TESTING THE LEDDO, JAYANTI AND DUAN (2019) REVISED PROSPECT THEORY VALUE FUNCTION: THE EFFECTS OF FRAMING OF OUTCOMES ON CHINESE STUDENTS' DECISIONS

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ABSTRACT

Prospect Theory (Kahneman and Tversky, 1979) predicts decision making when people are confronted with choices involving gains or losses with different degrees of uncertainty. Prospect Theory argues that people are generally risk averse when it comes to seeking gains and risk seeking when it comes to seeking losses. Tversky and Kahneman (1981) even found that framing the same decision in terms of gains or losses could influence whether people were risk averse or risk seeking. Leddo et al. (2019) noted that the original formalization of Prospect Theory did not take into account people's goals. They argued that people would be willing to take risks to achieve goals but become more risk averse once those goals are achieved, and they would become risk averse when confronted with losses in order to avoid a highly negative outcome but become more risk seeking to negate the negative outcome once it occurred. Leddo et al.'s research confirmed this hypothesis, leading to a revision of Prospect Theory's value function. Leddo and Elkas (2021) provided further support for this revised value function by showing that when replicating the famous Tversky and Kahneman (1981) framing study but incorporating goals into the gain and loss scenarios, people's decisions showed a framing effect, but one that followed the Leddo et al. (2019) revised value function.. The present study replicates this Leddo and Elkas (2021) framing study with students from China in order to investigate whether the framing effects found in that study hold up with people from another culture. This hypothesis was tested on 87 high school students using the four scenarios from the Leddo and Elkas (2021) study, which were translated into Chinese. Results showed no main effect in risk seeking

behaviors for gain vs. loss-framed outcomes, which was consistent with the revised Leddo et al. (2019) value function but inconsistent with the Kahneman and Tversky (1979) value function. Results also showed no main effect for whether the outcomes were above or below the aspiration/avoidance levels, which was inconsistent with the outcome predicted by the Leddo et al. (2019) value function. Similarly, when decisions were framed in terms of gains, there was no difference in risk seeking behaviors when outcomes were above or below the aspiration level. However, when decisions were framed in terms of losses, participants chose the risky alternative more frequently when the outcome was below the avoidance level than when it was above the avoidance level, a result consistent with the predictions made by the revised Leddo et al. (2019) value function.

Introduction

One of the most prominent and influential theories of decision making and choice behavior is Kahneman and Tversky's Prospect Theory (1979), which evolved from attempts to understand the place of expectation-based theories in describing individual decision making. Prospect Theory proposes a value function that relates actual outcome value to subjective utility and a decision weighting function which translates the stated probability of an outcome to a subjective weight that the stated probability carries in assessing the attractiveness of that outcome.

The Kahneman and Tversky value function has two distinct properties: a) it is concave for gains and convex for losses so that, for example, the difference in utility between 0 and 100 dollars is not the same as the difference in utility between 100 and 200 dollars, and; b) the function for losses is steeper than the function for gains so that a given amount of loss is more aversive than the same amount of gain is attractive. Figure 1 shows Prospect Theory's value function.

Since its inception, there have been many tests of Prospect Theory in a variety of contexts such as business and political decision making (Kahneman & Tversky, 2000; Jones 2001; Gilovich, Triffen & Kahneman, 2002; Weyland, 2006). Many studies have cited support for some of Prospect Theory's main claims. However, results have not always been consistent. For example, Weyland (1996) found that in Latin American countries, politicians facing economic hardships would sometimes enact bold, risky policies and others would enact conservative ones. Similarly, Alghalith et al. (2012) found that investors tended to be risk seeking regardless of whether they were gaining or losing money. Riabacke (2006) examined several lumber companies. These were first grouped into established companies and new and upcoming companies. The companies were asked to choose between a new risky technology not used yet but promised to be more efficient vs the current/old technology. The established company chose the old one while the

