

Chinese and Americans Agree on What Is Fair, but Disagree on What Is Best in Societal Decisions Affecting Health and Safety Risks

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Through surveys of students and junior professionals and interviews with business and government executives, we studied Chinese choices and fairness perceptions in risky health and safety decisions. The survey responses were compared with American responses from an earlier study by Keller and Sarin.

The survey results show that the American and Chinese respondents had similar fairness perceptions, but the Chinese did not make decisions that were consistent with their fairness perceptions, whereas the Americans did. We found that the middle-age Chinese professionals tended to make choices that were more different from the Americans than were the choices of the young Chinese management students. It is likely that these discrepancies were caused by cultural differences, with the younger Chinese tending to face a stronger Western influence.

The insights from the survey results were enriched by interviews that revealed fairness perceptions of Chinese business and government executives. A framework to interpret cultural influences on decision making was also proposed.

KEY WORDS: Health and safety risks; decision analysis; fairness; equity; cross-cultural; Chinese; risky decisions.

1. INTRODUCTION

Much research on fairness and its incorporation into decision making draws upon a Western point of view, from early work by Aristotle⁽¹⁾ and Plato⁽²⁾ to recent decision analysis research.⁽³⁻¹¹⁾ However, since fairness perception is rooted in the cultural heritage of decision makers, culture can influence decision making patterns.⁽¹²⁾ This motivates us to investigate fairness in the People's Republic of China (PRC) in comparison with the United States.

We chose to examine fairness perceptions

among Chinese decision makers for various reasons. The years since the late 1970s have seen growing economic interactions between China and the West (especially the United States). In 1995, China imported \$11.7 billion in goods from the United States, and the United States imported \$45.6 billion in goods from China.⁽¹³⁾ With the increased cross-national interaction and the increased economy^(14,15) in China, there is increased concern in the United States about Chinese pollution,⁽¹⁶⁾ working conditions, human rights (following Tiananmen Square) and altruistic responsibilities,⁽¹⁷⁾ intellectual property rights,^(13,18) and economic inequality in China between the rich coastal regions and the poorer inland provinces.

We decided to use scenarios concerning fairness and public health and safety risks to start our investigation. Such issues are important in the United States in many decisions, such as siting

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hazardous facilities,⁽¹⁹⁾ and China regularly faces natural hazards, such as the devastating floods in 1996 that affected cotton production. We also thought the differences in the cultures might show up in contrasting fairness and choice judgments. Many of the risk analysis concerns in the United States about siting hazardous facilities or environmental clean-up policies have centered on perceived risks of the facility or the policy and the fairness of the distribution of health risks among workers, local residents, and future generations. The conflicts in the United States have naturally led to differing opinions of stakeholder groups⁽²⁰⁾ and differences across subcultures. Some work in the United States with different subcultures finds differences in assumptions and actions concerning hazards.⁽²¹⁾ Some other work has examined differences in risk perception across countries.⁽²²⁾

In China's transition, there are likely marked intergenerational differences. Many of the existing cultural studies on China may no longer be valid for younger Chinese raised in this time of drastic change. One hint of this possibility is in Greenberger and Chen's⁽²³⁾ United States–China study of Southern Californian adolescents in comparison with their counterparts in Beijing. Neither group listed “contributing to society” as a main personal goal, despite the traditional Chinese value of placing the group above the individual. Therefore, we chose to investigate the influence of intergenerational differences on fairness perceptions and decision making involving health and safety risks.

In this study, we surveyed management students because we were interested in aiding and understanding risk analysis in business or government decisions. We surveyed part-time business students, most of whom were in their thirties with substantial work experience but less education in comparison with full-time graduate business students, mainly in their twenties with little work experience but better educational backgrounds. We found that responses from the young Chinese tended to be between young Americans' responses and middle-age Chinese responses. We conducted interviews with Chinese business and government executives to further explore the survey results.

The next section describes the survey method. Section 3 contains the survey results, section 4 describes the interview method and results, and section 5 interprets the cross-national phenomena found in the studies. Section 6 makes conclusions and points out directions for future research.

2. SURVEY METHOD

2.1. Survey Questions

The questions on fairness perceptions and choices in health and safety risks in our survey of Chinese management subjects were the same ones given previously by Keller and Sarin⁽⁸⁾ to graduate management students in California. The questionnaires were translated into Chinese and back-translated to English. This process was repeated once and the final Chinese version was then decided. In translating from English to Chinese, long sentences were usually broken down into short sentences to suit the reading habits of Chinese subjects. Some redundancy of words and sentences was used to ensure that the messages they carried would be delivered to the subjects. The original presentation of the problems was maintained so that the subjects would not interpret the scenarios in other ways. The order of the scenarios presented in this paper is different from the order they were given to the subjects, which did match the original Keller and Sarin⁽⁸⁾ paper order.

2.2. Survey Administration

The formal survey was carried out in Shanghai, China, during the fall academic term (a pilot survey was carried out 3 months before and had the same result). Participating in this survey were 105 students in the management school of a major Chinese university and 104 students in the evening (part-time) education program of the same university. The full-time group had 1.5 years of work experience on average, and the part-time group had 11 years of work experience on average. Students were invited by their professors to take part. As in the original Keller and Sarin⁽⁸⁾ work, the study participants were divided into two groups, in which they received the same scenarios, but the selection tasks were different. The choice task required the subjects to select the best decision, the fairness task asked them to select the fairer option. Half of the subjects in each group were randomly assigned to take part in the choice task. The other half were assigned to take part in the fairness task. The surveys were conducted in different sessions. Each subject was paid in Chinese currency 5 RMB (U.S. \$0.60), for “a lunch.” Responses from those subjects who fully completed their questionnaires were analyzed.

