

# Culture, Conformity, and Risk Attitudes

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*Abstract:* I investigate cultural differences in conformity in the context of risk attitudes. I expect that people from cultures that value conformity, such as collectivist East Asian cultures, will be more likely to conform to others than people from cultures that value individuality, such as the United Kingdom. My experiment consists of salient lottery choice tasks, where choices from a control group are revealed to a treatment group, for each culture. Comparing Asian and British students, I find no difference in the distribution of Asian choices between the control and treatment groups. However, the British students are inclined to choose against the majority of their peers. This behaviour is consistent with an individualist culture that places value on uniqueness.

## **Culture, Conformity, and Risk Attitudes**

*Social influence can be powerful in a society where everyone claims to be independent and autonomous. – Jetton, Postmes, and McAuliffe (2002, p. 204)*

### **1. Introduction**

How people behave depends not only on individual preferences, but is often shaped by the attitudes of those we interact with. As people gain utility from belonging to a peer group, we sometimes take on the norms and characteristics of the groups we belong to, in order to increase our attachment to those groups (Geisinger, 2004). How the attitudes of one's peers shapes individual behaviour is known as "peer effects". As group attachment is stronger in collectivist cultures, it is conceivable that peer effects are stronger in collectivist cultures than individualist cultures. In collectivist cultures, conformity brings positive feelings of harmony and connectedness, whereas in individualist cultures people enjoy the feelings of freedom and independence from being unique (Kim and Markus, 1999). My focus for this paper is to see whether people from collectivist cultures are more conformist in risk attitudes than people from individualist cultures.

In Laban (2014), I find that Asian students form larger financial risk-sharing networks at university compared to British students. I also find that the number of network connections affects the risk attitudes of Asian students but not British students. This makes sense, as those from collectivist cultures probably consider their networks more in decision making than those from individualist cultures. However, I now test if collectivists are influenced more by the attitudes of their peers compared to individualists. Peer effects in risk attitudes have been documented among a sample of MBA students (Ahern *et al*, 2014),

where after one year on the programme, individual risk attitudes converged to the average risk attitudes of the group. Similarly to Ahern *et al* (2014), I also test for peer effects in risk attitudes, but this time testing for any cultural differences. I choose East Asian students to represent a collectivist culture and British students to represent an individualist culture. These choices are consistent with Hofstede's (1980) measures of individualism and collectivism in each country.

I run an experiment with salient lottery choice tasks, where I present participants in treatment groups with the majority choices from control groups. While the distribution of choices among Asian students is unaffected by the presence of peer choices, the British students tend to choose against the majority of their peers. This makes sense, as people from individualist cultures gain utility from being different to others. The results from this research will be useful for policy-makers, who want an idea of how different cultural groups react to the decisions of their peers. Messages about the behaviour of others are increasingly being used by Government to influence behaviour (Wenzel, 2002). Knowing whether people from different cultural groups will prefer to conform or to go against the majority will help the Government to know which types of information will be useful to make public, and to whom.

## *2 Background Literature*

### *2.1 Peer Effects in Risk Attitudes*

Ahern *et al* (2014) study peer effects in risk attitudes and trust among a sample of MBA students at the University of Michigan. They measure pre-determined risk attitudes using a Holt and Laury (2002) lottery choice task, and they measure trust attitudes using

questions from the World Values Survey. They then re-elicite risk and trust attitudes after one year on the MBA programme to test for any convergence. Ahern *et al* (2014) decide to focus on attitudes rather than outcomes in order to fill a gap in the literature and better understand whether peers influence underlying attitudes as well as outcomes (Ahern *et al*, 2014, p. 1). Observing outcomes only, such as betting decisions among a group of friends at the horse races, does not tell us why we might see convergence. People may conform for social reasons or conform automatically without putting much thought into their decision, rather than a change in risk attitudes.

The reason Ahern *et al* (2014) use pre-determined attitudes is to avoid simultaneity between the influences of peers on attitudes and attitudes on peers. As individuals may influence the attitudes of their peers, as well as being influenced by their peers, looking at how the individual's attitudes change shows a causal relationship of the peer attitudes on the individual's attitudes. In addition, people may select peers with similar attitudes to themselves, leading to observed peer similarity that is not necessarily driven by peer influence. Ahern *et al* (2014) overcome this problem by using random assignment of peer groups in their experiment. Finally, they include a survey to verify that the peers have meaningful social relationships.

After one year on the MBA programme, Ahern *et al* (2014) find that risk attitudes of individuals *do* converge to the average risk attitudes of the group. In particular, a one standard deviation increase in average risk aversion of a randomly assigned peer group increases an individual's risk aversion by 0.2 standard deviations. On the other hand, no effects are found for the influence of peer attitudes on individual trust attitudes, suggesting that trust may be a more stable attitude, related to factors other than risk taking. This

finding supports recent evidence that trust is not just a special case of risk taking (Bohnet and Zeckhauser, 2009). I expect Ahern *et al's* (2014) finding of positive peer effects in risk attitudes would be stronger among people of collectivist cultures.

Delfino *et al* (2013) also look at conformity in attitudes under risk and uncertainty. Participants are given an investment choice task, where they choose how many tokens to invest in a risky or uncertain prospect. The risky prospect is represented by known probabilities of loss and the uncertain prospect is represented by unknown probabilities. They use a within-subjects design where participants first make a series of investment choices, with varying probabilities of loss. Next, the participants repeat the series of choices, but are given some information about the choices of an earlier group of subjects. The information about past choices is given as either a group average or one individual's choice.

Delfino *et al* (2013) find evidence of conformity in choices, which is stronger when the decision-makers are more cautious, when they are given a group average rather than an individual's choice, and when they are under time pressure. Interestingly, the authors find stronger conformity for risky prospects than for uncertain prospects. They initially expected this to be the other way around, as with less information to base their decisions on people may be more likely to copy others. However, the result could be because under uncertainty the participants may have thought the others were just choosing randomly, whereas for known probabilities the choices are a better indication of preferences. People are probably more likely to conform when they believe others' choices reflect their true preferences, rather than a random choice.

