuscript provides excellent ground to reduce this uncertainty of predicting behavior.	feeling invincible and not taking the warning seriously. Hence, we have to acknowledge that each person sees and responds slightly differently to flood risk, and try to reduce the uncertainty of predicting behaviour as much as possible.”
13	12/9-11	Sentence not so clear. Please rephrase to make it more clear.	Indeed the sentence was not clear and we decided to delete it, as the speculation did not add to the understanding of the paragraph.
14	12/17-18	Please state clearly that this is speculation, to avoid the risk of other authors take it as a data-based conclusion and propagate assumptions in their own research.	Done.
15	12/23	Previous studies refer to differences in risk perception between male and females. I think a few more remarks on this very subject should be included here.	We included a sentence and stated some literature: “Previous studies also reported differences in risk perception between men and women. On average, men are found to have lower perception levels of flood risk compared to women (Ho et al., 2008; Lindell and Hwang, 2008), even though (Botzen et al., 2009a) found the opposite relationship.”
16	12/26	any references for this claim?	No, we made clear that this is a speculation.
17	12/27	the word “also” is not needed here	Done.