2.3 Survey Data and Analysis

In reporting the results, we use “young Chinese” to label the full-time students, “middle-age Chinese” to label the part-time students. These labels capture the inter-generational feature of the two subject groups, although not all the full-time students are younger than the part-time students.³ We compare our results with those from full time students in an American MBA program from Keller and Sarin’s⁽⁸⁾ study. We ran χ^2 tests between groups to check for equality of the proportions of choices or fairness judgments and report those with significant differences.⁴

3. SURVEY RESULTS

The general trend is that young Chinese, middle-age Chinese, and Americans had very close judgments regarding “What is more fair.” However, their choice decisions were in striking contrast. The American subjects generally made decisions that were consistent with what was considered fair by the other half of the American subjects, but the Chinese subjects in several situations made decisions significantly different from what the other half of the Chinese subjects perceived as “fair.” Also, more middle-age subjects than young subjects tended to select the “unequal option.”

3.1. Results for Each Scenario⁵

The options that the subjects could choose from can be categorized as either “equal,” in which either all the people have an equal probability to die or live or there are equal outcomes, or “unequal,” in which

either some of the people have a larger chance to survive than others or there are unequal outcomes.

1. Serum-Producing Scenario—Dependent Probability Case

One hundred islanders were born highly susceptible to contracting a fatal disease. Recently, it was discovered that the presence of a naturally occurring noxious gas led to this condition and the gas has been eradicated. However, there is still some chance of the islanders contracting the disease and thus dying. You could decide to give an injection to all 100 islanders. This injection will prevent everyone from contracting the disease. However, the serum for the injection can only be obtained from the blood of a person who has artificially been made to contract the fatal disease. The serum cannot be obtained from a person who has naturally contracted the disease, so you cannot just wait to see if one person contracts the disease and then make the serum from the sick person’s blood.

If one islander is sacrificed by being made to contract the disease, enough serum will be obtained to eliminate the risk of death to the remaining 99 islanders.

If nothing is done, there is a 1% chance of an epidemic breaking out in which all 100 islanders will contract the disease and thus die. There is a 99% chance that no epidemic will break out, so all 100 islanders will live.

The two options are summarized below. Circle your choice/the option that is fairer.

Equal Probability

Do nothing, and thus take a 1% chance of all 100 islanders dying

(Considered fairer by most Americans and Chinese, and chosen by most Americans)

Unequal Probability

Sacrifice one islander

(Chosen by most Chinese)

This scenario illustrates our findings most clearly and merits some discussion. From Table I and Fig. 1, we can see that most of the American (92%) and Chinese (94% of young and 90% of middle-age group) subjects agree that the equal probability option is more fair. However, their choices are drastically different (at the $p < .01$ level for the difference between Americans and either Chinese group). Most Americans (87%) chose the fairer equal option, whereas the Chinese choice decisions are significantly opposite from their fairness perceptions, with 71% of

³ Although we do not report the details, we did analyze the data using ages as the criterion to differentiate the subjects. In the analysis for both the fairness task and the choice task, we cut the subject groups into two at age 28, 29, and 30. The results followed the same pattern as the ones we report using classes as the differentiation criterion.

⁴ Those that do not have significant differences and those with an expected cell size less than 5 are not reported. Degrees of freedom in all the scenarios is 1, which is $(2 - 1)(2 - 1)$.

⁵ For this paper’s discussion, we also gave each scenario a name: Keller and Sarin scenario 1 ~ serum producing; scenario 2 ~ serum distribution; scenario 3 ~ rescuer at risk; scenario 4 ~ miner location; and scenario 5 ~ flood. Options were named A or B, and the equal option was sometimes A and sometimes B.

Table I. Serum-Producing Scenario—Dependent Probability Case Results

	American		Young Chinese		Middle-age Chinese	
	Equal	Unequal	Equal	Unequal	Equal	Unequal
Percent saying this is fairer (number of subjects)	92%	8%	94%	6%	90%	10%
	(N = 53)		(N = 51)		(N = 49)	
Percent choosing this (number of subjects)	87%	13%	29%	71%	20%	80%
	(N = 53)		(N = 47)		(N = 49)	

young Chinese ($p < .01$) and 80% of middle-age Chinese ($p < .01$) choosing the unequal option of sacrificing one person. The 71% of young Chinese who selected the unequal option was less than the 80% of middle-age Chinese choosing to sacrifice one islander, but this difference was not statistically significant.

Keeney^(3,4) shows that a preference for more equitable distributions of risk implies a risk-prone attitude and that catastrophe avoidance reveals a risk averse attitude. In this scenario, the option of letting all face an equal risk rather than sacrificing one person to save the rest can be seen as a risk-prone choice because this risky option has the same expected lives lost ($.01 \times 100$ people = 1 life) as the sure thing option of sacrificing one person. The option to sacrifice one person to save the remaining 99 is thus a risk-averse option. We found that the majority of Americans made the risk-prone choice in this scenario and the majority of Chinese were risk averse.

Our finding of Americans' risk-prone attitude for life/death outcomes is consistent with the large body of experiments in the United States with monetary outcomes that have shown it is common for Americans to be risk prone when the possible out-

comes are losses. Our finding of Chinese' risk averse attitude for life/death outcomes is also consistent with previous research findings which indicated when choosing between a sure option and a risky option with monetary outcomes, Chinese were more risk averse than Americans when outcomes were losses,⁽²⁴⁾ and Chinese culture is more sensitive to the magnitude of potential losses and less affected by the probability of positive outcomes.⁽²⁵⁾ Although the context here is health and safety results, we found the same risk attitude difference between Americans and Chinese as in the monetary results.

