

Interactive comment on “Exploring the change of Risk Perception and Adaptation Behavior among Varied Social Character Before and After Earthquake Disaster – A Case Study in Taiwan” by Tzu-Ling Chen et al.

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This is an interesting study investigating risk perception and preparedness actions through surveys, pre and post an earthquake event. The findings are important and contribute to the growing body of research in this space. However, currently this manuscript requires significant revisions for those findings to be recognised clearly. Primarily, areas of research are missing in the introduction and discussion, that both can provide more context and help the authors interpret some of their findings. Second, there is a lack of clarity in a number of places, including the presentation of method-

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ology, results, and figures. Thirdly, while I appreciate the challenge of writing in a second language (and acknowledge the privilege of being able to write in my first), the manuscript is currently very difficult to read and understand in places – which sadly detracts from the data within. I would recommend the editors consult a professional editing service, seek assistance from the journal if it offers that option, or seek an additional author to assist with the writing.

Ans: Thanks for the valuable and insightful comments. First of all, thanks for pointed out that there are areas of research missing in introduction and discussion, and the revised version will focus on these two section to improve both statements and interpretation. Secondly, the submitted paper has been through English proofreading in American Journal Experts, and the comments have been transferred to AJE and hopefully the revised version could solve the issue.

My detailed recommendations follow below,

1. Some substantial areas of research are missing, including key preparedness and response literature. For example, discussion of the Protective Action Decision Model (Lindell & Perry, 2012; Lindell & Hwang 2008; Lindell & Prater 2002) and other hazard preparedness models (e.g., Paton et al., 2015), societal influences on household preparedness (Becker et al 2014), recent research on preparedness motivations (Becker et al 2017; Doyle et al 2018) which consider multiple-event risk perceptions (McClure et al 2016, Doyle et al 2018). Thus, the introduction and contextual discussion of the findings should explore some of the elements raised in this pre-existing literature, and how the results relate to those, including self- and collective-efficacy, outcome expectancy, responsibility, etc. Notably, the discussion omits a number of key texts investigating the relationship between gender and preparedness, and reasons for that difference (e.g., familial responsibilities), e.g. Dooley et al; Bateman and Edwards; Lindell & Prater; Olofsson & Rashid; Palmer; as well as texts exploring the barriers to preparedness (e.g., Blake et al 2018; Senkbeil et al 2014). The Literature on attribution theory, and on trust in communications is also lacking.

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Ans: Thanks for the valuable comments and providing abundant references for us. Based upon past studies, the interactions of social characters could collectively affect responses to disasters. This study discusses the response from various social characters respectively to explore how social characters affect the pre- and the post- risk perception and adaptation behavior. The revised version will take all the suggested areas of research into consideration and improve the statements in both introduction and discussion section.

2.The authors need to set the scene more in section 2.1 (Study Area) – what resilience building activities have been conducted in these regions, if at all? Some more information about the community, and previous events or resilience activities is needed.

Ans: Thanks for the comment. The revised version will include more information related to resilience achievements regarding the study area.

3.Section 2.2 – ‘simple random sampling’ – of what? The phone records?

Ans: Thanks for the comment. All survey sampling methods relied on voluntary response sampling. The former is streets survey, and the latter is telephone survey based on phone number databases within study area by the survey research center of the domestic academic institution. The revised version will improve the illustration in data collection.

4.Section 2.2 – what do you mean by ‘some notifications’?

Ans: Here “some notification” indicates to give some information for the respondents such as when was last time of earthquake magnitude was over 6.0, where the fault line is, what is the frequency of earthquake disaster in the study area and so on. Current version has not stated clearly and the revised version will improve the statement in data collection.

5.Section 2.2 – for the survey questions, why did you choose these particular factors (e.g., trust in government and responsibility attribution?). These factors need more

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detail explanation in the introduction, referencing the relevant literature (e.g., on trust and attribution theory for risk communication), such that in section 2.2 there is more rationale and explanation for their choice (and prioritisation over other potential factors).