new company chose the newer technology. Thus, when confronted with the same decision, established companies were risk averse (which generally seems to be the case), whereas the newer companies were risk seeking (which generally seems to be the case).
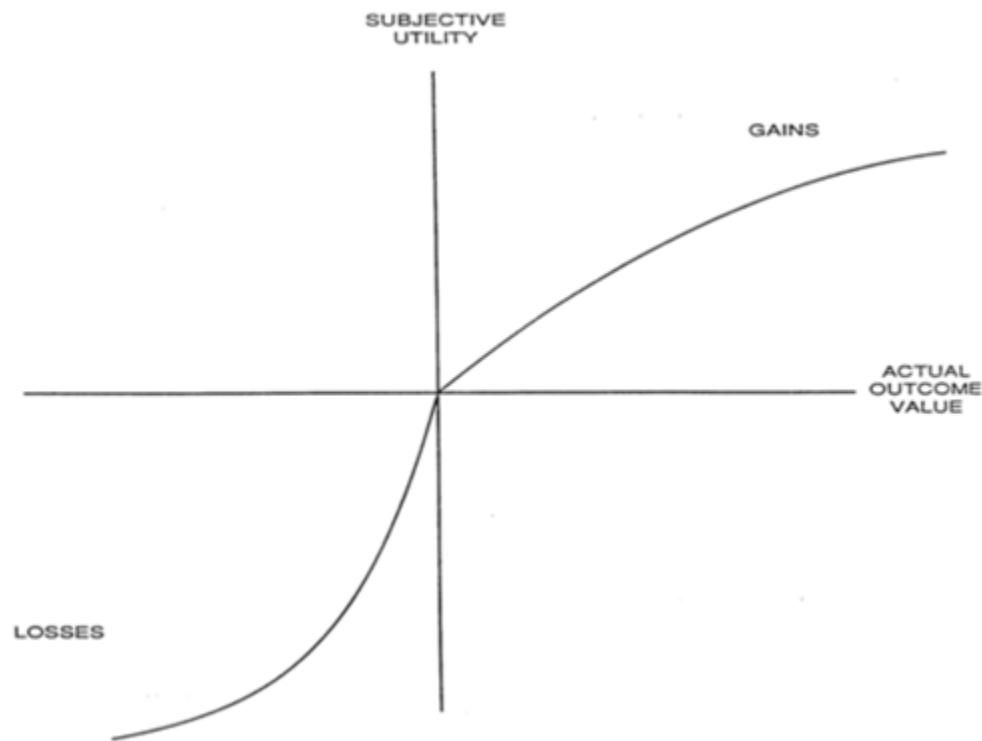

FIGURE 1. Kahneman and Tversky's (1979) value function showing relationship between actual outcome value and subjective utility.

Leddo et al (2019) Extension of Prospect Theory

Kahneman and Tversky have done an excellent job in explaining cases where people would be risk averse versus risk seeking. However, Prospect Theory fails to account for the real-world decisions described above. The reason for this may be reflected in the critique of Prospect Theory offered by Nwogugu (2005) that Prospect Theory was created based on hypothetical decisions that do not reflect the types of real-world decisions involving risk and reward that people typically face. In the real world, gains and losses may not be uniform in how they appear to the decision maker.

As a result, Leddo et al. (2019) noted that real-world decisions often occur in the context of goals, represented in terms of outcomes a decision maker is trying to achieve or ones s/he is

trying to avoid. Accordingly, Leddo et al. (2019) created a revised value function that included an aspiration level that represented an outcome the decision maker is trying to achieve and an avoidance level that represented an outcome that the decision maker is trying to avoid. The inclusion of aspiration and avoidance levels in the value function leads to predictions of decision making that run counter to those of classical Prospect Theory.

For example, Prospect Theory's value function argues that each successive dollar a person receives is worth less than the previous dollar. However, suppose a person has a goal of becoming a millionaire. Prospect Theory states that the 10th dollar the person gets along the way towards achieving that goal will be subjectively worth more than the 1 millionth dollar the person gets. Common sense suggests the reverse is true. On the other hand, once the million-dollar goal is achieved, it is reasonable to argue that each successive dollar earned has decreasing subjective value.

Conversely, suppose a person owns a business that will fail if it loses 1 million dollars. Prospect Theory states that each successive dollar lost has decreasing subjective value such that the first dollar lost is subjectively more aversive than losing the one millionth dollar that causes the business to fail. Again, this goes against common sense. As with the argument in the previous paragraph, it is reasonable to also argue that once the one-million-dollar loss occurs and the business is sure to fail, any losses greater than that have decreasing aversiveness.

