



Cross-national differences in cooperative decision-making in mixed-motive business contexts: the mediating effect of vertical and horizontal individualism

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Abstract

Based on the institutional vs the individual view of culture and the theory of individualism–collectivism in explaining the in-group–outgroup distinction that people make in different cultures, we predicted that Chinese people would make less cooperative decisions than Australians in mixed-motive business situations in which no formal or informal sanction systems were in place. We also predicted that Chinese would be less cooperative with foreigners than with fellow Chinese when they were in a foreign territory, whereas Australians would be equally cooperative with members of both groups. Data from two cross-national experiments provided general support for these predictions. Moreover, the results of Study 2 showed that the nation effects on cooperative decision-making were mediated by individual cultural orientation on vertical and horizontal individualism. The theoretical and practical implications of these findings are discussed in the context of cross-cultural business settings.

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Introduction

In recent years, researchers have come to discover systematic cross-national differences in many fundamental psychological effects, such as the construal of the self (Markus and Kitayama, 1991), the fundamental attribution error (Morris and Peng, 1994), intrinsic motivation (Iyengar and Lepper, 1999), confidence judgment (e.g., Yates *et al.*, 1996, 1997, 1998) and risk preference (Weber and Hsee, 1998; Weber *et al.*, 1998; Hsee and Weber, 1999; Rohrmann and Chen, 1999). However, little is known about whether people in different cultures differ in their decision-making in mixed-motive situations where individual interest is in conflict with the collective interest. Even less is known about decision-making involving members of different cultures (Leung, 1997). In the present study, we developed hypotheses contrasting the cooperative decision-making of Chinese and Australians when facing business partners from the same culture and from different cultures. We also proposed an underlying psychological mechanism explaining how culture might exert its influence on individual

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decision-making. We tested these hypotheses in two cross-national studies in which the participants were asked to make an investment decision in mixed-motive business contexts.

The purpose of this research was to determine how Chinese and Australian decision-makers differ in their tendency to cooperate with others, and to determine the cultural explanations for such differences. We chose business contexts that contained the primary features of the mixed-motive games for the present study. A mixed-motive game is a situation in which an individual faces a conflict between maximizing personal interests (defection) and maximizing collective interests (cooperation). It is generally more profitable to defect, but if all do so, all are worse off than if all choose to cooperate. One example of the mixed-motive game is the prisoner's dilemma game, in which one prisoner's unilateral confession of a crime will lead to the freedom of this person but a 10-year sentence for the other prisoner, whereas a bilateral confession will lead to a 5-year sentence for both but a bilateral non-confession leads only to a 1-year sentence for both. Another example of the mixed-motive game is the public goods dilemma, in which voluntary contribution is called from group members to establish or maintain a public good; once in existence, all have equal access to it, regardless of their contributions. In this case, if one contributes little but the majority of others contribute a lot, this person can then enjoy the benefit associated with the public good at minimal cost. On the other hand, if everyone thinks and acts this way, the public good will not be there and all will be worse off.

A mixed-motive game is particularly appropriate for studies of cross-cultural comparisons on cooperation because the individual *vs* collective dilemma embedded in these games puts the target person in tension. This tension makes cultural beliefs (e.g., individualism–collectivism) more salient in one's decision-making. Furthermore, the high level of interdependence involved in the mixed-motive games forces people to think about the consequences of their own choices for the group and other members. And the propensity to relate oneself with others is also culturally cultivated (e.g., Markus and Kitayama, 1991). Moreover, there is a great deal of uncertainty in these situations, because the participants do not know what choices others might make. This uncertainty makes the individual's characteristics play an important role in his or her decision-making. Finally, in public goods games, an equality distribution rule is used

once the public good is established; the extent to which an equality rule is accepted is also related to cultural beliefs and norms (e.g., Leung and Bond, 1984; Chen, 1995).

Cultural individualism–collectivism and cooperation among group members

One of the dimensions that differentiates the Chinese and Australian cultures is individualism–collectivism (Hofstede, 1991; Schwartz, 1994). Collectivism can be defined as a social pattern that consists of closely linked individuals who see themselves as parts of one or more collectives, and individualism can be defined as a social pattern that consists of loosely linked individuals who view themselves as independent of collectives. According to Triandis (1995), individualism and collectivism are cultural syndromes that consist of many defining attributes. One such defining attribute is the degree to which individualists and collectivists distinguish between in-group and out-group members in social interactions. In-groups are usually characterized by similarities among the members, and individuals have a sense of 'common fate' with members of the in-group. Clear out-groups are groups that disagree on valued attributes, or groups with which one is in conflict. However, the boundaries between in-group and out-group are not always clear, and there could be much elasticity involved in such categorizing (e.g., Buchan *et al.*, 2002). For example, two strangers from the same country who meet in a foreign city may suddenly see each other as in-group, whereas they might not talk to each other in their home country.