## *2.2 Peer Effects and Culture*

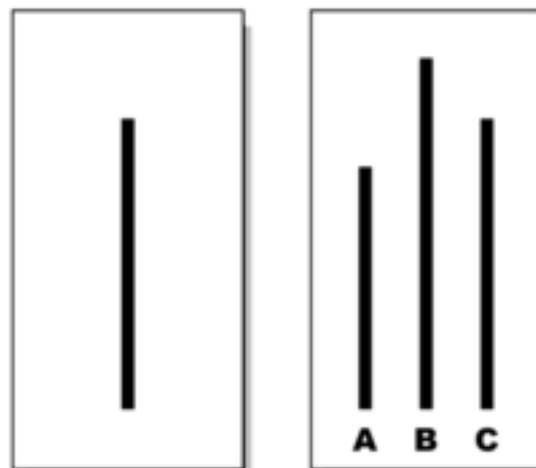
Although peer effects in risk attitudes are yet to be explored cross-culturally, there are several studies in the field of social psychology that document cultural differences in conformity in other areas. For example, Bond and Smith (1996) conduct a meta-analysis of studies using Asch's (1952, 1956) line judgement task to investigate cultural and temporal differences in conformity.

In Asch's line judgement task, subjects are presented with a group of three lines of varying lengths and asked to select the line that is equal in length to a standard line, as shown below in Figure 2.1. The task is designed such that the answer is fairly obvious. Subjects are in groups of seven to ten people and each individual is required to announce his or her choice to the group. However, in each group, all but one of the subjects is previously instructed by the experimenter to choose the wrong line and announce this to the group. Therefore, one subject is faced with information from the group that contradicts their private observation. The idea is to see whether this individual conforms by choosing the same line as the majority of their group.

Bond and Smith (1996) compare data collected for the line judgement task in 17 countries. Using three different measures of individualism and collectivism (Hofstede, 1980; Schwartz, 1994; Trompenaars, 1993), they find a positive and significant relationship between collectivism and conformity. In addition, when looking at the U.S. data, they find that conformity has declined since the 1950s. The authors also point out that the identity of the peers matters for conformity, with studies showing higher levels of conformity among friends than strangers (Bond and Smith, 1996, p. 112). This raises the question over whether

collectivists will only conform more than individualists when dealing with members of their in-groups.

Figure 2.1: Asch's Line Judgement Task (1952, 1956)



More recently, Kim and Markus (1999) investigate conformity preferences among East Asian and European Americans, by asking subjects to choose between items that represent either conformity or uniqueness. In their first set of studies, subjects choose from sets of abstract shapes where the majority of shapes look the same but there are a minority of shapes that look different. Overall, more European Americans than Chinese Americans choose the shapes that are in the minority, indicating a preference for uniqueness. They also replicate this study in Korea and once again find the European Americans to select the minority shapes more often than the Koreans.

In order to see whether this cultural difference in preference is also manifested through choice, Kim and Markus (1999) run another study where subjects are asked to choose a pen from a group of five pens, that are coloured either green or orange. As there

are five pens, the majority of pens are the same colour, while the minority of pens are the other colour. Overall, most Americans (74%) choose the less common colour while most East Asians go for the majority colour (76%). One reason Kim and Markus (1999) choose to present their subjects with trivial choice tasks is to remove social pressure from their experiments. This is to show that the tendency to conform can be a preference, which is based on cultural values rather than a response to group pressure (Kim and Markus, 1999, p. 787).

### *2.3 Motivations for Conformity*

Similarly to Kim and Markus (1999), I am interested in conformity as a cultural value. To isolate this value, we need to remove other peer influence forces that drive risk taking behaviour. For example, Gamba and Manzoni (2014) show that the simple act of comparing oneself to others can prompt risk seeking behaviour. In addition, interacting with others from the same cultural group may bring about stereotypes, which can affect behaviour but sometimes be misleading (Shih *et al*, 1999). Therefore, I focus on simple individual choice tasks in this paper, where each participant's decisions are kept private.

This is especially important when looking at cultural differences, as the varying drivers of behaviour could affect people from different cultures in different ways. For example, the tendency to become more risk seeking when making decisions in a group could work in a culturally-specific way (Kim and Park, 2010). Collectivists may focus on a norm of interdependent relationships that leads to a diffusion of responsibility. On the other hand, individualists may be more focused on individual goals such as showing-off to other group members. By focusing on one aspect of peer influence, such as the preference of

being similar to other people, we can gain a better understanding of how culture affects conformity.

In addition, I control for the beliefs of players by giving everyone the same precise information regarding probabilities. In environments of uncertainty, players may copy each other simply because they believe others have made a good choice. Without knowing the probabilities involved, players have little else to base their decisions on. How people's beliefs are shaped by others may also differ culturally, leading to a confounding situation where cultural differences could be driven by different beliefs as well as different preferences. To isolate conformity due to preferences, the only benefit players should receive from conforming is to know they have behaved similarly to others, rather than any informational or social gains. This motivation should be stronger in cultures that value conformity.

#### *2.4 Applications*

Focusing on conformity as a cultural value may also be useful for public policy. Although the Government cannot directly control peer influence due to social pressure or comparison, they can attempt to influence behaviour through messages about social norms. For example, in a field trial with the Australian Tax Office, Wenzel (2002) finds that people tend to overestimate a negative attitude towards tax compliance in others, and believe that tax evasion is more widespread than it actually is. When sharing this information with taxpayers, Wenzel finds an increase in compliance relative to a control group. This effect works through changing the perceived social norm, which people prefer to conform to. Knowing how different cultural groups are affected by such messages will help the Government to target policy in areas that would be most effective.

Another area cultural differences in conformity can be applied is herding in financial markets. Herding is where people choose to invest in a stock because they have observed others investing in the stock (Bikhchandani and Sharma, 2000). Park and SgROI (2009) distinguish between rational and irrational herding. Rational herding is where people use information gained from observing others' actions in order to make better decisions. Irrational herding represents a decision to follow others even though no useful information is gained from observing the others' actions. Park and SgROI (2009) also point out the existence of contrarian behaviour, which is where people go against the majority action e.g. investing in a stock that others are avoiding. Similarly to herding, contrarianism can be either rational, i.e. using valuable information, or irrational, i.e. doing something different for the sake of it.

Herding can lead to irregularities in the stock market, such as over-priced stocks and bubbles that eventually burst. Looking at cultural differences in conformity raises the question of whether certain cultures are more susceptible to herding. If cultural values are indeed an important driver of conformity, the tendency to herd may be even stronger among collectivist cultures. However, the goal of participating in the stock market is to make money, and financial concerns may outweigh any cultural inclinations.

### *3. Experimental Design*

#### *3.1 Hypotheses*

My main hypothesis to be tested is that students from collectivist cultures will be more susceptible to peer effects than students from individualist cultures. Previous research shows that Asian students are more risk seeking with money than American students (Hsee

and Weber, 1999). One key reason for this appears to be the ability to rely on social networks for support in collectivist cultures, known as the “cushion hypothesis” (Hsee and Weber, 1999). Therefore, I have three hypotheses for this research:

Hypothesis One: Students from collectivist Asian cultures will be more financially risk seeking than students from individualist cultures. Therefore, when measuring a preference for risk, a sample of Asian students will have a higher mean preference than students from an individualist culture such as Britain.