 Accordingly, unlike the traditional Prospect Theory value function, which is concave for gains and convex for losses, the Leddo et al. (2019) revised Prospect Theory value function is convex for gains up to the aspiration level and concave thereafter and concave for losses up to the avoidance level and convex thereafter. The Leddo et al. (2019) revised value function is shown in Figure 2.

Figure 2: Revised Prospect Theory value function
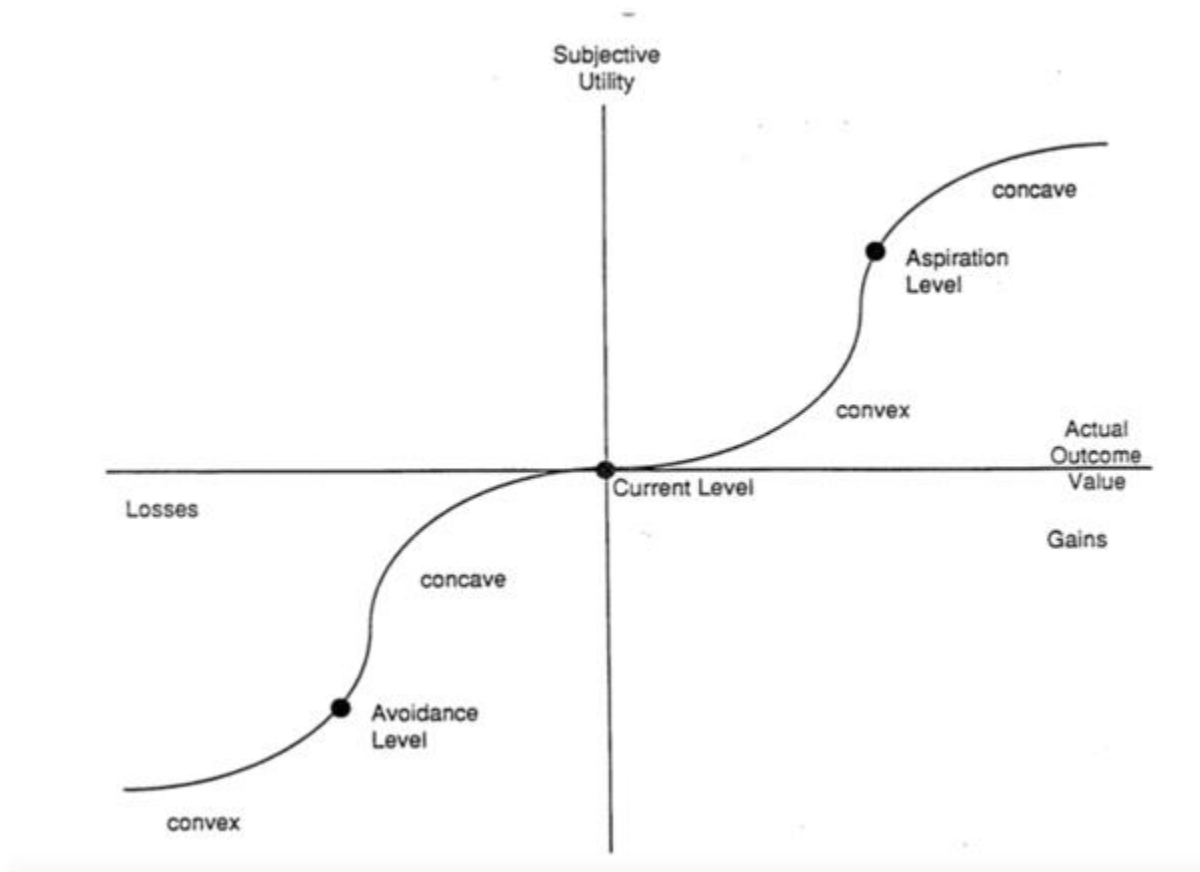
The reformulated value function is useful in explaining the empirical results described earlier that appear at odds with the original version of Prospect Theory. For example, investors presumably have a very high aspiration level, so it makes sense for them to be risky when they are gaining money at levels below whatever aspiration level they set. For the lumber companies, new companies have not yet established themselves. Therefore, we would expect new companies to be below their aspiration levels and be willing to engage in risky behaviors. On the other hand, an "established" company has already achieved the goal of becoming successful (its aspiration level), so we would expect to see it to be more risk averse in decision making.