To predict how cooperative Chinese and Australians will be in mixed-motive games with business partners of their own cultural heritage (compatriots) or not (non-compatriots), two sets of literature are relevant: the literature on individualism–collectivism (cf. Triandis, 1995) and the literature on the institutional *vs* the individualistic view of culture (Yamagishi, 2003). These two theoretical accounts will help us predict whether the Chinese will be more or less cooperative than the Australians in general, and whether the Chinese's and Australians' cooperative decisions will be more or less influenced by the extent to which their business partners share the same cultural heritage.

Who will be more cooperative: Chinese or Australians?

Because few cross-cultural studies included Australians in their sample, we have to rely on general

conclusions made from cross-cultural research with regard to individualism–collectivism to infer the extent to which the Australians, who are more individualistic, will behave in mixed-motive games in comparison with the Chinese, who are more collectivist. Previous research on the social loafing phenomenon – individuals tending to exert less effort when working with others than when working alone (Latane *et al.*, 1979) – has shown that loafing occurs in individualistic groups, but not in collectivist groups (e.g., Gabrenya *et al.*, 1983; Earley, 1989). For example, Matsui *et al.* (1987), using Japanese students (collectivists according to Hofstede, 1991; Schwartz, 1994) as participants, found that individuals' performance in groups was superior to their performance alone.

The above findings seem to suggest that collectivists work better with others and are more cooperative than individualists. However, Yamagishi's findings from a series of cross-societal experiments using trust games, public goods dilemmas, and social dilemmas in the United States and Japan (Yamagishi, 1988a, b; Yamagishi and Yamagishi, 1994) suggest something of a different nature. For example, in his experiment on free riding and exit from the group (Yamagishi, 1988a), he compared the tendencies of American and Japanese participants to leave a group that contains free riders in a public goods dilemma. In contrast to a simplistic individualism–collectivism prediction that the Japanese were collectivist, so that they would have a stronger preference for staying in the group, he found that the Americans exhibited a much stronger tendency to remain in the group than the Japanese. In another cross-societal experiment comparing cooperative tendencies in social dilemmas in the United States and Japan (Yamagishi, 1988b), he again found that Japanese participants cooperated less than Americans, in contrast to what would have been predicted by the view that Japanese individuals value group interests over individual interests more than Americans do. Therefore Yamagishi proposed an 'institutional view of culture' (Yamagishi, 2003) to explain the seemingly contradictory findings.

The institutional view of culture posits that the Japanese often 'prefer' to belong to groups, and place group interests above their own individual interests, not because of an intrinsic tendency, but because there exists a system of formal and informal mutual monitoring and sanctioning in the group. Once such a system is absent, as in the case of Yamagishi's experiments in which groups

consisted of complete strangers, people's behavior is no longer confined or constrained by concerns of others, and they become more willing to reveal their egoistic sides and behave accordingly. In other words, the institutional view of culture assumes an external incentive for collectivists' cooperation with groups. The long-term conditioning of the externally driven cooperative behavior therefore becomes more vulnerable to, or less likely to endure in, situations where such external incentives are removed than in situations where such incentive is absent in the first place (Pillutla and Chen, 1999a; Chen and Yao, 2003). That is why the Japanese participants in Yamagishi's (1988a, b) studies were more likely to leave a group when there was free riding than their American counterparts, and why the Japanese contributed less to provide for the welfare of the other group members than did the Americans.

The institutional view of culture provides us with a new perspective with which to interpret the results of the cross-cultural social loafing studies described earlier. The reason why the Chinese managers in Earley (1989), the Taiwanese school children in Gabrenya *et al.* (1983), and the Japanese participants in Matsui *et al.* (1987) did not exhibit social loafing was not that the collectivists were more cooperative with others by nature. Instead, it was because these subjects were no strangers to one another: they had interactions with one another prior to the experiment, and might have viewed their experimental group as an in-group, and therefore informal mutual monitoring and sanctioning for loafing might be in place.

This explanation seemed to receive support from the findings of several cross-cultural experiments that distinguished between in-group and out-group contexts. For example, Earley (1993) examined the implications of group membership for individuals' performance in a group setting and found that the performance of Americans was higher when working alone than when working in an in-group or an out-group, whereas Chinese performance was higher in an in-group context than in an individual or out-group context. In a negotiation study conducted in Hong Kong and the United States, Chan (1991) found that negotiation between friends (in-group) was more cooperative and led to higher mutual outcomes in Hong Kong than in the US, but the opposite pattern was found between strangers (out-group).