The risk-averse attitude of the Chinese can be reflected in the Confucian doctrine of the *mean*.⁽²⁶⁾ The *mean*, according to Confucius, is "without inclination to either side." Although this concept is usually intended to advise people to be moderate, its philosophical extension encourages people to avoid extreme outcomes. Applying the doctrine to this situation, it can be understood that many Chinese want to avoid the extreme outcome (when all people die together) and choose to have a non-extreme outcome (that is, one person dies and the rest live).

This choice difference is also consistent with the results of individualism studies⁽²⁷⁻²⁹⁾ that find that Chinese appear to have low individualism, as compared to the United States, which has high individualism. In an individualistic society, an individual life is treated as important. For example, Americans prefer saving fewer individuals who were exposed to higher risks over saving more individuals who were exposed to lower risks.⁽³⁰⁾ In a collective society like China,⁽³¹⁻³⁵⁾ group interest is often considered more important than individual interest. This is shown by some Chinese subjects in both the surveys and interviews who said, "Partial interest should be subordinated to overall interest" as an explanation of their decision.

Our interpretation of the Chinese results is consistent with the Chinese equivalent of the English word "fairness," that is, *gong ping*. *Gong* can be understood as "public," and *ping* can be understood

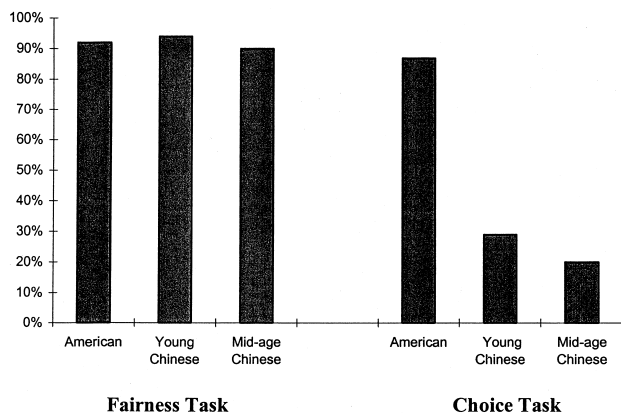


Fig. 1. Percentage of subjects selecting equal option in first serum-producing scenario.

as “balance.” *Gong ping* together can be seen as a depiction of good balance in the best interest of the public. It is incorporated in the spirit of collectivism and in the way of the *mean*.

The next case of the serum-producing scenario modifies the previous “dependent probability case” by having each islander have an *independent* 1% chance of death. We call it the “Independent-Probability Case.”

2. Serum-Producing Scenario—Independent Probability Case

If nothing is done, each of the 100 residents has a 1% chance of contracting the disease and thus dying. The most likely outcome is that one person will die (the chances of this are 37%). However, other outcomes are also possible. For example, it is almost as likely that no one will die (the chances of this are 36.6%). At the other extreme, it is possible, but unlikely, that many people will die.

Equal Probability

Do nothing, and thus take the chance of the following possible outcomes

36.6% chance no one dies

37.0% chance 1 islander dies

18.5% chance 2 islanders die

6.1% chance 3 islanders die

1.5% chance 4 islanders die

.3% chance more than 4 islanders die

(Considered as more fair by most Chinese and Americans, chosen by most Americans but only by a weak majority of Chinese)

Unequal-Probability

Sacrifice one islander

(More middle-age Chinese chose this than did young Chinese or Americans)

The outcome of the equal-probability option in this case is less extreme than the previous one—that is, the chance that the whole group is eradicated is low and most likely only a few people will die. In Table II we see again that the Chinese and the Ameri-

cans have similar fairness perceptions, with more than 91% of each group stating the equal probability option is fairer. Although there is still a sizable portion of the Chinese subjects (33% of the young and 40% of the middle-age Chinese) who chose to sacrifice one person, more chose not to this time. This distribution of Chinese choices is significantly different from their fairness perceptions ($p < .01$ for both age groups) and there is a significant difference between the choices of the Americans and middle-age Chinese ($p < .05$).

The results of the dependent and independent probability cases combined may imply some conflicting values. Some values, for example, “treat every one equally,” favor the equal-probability option. Other values, for example, “prevent the whole group from being extinguished,” favor the unequal-probability option. When the number of people who may die becomes much larger than the one person who is to be sacrificed, the Chinese tend to sacrifice the single person perhaps because of their collective tendency and the tendency to maintain the *mean*, as in the independent probability case. When the number of people who may die decreases, a large number of Chinese subjects shifted to treat each person equally, perhaps because of the need to emphasize values such as collectivism and the *mean*, also decreases, as in this dependent probability case.

3. Flood Scenario

A resident of your jurisdiction built a house on remote hills knowing fully well that an excessive rainstorm could damage his house and endanger his life. Unfortunately, an unusually severe rainstorm has just occurred and the resident is trapped alone in his house by rising floodwaters and impending landslides. You have a flood protection team closely watching a dam in your area. You can send the team to rescue the trapped resident. However, you would then expose a population of 100 nearby residents (including the trapped resident) to a risk of death because the dam would now be unattended, and could break, leading to severe flooding.

