Response to Reviewer 2 Comments

Dear Reviewer,

We really appreciate your constructive comments that have helped us to improve this manuscript. We appreciate the chance to revise the manuscript. Enclosed please find our revised manuscript that addressed all the comments made by the reviewers. Below we provide point-by-point responses to all the comments.

Thanks so much

Best regards,

Xiaorong Hou, Yong Zhao

The main corrections in the paper and the response to the reviewer’s comments are as follows:

Reviewer 2

Point 1: In the abstract, please concretely indicate how framing messages were developed? What concepts or theory were used to develop those messages? Please exclude “available literature”.

Response 1: Thanks for your comments. We agree with your opinion. We used prospect theory and construal level theory to guide the design of our messages in this project. Please, see page 1, line 30. In the method part, we have introduced in detail how the framing messages were designed. Please, see page 3-4, lines 120-125.

Point 2: Page 2 line 49. What is BMI stand for? It has never mentioned before.

Response 2: We are sorry for this oversight. BMI is the abbreviation of body mass index and we have now added the full name of BMI to the article. Please, see page 2, line 50.

Point 3: In the introductory part, please clearly indicate the age defined as preschool stage with citation(s).

Response 3: Thanks for your comments. In this study, we defined preschool children as children aged 3-6 years. Many kinds of literature have adopted this age definition. We have inserted references into the sentences of age definition. Please, see page 2, line 54.


Point 4: Page 2 line 68, “Caregivers with different cognitive abilities and from different professional education levels may have considerable differences in the degree and the time they need for acceptance.” Please insert citation(s).

Response 4: Thanks for your comments. Ownby et al. summarized the factors could affect health literacy, including cognitive abilities and education level. Health literacy is closely related to individual's ability to obtain health message. In this revised version we have inserted references into the sentences. Please, see page 2, line 70.
Point 5: In the introduction, please add a paragraph presenting the objectives of this study, possibly the last paragraph. In addition, it would be more appropriate to present the situation relevant to simple obesity among preschool children in the case study as well.

Response 5: Thanks for your comments. We agree with your opinion. We have set out the specific purpose of the study in the last paragraph. Please, see page 3, lines 93-97.

Therefore, it is necessary to prevent and intervene in simple obesity and intervention among children during the preschool stage on the basis of goal- and temporal-framing effects. This research aim to explore whether the acceptance of prevention message on preschool childhood simple obesity can be increased by gain-framed message and present-oriented message among caregivers and demonstrate the role of demographic characteristics, theme of healthy behavior, personal involvement and use of negative words within the message acceptance of moderating framing effects.

In the first paragraph of the article, we propose the relationship between preschool children and simple obesity. “Geserick et al. found that the preschool years are a critical period for childhood simple obesity, and the rapid increase in body mass index (BMI) among children aged 2 to 6 years old was highly correlated with obesity in adolescence and even adulthood, with a relative risk of 1.43.” We have made appropriate changes to emphasize that the prevention of simple obesity should start from the group of preschool children. Please, see page 2, lines 53-54.

Point 6: Regarding the study design, section 2.1, it was mentioned that several factors were investigated on their influence on acceptance of framing messages. Please clearly indicate those factors and discuss on their possible effect on individual acceptance of framing messages, both goal framed and temporal framed. The discussions must be based on literature reviews. For instance, how gender, education level, participation in health training, etc. could influence individual acceptance of framing messages? Following these discussions, research hypotheses can be indicated. Without this part, the paper would definitely lack of scientific soundness, and would finally lead unconvincing findings.

Response 6: Thanks for your comments. We have pointed out the factors in section 2.1, including gender, educational background, theme, the use of negative words, previous participation in related health intervention and career category.

In the revised discussion, we pointed out the factors to be discussed that were based on the available literature. In goal framing effects, there was only abnormal framing message choice in Db theme. We thought that this difference may be probably related to the use of negative words. A detailed explanation was showed in the second paragraph of the discussion. Please, see page 9, lines 234-255. In temporal framing effects, we thought that the difference in theme performance is probably related to the increase of framing message. The detailed explanation was shown in the third paragraph of the discussion. Please, see page 9-10, lines 256-275. In these two paragraphs, we have elaborated a good amount of literatures, put forward the scientific hypothesis and made critiques.