Hypothesis Two: When presented with the decisions of their peers, the distribution of choices among collectivist Asian students will become more clustered than the students from individualist cultures, with less extreme choices. This means that choices will converge to the mean as people prefer to make similar choices to their peers.

Hypothesis Three: When presented with the decisions of their peers, Asian students will be more likely to conform to the majority than students from individualist cultures. Students from individualist cultures may not be affected at all by the decisions of others, or they may be affected by choosing differently to their peers to express their individuality.

### *3.2 Experiment*

I run a 2 X 2 between-subjects design, where I compare individualist and collectivist cultures in treatments with or without peer effects. Although a within-subjects design is more economical, subjects would need to complete two different risk attitude elicitations, i.e. before and after peer effects are induced. This would be subject to possible consistency bias, as the players may choose the same options in the second task simply to appear

consistent with the first task, thereby ignoring the peer effects. I choose a between-subjects design to avoid this bias.

To represent an individualist culture, I invite students of British or Irish nationality. For students of collectivist culture, I invite students from China or other East Asian countries such as Taiwan and Vietnam. I avoid inviting Japanese students, as in Japan collectivism is focused on the work group rather than the family (Bond and Smith, 1996, p. 126). This experiment was run at the Finance and Economics Experimental Laboratory (FEELE) at the University of Exeter in March 2014. I run four sessions, with 20 participants in each. However, one session only contains 19 participants due to no-shows.

I run separate sessions for British and Asian students. Each cultural group has both a control session without peer effects and a treatment session with peer effects. In the treatment sessions, peer effects are induced by revealing the results from the respective culture's control session. For example, Asian students in the treatment session are given the results of Asian students in the control session, and vice versa for the British students. One advantage of running separate sessions is that social norms of individualism and collectivism may be enhanced in each cultural group. However, the main reason I run separate sessions is to induce peer effects in a culturally specific way.

This is because I expect the Asian and British students to choose different options in the control sessions, with Asian students going for more risk seeking options. I want to present the students in the treatment sessions with a culturally specific social norm, which they can then decide whether or not to conform to. Also, as identity of the peers is likely to be important (Bond and Smith, 1996, p. 112), I want each group in the treatment sessions to imagine a session being run previously with similar participants to themselves. Running

sessions with all-Asian or all-British students is an effective way to induce this image. However, to avoid experimenter demand effects<sup>1</sup>, the students are not explicitly told that the previous sessions contained participants of the same culture.

Participants complete a lottery choice task in the experiment, very similar to Hsee and Weber’s (1999) hypothetical task. I choose this task because Hsee and Weber find very promising cultural differences but do not pay subjects according to their decisions. Therefore, I thought this task would be interesting to run saliently. The exact lottery choices subjects make are shown below in Table 3.1. Each question appears in order on a computer screen, which is programmed using z-Tree (Fischbacher, 2007). The reason I choose to present the questions in order is to prevent confusion and inconsistent responses. Hsee and Weber (1999) vary the order of their questions and find no significant order effects (Hsee and Weber, 1999, p. 169).

Table 3.1: Lottery Choice Task

<b>Question</b>	<b>Safe Option</b>	<b>Risky Option</b>
1	Receive £4 for sure	Flip a coin; Receive £20 if heads or £0 if tails
2	Receive £6 for sure	Flip a coin; Receive £20 if heads or £0 if tails
3	Receive £8 for sure	Flip a coin; Receive £20 if heads or £0 if tails
4	Receive £10 for sure	Flip a coin; Receive £20 if heads or £0 if tails
5	Receive £12 for sure	Flip a coin; Receive £20 if heads or £0 if tails
6	Receive £14 for sure	Flip a coin; Receive £20 if heads or £0 if tails

After the lottery choice task, each participant is asked to roll a die to determine which question we will pay them for. If they have chosen the coin flip for the selected question, they then flip a coin to determine their payoff. In addition, everyone receives a £5

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<sup>1</sup> Brislin and Lonner (1973, p. 70) note the possibility of cultural differences in experimenter demand effects, with “courtesy bias” being particularly prevalent in Eastern cultures, where participants like to please the experimenter.

show-up fee to avoid people leaving with nothing. The payment method is explained to participants at the beginning of the experiment. I decide to pay each participant for only one decision, in order to avoid wealth effects and participants hedging risk between the questions. Subjects earn £14.89 on average for this experiment, with a maximum of £25 and a minimum of £5.

The only difference between the control sessions and the treatment sessions is that in the treatment sessions, participants are presented with a sentence for each question detailing the results from the corresponding control session. This sentence is a true statement based on actual results. For example, for the first question, participants in the Asian treatment session are given the following sentence:

*Yesterday we ran the same experiment and 30% of participants chose £4 for sure while 70% of participants chose the coin flip.*

I then compare the numbers of Asian and British students choosing in-line with the majority, expecting Asian students to be more likely to follow the majority than the British. Instructions for this experiment are given below in Appendix One.

### *3.3 Follow-up Questionnaire*

Once payoffs are determined, the subjects complete a follow-up questionnaire, also programmed in z-Tree (Fischbacher, 2007). This questionnaire contains a survey measure of risk attitudes in different contexts (Dohmen *et al*, 2011), as well as demographic questions and a hypothetical social risks problem. One key reason I include an additional measure of risk attitude in the follow-up questionnaire is to allow us to control for subjects' underlying risk attitudes when comparing lottery choices between treatments. Perhaps the subjects in

one treatment happen to be very risk averse with money and their choices are driven more by their attitudes than peer effects. Including an additional measure of risk attitude allows us to observe differences between treatments that are not accounted for by differences in risk attitude.

The risk attitude questions in my follow-up questionnaire come from the German Socio-Economic Panel. These questions involve an 11-point Likert scale rating of the willingness to take risks in different contexts. Specifically, questions are asked about taking risks in the following contexts: while driving, with financial investment, when engaging in leisure and sport, with your career, with your health, and with social approval<sup>2</sup>. The questions have been validated experimentally and shown to be good predictors of behaviour in each context (Dohmen *et al*, 2011).

I also present subjects with a hypothetical social risks problem, inspired by Weber *et al* (1998). In Laban (2014), British students showed a greater tendency to take social risks than Asian students, which could be due to a greater need to maintain good relationships in collectivist cultures. In order to test for peer effects in social risks as well as financial risks, I give the percentage of people choosing each option from the control sessions to those in the treatment sessions. As with financial risks, I expect Asian students to be more susceptible to peer effects in social risks than British students. The social risks problem is framed as follows:

*Imagine you have a good relationship with your roommate, and that your roommate is currently facing an important decision. You have a strong opinion about the*

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<sup>2</sup> I add the question about social approval to capture cultural differences in attitudes toward social risks.