Table II. Serum-Producing Scenario—Independent Probability Case Results

	American		Young Chinese		Middle-age Chinese	
	Equal	Unequal	Equal	Unequal	Equal	Unequal
Percent saying this is fairer (number of subjects)	91%	9%	94%	6%	96%	4%
	(N = 53)		(N = 51)		(N = 49)	
Percent choosing this (number of subjects)	79%	21%	67%	33%	60%	40%
	(N = 53)		(N = 47)		(N = 49)	

Table III. Flood Scenario Results

	American		Young Chinese		Middle-age Chinese	
	Equal	Unequal	Equal	Unequal	Equal	Unequal
Percent saying this is fairer (number of subjects)	53%	47%	69%	31%	51%	49%
		(N = 53)		(N = 51)		(N = 49)
Percent choosing this (number of subjects)	58%	42%	25%	75%	24%	76%
		(N = 53)		(N = 47)		(N = 49)

Equal-Probability

*Send the team to rescue the trapped resident
There is a 1% chance the dam will break and all 100 residents will die.
There is a 99% chance that none of the residents will die.*
(Considered as more fair by weak majorities of Chinese and Americans, chosen by most Americans)

Unequal-Probability

Have the flood protection team continue watching the dam. The 1 trapped resident will die and the 99 others will live.
(Chosen by most Chinese)

This “Flood Scenario” is the same as the “Serum-Producing Scenario—Dependent Probability Case” in the probabilities and outcomes. Both scenarios involve the evaluation of an option that is consistent with the preference for having each person with an equal probability of death and another option that is not. In the “Serum-Producing Scenario—Dependent Probability Case,” the option consistent with equal probability was perceived as more fair by large majorities in all three subject groups. However, as seen in Table III, in the “Flood Scenario,” the same option was perceived as more fair only by weak majorities (53% of Americans, 69% of young and 51% of middle-age Chinese). Similar to their fairness judgments, a 58% majority of Americans chose the equal option. In contrast, significantly different from their fairness judgments, 75% of young ($p < .01$) and 76% of middle-age ($p < .01$) Chinese chose the unequal option. The choices of the Americans were significantly different from the choices of both Chinese age groups at the $p < .01$ level.

All that was changed in this flood scenario was the context. If a person decides to use an absolute rule of only looking at the probabilities of a specific number of deaths, as some decision models do, then the same choices would be made in both scenarios. The effects of changes in context can result from a

process that is conceptually similar to the framing effect.⁽³⁶⁾ Wagenaar, Keren, and Lichtenstein⁽³⁷⁾ discussed context effects in similar scenarios resulting from differences in the way a situation is presented (surface structure) and the way it is perceived in an individual’s mind (deep structure).

The next two scenarios are slightly different from the previous ones, in which subjects faced tradeoffs between one person and a group of persons. In the next two scenarios, they faced tradeoffs between half of a group and a whole group.

4. Miner Location Scenario

On an island within your jurisdiction, 100 miners are trapped, 50 in location A and 50 in location B. Two rescue options are possible. Circle your choice/ the option which is fairer.

Equal Outcome⁶

*Attempt to rescue all the miners in both locations. The possible outcomes are:
50% chance none die (because the rescue operation is successful);
50% chance all 100 die (because the rescue operation is not successful).*

(Considered more fair by most Americans and Chinese, chosen by most Americans and a weak majority of young Chinese)

Unequal Outcome

*Attempt to rescue only the miners in one location. The possible outcomes are:
50% chance the 50 miners in Location A live and the 50 miners in Location B die, because the rescue operation is sent to Location A;
50% chance the 50 miners in Location B live and*

⁶ We cannot use equal probability and unequal probability to label the two options, because before the decision is made, a miner in each site has an equal *ex ante* probability of .50 of dying. However, after the event happens, miners in the first option have equal outcomes, whereas those in the other option do not.

the 50 miners in Location A die, because the rescue operation is sent to Location B.
(Chosen by a weak majority of middle-age Chinese)

We see two differences between this scenario’s design and the “Serum-Producing Scenario—Dependent Probability Case.” First, the chance that all group members die in the equal option increased from 1% to 50%. This would likely lead more subjects to choose the unequal option. Second, the number of group members that needed to be sacrificed in order to save the rest of the group increased from 1 to 50 in the unequal option. This would likely lead subjects in the opposite direction toward the equal option.

The American responses were quite similar in both the fair task and the choice task, and in the two scenarios (with at least 87% of each group selecting the equal option), whereas the Chinese responses differed in both. First, the Chinese still had a significant difference between their fairness and choice tasks ($p < .01$ for both age groups). However, this time more choice task subjects (59% of young and 49% of middle-age Chinese) chose the equal probability option than in the Serum-Producing Scenario (29% and 20%, respectively). There was still a significant difference in the distribution of choices between the Americans and either Chinese age group ($p < .01$). The fact that more Chinese subjects chose the equal probability option shows that the tendency to move from the unequal option to the equal option (compared to the Serum-Producing Scenario) is stronger than the tendency to move from the equal option to the unequal option. This probably implies that the Chinese were more sensitive to the number of deaths than the magnitude of the risk faced by each individual. In contrast, Americans appeared more concerned with the higher risks faced by individuals than the number of individuals involved.⁽³⁰⁾ Such a Chinese phenomenon again can reflect the Chinese tendency to avoid the “catastrophic” results of all people dying and maintain the *mean*.