According to Triandis' theory of individualism–collectivism, one important attribute is the extent

to which people make distinctions between in-group and out-group members. Whereas individualists make little distinction between the two, collectivists make a sharp distinction. It appears that Yamagishi's institutional view of culture provides a plausible explanation as to why it is so for collectivists; it explains the motivation behind collectivists' behaviors. These two theoretical accounts are therefore consistent in that one describes whom collectivists will be more or less cooperative with, and the other explains the underlying mechanisms for such tendencies.

Based on this discussion, we hypothesize that:

Hypothesis 1: When complete strangers are involved in a mixed-motive game, Chinese will be less cooperative than their Australian counterparts.

Who cares more about whether the business partner is of the same or different cultural heritage: Chinese or Australians?

Whereas the institutional view of culture provides a plausible explanation for the sharp distinction collectivists make in their in-group-vs-out-group behavior, the individualistic view of culture (Yamagishi, 2003) offers a reasonable explanation for the individualists' rather identical behavior in either in-group or out-group contexts. The individualistic view of culture states that individualists value individual interests over group interests, consistently so across group contexts. If individualists choose to cooperate in a mixed-motive game with people they know, they are likely to do the same with people they are not familiar with. In other words, individualists are more independent of social influence. There is much empirical support for the individualist's behavioral consistency implied in the individualistic view of culture. For example, cross-cultural research has established that individualists are less susceptible to the influence of social norms in determining their behavior than are collectivists (Bontempo and Rivero, 1992; Suh *et al.*, 1998; Suh, 2002). They rely more on their own beliefs, attitudes, or personal needs in deciding what to do (Davidson *et al.*, 1976; Miller, 1984). Cross-cultural experiments on cognitions have also shown that individualists experience more cognitive dissonance than collectivists when there are inconsistencies between attitudes and behavior (Markus and Kitayama, 1991; Triandis, 1994). Therefore we predicted that little distinction would be made

among individualists who interacted with either in-group or out-group members.

In the present study, we were interested in exploring cross-national differences in cooperative decision-making with members of the same or different cultures. Because in-groups are formed through long-term interaction and history, it is practically impossible to 'create' in-groups in experiments using hypothetical business situations. However, we could create situations that involved different degrees of 'in-groupness' through experimental manipulation. The creation of the same-culture vs different-culture member as business partner was our means to achieve that end. A stranger compatriot would be viewed as more 'in-group' in a foreign land than in one's home territory; and a stranger non-compatriot would be viewed as more 'out-group' in one's home territory than in a foreign territory.

To examine how elastic the notion of 'out-groupness-vs-in-groupness' was, and how it affected individual cooperation in mixed-motive games, we created 'compatriot' and 'non-compatriot' business partners. Whereas non-compatriots may be viewed as outsiders regardless of the geographical location, and a stranger compatriot at home may be viewed as an outsider, two complete stranger compatriots may see each other as belonging to an 'in-group' when they meet in a foreign territory. Meanwhile, stranger compatriots in a foreign land possess some informal sanctioning power for the Chinese for several reasons. First, the number of compatriots in a foreign country is usually few, and some *guanxi* bases (for a review, see Chen and Chen, 2004) might be discovered after some interactions. The recognition of a *guanxi* network may impose some sanctioning power between the compatriots. Second, because of the 'strangeness' of the foreign land, the original stranger compatriot may look much more like oneself than before. In other words, the physical similarity, the speaking of the same mother tongue, and other readily identifiable cultural traits would suddenly become salient in light of the foreign land. Finally, shared identity may emerge as a result, and psychological connection is likely developed. This connection could then serve as an informal sanctioning system. In their home country, however, they are much less likely to develop such identity and connection. Therefore it is more likely for the Chinese to cooperate with a compatriot in a foreign territory than in their home country. Based on this reasoning, we hypothesize that:

Hypothesis 2: Chinese will be more cooperative with stranger compatriots in a foreign territory than with stranger compatriots in their home country, or with non-compatriots regardless of the geographic location, whereas Australians will not differ across conditions.

How does culture exert influence on individual decision-making?

Culture affects individual decision-making through its influence on individual values. The strong institutional (formal or informal sanction system) influence on Chinese behavior is likely to direct Chinese's thinking and attention to others' existence and behaviors in determining what one ought to do in a given situation. On the other hand, the individualistic view held by Australians will direct their attention to self-needs, self-interests, personal values and attitudes rather than those of others. The horizontal and vertical aspect of individualism–collectivism seems to address this difference between Chinese and Australians.