*decision your roommate should make, and need to decide whether or not to give your roommate advice. If you give advice that your roommate appreciates, this will greatly enhance your relationship. However, if your roommate dislikes your advice, this will seriously harm your relationship. If you give no advice, this will have no effect on your relationship. Will you give advice or remain silent?*

Finally, subjects in the treatment sessions are presented with an extra question in their follow-up questionnaire. The subjects are asked whether or not they considered the previous results and if so how did this affect their decision. I expect more Asian students to be influenced by their peers than British students, and to be more likely to choose in-line with the majority. The questions from the follow-up questionnaire are presented below in Appendix Two.

#### *4. Results*

##### *4.1 Lottery Choices*

Similarly to Hsee and Weber (1999), I calculate a risk preference index to compare the risk preferences of those taking part in the experiment. The risk preference index represents the number of risky choices taken out of the six options. Therefore, the risk preference index has a minimum of zero and maximum of six, with higher numbers representing more risky choices. Twelve students give inconsistent responses, where they switch from preferring a safe option to a risky option when the value of the safe option is higher than the safe option they chose previously. However, the number of risky choices still gives us some useful information regarding risk preference, even if inconsistent. Also, as risk preference tends to be malleable (Beauchamp *et al*, 2012), rather than a stable underlying

characteristic, inconsistent responses are a reflection of real life decision making. Therefore, I decide to keep the inconsistent responses for the analysis. As a robustness check, I repeat the analysis with the inconsistent responses removed and find that the conclusions of this paper remain unchanged.

Table 4.1 below shows the average risk preference index by nationality. In the control sessions, Asians choose more risky options than British students on average, but the difference is not statistically significant ( $p = 0.736^3$ ). However, in the treatment sessions, British choose more risky options than Asian students on average. This difference is not statistically significant either ( $p = 0.454$ ). Interestingly, the British students in the treatment group are more risk seeking than the British students in the control group ( $p = 0.138$ ), which may be related to the peer effects treatment, or other demographic factors. Later on we will check for any cultural differences when controlling for underlying risk attitudes as well as other demographic factors.

Table 4.1: Average Risk Preference Index<sup>4</sup>

	<b>British</b>	<b>Asian</b>
<b>Control</b>	1.55 (1.00)	1.80 (1.44)
<b>Treatment</b>	2.05 (1.19)	1.79 (1.13)

As can be gleaned from the summary statistics above, there is little difference in the distribution of risky choices between treatments for the Asian students. However, the British students take more risky choices in the treatment condition than in the control

<sup>3</sup> Throughout this paper, I use a Mann-Whitney *U*-test to determine whether the samples are statistically different.

<sup>4</sup> Standard deviations are given in parentheses.

condition. We now look at the lottery choices in more detail to see whether there are any cultural or treatment differences. Table 4.2 below shows the proportion of students choosing each option for each question in the control condition. These proportions are then presented to students in the respective culture's treatment conditions. None of these differences in proportions between cultures are significant for any of these questions<sup>5</sup>.

Table 4.2: Choices in the Control Conditions

Question	Options	British Students	Asian Students
1	Safe: Receive £4 ECU for sure Risky: Flip a coin; Receive £20 if heads or £0 if tails	Safe: 15% Risky: 85%	Safe: 30% Risky: 70%
2	Safe: Receive £6 ECU for sure Risky: Flip a coin; Receive £20 if heads or £0 if tails	Safe: 65% Risky: 35%	Safe: 45% Risky: 55%
3	Safe: Receive £8 ECU for sure Risky: Flip a coin; Receive £20 if heads or £0 if tails	Safe: 65% Risky: 35%	Safe: 70% Risky: 30%
4	Safe: Receive £10 ECU for sure Risky: Flip a coin; Receive £20 if heads or £0 if tails	Safe: 100% Risky: 0%	Safe: 90% Risky: 10%
5	Safe: Receive £12 ECU for sure Risky: Flip a coin; Receive £20 if heads or £0 if tails	Safe: 100% Risky: 0%	Safe: 90% Risky: 10%
6	Safe: Receive £14 ECU for sure Risky: Flip a coin; Receive £20 if heads or £0 if tails	Safe: 100% Risky: 0%	Safe: 95% Risky: 5%

There is also little cultural difference in risk preferences in the treatment conditions. However, perhaps the more interesting differences are those *within* cultures between treatments. Figures 4.1 and 4.2 below show how the distribution of choices compares

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<sup>5</sup> Using a two-sided two-sample Z-test for difference in proportions.

between treatments, for Asian and British students respectively. Although the distribution of choices for Asian students is roughly the same between treatments, the British tend to

Figure 4.1: Proportion of Asian Students Choosing the Safe Option for Each Question