One of the more interesting findings in the original Prospect Theory (1979) formulation was the notion of framing effects. Tversky and Kahneman (1981) found that people could show opposite attitudes toward risk regarding the same decision, depending upon whether the decision was framed as involving gains or losses. For example, people were confronted with two scenarios in

which 600 people were threatened with death. When the scenario was framed in terms of choices involving gains, i.e., how many lives would be saved, people chose to save 200 people for sure rather than gambling to save all at the risk of saving none. On the other hand, when the same scenario was framed in terms of choices involving losses, i.e., how many lives would be lost, people chose to gamble on an all or none scenario rather than allowing 400 people to die for sure (which implied 200 would be saved as in the first scenario).

The above results were seen as further confirmation of the Prospect Theory's value function, which predicted people would be risk averse for gains and risk seeking for losses. The Leddo et al. (2019) reformulation of the Prospect Theory value function would not predict a main effect like that for gain vs. loss when framing a decision. Rather, our value function would predict that the framing effect would depend on whether the decision is presented as being above or below the aspiration level or the avoidance level. For example, if there were a scenario involving the threat of people dying, and there were a target number of people who needed to live (say, to perpetuate the human race), then framing a decision in terms of saving lives would result in risk averse behavior if the number of lives saved were above the aspiration level (the target number of people needed to be saved). This is consistent with the original Prospect Theory formulation. The equivalent scenario, when framed in terms of lives lost, would place the projected lives lost above the avoidance level (i.e., fewer people are expected to die than the target number). Our reformulated value function would predict that this, too, would result in risk averse behavior, contrary to the predictions of the traditional Prospect Theory.

Conversely, in the saving lives version of the scenario, if the projected number of lives that would be saved is below the target number, our version of the value function predicts risk-seeking behavior, which is contrary to the predictions of the original Prospect Theory. The equivalent scenario, when framed in terms of lives lost, would place the projected lives lost below the avoidance level (i.e., more people are expected to die than the target number). Our reformulated value function would predict that this, too, would result in risk-seeking behavior, which is consistent with the original Prospect Theory.

To summarize, the original Prospect Theory value function predicts a main effect in attitude toward risk based on whether a decision is framed in terms of gains or losses. Our revised value function predicts no main effect for gain vs. loss but does predict a main effect for whether outcomes (both gains and losses) are above or below the aspiration and avoidance levels. This hypothesis was tested in Leddo and Elkas (2021) and the results were consistent with the Leddo et al. (2019) revised value function rather than the original Kahneman and Tversky (1979) value function. Specifically, there was no main effect for gain vs. loss in risk seeking behavior as

predicted in the original version of Prospect Theory but is not predicted in the revised version. There was a main effect in risk seeking behavior as a result of whether the outcome was above or below the aspiration/avoidance level as predicted in the revised Prospect Theory value function. When decisions were framed in terms of gains, participants showed greater risk seeking behaviors when the outcomes were below the aspiration level than when above as predicted by the revised value function. When decisions were framed in terms of losses, participants showed greater risk seeking behaviors when the outcomes were below the avoidance level than when above as predicted by the revised value function.

Overall, these results were consistent with the revised Leddo et al. (2019) value function and inconsistent with the original Kahneman and Tversky (1979) value function. However, these results were tested solely on American participants. It is often the case that documented social science-related findings fail to hold up in tests in other cultures (Henrich, Heine, and Norenzayan, 2010). A landmark study investigated how well the traditional probability weighting function of Prospect Theory (something we did not investigate in our revision of Prospect Theory's value function) held up in 30 different countries (Haridon and Vieider, 2019). These researchers found that, generally speaking, people in countries investigated had probability weighting functions that were similar to that in Prospect Theory in which smaller probabilities were overweighted and higher probabilities were underweighted.

Accordingly, we have been testing our reformulation of Prospect Theory's value function in other countries. For example, Boucher and Leddo (2022) tested the revised value function with South American high school students. They found that there were no statistically significant differences in participants' choices regardless of where on the value function the outcomes lay. Gu and Leddo (2022), tested the revised value function with Chinese students. Results of that study showed no difference in risk seeking behavior for gains above or below the aspiration level, which was inconsistent with predictions made by the revised value function. However, for losses, there was a very pronounced difference in risk seeking behavior for outcomes above or below the avoidance level such that no participant chose the risky option when outcomes were above the avoidance level and nearly all participants chose the risky option when outcomes were below the avoidance level. This was perhaps the strongest confirmation of that portion of the value function found in any of our functions.

