Similar in How to Frame, But Different in What to Choose

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This study addresses questions about individuals' self-framing for health insurance decisions, and whether their self-selected frames affect their choice preferences. Participants were recruited from the United States and China. Four possible frames were presented for a hypothetical health-insurance decision problem. Risk attitudes were also elicited using hypothetical lotteries. We found that the majority of the U.S. sample preferred a risk-averse, full-coverage insurance plan regardless of their frames; whereas the Chinese participants' choices for insurance were more affected by their self-selected frames. Some relationship between risk-attitudes towards lotteries and insurance preferences were also identified.

Keywords: Health Insurance; Framing Effects; Self Framing; Cultural Differences; Prospect Theory; Experiments.

Introduction

Framing effects refers to the findings that people's risk preference change when outcomes are framed or presented in different ways. Consider two options, one with risky outcomes and one with a certain outcome. Depending on the choice of reference point, the outcomes can be framed either as gains or losses. People tend to prefer the certain-outcome option when it is presented with a gain frame, and prefer the risky option when presented with a loss frame. This paradox can be explained by the two-part value-function in Kahneman and Tversky's (1979) Prospect Theory. With the S-shaped value function, individuals are risk-averse in gains and risk-seeking in losses, resulting in the change of risk attitudes in different domains. However, the question about how to determine the reference point is not clearly described in Prospect Theory, although Kahneman and Tversky speculated that the choice of reference points relates to experiences, current status, and aspiration levels.

Framing effects have been studied intensively over the past decades (e.g., Fischer, Kamlet, Fienberg & Schkade 1986; Frisch 1993; Rowe & Puto 1987; Shelley & Orner 1993; Wang & Johnston 1995). Among these studies, however, frames were typically imposed or manipulated by experimenters. Relatively few studies have asked about the subjective frames held by the individuals when confronted with risky options. Fischhoff (1983) conducted one of the first studies to investigate spontaneous framing, and some others have studied the self-framing in various decision contexts (e.g., Wiener, Genry & Miller 1986; Beggan 1994; Elliott & Archibald 1989). Most results suggested that gain frames are preferred to loss frames for decisions like purchasing flood insurance (Wiener, Genry & Miller 1986), paying back a loan, and selling a possession (Beggan 1994). It has also been found that the self-framing is somehow varied across different subgroups, e.g., the insurance students and the MBA students in the experiments by Wiener et al. (1986), or moderated by different role expectations, e.g., the sellers and buyers in the studies by Beggan (1994). Regarding the impacts of self-framing on decision making, the findings were more controversial. Some studies (Beggan 1994; Wiener et al. 1986) observed that the people who preferred the gain or final-asset frame tend to choose risk-aversion options, as expected by Prospect Theory, whereas other studies didn't find significant framing effects (Fischhoff 1983). In order to enrich the understanding of self-framing and its influence on decision making, we approach these questions by using cross-national samples under the context of health-insurance purchase decisions.

Just like the classical Asian disease problem in Tversky & Kahneman (1981) where the outcomes can be framed as saving or losing lives, insurance decisions can be framed as saving or losing money, depending on whether the decision-maker chooses the best outcome or the worst outcome as the reference point. Other ways of framing insurance decisions are also possible. For example, one can evaluate each outcome in terms of the final-wealth state, as suggested by Expected Utility Theory, or one can compare each outcome to the status quo, as suggested by Prospect Theory. We investigate which frames are more natural to individuals when considering health-insurance decisions, and whether their subjective frames can predict their preferences for different insurance plans.

Our participants were recruited from two countries, People's Republic of China and the United Sates. Although markets for insurance have developed in mainland China during the last few years, the concept is still relatively new to most Chinese. Especially when compared to western countries, Chinese citizens have much less experiences with insurance products. At the same time, the actual need for insurance in China is rapidly increasing. Take health insurance as an example. According to a large-scale national survey (Xie, Wang & Xu 2003), poor health-service and diseases are among the top 20th hazards that Chinese are most concerned with. During the rapid transition from centralplanned economy to market economy since 1980s, health care system has evolved from a statefunded system to the one where individuals have to pay by themselves. Today Chinese must face the rising costs of health care, which can be quite devastating (Pan 2002). Health insurance or risk pooling is one tool that can help manage the risks of potentially high health-care costs for each individual, and the opening of the insurance market to international companies is on the urgent policy agenda. The need for a better understanding of the perception of health-care related risks offers a research opportunity to compare the differences between people from the U.S. and China, two populations with different cultures and different levels of insurance experiences. Although previous studies have observed cultural differences in risk perception and risk attitudes (e.g. Weber & Hsee 1998; Bontempo, Bottom & Weber 1997), this article examines more specific research questions related to self-framing in the context of health-insurance decisions.