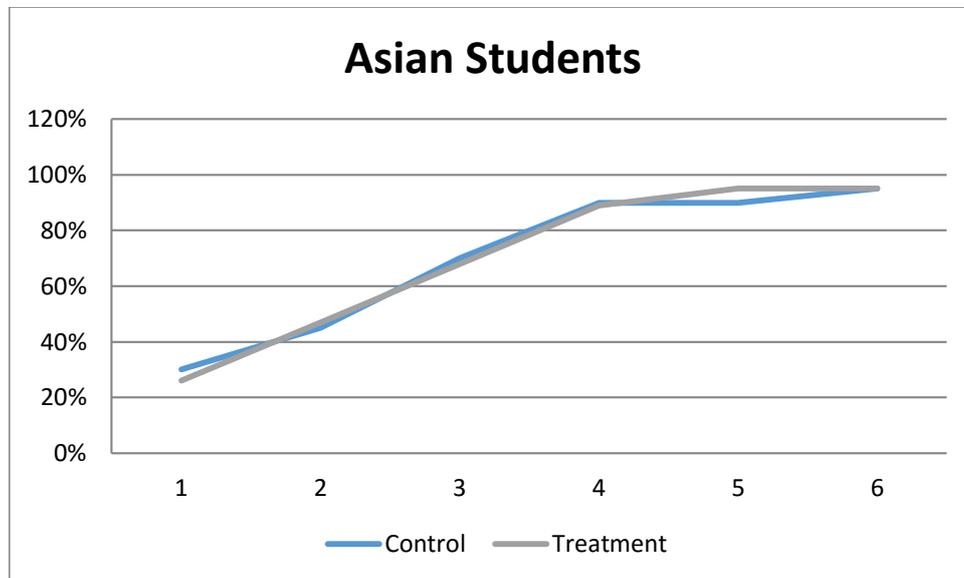
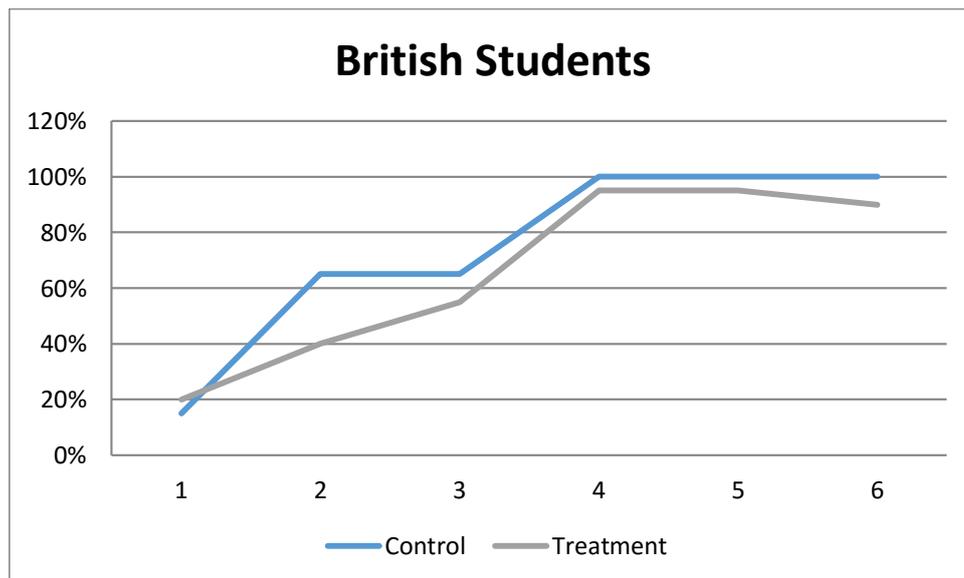


Figure 4.2: Proportion of British Students Choosing the Safe Option for Each Question



make riskier choices in the treatment condition. However, rather than displaying herding behaviour, the British students are moving away from the majority choices towards the

minority choices, which is an example of contrarian behaviour. This makes sense as those from individualistic cultures like Britain are likely to place value on being different from other people. Although mean risk preference is higher for British in the treatment group, a two-sample Kolmogorov-Smirnov test of equality of distributions shows no significant difference in distributions between the treatment and control sessions ( $p = 0.452$ ). We now need to control for demographics and underlying risk attitudes to see whether there are factors other than contrarianism that are driving behaviour.

#### *4.2 Survey Questions*

When looking at cultural differences in context-specific risks, we can see from Table 4.3 below that Asians are less willing to take risks than British in every category. This contrasts my Hypothesis One, that Asians will be more willing to take financial risks than British, but the difference is not quite significant ( $p = 0.103$ ). As expected, the Asian students are also less willing to take social risks than the British, but again this difference is not quite significant ( $p = 0.135$ ). We will use these measures of risk attitude to control for differences in risk preference when testing for peer effects in social and financial risks.

While most of the other categories show similar results for both cultures, there is a noticeable difference in the willingness to take risks with health. The British students indicate an average willingness to take health risks of 4.13 out of 10, which compares to only 2.64 for the Asian students. This difference is statistically significant ( $p = 0.011$ ) and can possibly be explained by Confucian values such as patience and self-control among the Asian students. Students who believe in these values would be less likely to over-indulge in unhealthy food or alcohol than students who believe in living for the moment.

Table 4.3: Average Willingness to Take Risks on a Scale from 0–10<sup>6</sup>

	<b>British</b>	<b>Asian</b>
<b>General</b>	5.58 (1.99)	5.44 (2.25)
<b>Driving</b>	3.00 (1.75)	2.41 (2.44)
<b>Financial Investment</b>	5.58 (2.09)	4.74 (1.96)
<b>Leisure and Sport</b>	7.10 (2.04)	6.46 (1.89)
<b>Career</b>	5.58 (2.18)	5.00 (2.22)
<b>Health</b>	4.13 (2.65)	2.64 (2.61)
<b>Social Approval</b>	5.73 (2.16)	5.00 (2.03)

Table 4.4 below shows the average willingness to take financial risks by treatment and nationality. When looking at the willingness to take financial risks, we can find no significant difference between treatments for the British students ( $p = 0.427$ ). This means that the tendency for British students to make riskier decisions in the treatment condition is unlikely to be explained by differences in risk attitudes alone. As for the Asian students, those in the control condition indicate a greater willingness to take financial risks than those in the treatment session, but the difference is not significant ( $p = 0.181$ ). However, the Asians show little difference between treatments in their lottery choices. Perhaps those Asians in the treatment condition were inspired to make riskier choices based on their peers' choices in the control condition. We now consider these results in-light of demographic variables.

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<sup>6</sup> Standard deviations are given in parentheses.

Table 4.4: Average Willingness to Take Financial Risks on a Scale from 0–10<sup>7</sup>

	<b>British</b>	<b>Asian</b>
<b>Control</b>	5.40 (2.06)	5.25 (1.52)
<b>Treatment</b>	5.75 (2.15)	4.21 (2.25)

Gender is an important factor that can affect risk attitudes, with males tending to take greater financial risks than females. In-line with previous results (e.g. Dohmen *et al*, 2011), males rate their willingness to take financial risks significantly higher than females in these experiments ( $p = 0.005$ ). Males also have a higher risk preference index in the lottery choice task, but this difference is not significant ( $p = 0.672$ ). As similar proportions of males and females attend the British session, the difference between treatments is unlikely to be driven by gender. On the other hand, the Asian treatment session contains a higher proportion of females than the control session. The higher proportion of females in the Asian treatment session could be one reason they have a lesser willingness to take financial risks than the control session.

Age can also be important for determining risk attitudes (Dohmen *et al*, 2011). However, as the students attending these experiments tend to be of similar age, I do not expect to find a significant effect of age on risk attitudes. In-line with this prediction, age is insignificant in the estimation of both risk preference index and the survey measure of willingness to take financial risks. With a greater dispersion of ages in the sample, we may obtain some more interesting results on how age interacts with culture, conformity, and risk attitudes.

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<sup>7</sup> Standard deviations are given in parentheses.