The present study seeks to replicate the Leddo and Elkas (2021) framing study with Chinese students. The research question here is whether there will be framing effects, and if so, what will those effects be?

Method

Participants

Participants were 87 Chinese high school students. They were not paid for their participation in the study.

Materials Used

A total of four scenarios were used. According to Leddo et al. (2019), there are four distinct portions of the revised Prospect Theory value function. These are: decisions involving gains once a goal or aspiration level has been met (above the aspiration level); decisions involving gains prior to a goal or aspiration level having been met (below the aspiration level); decisions involving losses prior to an avoidance level having been met (above the avoidance level); decision involving losses once an avoidance level has been met (below the avoidance level). In the original Tversky and Kahneman (1981) framing study, the authors created alternate versions of scenarios with identical outcomes, framing one version in terms of loss and the other in terms of gains. The present materials mirrored this approach with the exception that the scenarios were constructed to frame gain and loss frame choices around the aspiration and avoidance levels, respectively. In this case, the gain scenarios were framed in terms of saving enough people to ensure the survival of the human race or losing enough people so that the human race could not survive. The four scenarios were taken from our previous research on framing (Leddo and Elkas, 2021) and then translated into Chinese using Google Translate. The translated versions were then reviewed by native Chinese speakers for accuracy. The scenarios and the translated versions are presented below.

Scenario 1: Gain above the aspiration level of saving 100 people

A deadly pandemic is threatening to wipe out every human on Earth. 1000 people remain. World leaders have gotten together and decided that if 100 people can be saved, the human species will survive. There are enough vaccines to protect 100 people with 100% certainty. A proposal is made to split each vaccine into two doses and try to save 200 people. Scientists claim that the outcome for this is uncertain and if this solution is employed, there is a 50% chance 200 people will be saved and a 50% chance that no people will be saved. Should the vaccines be split in half or kept whole?

情景 1：超过拯救 100 人的愿望水平

一场致命的流行病正威胁要消灭地球上的每一个人。还剩1000人。世界各国领导人齐聚一堂，决定如果能拯救 100 人，人类就能生存。有足够的疫苗可以 100% 确定地保护 100 人。有人提议将每种疫苗分成两剂，并尝试拯救 200 人。科学家们声称，这个结果是不确定的，如果采用这种解决方案，有 50% 的机会会拯救 200 人，而有 50% 的机会不会拯救任何人。疫苗应该分成两半还是保持完整？

Scenario 2: Gain below the aspiration level of saving 100 people

A deadly pandemic is threatening to wipe out every human on Earth. 1000 people remain. World leaders have gotten together and decided that if 100 people can be saved, the human species will survive. There are enough vaccines to protect 50 people with 100% certainty. A proposal is made to split each vaccine into two doses and try to save 100 people. Scientists claim that the outcome for this is uncertain and if this solution is employed, there is a 50% chance 100 people will be saved and a 50% chance that no people will be saved. Should the vaccines be split in half or kept whole?

情景 2：收益低于拯救 100 人的愿望水平

一场致命的流行病正威胁要消灭地球上的每一个人。还剩1000人。世界各国领导人聚集在一起，决定如果能拯救 100 人，人类就可以生存。有足够的疫苗可以 100% 确定地保护 50 人。有人提议将每种疫苗分成两剂，并尝试拯救 100 人。科学家们声称，这个结果是不确定的，如果采用这种解决方案，有 50% 的机会会拯救 100 人，而有 50% 的机会不会拯救任何人。疫苗应该分成两半还是保持完整？

Scenario 3: Loss above the avoidance level of losing 900 people

A deadly pandemic is threatening to wipe out every human on Earth. 1000 people remain. World leaders have gotten together and decided that if more than 900 of these people die, the human species would go extinct. There are 100 doses of a vaccine. There are two proposals made. One is to give a full dose of the vaccine to 100 people. If this is done, there is a 100% chance that the other 900 people will die. The second proposal is to split each vaccine into two doses and give half-doses to 200 people. If this is done, there is a 50% chance that 800 people

will die and a 50% chance that 1000 people will die. Should the vaccines be split in half or kept whole?