5. Serum Distribution Scenario

There are 100 islanders who are susceptible to a specific fatal disease that has recently appeared on the mainland. Scientists have identified a kind of serum that has the potential of protecting people from contracting the disease. Unfortunately, there is not enough serum available to give all the susceptible islanders a high enough dose to successfully prevent the disease. Action must be taken immediately to protect the public health. All susceptible people must be injected with the serum within 24 hours, or each will have a 15% chance of contracting the disease and eventually dying. There is no time to acquire more serum. There are only 3000 milligrams of the serum available. As the public health officer, it is your job to choose between the following options. Circle your choice/the option which is fairer.

Equal Probability:

Give the same low dose of 30 milligrams of serum to all 100 susceptible islanders. Fifty of those susceptible are northerners, 50 are southerners. Each susceptible person will have an independent 10% chance of dying. The expected number of deaths is 10.
(Considered more fair and chosen by most Americans and Chinese)

Unequal Probability:

Divide up the available serum among the 50 northerners who are susceptible to the disease. Thus, these people will receive a higher 60 milligram dose. Each of the 50 will now have an independent 5% chance of dying. Because the 50 susceptible southerners will receive none of the serum, each will still have a 15% chance of dying by contracting this disease. The expected number of deaths is 10.

Like the “Miner Location Scenario,” this is also a scenario in which subjects have to balance the benefits of the two halves of a group, the results are shown in Table V. Similar to other scenarios, at least 92% of each group judged the equal probability option to

Table IV. Miner Location Scenario Results

	American		Young Chinese		Middle-age Chinese	
	Equal	Unequal	Equal	Unequal	Equal	Unequal
Percent saying this is fairer (number of subjects)	91%	9%	94%	6%	84%	16%
		(N = 53)		(N = 51)		(N = 49)
Percent choosing this (number of subjects)	91%	9%	59%	41%	49%	51%
		(N = 53)		(N = 47)		(N = 49)

Table V. Serum Distribution Scenario Results

	American		Young Chinese		Middle-age Chinese	
	Equal	Unequal	Equal	Unequal	Equal	Unequal
Percent saying this is fairer (number of subjects)	94%	6%	98%	2%	92%	8%
		(N = 53)		(N = 51)		(N = 49)
Percent choosing this (number of subjects)	98%	2%	82%	18%	72%	28%
		(N = 53)		(N = 47)		(N = 49)

be fairer. There is more agreement on choices between the countries in this scenario, relative to earlier scenarios. Most Chinese subjects (82% of young and 72% of middle-age Chinese) chose the equal-probability option in this scenario, but there are still some relatively smaller differences in the percentages of Chinese favoring the equal option in the fairness and choice tasks (98% vs. 82% for young and 92% vs. 72% for middle-age Chinese). There also remain some relatively smaller differences between Americans (with 98% choosing the equal option) and young and middle-age Chinese (with 82% and 72% choosing the equal option, respectively.)

The reason for this move toward cross-cultural agreement is probably similar to that of the difference between the independent case and the dependent case in the “Serum-Producing Scenario,” that is, the two possible outcomes in this scenario are less extreme. The probability that all die under the equal-probability option is quite low and it is most likely that only a few people die. Therefore, there is not an urgent need to avoid a “catastrophe,” on which the Chinese and Americans appear to have quite different opinions.

6. Rescuer at Risk Scenario

On an island within your jurisdiction, 100 miners are trapped in one location in a mine. There is a way to rescue these miners by sending a rescue team through an unused tunnel. You have dispatched a rescue team of 10 rescuers to this tunnel. The team has come upon a portion of the tunnel that is dangerous. They need to station a rescuer at this point in the tunnel for the next 10 hours to listen and watch for any signs that the trapped miners send to the team. However, there is a chance that sometime in the next 10 hours, a cave-in will occur that will be fatal to the rescuer stationed there. The rest of the tunnel is safe, so the rescuers are not at risk in other parts of the tunnel. The team is able to communicate with you at a command post via a portable radio. The team has contacted you for your orders about what to do next.

They want to know if they should station one rescuer at the key point in the tunnel for 10 hours, or have each rescuer take a 1-hour shift. There is a 10% chance that a cave-in will occur, and only one cave-in would occur, if any. The rescuers will definitely be able to save the 100 miners, no matter which option is taken.

Equal Probability

Each of the 10 rescuers takes a 1-hour shift. Thus each rescuer has a 1% chance of death, because each would be in the tunnel one-tenth of the time, and one-tenth times 10% is 1%.

(Considered more fair by most Americans and Chinese, chosen by most Americans and young Chinese, and by a weak majority of middle-age Chinese)

Unequal Probability

One rescuer does the entire 10-hour shift. This rescuer has a 10% chance of death. The other nine rescuers have a 0% chance of death.

As seen in Table VI, the Chinese responses and the American responses are quite similar in this scenario, although some differences persist that are relatively small compared to some earlier scenarios. They all favor the equal-probability option. Americans and young Chinese are nearly the same, with 96% of each group judging the equal option fairer and fewer (83%–84%) choosing the equal option. Compared with Americans, or young Chinese, significantly fewer (82%) middle-age Chinese selected the equal option as fairer ($p < .05$ and $.01$, respectively) and the choice proportion of 62% for the equal option is similarly significantly less than their own fairness proportion ($p < .05$). Notice that, again, there is not an urgent need to avoid a “catastrophe” in this scenario because only one person may die, and the chance that he may die is only 1% in the equal-probability option.