As subject major may also affect risk attitudes, I endeavoured to invite similar proportions of students from each subject area to each session. However, as most of the Asian students registered for economic experiments are studying business, this is not such an easy task. To avoid any bias, I invite a high proportion of British business school students in attempt to match the proportion of Asian business school students. Overall, the proportions are fairly similar, with 85% of Asian students studying a business major, compared to 78% of British students studying business. There are no significant differences in either risk preference index or the survey measure of financial risk attitude between business and non-business majors.

I include all of these demographic factors, along with the measure of underlying financial risk attitude, in an ordered probit<sup>8</sup> regression on the risk preference index. In addition, I include a binary variable, *Peer Effects*, equal to one if the participant took part in the treatment session and zero if they took part in the control session. Gender and subject major are also represented as binary variables, with *Female* equal to one if female, and *Business Major* equal to one if studying business. *Age* is a continuous variable measured in years and *Financial Risk* measures the willingness to take financial risks on a scale from 0 – 10. I use robust standard errors to account for heterogeneity in the sample. I run this regression both overall and for each cultural group separately<sup>9</sup>. Results are presented below in Table 4.5.

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<sup>8</sup> An ordered probit model accounts for the ordinal nature of the data by focusing on the ranking of outcomes rather than precise quantitative values (Greene, 2003, p. 736).

<sup>9</sup> In the overall regression, I also included a binary variable for cultural group, as well as an interaction term between treatment and culture. However, neither of these variables were significant and were subsequently dropped from the analysis. Results from these regressions are available in Appendix Three.

Table 4.5: Coefficients from Ordered Probit Regression on Risk Preference Index<sup>10</sup>

	Entire Sample	British Sample	Asian Sample
<b>Female</b>	0.100 (0.244)	-0.128 (0.349)	0.465 (0.458)
<b>Age</b>	0.033 (0.068)	-0.222 (0.165)	0.250** (0.122)
<b>Business Major</b>	-0.350 (0.331)	-0.483 (0.368)	-0.472 (0.581)
<b>Financial Risk</b>	0.151** (0.069)	0.150 (0.102)	0.244* (0.128)
<b>Peer Effects</b>	0.361 (0.259)	0.650* (0.370)	0.008 (0.422)
<b>Cut 1</b>	0.366 (1.403)	-4.686 (3.021)	5.389 (2.827)
<b>Cut 2</b>	1.140 (1.395)	-3.842 (3.007)	6.185 (2.836)
<b>Cut 3</b>	1.897 (1.392)	-3.055 (2.961)	6.979 (2.886)
<b>Cut 4</b>	3.475 (1.421)	-1.368 (2.916)	8.606 (2.990)
<b>Cut 5</b>	3.772 (1.413)	N/A	N/A

As the magnitude of coefficients cannot be directly interpreted in ordered probit models, I focus on the sign and significance of results. In both the overall and Asian sample regressions, financial risk attitude has a significant and positive effect on the lottery choices. This makes sense, as a greater willingness to take financial risks should result in riskier lottery choices. The only significant demographic variable is age and this is only significant for the Asian group, where age has a positive effect on the risk preference index. Interestingly, the treatment binary variable is only significant for the British students, where they make significantly more risky choices on average in the treatment session than the

<sup>10</sup> Robust standard errors are given in parentheses. Significance at the 10%, 5%, and 1% level of confidence is indicated with \*, \*\*, and \*\*\*, respectively. In ordered probit models, the probability of the dependant variable taking on any particular value is given by the probability a latent variable lies between each cut point.

control session. This shows that the British students are affected by the peer effects treatment, even when controlling for their underlying risk attitudes and demographics.

Although the British appear to be engaging in contrarian behaviour, they certainly do not admit to this in their follow-up questionnaires. Only two British students in the treatment session admit they considered the previous results, compared to seven Asian students. When asked how the previous results affected their decisions, the two British students make the following comments:

*"I took the previous decisions into account on question 3 and gave a different answer because of this."*

*"Usually followed the pattern"*

However, of the two British students who considered the previous results, three of their decisions go against the majority, out of twelve choices in total. This compares to only two out of forty-two decisions going against the majority among the Asian students who considered the previous results. The Asian students make the following comments, when asked how the previous results affected their decisions:

*"how much money I can get maximum"*

*"knowing others responses is important to make my decision"*

*"When I made a decision, I would consider that how others were thinking, and then I made some decisions based on the results others made. But overall, the results didn't have much effect."*

*“for the question 3, I was thinking to take the risk. but I changed my mind when I saw the general choices from other people was not taking risk. then I changed my mind.”*

*“when the proportion of people who chose yes is high, I decided to choose yes as well”*

*“I will be less willing to take risk if most people do not take the risk.”*

*“To double check if my decision was approved by the majority after I have made my own decision.”*

These questionnaire results are as expected, since imitating others has positive connotations such as harmony in collectivist cultures but negative connotations such as lack of free-will in individualist cultures. To avoid these negative emotions, the British students are unlikely to admit being influenced by other people, even if they were influenced by going against the majority. Paradoxically, as noted by Jetten *et al* (2002), individualists are conformist in their non-conformity.

#### *4.3 Social Risks*

As part of the follow-up questionnaire, I present subjects with a hypothetical social risks problem, where they must decide whether or not to give advice to a roommate. Results by treatment and nationality are given below in Table 4.6. In both treatments, more British than Asian students indicate they would give advice to the roommate, which is the riskier option in this scenario. However, the cultural differences are small compared to the differences between treatments, with more students going for the safer option when given information about the choices of their peers. Interestingly, the students display contrarian

behaviour, by going against the majority choices from the previous sessions. However, none of these differences in proportions are statistically significant<sup>11</sup>.

Table 4.6: Proportion of Students Choosing to Give Advice

	<b>British</b>	<b>Asian</b>
<b>Control</b>	80%	75%
<b>Treatment</b>	70%	63%

Similarly to financial risks, we can use our measure of willingness to take social risks from the follow-up questionnaire to control for underlying social risk attitude in the face of peer effects. As shown in Table 4.7 below, there is no difference in the average willingness to take social risks between treatments for Asian students, with an average willingness of 5 out of 10 in each treatment. In contrast, the British students indicate a greater willingness to take social risks in the treatment condition than in the control condition, with an average of 6.10 in the treatment condition, compared to 5.35 in the control. However, this difference is not statistically significant ( $p = 0.224$ ).

Table 4.7: Average Willingness to Take Social Risks on a Scale from 0–10<sup>12</sup>

	<b>British</b>	<b>Asian</b>
<b>Control</b>	5.35 (2.01)	5.00 (2.08)
<b>Treatment</b>	6.10 (2.29)	5.00 (2.03)

Although insignificant, the differences between treatments support the notion that British are engaging in contrarian behaviour. Firstly, the minority choice becomes more popular when the students are told it is the minority choice. Secondly, the students choose

<sup>11</sup> Using a two-sided two-sample Z-test for difference in proportions.