场景3：损失超过900人的回避水平

一场致命的流行病正威胁要消灭地球上的每一个人。还剩1000人。世界各国领导人聚在一起决定，如果这些人中有 900 多人死亡，人类就会灭绝。有 100 剂疫苗。提出了两个建议。一是给100人接种全剂量疫苗。如果这样做了，那么其他 900 人将有 100% 的机会死亡。第二个建议是将每种疫苗分成两剂，给 200 人服用半剂。如果这样做，则有 50% 的可能性会导致 800 人死亡，并且有 50% 的可能性会导致 1000 人死亡。疫苗应该分成两半还是保持完整？

Scenario 4: Loss below the avoidance level of losing 900 people

A deadly pandemic is threatening to wipe out every human on Earth. 1000 people remain. World leaders have gotten together and decided that if more than 900 of these people die, the human species go extinct. There are 50 doses of a vaccine. There are two proposals made. One is to give a full dose of the vaccine to 50 people. If this is done, there is a 100% chance that the other 950 people will die. The second proposal is to split each vaccine into two doses and give half-doses to 100 people. If this is done, there is a 50% chance that 900 people will die and a 50% chance that 1000 people will die. Should the vaccines be split in half or kept whole?

场景4：损失低于900人的回避水平

一场致命的流行病正威胁要消灭地球上的每一个人。还剩1000人。世界各国领导人聚在一起决定，如果这些人中有 900 多人死亡，人类就会灭绝。有 50 剂疫苗。提出了两个建议。一是给50人接种全剂量疫苗。如果这样做了，那么其他 950 人将有 100% 的机会死亡。第二个建议是将每种疫苗分成两剂，给 100 人服用半剂。如果这样做，则有 50% 的可能性会导致 900 人死亡，有 50% 的可能性会导致 1000 人死亡。疫苗应该分成两半还是保持完整？

Procedure

Researchers sent the questionnaire to individual Chinese high school students, living in China. Each student answered only one scenario to avoid any potential bias that may arise from seeing

different scenario versions. Students were randomly assigned to questionnaire version with 20 students receiving version 1, 21 receiving version 2, 24 receiving version 3 and 22 receiving version 4.

Results

Table 1 below shows the number of participants who chose to split the dose (the risky option), broken down by scenario. These are shown in the first row of Table 1. For comparison purposes, the results for US participants, as reported in Leddo and Elkas (2021), are shown in the second row of Table 1.

Table 1: Percentage of participants who chose to split doses based on scenario

	Below-aspiration level gain	Above-aspiration level gain	Below-avoidance level loss	Above-avoidance level loss
Split doses (Chinese)	28.6%	45%	63.6%	25%
Split does (US)	72.7%	9.1%	68.2%	22.7%

The original Kahneman and Tversky version of the Prospect Theory framing effect stated that people's attitudes toward risk depends on whether the scenario presented a decision framed in terms of a gain (lives saved) or a loss (lives lost). It was silent as to whether the scenario stated any goals that may impact the desirability of saving or losing a certain number of people. On the other hand, our revision of Prospect Theory's value function predicts that people's attitudes toward risk depend on whether the scenario presents a decision framed in terms of outcomes below or above a stated goal (i.e., goal met or not met) and does not depend on gain or loss per se. Therefore, the original version of Prospect Theory predicts a main effect for gain vs. loss with no prediction for location of current state with respect to goals while our version of Prospect Theory predicts a main effect for location of current state with respect to goals and no effect for gain vs. loss.

A cursory review of Table 1 suggests that the data support our revised version of Prospect Theory, rather than the original version. Overall, when the decision was presented in terms of gains (how many lives would be saved), participants chose the risky option (split the pills) 15 out of 41 times. This was statistically equal to the 20 out of 46 times participants chose the risky option when the decision was presented in terms of losses (how many people would die), $z < 1$, ns. This outcome runs counter to the findings in the original Tversky and Kahneman (1981) framing effects study that was based on their 1979 version of Prospect Theory but is consistent with our revised version and the present hypothesis that there would be no main effect for gains vs. losses.