Table VI. Rescuer at Risk Scenario Results

	American		Young Chinese		Middle-age Chinese	
	Equal	Unequal	Equal	Unequal	Equal	Unequal
Percent saying this is fairer (number of subjects)	96%	4%	96%	4%	82%	18%
	(N = 53)		(N = 51)		(N = 49)	
Percent choosing this (number of subjects)	83%	17%	84%	16%	62%	38%
	(N = 53)		(N = 47)		(N = 49)	

3.2. Pattern of Responses by Each Subject Across Scenarios

The equal option was seen as fairer in each of the scenarios by a majority of Americans, of young Chinese, and of middle-age Chinese. Figure 2 shows how often subjects chose the option that the majority found fairer. For each subject in the choice task we counted the number of times (ranging from 0 to 6) the equal option was chosen in the six scenarios. The vertical bars in Fig. 2 show the percentage of subjects in each group choosing a specific number of the fairer options. For example, the highest white bar shows that 48% of the American subjects made 5 choices (out of 6) that were “fairer.” The next highest white bar shows that 40% of Americans made 6 choices (out of 6) that were “fairer.” Thus, 88% of Americans chose the fairer equal option in at least 5 out of 6 scenarios. There is an observable visual trend shifting from the middle-age Chinese to young Chinese to young Americans to choose a larger number of options that are “fairer.” The distribution of Americans’ fair choices was significantly different from either age Chinese group (χ^2 test,⁷ $p < .005$, $df = 3$).

⁷ The degrees of freedom for this test are $(4 - 1)(2 - 1) = 3$, after collapsing the cells with 0 to 3 choices together to make the new cell large enough to perform the statistical test.

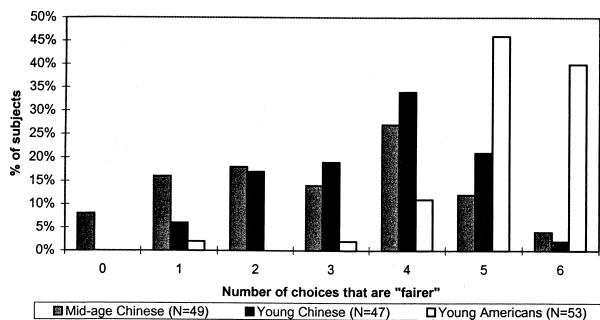


Fig. 2. Number of choices that are “fairer”—intergroup comparisons.

There was not a statistically significant difference in the overall distribution of fair choices between the two Chinese age groups. However, the proportion of young Chinese choosing the fairer equal option was greater than the proportion of middle-aged Chinese choosing the equal option in all six scenarios but the difference was only significant for the last scenario ($p < .01$) and approached significance with $p < .10$ for the other five scenarios.

4. INTERVIEWS WITH INFLUENTIAL CHINESE DECISION MAKERS

The previous section reported the results of our survey of Chinese management students and professionals. To gain further insights we studied another professional group whose decisions have important implications to the society—Chinese government officials and business executives, in lengthy interviews.⁸

4.1. Method

The interviews were divided into two sections. The first section started with the Serum-Producing Scenario—Dependent Probability Case, and the second section started with the Miner Location Scenario (Keller and Sarin’s⁽⁸⁾ scenarios 1 and 4, respectively).

We started each section by helping the participants to be familiar with our interview topics. We described the scenarios to the participants and asked them to provide their choices and general opinions on the scenarios, their life experiences that were similar to the scenarios, and their actual decisions in these experiences. The middle part was an unstructured interview, in which several participants revealed their decision criteria. Toward the end of the interviews, participants were allowed to state their general opin-

⁸ The purpose of the interviews was to reveal the mindset of selected Chinese decision makers. The results can not necessarily be generalized to all Chinese decision makers.

ions regarding fairness and the fairness of their decisions in the hypothesized and actual situations.

The face-to-face interviews were conducted by Bian in Mandarin Chinese in China's three coastal provinces from October to December 1996. No two interviews were conducted during the same day which offered time for Bian to analyze the previous interviews and incorporate the insights of the analysis into the strategy of the next interview. All participants were males. We believe that our participants expressed their true opinions due to the relaxed surroundings, the comfort level between the interviewer and the participants, and our promises to keep their identities confidential. Each interview lasted 40 to 60 minutes. The interviews were translated into English, transcribed by Bian and double-checked by another Chinese individual.

4.2. Results

The participants' backgrounds are presented in Table VII and the interview topics are summarized in Table VIII.

Participants' opinions regarding fairness can be divided into two categories. The industrial institute chief engineer (participant 5) believed that "fairness" should be clearly defined and the source of fairness, "morality," should be regarded as an extremely important criterion in social life. He said, "Only through introducing to the society a prototype of morality will we be able to achieve fairness." He was not able to define fairness.

For four of the participants (1-4), an equal distribution of risks or outcomes to every one (the fairness criterion agreed upon by most survey subjects in the hypothetical scenarios) did not appear to be considered when making decisions. None of them mentioned fairness until fairness was mentioned by the interviewer. When fairness was asked about, the responses were different but showed some common patterns.

First, none of the four participants were able to define fairness as an abstract concept. However, they

did not regard an unequal risk distribution as necessarily unfair and did not regard an equal probability distribution as necessarily fair. Such a pattern can also be observed in the Western culture, in which fairness is "based on a standard of comparison that ranks the various claimants according to their relative" deservedness.⁽³⁸⁾

Second, they expressed that absolute fairness does not exist or an absolutely fair solution cannot be achieved (see Table IX for some quotes).

This second pattern needs to be considered closely with the decision scenarios in which it was shown. These scenarios are designed to show extreme contrasts between equal and unequal probabilities (or outcomes), and they are clearly stylized examples to generate discussion. We need to be careful in generalizing the fairness opinions found under such an environment to other aspects of life.