<sup>12</sup> Standard deviations are given in parentheses.

the safe option more readily in the treatment condition, even though they indicate a greater willingness to take social risks than those in the control. The students are choosing against the majority, even though their preferences indicate they should prefer the riskier option even more than those in the control session.

I use a probit regression to see whether there are any significant treatment effects when controlling for demographics and underlying social risk attitude. My dependent variable is a binary variable equal to one if the person indicates they would give advice in the roommate problem, and zero if they choose to remain silent. I include the same demographic variables as the regression on risk preference index, but this time include a measure of the underlying social risk attitude. The variable *Social Risk* indicates how subjects rate their willingness to take social risks on a scale from 0 – 10. Results from the regression are presented below in Table 4.8.

The only significant variable in the below regression is the binary variable for whether or not the subject is studying a business major. As the coefficient is negative, those studying business are *less* likely to take the social risk by giving advice. This effect works entirely through the British sample, with collinearity in the British sample regression but insignificance in the Asian sample regression. As there is no difference in underlying social risk attitudes between business and non-business majors, this result could be driven by how business majors interpret the question, rather than underlying attitudes. Perhaps they see the scenario as a strategic interaction rather than a risky situation *per se*. Although the summary statistics indicate a possible contrarian treatment effect on the British students, there are no significant treatment effects in the regression. More research with higher

sample sizes is necessary to obtain a clearer result about cultural differences in peer effects in social risks.

Table 4.8: Coefficients from Probit Regression on Roommate Problem<sup>13</sup>

	Entire Sample	British Sample	Asian Sample
<b>Female</b>	-0.235 (0.324)	0.188 (0.480)	-0.294 (0.566)
<b>Age</b>	-0.005 (0.093)	0.021 (0.195)	0.118 (0.174)
<b>Business Major</b>	-1.004* (0.544)	Omitted	-0.650 (0.760)
<b>Social Risk</b>	0.024 (0.078)	-0.084 (0.126)	0.161 (0.118)
<b>Peer Effects</b>	-0.186 (0.331)	0.058 (0.491)	-0.421 (0.464)
<b>Constant</b>	1.684 (1.961)	0.425 (3.780)	-1.787 (3.785)

## 5. Discussion

### 5.1 Overview

For financial risks, these experiments show that British students make riskier choices when given information about the majority choices of their peers. In this case, the British show contrarian behaviour rather than herding, as they tend to go against the majority choices. However, the Asian students show neither contrarianism nor herding. According to Hypothesis Two, I expected the Asian students to imitate the majority choices and have a more clustered distribution of choices in the treatment session compared to the control session. However, there are no significant differences in the distribution of choices between

<sup>13</sup> Robust standard errors are given in parentheses. Significance at the 10%, 5%, and 1% level of confidence is indicated with \*, \*\*, and \*\*\*, respectively. In ordered probit models, the probability of the dependant variable taking on any particular value is given by the probability a latent variable lies between each cut point.

treatments for Asian students, even when accounting for demographic factors and underlying risk attitudes. Nonetheless, when looking at conformity as a scale, the British students are less conformist than the Asian students, which is in-line with Hypothesis Three. Also, although the Asian students did not choose very differently between the two treatments, their comments in the follow-up questionnaire support the notion of strong peer influence in collectivist cultures.

### *5.2 Cultural Norms*

Contrarian behaviour is expected in individualist cultures such as Britain, especially when an experimenter is obviously trying to influence the participants by blatantly showing the previous results. The students may have felt as though the experimenter was trying to coerce them into choosing in-line with the majority, and therefore chose against the majority in order to restore their free-will. This explanation is consistent with Brehm's theory of psychological reactance (1966). Psychological reactance is a negative emotional state brought about by people perceiving their freedom as being limited through obligation or coercion. People feeling this way are likely to behave in such a way as to restore their freedom, perhaps by choosing against the majority in these experiments.

One implication of contrarian behaviour is that people from individualistic cultures may be resistant to policies that try to influence people by social norms. Some people may even react negatively, by doing the opposite of what the policy intends. For example, a message that "most people enjoy alcohol responsibly" may encourage individualists to stand out from the crowd by breaking the norm. Policymakers need to be aware of how policies can affect people from different cultural groups in different, and perhaps unintended, ways.

While the British behave according to their cultural norms, the Asian students do not show evidence of conformity in these experiments. One reason for this could be that the Asians had similar preferences to begin with, which limits the scope to become more conformist in-light of new information. Many Asians mentioned in their follow-up questionnaire that the decisions of others confirmed their original choices. An experiment that contrasts peer preferences with individual preferences may be better placed to elicit conformity preferences among Asians, such as Asch's line judgement task (1952, 1956).

Another reason for the result could be that the students in the previous session were not considered part of an in-group. In collectivist cultures, in-group formation is a long process that requires bonding (Triandis, 1989). As the students in the treatment session did not even see the students in the control session, it is likely they were treated as strangers. Indeed, Williams and Sogon (1984) document higher conformity by Japanese students when they are dealing with familiar people than with strangers. Perhaps if this experiment was run amongst a group of friends or classmates, we would see greater conformity among the Asian students.

### *5.3 Methodological Issues*

In order to better understand the results, we need to look at various methodological issues that could be driving the behaviour and apparent cultural differences. Firstly, the fact that the experiment was presented in English may introduce some bias. Keysar *et al* (2012) show that using a foreign language, as opposed to native language, reduces biases in decision making. This is likely because people are less emotionally and cognitively attached when thinking in a foreign language, and therefore make decisions more systematically and less intuitively.

One bias that raises a particular concern for these experiments is the certainty effect (Kahneman and Tversky, 1979; Allias, 1953). The certainty effect is where people have a bias towards certain outcomes, when they would prefer a riskier option when probabilities are scaled by a fixed constant. As the experiments in this paper involve choices between certain outcomes or a lottery, the participants may be subject to the certainty effect. In addition, the Asian students may be less subject to the certainty effect than the British students, as the instructions are in English. As part of the follow-up questionnaire, I ask participants for their native and second languages. Only 3 out of the 19 Asian participants list English as their native language, compared to all of the British students. As certainty bias encourages choosing the sure outcome, the Asian students may have made riskier choices in these experiments than if the instructions were in their native language. However, my instructions are very short and choices between simple lotteries seem unlikely to be interpreted very differently between cultures.