In the following sections, we describe two experiments: the first experiment investigated self-framing and framing effects for health insurance; the second experiment elicited the risk attitudes, and examined the predictive power of risk attitudes for the insurance choices in the first experiments.

Experiment 1: Subjective Frames and Framing Effects

Method

The first experiment focused on how individuals frame health-insurance choices. A self-administered questionnaire was designed. A Chinese version was translated from the original English version following the back-translation methods (Brislin 1986). The first part presented a hypothetical scenario about a health-insurance decision faced by an employee. The problem was described as follows:

Mr. Jones has a job that pays \$20,000 per year. There is a health risk associated with this job. Each year, 80% of the workers have no problems, but about 20% of the workers have to spend \$2,000 on job-related health problems. Mr. Jones currently has no health insurance for these risks. However, the

employer is offering two special health-insurance policies that will cover the \$2,000 medical costs if they occur.

The first plan has lower annual premium, but only partial coverage.

- Plan 1: Annual premium of \$200. If the problem occurs, Mr. Jones pays \$1,000 and the insurance pays the other \$1,000.
- The second plan has higher annual premium, but complete coverage.
 - Plan 2: Annual premium of \$400. If the problem occurs, the insurance pays the entire \$2,000.
- For the next year, Mr. Jones has to decide between:
 - Having no insurance: Remaining uninsured.
 - Buying Plan 1: Buying the plan with lower annual premium, but only partial coverage.
 - Buying Plan 2: Buying the plan with higher annual premium, but complete coverage.

The participants were presented with four possible perspectives, corresponding to four ways of framing by adopting different reference points:

- *1. Loss Frame*: Each outcome is compared to the best possible outcome (no health problem, no loss). This results in each outcome being valued as a loss or zero.
- 2. *Gain Frame*: Each outcome is compared to the worst possible outcome (health problem, largest loss). This results in each outcome being valued as a gain or zero.
- 3. *Final Wealth Frame:* Each outcome is valued as the net annual income after medical expenses.
- 4. *Status Quo Frame:* Each outcome is compared to the current status. This results in each outcome being valued as either a gain or a loss.

The questions were presented on a separate page of the questionnaire (see Appendix 1). After reading all the four perspectives, in the next page, the participants were asked:

If you were Mr. Jones, which perspective would you use to think about the problem? (check one box)

- □ Perspective 1: "Buy insurance means your might lose money."
- □ Perspective 2: "Buy insurance means your might save money."
- □ Perspective 3: "Yearly income is important."
- □ Perspective 4: "What you decide about insurance means you might save or lose money."
- \Box None of the above. I would think in the following way: (Please elaborate)

Two levels of annual salary (\$20,000 and \$40,000) and two possible initial insurance statuses (having no insurance and having insurance Plan 1) were manipulated in the design of survey, resulting in four versions of the questionnaire. The descriptions of the four perspectives (frames) were adjusted accordingly. The four versions of questionnaire were distributed randomly to the participants.¹

Participants

¹ The analysis shows no impacts of hypothetical salary and status quo on the self-selected framing and the choice of insurance program, expect for the US sample, in which the participants who were assigned partial insurance as status quo were more likely to choose status quo as the reference point, namely, the status quo frame. However, since we mainly concerned about the theoretical implications of the gain and loss frames in this paper, no further analysis was conducted regarding the impact of manipulation here.

The survey was conducted in two cities of China during December 2001. One hundred and twentyeight Chinese participants were recruited through informal contacts. It took about 20 to 30 minutes for each participant to finish the survey. The English-version survey was replicated in Pittsburgh, with 53 participants from informal university contacts and parent groups at local schools.

Results

Figure 1 shows the results of the distributions of self-selected frames by the Chinese and U.S. samples. The four frames were not equally attractive to our participants. The Gain and Final Wealth frames were chosen most frequently by both nations. Relatively more Chinese participants adopted the Final Wealth frame than the U.S. participants (35.8% Chinese vs. 17.0% U.S., p<0.05), and more U.S. participants adopted the Gain frame (40.7% Chinese vs. 62.3% U.S., p<0.05). The preferences of subjective frames were independent of the conditions of annual income or initial insurance status stated in the problem.