Ans: Thanks for the comment. This study has reviewed the past research on the impact of social character and pre- and post- disaster. There are purposes of applying such questions to detect individuals’ disaster perception and adaptive behaviors. The revised version will clarify the reasons and principles of the factors applied in this article.

6.I do not think the authors need to include the full description of the ANOVA in section 2.4, given it is a well know statistical test. Would recommend trimming, or if needed including in an appendix. Much of section 2.4 can be summarised much more briefly, as these are standard approaches.

Ans: Thanks for the comment. The revised version will give brief intro of ANOVA.

7.The tale end of section 2.4, outlining the Likert scale of 1 to 7, should be moved to section 2.3 where the measures are discussed.

Ans: Thanks for the comment. The revised version will move the Likert scale of 1 to 7 to section 2.3.

8.Lines 145 to 150, seems to contradict oneself on first reading – first you say that there is willingness to house retrofit, and then that it decreased. I think you mean pre/post earthquake, but this needs clarification.

Ans: Thanks for the comment. Due to the research question is not that clear in the introduction and further results in the confusing statement in the findings. The revised version will make it consistency to state both social character and pre- and post- disaster change.

9.In general the ANOVA results need clearer reporting, to standard (brief style) formatting including more clearly the F statistic and degrees of freedom, rather than just the

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P value. To that end, the P value isn't 0.000, but should be reported as $p < 0.0005$.

Ans: Thanks for the comment. The revised version will provide the traditional ANOVA to give a clear reports of the results.

10.Line 140, explain why high school/blue collar might have less capability to adjust in the introduction, to set the context here.

Ans: Thanks for the comment. Due to the different educational base, the capability might be varied. The revised version will bring more discussions first in the introduction section to explain such issue.

11.Section 3.2 (Age) is hard to follow, and needs rewording completely, as currently it reads contradictory.

Ans: Thanks for the comment, and the revised version will rewrite section 3 and 4.

12.Line 190 – this should be explored in the discussion, in the context of how both resources (\$) and / or care responsibilities could be a possible interpretation of this finding.

Ans: Thanks for the comment. As we know, households with children could have more willingness to pay more for house retrofit, and self-owned household could believe original house safety or relied on their life experience. However, it is suitable for complete domestic research because of cultural difference and detailed socioeconomic information. That is the reason why we decide to have a comprehensive comparison instead of specific discussion. We believe it is a good issue for future work.

13.Section 3.3 – does the higher education group correlate with income? Equally, could this group have less worry of buildings collapsing, because they could afford to have better buildings to start with (or were able to retrofit)? These nuances need further discussion.

Ans: Thanks for the comment. Here, in the study area, there is a trend that higher

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education might have relative higher income. The revised version will add up more discussions in the introduction section to lead more rational discussion in the discussion section.

14.Line 193 – This discussion of gender needs more explanation in context of the references listed previously.

Ans: Thanks for the comment and we will improve the whole discussion part in the revised version accordingly.

15.Throughout the figures need more context and linking to the text (e.g., Figure 8 on line 200 – it's hard to link the text to the figure. The figures need more explanatory captions to guide the reader, and the text needs more explanatory linking to the figures.

Ans: Thanks for the comment. Figure 8 to 10 could only provide limited information and therefore we will delete the figures in the revised version. In addition, the whole section of discussion will be rewritten to improve the overall research purpose.

16.Other issues (such as fatalism, or anxiety) need to be raised in the discussion in more detail – see e.g., McClure et al 2001 and Paton 2005, Wei & Lindell 2017

Ans: Thanks for the comment, and the revised version will focus on discussing the potential impacts of social character and pre- and post- disaster. Therefore, the research question will be stated in the introduction and other issues will be taken away.

17.Line 227 – I'm not sure where the concept of bounded rationality came from in this paragraph. Needs better linking and explanation.

Ans: Thanks for the comment, and the revised version will focus on discussing the potential impacts of social character and pre- and post- disaster. Therefore, the research question will be stated in the introduction and bounded rationality will be taken away.

18.Line 229 – what do you mean by internal control?

Ans: Thanks for the comment, and the revised version will focus on discussing the po-

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tential impacts of social character and pre- and post- disaster. Therefore, the research question will be stated in the introduction and internal control will be taken away.