When considering certainty bias, the questions arises as to whether people felt a bias towards a certain outcome in the roommate problem. The question is framed such that one option has a certain outcome, "*If you give no advice, this will have no effect on your relationship*", and the other option has a risky element, depending on whether or not the roommate appreciates the advice. Although giving no advice may be seen as a certain outcome, this scenario is less straightforward than the lottery choices. For example, subjects may imagine a scenario where the roommate makes a bad decision and they regret not giving them advice, which could have avoided the bad outcome. Therefore, even the supposed certain outcome may not be interpreted as certain by the subjects.

As well as a possible cultural difference in certainty bias in the decision making task, we need to consider other possible flaws with the task itself. The lottery choice task by Hsee and Weber (1999) does not produce a large amount of variety in the data. Most people switch from preferring the risky option to the safe option at around question two in the Hsee and Weber (1999) task. As most people are risk averse, hardly anyone chooses the coin flip when the safe option is more than about £6. I used this task as Hsee and Weber (1999) found some promising cultural differences when running this task hypothetically. However, perhaps including more intermediary choices between the questions people tend to switch on would provide us with a richer dataset. There is also some evidence that lottery choice tasks do not accurately predict risk taking in real life situations and that context-specific questionnaire measures may provide more predictive power (Dohmen *et al*, 2011).

In addition, the strength of identification with national cultures can vary widely among individuals. The students who attended these experiments may hold particularly individualist or collectivist values, regardless of their nationality. We can only attribute the results to culture if we understand the cultural values held by participants. Jetten *et al* (2002) use a questionnaire to measure strength of identification with national culture, as well as endorsement of individualist or collectivist values. Measures such as these should be included in future cross-cultural work.

## 6. Conclusions

In these experiments, I expected that students from collectivist Asian cultures would be more conformist than students from individualist cultures such as Britain. However, rather than the Asian students imitating their peers more than British students, the difference is evidenced by British students being contrarian and choosing against their

peers. This makes sense, as those from individualist cultures tend to value uniqueness. The British students do not openly admit being influenced by others, which also makes sense as peer influence is seen negatively as a constraint on personal freedom in individualist cultures. While the British students try to restore their freedom by choosing against the majority, they are paradoxically still being influenced by others, even though the influence pushes them in the other direction to what the majority are doing. On the other hand, the Asian students seem happy to admit that they are influenced by the behaviour of others, as evidenced by their responses to the follow-up questionnaire.

My two secondary hypotheses fail to gain support from these experiments. Asian students do not choose riskier options than the British students in the lottery choice task, and neither do they indicate a greater willingness to take risks with money in their follow-up questionnaire. This contrasts previous evidence that students from collectivist cultures are more financially risk seeking than those from individualist cultures (Hsee and Weber, 1999). In addition, my hypothesis that the distribution of choices among Asian students will converge to the mean in the presence of peer effects, is not confirmed by this experiment. More studies with larger sample sizes and a greater variety of choice options are needed to ascertain whether Asian students are more likely to conform to their peers than British students.

## Appendix One: Experiment Instructions

### Instructions

You are about to take part in an experiment. Your payoff from this experiment will depend on the decisions you make during the experiment. Therefore it is important that you carefully read and understand these instructions.

Your earnings from the experiment will be in pounds and you will be paid anonymously in cash before you leave the room. You will also receive a £5 show-up fee, in addition to any money earned during the experiment.

During the experiment you will be asked to make a series of decisions. At the end of the experiment, **one** of the decisions you make will be randomly selected to determine your payoff. This will be done by a dice roll, as you will make six decisions in total.

Some of the choices will involve a lottery where you have a 50% chance of each payoff. In these cases, we will flip a coin to determine your payoff.

The experiment will begin shortly. Please raise your hand if you have a question at any stage.

## Appendix Two: Follow-up Questionnaire

### Follow-up Questionnaire

Imagine you have a good relationship with your roommate, and that your roommate is currently facing an important decision. You have a strong opinion about the decision your roommate should make, and need to decide whether or not to give your roommate advice. If you give advice that your roommate appreciates, this will greatly enhance your relationship. However, if your roommate dislikes your advice, this will seriously harm your relationship. If you give no advice, this will have no effect on your relationship. Will you give advice or remain silent?

*In Peer Effects Treatments:* Yesterday we ran the same questionnaire, and XX% of participants chose to give advice while XX% of participants chose to remain silent.

- OK Button -

How willing are you to take risks in general, with 0 being not at all willing to take risks, and 10 being very willing to take risks?

- OK Button -

How willing are you to take risks when driving, with 0 being not at all willing to take risks, and 10 being very willing to take risks?

- OK Button -

How willing are you to take risks with financial investment, with 0 being not at all willing to take risks, and 10 being very willing to take risks?

- OK Button -

How willing are you to take risks when engaging in leisure or sport, with 0 being not at all willing to take risks, and 10 being very willing to take risks?

- OK Button -

How willing are you to take risks with your career, with 0 being not at all willing to take risks, and 10 being very willing to take risks?

- OK Button -

How willing are you to take risks with your health, with 0 being not at all willing to take risks, and 10 being very willing to take risks?

- OK Button -

How willing are you to take risks with social approval, with 0 being not at all willing to take risks, and 10 being very willing to take risks?

- OK Button -

*In Peer Effects Treatments:* During the experiment, we gave you information on the results from yesterday's session. Did you consider these results when making your decisions?

If you answered "yes" above, please tell us how the previous results affected your decisions?

What do you think this experiment was about? (Optional)

- OK Button -

Please answer the following questions:

Age (in years):

Gender: M/F

Subject major:

Nationality:

Nationality(ies) of your parents/guardians:

Country of birth:

Native language:

Second languages:

- OK Button -

**Appendix Three: Regression with Binary Variable for Culture  
and Interaction Term**

<b>Coefficients from Ordered Probit Regression on Risk Preference Index<sup>14</sup></b>	
<b>Female</b>	0.112
<b>Age</b>	0.046
<b>Business Major</b>	-0.407
<b>Risk Attitude</b>	0.143**
<b>Peer Effects</b>	0.588
<b>Asian</b>	0.213
<b>Asian * Peer Effects</b>	-0.452
<b>Cut 1</b>	0.660
<b>Cut 2</b>	1.433
<b>Cut 3</b>	2.192
<b>Cut 4</b>	3.795
<b>Cut 5</b>	4.104

<sup>14</sup> Robust standard errors are given in parentheses. Significance at the 10%, 5%, and 1% level of confidence is indicated with \*, \*\*, and \*\*\*, respectively. In ordered probit models, the probability of the dependant variable taking on any particular value is given by the probability a latent variable lies between each cut point.

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