Third, instead of trying to achieve fairness, the decision makers would rather pursue some practical goals, such as "fulfilling responsibility" (participant 1); "efficiency" (participant 2), and reaching the "development goal of the overall business organization" (participants 3 and 4).

Fourth, if to pursue these practical goals actually would harm a small part of the people, they believed that to compensate those who were treated unequally is a good way to balance "fairness" and "development," rather than not to pursue the goals. All of the participants insisted that they made the right decisions when the interviewer challenged them on the fairness of their decisions. In contrast, in many risk-related conflicts in the United States, residents or workers reject the mechanism of receiving compensation for health and safety risks, demanding that they not be exposed to the risks.

5. EXPLANATION OF THE CROSS-NATIONAL DIFFERENCES

We believe that cultural influence is a major reason for the behavioral differences between Chi-

Table VII. Background of Chinese Business and Government Executives Interviewed

No.	Age	Position	Education
1	35	Refinery vice president	3-year certificate, chemical engineering
2	43	Middle-size city deputy mayor	Part-time bachelor, economics
3	45	Large city industrial bureau director	Bachelor, engineering
4	50	Machinery factory president	Bachelor, engineering
5	38	Industrial institute chief engineer	Bachelor, engineering

Table VIII. Interview Scenarios

Participant	Scenario
1	<i>Hypothesized:</i> Fire accident took place in the refinery. You could send a factory firefighter team to extinguish the fire. By doing so the team would face much life-threatening danger. You could also wait until the city teams (with larger size and better equipment) come for a safer rescue. By doing so a lot of the people and facilities that are nearby would be damaged. Will you send the firefighter team or wait for the city team? <i>Decision:</i> Send the team.
2	<i>Real:</i> In a major flood, the water level in the river near the city was over the historically highest point. It was very likely that the water would flood the city. You could break the dike to shed water, which could prevent the residents from being flooded. But this would for sure endanger the life and property of the people at the breaking point. What did the city do? <i>Decision:</i> Break the dike.
3	<i>Real:</i> A bus factory in an industrial bureau with about 2000 employees had been losing money for consecutive years. One option was to work for a turnaround. The other option was to close the plant and redirect the resources (including a large cash investment) to other plants under the same bureau. Which did you do? <i>Decision:</i> Close the plant.
4	<i>Real:</i> A production line in a large factory had been losing money for several years. You could make further investments to improve the competitiveness of this product line. You could also close it and focus the resources on other profitable production lines. Which did you do? <i>Decision:</i> Close the plant.
5	<i>Hypothesized:</i> Serum-Producing Scenario. <i>Decision:</i> Do nothing, face 1% chance all 100 die.
5	<i>Real:</i> A major problem was identified in a power plant and it had to be fixed. One option was to shut down the whole plant and fix it. This would cause substantial economic loss to the plant and the power users and display the management's incompetence to the higher level administration and the public. The second option was to fix it without shutting down the equipment, but this would very likely kill the workers. Which option did you choose? <i>Decision:</i> Stop the equipment.

nese and Americans found in our surveys. The following discussion presents a framework that can facilitate the understanding of such cultural influences.

5.1. The Decision Values Framework

Many models can help us understand the influence of cultural differences on people's behavior. We find the Whiting and Whiting⁽³⁹⁾ model particularly relevant to our study. In Whiting and Whiting⁽³⁹⁾ a decision is determined by a value that is "a statement that attributes goodness or badness to any event" and values are ordered with regard to the strength with which they are held. A situation will first call forth a number of values for the decision maker. The

strongest held value⁹ is then selected and it determines the final decision.

This structured decision framework comes from a Western cultural research tradition and probably cannot be used for many Chinese decision makers.

⁹ The value concept we used in our paper is restricted to "goodness or badness" that was proposed by Whiting and Whiting.⁽³⁹⁾ This concept actually reflected other factors such as framing of information, prior experience, socioeconomic contexts, and features of the risks which all affect the "goodness or badness" judgment. It is still the "goodness or badness" that directly determines the decision, however, other factors indirectly influence the decisions by affecting the "goodness or badness" judgment. The idea that the single strongest held value determines the final solution can be seen as special case (with all weight on one attribute) of a multiattribute utility model with weights on the multiple attributes.

Table IX. Quotes from Chinese Executives on Fairness

Participant	Opinions regarding fairness
1	"In fact, there is no absolute fairness. Unfairness is absolute, fairness is relative."
2	"We cannot say that unfairness is absolute, but we can say that absolute fairness is not existent. We can even say that fairness is something too emotional."
4	"Maybe you receive fair treatment in one aspect, but [you will] lose fair treatment in another aspect. Therefore you cannot simply talk about fairness."

In fact, some argue that in the traditional Chinese culture there are no absolute standards by which to resolve the conflict of values, as compared to the absolute rules on which Westerners tend to depend.⁽⁴⁰⁾ Moreover, the Chinese culture is situation centered⁽³¹⁾ and choices are greatly influenced by the discussion context.^(41,42) Even modern-day Chinese were found to have a hard time generating decision alternatives and establishing decision criteria in a decision analysis application by Pollock and Chen.⁽⁴³⁾

However, evidence does exist that some Chinese decision makers have “very little aversion to an analytical approach to problem solving.”⁽⁴⁴⁾ In our ongoing research, we have also found that some Chinese decision makers consciously analyzed their decision situations. Therefore, we are reasonably confident in using this decision values framework to discuss both American and Chinese decision making. Because the general decision framework is assumed to be the same for both Americans and Chinese, the cultural influence can only be shown in the value system of the subjects; that is, subjects of different cultures can call forth different values for a decision situation, and select a different final value that determines the decision.