Figure 1. Self-selected frames by Chinese and U.S. Participants

In general, more Chinese participants chose the no-insurance option (21.1% Chinese vs. 3.8% U.S., p<0.001), and more U.S. participants chose Plan 2, a full-coverage insurance plan (79.3% U.S. vs. 50.8% Chinese, p<0.001), indicating less risk-reverse tendencies by Chinese participants, which supports some previous findings of this tendency (e.g., Bontempo, Bottom & Weber 1997).

Figure 2 indicates the insurance choices within each frame. One of our most interesting results was that Chinese participants tended to be more affected by their own subjective frames whereas the U.S. counterparts did not. Specifically, if we combine the columns of the options of no-insurance and partial-insurance (Plan 1), Chi-square tests shows that Chinese sample has a significant frame-choice relationship (χ^2 =16.39, p<0.001, d.f. =3), but no significant frame-choice relationship exists in the U.S. sample (χ^2 =1.4, n.s, d.f. =3). Given the Gain Frame, the likelihood of choosing the full-coverage insurance is about the same for both nationalities, whereas given the Loss Frame, the likelihood of choosing no-insurance option is much higher for the Chinese participants. In other words, our Chinese sample replicated Tversky and Kahneman's findings about framing effects.



Figure 2. Self-selected frames By Chinese and U.S. Participants

In their experiment, when the participants were given a survival (gain) frame, 72% chose the program which can save 200 lives for sure. For the participants who were given a mortality (loss) frame, 78% chose the risky option which has 2/3 probability of losing 600 lives and 1/3 probability of losing no lives, instead of the sure option which was framed as losing 400 lives with certainty (Tversky & Kahneman 1981). For the Chinese sample in our experiment, 71% of the participants who adopted the Gain Frame chose the full-coverage insurance plan, whereas 70% of the participants who adopted the Loss Frame chose the risky option, i.e., buying no insurance.² Our U.S. sample did not replicate this framing effect.

Experiment 2: Risk Preferences and Frames

Method

Experiment 2 was performed at the same time, in order to elicit the risk attitudes. After finishing the first part of the questionnaire, the same participant made selections between hypothetical lotteries. The questions were adapted from the experiments in Eliott and Amchibald (1989). See Table 1 for the questions and the summary of responses.

Results

For questions 1 and 4 in Table 1, "probably buy" and "definitely buy" were labeled as risk seeking, and "probably not buy" and "definitely not buy" were labeled as risk averse. Similarly, for questions 2 and 3, the answer "probably choose A" or "definitely choose A" implied risk-averse tendency, while "probably choose B" or "definitely choose B" implied risk-seeking tendency. If an individual consistently offered positive or risk-averse answers to both questions 1 and 4, then he/she was labeled as *strictly-risk-seeking*; if an individual always offered negative or risk seeking answers for both questions, then he/she was labeled as *strictly-risk-averse*. The answer "don't care" implied a risk neutral attitude. Table 2 and Table 3 present the results based on these implications. The percentage of strictly-risk-averse participants was significantly less for Chinese sample (i.e., 21.6% of the Chinese vs. 35.9% of the U.S. participants, p<0.05), whereas about same percentage of participants). The less strong risk-averse attitude for monetary risks by Chinese group is again consistent with the findings from previous literature (e.g., Hsee & Weber 1999).

 $^{^{2}}$ A 95% confidence interval around the probability that full coverage insurance plan will be chosen given the Gain Frame is 70.00% ± 14.12%, and a 95% confidence interval around the probability that buying no insurance will be chosen given the Loss Frame is 70.69% ± 18.72%. The results by Tversky and Kahneman were within these confidence intervals.

Questions	Answers	Response (%)	
		US	China
		(N=53)	(N=126)
Question 1. If you were asked to pay \$1 for a lottery	Definitely buy.	11.3	25.4
that had a 50% chance of winning \$2, and a 50%	Probably buy.	41.5	17.5
chance of winning nothing,	Don't care.	7.6	31.0
Would you	Probably not buy.	18.9	7.9
	Definitely not buy.	20.8	18.3
		US	China
		(N=53)	(N=126)
Question 2. If you had to pick between the following	Definitely choose A.	69.8	42.9
two options:	Probably choose A.	18.9	8.7
A) A sure win of \$750	Don't care.	5.7	18.3
B) A 40% chance of winning \$2,000, and a 60% chance	Probably choose B.	5.7	25.4
of winning nothing Would you	Definitely choose B.	0.0	4.8
-			
		US	China
		(N=53)	(N=125)
Question 3. If you had to pick between the following	Definitely choose A.	7.6	8.0
two options:	Probably choose A.	9.4	4.0
A) A sure loss of \$1,500	Don't care.	28.3	23.2
B) A 80% chance of losing \$2,000, and a 20% chance of	Probably choose B.	49.1	34.4
Would vou	Definitely choose B.	5.7	30.4
		US (N=53)	China (N=125)
Ouestion 4. If you were asked to pay \$3,000 for a	Definitely buy.	3.8	5.6
lottery that had a 50% chance of winning \$6,000, and a	Probably buy.	11.3	16.0
50% chance of winning nothing,	Don't care.	3.8	15.2
Would you	Probably not buy.	32.1	24.0
	Definitely not buy.	49.1	39.2