Gender, educational background, and participation in health training were all discussed in the fourth part of the discussion, which were elaborated in combination with evidence from the literature. Because
these factors are mentioned more in the previous literature, and our findings has shown the similar conclusion as some of the previous literature[1–4]. Due to the lack of literature on peasants and framing effects, our discussion on peasants is lacking scientific basis, which may reduce its credibility. We have described this fact in the limitation discussion. Please, see page 11, lines 308-310.


**Point 7:** Page 2, line 119-120, it is not necessary to explain about WeChat.  
**Response 7:** Thanks for your comments. We agree with your opinion. We have deleted the sentence which explained WeChat.

**Point 8:** In the section of participant selection, please explain how the size of population was decided.  
**Response 8:** Thanks for your comments. At present, very few researches explored the effect of goal-framing and temporal-framing on childhood simple obesity prevention message among caregivers, and comparing with the number of questionnaire items (11), the sample size of this study (592) is more than fifty times, which met the needs of sample analysis.

**Point 9:** In the section of questionnaire, it was indicated that the developed questionnaire was tested before the real survey. Please clearly report who and how many people participate in the test, and please report the results of pre-test. Normally, reliability of the developed questionnaire items must be reported.  
**Response 9:** Thanks for your comments. In March 2019, the pre-survey investigated 31 caregivers to test the reliability of the questionnaire. The Cronbach’s alpha of the questionnaire (demographic characteristics and framing messages) was found to be 0.817. The Cronbach’s alpha for the framing messages materials was 0.893. The Cronbach’s alpha of this questionnaire > 0.8 indicate that the newly-developed questionnaire had good reliability. We have added these to the section 2.3. Please, see page 3-4, lines 125-128.

**Point 10:** Most importantly, I would suggest showing questionnaire items and a response category. Another option, please explain how participants were asked; so that, readers can realize characteristics of collected data. And please clearly explain how questionnaire items were developed. Please avoid too board explanations. For
instance, “The item questionnaire was developed with reference to available literature”.

Response 10: Thanks for your comments. We agree with your opinion. We have shown questionnaire items of framing effects and response categories in Appendix B. Please, see page 13, Appendix B. Participants observe four different types of framing message on the same theme at the same time. They were asked to read the messages carefully and chose the most acceptable one. Please, see page 4, lines 132-133.

We refer to the review articles [5,6] and research papers [7–9] of framing effects to determine the questionnaire content of demographic characteristics. The content of prevention messages of simple obesity in preschool children were derived from clinical research [10,11], epidemiological studies [12] and clinical practice guidelines [13–15]. We processed these prevention messages into health framing messages according to the prospect theory and construal level theory. We used expert judgment to ensure the validity of the questionnaire. The content of the questionnaire was finalized after several discussions by an expert group. We have now added how questionnaire items were developed in detail in section 2.3. Please, see page 3-4, line 120-125.

10. D.; Jarrin; J.; Mcgrath; C.; Drake Beyond sleep duration: distinct sleep dimensions are associated with obesity in children and adolescents.

Point 11: Regarding data collection, normally, it should be presented the date and place that data were collected.
Response 11: Thanks for your comments. We have now written down the kindergartens’ name and date in the acknowledgment section. Please, see page 11, lines 336-339. We conducted the survey covering a period of about 3 months in 8 kindergartens. We thought that writing this in the method section would increase the length of the article.

Point 12: Page 5, line 167, What do you mean by “initial survey”? 
Response 12: Thanks for your comments. What we want to express is that in the survey, 592 caregivers filled in the questionnaire, but 87 caregivers were not included in the statistical analyses because they did not fill in the questionnaire as required. “Initial” was caused by a presentation error, which we have modified.

Point 13: In table 1, Please eliminate the category “other relationship”.
Response 13: Thanks for your comments. We agree with your opinion and made the necessary edits.

Point 14: Page 9, line 223, “only 253 (50.1%) caregivers found the LP message acceptable.” 50.1% is the highest proportion. Please exclude “only”.
Response 14: Thanks for your comments. We agree with your opinion. The “only” was eliminated.

Point 15: Page 9, line 226 regarding this statement “However, we found that the effect of framing effects affected by some factors through further analysis”, what do you mean?
Response 15: Thanks for your comments. This sentence meant to connect the context. We intend to shift the reader's attention from the description of the results to the discussion of the factors affecting the framing effect. We have changed this sentence to “Then, we discussed some factors that affect the framing effects through statistical analysis” to reduce possible misunderstandings. Please, see page 9, lines 232-233.