19. Line 228-231 repeats exactly some sentences in the introduction – reword appropriately

Ans: Thanks for the comment, and we will rewrite section 3 and 4 in the revised version.

20. The discussion needs some more explanation of the limitations – a limitation and future research section would be ideal. They are touched on in the conclusion (e.g., time limitation), but lack enough detail for the reader to evaluate and interpret.

Ans: Thanks for the comment, and the revised version will add up the explanations of the limitation in the conclusion section.

21. The authors introduce the term ‘subjective resilience’ but need to define and explain this further. How does it relate to the various measures discussed?

Ans: Thanks for the comment. “Subjective resilience” has been discussed in the introduction, but it has less connection with the rest of discussion. Therefore, we will reevaluate whether use risk perception and adaptive behavior only in the revised version.

22. The authors refer to ‘sex’ (see section 3.1 in particular), when I believe they need to be referring to ‘gender’ as the issues here relate to familial responsibilities and social roles relating to someone’s gender – not their biological sex. See Rushton et al (2019) for more.

Ans: Thanks for the comment. According to the previous articles, both sex and gender could be applied for such category. However, gender indeed might be more appropriate and we will revise it.

23. Figures need improving for clarity. Figure 1a-d need to be larger as the keys are hard to read, Figure 2 would be better in an appendix. All figures would benefit from

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more explanatory extensive captions that enable them to be read and interpreted more easily. Figures 3, 4, 5, 6 & 7 are not in a format I am familiar with. It took a while to interpret them, I feel they need some much clearer captions and further explanation to facilitate interpretation.

Ans: Thanks for the comment, and we will amplify Figure 1a, and take other reviewers’ comment we will delete 1b-d for the figures could only reveal limited information. Figures 3 to 7 are radical new here, and we will take the comments seriously and bring up tables or readable figures in the later version.

24. Some of the tables are a bit unclear, e.g., Table 2: it is hard to follow which of the rows in column 1 apply to which rows in the other columns. Can they be reformatted to aid comprehension?

Ans: Thanks for the comment, and we will have revised the table in order to increase readability.

25. References ===== Rushton A, Gray L, Canty J, & Blanchard K (2019) Beyond binary: (re)defining “gender” for 21st century disaster risk reduction research, policy, and practice *Int J Environ Res Public Health*, <https://doi.org/10.3390/ijerph16203984>. McClure J, Allen MW, & Walkey F (2001) Countering fatalism: Causal information in news reports affects judgments about earthquake damage *Basic Appl Soc Psych*, https://doi.org/10.1207/S15324834BASP2302_3. Paton D, Smith L, & Johnston D (2005) When good intentions turn bad: Promoting natural hazard preparedness *Aust J Emerg Manag* 20(1) 25–30. Wei H-L, & Lindell MK (2017) Washington households’ expected responses to lahar threat from Mt. Rainier *Int J Disaster Risk Reduct* 22 77–94, <https://doi.org/10.1016/J.IJDRR.2016.10.014>. Senkbeil JC, Scott DA, Guinazu-Walker P, & Rockman MS (2014) Ethnic and Racial Differences in Tornado Hazard Perception, Preparedness, and Shelter Lead Time in Tuscaloosa *Prof Geogr* 66(4) 610–620, <https://doi.org/10.1080/00330124.2013.826562>. Blake D, Marlowe J, & Johnston D (2017) Get prepared: Discourse for the privileged? *Int J Dis-*

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Potter SH, Becker JS, Johnston DM, Lindell MK, Johal S, Fraser SA, & Coomer MA (2018) Motivations to prepare after the 2013 Cook Strait Earthquake, N.Z. *Int J Disaster Risk Reduct* 31 637–649, <https://doi.org/10.1016/j.ijdr.2018.07.008>.

Ans: Thanks for the long list for the references. We will include as many as we can according to our research question.

Interactive comment on *Nat. Hazards Earth Syst. Sci. Discuss.*, <https://doi.org/10.5194/nhess-2019-422>, 2020.