Table 1. Responses to the Lottery Questions in Experiment 2

Table 2. Risk Preferences in Experiment 2

			Risk-averse (%)	Risk-neutral (%)	Risk-seeking (%)
Question 1	Chinese	126	26.19*	30.95 *	42.86
	US	53	39.62*	7.55*	52.83
Question 2	Chinese	126	51.59*	18.25*	30.16*
-	US	53	88.68*	5.66*	5.66*
Question 3	Chinese	125	12.00	23.20	64.80
	US	53	16.98	28.30	54.72
Question 4	Chinese	125	63.20*	15.20*	21.60
	US	53	81.13*	3.77*	15.09

* two-tailed t-test of two proportions rejects null hypothesis at .05 level.

Table 3 also demonstrates the relationship between risk attitudes and the insurance preference. For both nations, somewhat higher percentage of the *strictly-risk-averse* subset chose the full-coverage-insurance plan than the *strictly-risk-seeking* subset, but hese differences were not significant. Comparing to the base rates for each nation, the *strictly-risk-averse* Chinese group was more likely to buy full insurance, whereas the *strictly-risk-seeking* U.S. group was less likely to buy full insurance. No significant differences were found in other subsets.

Risk Attitude	Nation	Ν	No Insurance (%)	Partial Insurance (%)	Full Insurance (%)
Strict risk-seeking	Chinese	21	14.29	28.57	57.14
(1-Y, 4-Y)	US	7	0.00	42.86	57.14
Strict risk-aversion	Chinese	27	18.52	7.41	74.07
(1-N, 4-N)	US	19	5.26	10.53	84.21
Neither Strict risk-seeking nor	Chinese	79	22.78	35.44	41.77
strict risk-aversion ~ ((1-Y,4-Y) ∪ (1-N,4-N))	US	27	3.70	14.81	81.48
Entire sample	Chinese	128	21.09*	28.13	50.78*
	US	53	3.77*	16.98	79.25*

Table 3. Risk Preferences and Insurance Choices

* two-tailed t-test of two proportions rejects null hypothesis at .05 level.

Discussion

Understanding people's risk preferences is crucial for efficient risk pooling and for designing attractive insurance policies. This article describes a cross-cultural study on the framing of health insurance decisions. In general, the Chinese sample appears to be less risk-averse for both lotteries and insurance-purchase decisions. This is consistent with the findings in previous cross-cultural risk studies (Bontempo, Bottom & Weber 1997; Weber & Hsee 1998). Weber & Hsee (1998) hypothesized that Chinese perceive less financial risk because it is easier for them to get support from social relationship when they face financial problems. This may partially explain our results as well. But we didn't test this hypothesis explicitly. Instead our main questions concerned about what reference point people *self-select* when evaluating health-insurance alternatives, and how self-selected frames would affect decision preferences.

According to Prospect Theory, there are two stages for a decision problem. In the first stage, people code the outcomes as gains or losses relative to their reference points; in the second stage, they doose the alternative based on their risk attitudes towards gains and losses. Thus the final choice depends on risk attitudes and framing. Now we will discuss the interrelationship among these components.

Although no relationship was found between risk attitudes towards lotteries and the preferences of subjective frames, we did find some relationship between the risk attitudes towards lotteries and the choice of insurance programs (See the results in Experiment 2). This is somewhat different from the findings by Elliott & Archibald (1989), in which they reported no relationships between risk attitudes towards lotteries and the choice of life-saving programs. Our speculation is that, although we elicited risk-attitudes by asking similar hypothetical lottery questions as theirs, the decision contexts regarding the choice problems are different. In our experiments, the risk attitudes towards monetary-

lotteries might be more compatible with our health-insurance problems, because money was involved in both situations. In their experiments, however, the risk attitudes elicited from lottery questions can be less consistent with the life-saving problems. The differences of decision contexts (money vs. life) may potentially count for the lack of relationship between risk attitudes and choice preferences in their experiments.