5.2. Using this Framework in the Serum-Producing Scenario—Dependent Probability Case

In this scenario, the choice difference between the Americans and Chinese is the strongest among all the scenarios. A large majority of the American subjects chose the “equal” option of letting all 100 islanders face the equal 1% risk of all dying together. The vast majority of Americans perceived this option to be fairer. Large majorities of the two Chinese subject groups agreed that this option was fairer, but they chose the “unequal” option of sacrificing one islander to save the other 99.

According to the Whiting and Whiting⁽³⁹⁾ framework that we proposed, what determines the behavior is the value chosen by the decision maker from a number of values called forth by the decision situation. For simplicity of discussion, we assume that (1) two values are called forth by this scenario, and (2) the two values are the same for the American and Chinese subjects. These two values may be “to treat everyone equally” (value A) and “to prevent the extinction of the whole community” (value B). If value A is chosen, the decision will be to risk the extinction of the whole community and not to

sacrifice a person. If value B is chosen, the decision will be to sacrifice a person in order to make sure the rest of the community is saved.

The results suggest that in the fairness task, most American and Chinese subjects used the value “to treat everyone equally.” However, in the choice task, most American subjects used the value “to treat everyone equally,” whereas most Chinese used the value “to prevent the extinction of the whole community.” The reasons for this different value decision have already been discussed under the Serum-Producing Scenario, in which we mentioned three cultural features: individualism vs. collectivism, risk attitude, and the doctrine of the *mean*. These features are also consistent with the value choices here.

Once the value chosen is to “prevent the extinction of the whole community,” the Chinese would likely decide to “sacrifice a person.” Because this is a decision that does not “treat every one equally,” they would have tried to justify this decision through the decision implementation process. Several survey subjects wrote: “to let someone have the glorification to die for the people he loves,” or “to execute a criminal who deserves to die,” and so on. This should indicate the strong influence of the competing value “to treat everyone equally.” The subjects appear to try to maximize this value in their action within the constraint that the first value “to prevent the extinction of the whole community” is satisfied. When the danger of the population extinction becomes lower, as in the less extreme Serum-Producing Scenario—Independent Probability Case, this competing value gains more ground. This conjecture is demonstrated by the fact that substantially fewer Chinese subjects chose to sacrifice a person in the independent probability case than in the dependent probability case.

6. CONCLUSIONS AND FURTHER RESEARCH

We conducted surveys to study Chinese choices and perceptions regarding fairness when facing health and safety risks and compared the results with American results. We found that the Chinese and American survey participants had very similar fairness perceptions toward hypothesized situations. However, they made quite different decisions in the same situations. We found that young Chinese tended to be between middle-age Chinese and Americans, although differences in the responses of the two Chinese age groups were not usually statistically sig-

nificant. Our understanding was further enriched by in-depth interviews with government and business executives in China, who considered business and economic achievement higher than fairness concerns.

We believe that cultural differences between Americans and Chinese are an important factor behind our findings. Such often-quoted Chinese features as their tendency to avoid risks and catastrophes⁽²⁴⁻²⁶⁾ and collectivism in social activities⁽²⁷⁻³⁵⁾ directly contributed to the differences found in this paper as many survey respondents and interviewees mentioned these notions frequently.

We must point out that the cross-national differences in this paper cannot all be attributed to cultural differences. There can be many other reasons for the observed survey choices. For example, the Chinese and American surveys were conducted during different time frames and were not exactly the same in terms of the demography of the subjects, and consequently caution needs to be applied when one tries to generalize the cross-national results. Other factors such as prior cultural and social experiences, socio-economic contexts, framing of different scenarios, *a priori* beliefs about risk, and different probability judgments^(45,46) could also lead to different perceptions of the scenarios. For example, Keller and Sarin⁽¹⁹⁾ found differences in choices involving health and safety risks by experimental subjects depending on their academic background and whether choices were made as individuals or groups.

We also must point out the distinction between equity and equality when considering fairness. The specific conditions in the scenarios of this paper limited the fairness consideration to equality (of chances to live or die, or of outcomes), and the American subjects seemed to stick to this equality criterion in their choice behavior. However, in many other situations they, like their Chinese counterparts, may not always do so, particularly when the status quo reflects an uneven distribution of risks and benefits, or when people “deserve” different distributions because they have put in different amounts of effort or other resources.

Understanding Chinese fairness perceptions, their impact on Chinese decision making, and their difference from those of Americans can help negotiations and multinational operations between the two countries. Negotiations can be benefited because some conflicts are not the result of competing interests, but the result of different perceptions or decision processes. Therefore, by understanding the way each group perceives decision situations and make choices,

conflicts can be resolved. It may also be possible to design business strategies for locating facilities and operations across countries that should be acceptable to local communities involved. Compared to the United States, Chinese regions may have different tradeoffs between their health and safety goals and their development goals.

Our focus in this study on health and safety risks is at a theoretical and philosophical level. We rarely face such extreme situations in our daily life. In two follow-up studies^(47,48) building on work by Kahneman, Knetsch, and Thaler,^(49,50) we are studying fairness perceptions in people’s daily economic life. Results show that actions North Americans deem unfair, such as raising the price of umbrellas on rainy days, were deemed acceptable by Chinese.

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