Our hypothesis also states that there would be a main effect for attitudes toward risk when outcomes are presented as above or below the aspiration and avoidance levels (i.e., the number of people required to live or not die in order to perpetuate the human race).When the scenario was presented as being above the goal,only 15 of 44 participants (34.1%) chose the risky alternative. On the other hand, when the scenario was presented as being below the goal, 20 of 43 participants (46.5%) chose the risky alternative. While this result was in the direction of our hypothesis, the result was not statistically significant, $z = 1.18$, ns.

In comparing the results of Chinese students to US students from the previous Leddo and Elkas (2021) study, we see that when scenarios present outcomes in terms of losses, both US and Chinese students respond almost identically. When scenarios involved losses, Chinese selected the riskier option more often when outcomes were below the avoidance level than when they were above the avoidance level ($z = 2.64$, $p <. 01$) as predicted by our revised Prospect Theory value function. These results are also consistent with the findings of Gu and Leddo (2022) that when testing the Leddo et al. (2019) reformulation of Prospect Theory with Chinese participants, the latter were more likely to pick the riskier option after an avoidance level had been met than before it was met, consistent with the predictions of Leddo et al. (2019).

On the other hand, when scenarios presented outcomes in terms of gains, Chinese students responded differently than their American counterparts and actually, directionally, selected the riskier option when outcomes were above the avoidance level. However, this result was not statistically significant, $z=1.09$, ns. This result also matches the findings of Gu and Leddo (2022) that when presented with scenarios involving gains, Chinese participants were equally likely to pick the risky option regardless of whether an aspiration level had been met and that, overall, Chinese participants were generally conservative in their selections (all proportions were below 50%).

Apart from the results that test whether the original or the modified Prospect Theory value function were supported, there is still the research question as to whether framing effects occurred. This can best be answered by looking at whether mathematically identical outcomes produced different decision making behaviors when framed in terms of gains vs. losses. In the present scenario, there are two pairs of mathematically identical outcomes. The gain scenario in which the outcomes are above the aspiration level and the loss scenario in which the outcomes are above the avoidance level are mathematically identical, i.e., saving the human race can be achieved with 100% certainty. In those scenarios, the risky options were chosen 45% and 25% of the time, respectively. This difference is not statistically significant.

Similarly, the gain scenario in which the outcomes are below the aspiration level and the loss scenario in which the outcomes are below the avoidance level are mathematically identical, i.e., saving the human race can be achieved with 50% certainty. In those scenarios, the risky options were chosen 28.6% and 63.6% of the time, respectively. This difference is statistically significant, $z = 2.30$, $p < .05$. Taken together, these results suggest that framing effects occurred when outcomes were below the aspiration and avoidance levels but not when outcomes were above the aspiration and avoidance levels.

Discussion

The results from the present study showed no main effect in risk seeking behaviors when participants were presented with scenarios involving losses vs. gains. This runs counter to the predictions made by the original Prospect Theory (1979) value function, which argues that people are more risk seeking when making decisions involving losses than they are for gains. This is also inconsistent with the Tversky and Kahneman (1981) finding that framing a decision in terms of losses or gains can induce people to become risk seeking or risk averse. Rather, the above results are consistent with the Leddo et al. (2019) reformulation of the Prospect Theory value function that argues that there is no main effect in risk seeking behaviors when people are presented with decisions involving losses vs. gains.

The results also showed that when the decisions were framed in terms of losses, participants chose the riskier option when outcomes were below the avoidance level than they did when outcomes were above the avoidance level. This is also consistent with the predictions made by the Leddo et al. (2019) revision of the Prospect Theory value function and consistent with our previous framing effects results (Leddo and Elkas, 2021) and our previous results with Chinese students in non-framed scenarios (Gu and Leddo, 2022).

The one striking departure from our previous findings regarding framing and the predictions made by the Leddo et al. (2019) value function is that when decisions were framed in terms of gains, there was no statistically significant difference in decision making when the outcomes were above or below the aspiration level. This is also consistent with our previous results with Chinese students in non-framed scenarios (Gu and Leddo, 2022).