As mentioned in the introduction section, the preference for gain frames was found to be strong in consumer decision-making (Beggan 1994; Wiener et. al 1986; Elliott & Archibald 1989). Our results confirmed these findings — the gain frame was most preferred by participants from both nations, especially for the U.S. sample. Possible explanations are that people have less cognitive difficulties to deal with gains than with losses (Fiske & Taylor 1991; Reyna & Brainerd 1991), and they get more utilities if they frame an ambiguous situation as a gain (Thaler 1985).

Despite the similar patterns in subjective-framing preferences between two national samples, dramatic differences appeared in terms of framing effects. It is interesting to see that Chinese sample showed strong framing effects, whereas the U.S. sample had virtually no framing effects. It is not surprising that framing effects did not exhibit consistently across our two national samples, which supports the previous findings that risk attitudes in loss domain were less stable, and that framing effects were not as universal as one might thought (Fagley & Paul 1987; Hughes 2000). Several interpretations are possible for explaining our findings about cross-national differences, which are discussed below.

One possibility is that the two national samples may have different parameter values in weighting and value functions from the Cumulative Prospect Theory (CPT) model (Wang & Fischbeck 2004a, 2004b). For example, if U.S. participants had more risk-averse value-functions in loss domain, then they might still prefer buying insurance even if they frame it as losses, as what indicated in our results. It is also plausible that the U.S. participants over weighted the relatively small probability of loss, which is 0.20 in our case, resulting in risk-averse attitude in losses. For more discussions about how the interaction of parameter values in CPT can predict framing effects, refer to Wang & Fischbeck (2004b).

Another possible reason for the differences in framing effects is that the individual who has more experience or expertise with a specific decision context is less affected by framing effects because she can be better in recognizing the equivalence of different framing information (e.g., Levin & Gaeth 1988; Maule 1995). For example, ground beef can be described as either 75% lean or 25% fat. Some marketing research found that after participants actually tasted the meat, the magnitude of framing effect lessened (Levin & Gaeth 1988). Since Chinese participants were less familiar with health insurance decisions, it is understandable that they were more affected by the ways of framing.

This study provides some evidence that the Chinese and U.S. samples adopt similar frames for health-insurance decisions, but have very different patterns of framing effects. It is still an open question regarding how representative these cultural/domain differences/similarities actually are. Moreover, the cognitive processes behind framing effects deserve more investigation. Open research questions include evaluating the different hypotheses about the underlying reasons for framing effects. As we discussed above, it is interesting to ask to which the extent the differences in framing effects are caused by the external factors such as the exposure experiences with decision contexts (Levin & Gaeth 1988), or by the internal individual differences of risk attitudes towards gains and losses, as reflected by the value and weighting functions in Prospect Theory (Wang & Fischbeck 2004a, 2004b).

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Appendix I. The descriptions of four frames in Experiment 1

There are many ways to think about this problem. Listed on the next page are four perspectives that Mr. Jones might use to think about his decision. Please read them all before answering the questions that follows.

Perspective 1. "Buying insurance means you might lose money."

Mr. Jones plans on the best case happening (not getting sick), and having to spend nothing next year on medical problems.

If he buys **no insurance**, there is 80% chance that he will spend nothing, and 20% chance that he will have to spend \$2,000.

If he buys **plan 1**, there is 80% chance that he will have to spend \$200, and 20% chance that he will have to spend \$1,200.

If he buys **plan 2**, he will have to spend \$400, no matter what happens.

Perspective 2. "Buying insurance means you might save money."

Mr. Jones plans on the worst case happening (getting sick), and having to spend \$2,000 next year on medical problems.

- If he buys **no insurance**, there is 80% chance that he will save \$2,000, and 20% chance that he will save nothing.
- If he buys **plan 1**, there is 80% chance that he will save \$1,800, and 20% chance that he will save \$800.
- If he buys **plan 2**, he will save \$1,600 no matter what happens.

Perspective 3. "Yearly income is important."

Mr. Jones is concerned about his income for the year.

- If he buys **no insurance**, there is 80% chance that his net income will be \$20,000, and 20% chance that it will be \$18,000.
- If he buys **plan 1**, there is 80% chance that his net income will be \$19,800, and 20% chance that it will be \$18,800.
- If he buys **plan 2**, his net income will be \$19,600 no matter what happens.

Perspective 4. "What you decide about buying insurance means you might save or lose money."

Mr. Jones is concerned about what would happen if he buys insurance. That is, how things would change compared to staying uninsured.

- If he buys **plan 1**, there is 80% chance that he will spend \$200 more, and 20% chance that he will save \$800.
- If he buys **plan 2**, there is 80% chance that he will spend \$400 more, and 20% chance that he will save \$1600.