Point 16: Page 9, Line 257-259, it was indicated that “The results show that caregivers were more likely to accept the future-oriented message in Pa and Sf theme compared with Dh theme.” This is not true. According to Table 3, participants were more likely to accept present-oriented message in all themes.
Response 16: Thanks for your comments. This is a misunderstanding caused by our unclear expression. We have now revised this sentence to “The results show that there is a trend of increasing the proportion of caregivers who thought the future-oriented message is more acceptable with the increase of the serial number corresponding to the theme.” Please, see page 10, lines 265-267.

In table 3, the proportion of caregivers who thought the present-oriented message is more acceptable exceeds 50% in all the themes (Dh, Db, Pa, Sf). But the proportion of caregivers who thought the future-oriented message is more acceptable from 11.3% in Dh, increased to 14.1% in Db, then increased to 32.3% in Pa and increased to 39.4% in Sf at last. This is an increasing trend. In the third paragraph of the discussion part, we tried to explain this phenomenon with the traditional psychological and construal level theory. This means that there may be a defect in the construal level theory, which would cause the instability of temporal framing.

Point 17: Regarding the discussion part, it was well structured. Many findings were not discussed, contained no explanations. Please provide discussions on these findings,
based on relevant studies and concepts.
The result in Table 2 showed that GP message was most preferred by participants for communicating about Dh, Pa, and Sf, except Db. Why?

**Response 17:** Thanks for your comments. Because each of our framing messages expresses two kinds of framing effects at the same time the results show that the collocation of gain-framed and present-oriented is more easily accepted by caregivers in most themes. This is not the case in Db, but Table 2 cannot clearly explain whether the change is caused by goal framing effects or temporal framing effects. So, we showed table 3. Please, see page 6, lines 194-195.

The results in Table 3 show that “GP message was most preferred by caregivers except Db” because the goal framing effects did not perform in Db. In the second paragraph of discussion part, we summarize these results and present our conclusions incorporating references from a good number of literatures. Please, see page 9, lines 234-237.

**Point 18:** For the table 3, for communicating about Dh, Pa, and Sf, participants more accepted gain-framed message. Why?

**Response 18:** Thanks for your comments. According to the results of previous health message studies on other topics, we made a hypothesis before the survey: in the framing message on simple obesity prevention for preschool children, the caregivers would more willing to accept gain-framed message and present-oriented message. We added this hypothesis in the last paragraph of the introduction. Please, see page 3, line 95. Many literatures explain this phenomenon through prospect theory and construal level theory.

**Point 19:** For communicating about Db, participants more accepted loss-framed message. Why?

**Response 19:** Thanks for your comments. This problem is also discussed in the second paragraph of the discussion in combination with the literature. In our hypothesis: “communicating about Dh, Pa, and Sf, participants more accepted gain-framed message” is normal and it can be identified in most literature. And “For communicating about Db, participants more accepted loss-framed message” is an abnormal phenomenon. This phenomenon is the core of the discussion in the second paragraph of the discussion part.

**Point 20:** Many significant variables presented in Table 4 and 5 were not discussed on their influence on goal framing and temporal framing effects. For instance, influence of gender on participants’ acceptance of goal framed message. What presented in “Line 268-282” were quite board, and provide nothing for the contribution of this research. Please deliberatively and carefully discuss the results, and provide possible contributions based on those findings.

**Response 20:** Thanks for your comments. We agree with your opinion.

We have made a reasonable discussion on these influencing factors in combination with the literature. The reason why these factors were put in the last part of the discussion is that these results are similar to the conclusions of most previous studies. For instance, many studies have reported on the impact of gender, educational background and personal involvement on participants’ acceptance of framing messages. Please, see page 10, lines 276-290. Most importantly, at the same time, these results also confirmed that many conclusions in the field of framing effects are applicable to the reception effect.
in the message on the prevention of simple obesity in preschool children. At the end of this paragraph, we have set out the possible contributions of these conclusions. Please, see page 10, lines 292-294.

**Point 21:** Page 2 line 48, Should be Geserick et al. [3]. Similarly, line 78-79. Myers [22]. Citations in many parts should be revised as well

**Response 21:** Thanks for your comments. We agree with your opinion. We have corrected the mistakes in the format of the references.