While the present results were inconsistent with the Kahneman and Tversky (1979) formulation of Prospect Theory, including the framing effects study (Tversky and Kahneman, 1981), and were partially consistent with the reformulated Leddo et al. (2019) Prospect Theory value function, the results were consistent overall with the pattern of findings in Gu and Leddo (2022). Specifically, Chinese participants were cautious in gain scenarios, regardless of whether the aspiration level was met (again, the percentages were below 50% and not statistically different from each other) and risk seeking in loss situations only after an avoidance level was met. Similarly, Chinese participants also showed a difference compared to their American counterparts in susceptibility to framing of decisions. While Americans showed framing effects for decisions presented in terms of gains vs. losses when outcomes were presented both above and below the aspiration/avoidance levels, Chinese people showed framing effects only when outcomes were presented below the aspiration/avoidance levels. Collectively, these results suggest that Chinese people are generally more cautious when it comes to decisions, except when those decisions lead to outcomes below a stated avoidance level. At that point, Chinese people seem willing to accept the same level of risk that Americans do.

REFERENCES

Alghalith, M., Floros, C., & Dukharan, M. (2012). Testing dominant theories and assumptions in behavioral finance. *Proquest*. http://search.proquest.com/docview/1014252017/94778EE9FA05455CPQ/4?accountid=34939

Boucher, I. & Leddo, J. (2022). Investigating the Leddo, Jayanti, and Duan (2019) revised Prospect Theory value function with Nicaraguan students. *International Journal of Social Science and Economic Research, 7(4),* 1141-1152.

Gilovich, T., Griffin, D., & Kahneman, D. (Eds.) (2002). *Heuristics and Biases: The Psychology of Intuitive Judgment*. New York: Cambridge University Press.

Gu, Y. & Leddo, J. (2022). Investigating the Leddo, Jayanti, and Duan (2019) revised Prospect Theory value function on Chinese students. *International Journal of Social Science and Economic Research, 7(6),* 1618-1631.

Haridon, O.L. & Vieider, F. M. (2019). All over the map: A worldwide comparison of risk preferences. *Quantitative Economics, 10,* 185-215.

Heinrich, J., Heine, S.J. & Norenzayan, A. (2010). The weirdest people in the world. *Behavioral and Brain Sciences, 33,* 2-3.

Jones, B.D. (2001). *Politics and the Architecture of Choice: Bounded Rationality and Governance*. London and Chicago: The University of Chicago Press.

Kahneman, D., & Tversky, A. (1979). Prospect Theory: An Analysis of Decision Under Risk. *Econometrica*, 47(2), 263-91.

Kahneman, D., & Tversky, A. (Eds.) (2000). *Choices, Values, and Frames*. Cambridge: Cambridge University Press.

Leddo, J., Jayanti, A. & Duan, I. (2019). Prospect Theory Revisited: Incorporating Decision Maker's Goals into the Value Function. *International Journal of Social Science and Economic Research, 4(10)*, 6619-6640.

Leddo, J & Shukla, A. (2020). Prospect Theory Revisited: Investigating the Applicability of a Revised Value Function on Decisions that Benefit the Self or Others. *International Journal of Social Science and Economic Research, 5(9)*, 2672-2684.

Leddo, J & Elkas, M. (2021). Prospect Theory Revisited: Viewing the results of framed decisions through a revised value function. *International Journal of Social Science and Economic Research, 6(10)*, 3972-3983.

Nwogugu, M. (2005). Towards multi-factor models of decision making and risk: A critique of Prospect Theory and Related Approaches, part I. *The Journal of Risk Finance, 6, 2.* pp. 160-162.

Riabacke, A. (2006). Managerial Decision Making Under Risk and Uncertainty. *IAENG International Journal of Computer Science,* Retrieved from http://www.iaeng.org/IJCS/issues_v32/issue_4/IJCS_32_4_12.pdf

Sasaki, S., Xie, S.,Ohtake, F., Qin, J. & Tsutsui, Y. (2006). Experiments on risk attitude: The case of Chinese students. *SSRN Electronic Journal,19(2), 245-259*

Tversky, A., & Kahneman, D. (1981). The framing of decisions and the psychology of choice.

Science, 211, 453-458.

Weyland, K. (1996). Risk Taking in Latin American Economic Restructuring: Lessons from Prospect Theory. *International Studies Quarterly*, 40(2), 185-207.

Weyland, K. (2006). *Bounded Rationality and Policy Diffusion: Social Sector Reform in Latin America*. Princeton and Oxford: Princeton University Press.