According to Markus and Kitayama (1991), there are four kinds of self: independent or interdependent, and same or different. The combinations of these four types can be categorized as horizontal individualism (independent/same) and horizontal collectivism (interdependent/same), vertical individualism (independent/different) and vertical collectivism (interdependent/different). The horizontal dimension emphasizes the 'same self', maximizing self-interest or self-goal without much comparison with others. Horizontal individualists are less likely to be interested in distinguishing themselves from others, to pay attention to information about how others are doing, or to be eager to win. They behave more consistently across situations. In contrast, the vertical dimension emphasizes a 'different self' and winning over others. To establish 'different' and 'better' self, vertical individualists must pay more attention to others, be more sensitive to whom they are dealing with, and the context in which they take actions. As a result, they behave less consistently across contexts.

Therefore a parallel can be drawn between the horizontal and vertical individualism–collectivism values and the characteristics of the institutional and individualistic cultures. The institutional culture emphasizes the use of formal and informal sanctioning systems to guide people's behavior. In China, the use of such a system is especially

prevalent. For example, to motivate students to achieve, schools (from elementary school to university) widely adopt the ranking system: that is, students are ranked every time an exam or a test is conducted, and such ranking is always publicized. If the ranking itself represents the formal sanctioning, the publicizing of this information is related mainly to informal sanctioning. It is evident that such a system is more likely to enhance the social comparison process and 'nurture' people to become 'vertically' oriented. On the other hand, the individualistic culture emphasizes focus on oneself in terms of reaching goals or self-achievement. In school, teachers always encourage students to challenge themselves and to reach their own potential. All information regarding one's academic record is private. Obviously this culture is more likely to produce people who are 'horizontally' oriented. In other words, we hypothesize that:

Hypothesis 3: Chinese and Australians will differ on cultural values such that Chinese will score higher on the vertical dimension of individualism–collectivism whereas Australians will score higher on the horizontal dimension of individualism–collectivism.

The notion of horizontal–vertical individualism–collectivism has received some empirical support in decision-making research. One notable study was by Probst *et al.* (1999), in which they examined how individual cultural values in terms of horizontal–vertical individualism–collectivism predicted cooperative behavior in social dilemmas. Using both single-group and inter-group prisoner's dilemma paradigms, the authors found support for the prediction of the *vertical individualists*, whose cooperation varied in the two types of dilemma as a function of the extent to which their *personal* outcomes would be maximized, and the prediction of the *vertical collectivists*, whose cooperation varied in the two dilemmas as a function of the extent to which their *group* outcomes would be maximized. These findings suggest that individual cultural orientation is a powerful predictor of cooperative behavior in mixed-motive games.

One problem with the study of Probst *et al.* (1999) was that it was not cross-cultural (their sample comprised students at the University of Illinois): therefore it could not address how individual cultural values would explain the culture-level effects on individual behavior. Cross-cultural studies in other areas have demonstrated that

individual cultural orientation often mediates the relationship between culture and individual behavior (e.g., Chen *et al.*, 1998; Lam *et al.*, 2002). For example, Chen *et al.* (1998) found a stronger in-group favoritism among the in-group Chinese than among the in-group Americans. Their further analysis revealed that the individual-level independent or interdependent self-construal was a mediator between culture and in-group favoritism. Similar mediating effects were found in Lam *et al.*'s (2002) study in which they examined the relationship between participative decision-making and employee job performance in a multinational commercial bank. They found that, for the American employees, participative decision-making had a positive effect on individual job performance only when they had high level of self-efficacy, whereas for the Hong Kong Chinese employees participative decision-making had positive effects on group performance only when members had high levels of collective efficacy. Furthermore, this cultural effect was fully mediated by employees' cultural value orientations.

Based on the above discussion, we hypothesize that:

Hypothesis 4: The country-level effects on Chinese and Australian cooperative decision-making in mixed-motive contexts will be mediated by individual cultural value orientation.

Overview of the current study

Two cross-national studies were conducted to test our hypotheses. Study 1, using country as proxy for culture and a two-person prisoner's dilemma game as the decision-making context, put participants in a foreign territory with either compatriots or non-compatriots, and tested Hypotheses 1 and 2. Building on the results of Study 1, Study 2 measured each participant's cultural orientation and further tested hypotheses related to how individual cultural values influenced cooperative decision-making in a step-level public goods dilemma game.

Study 1

Method

Participants

Based on the findings of Hofstede's (1980, 1991) large-scale survey of beliefs and values in more than

40 countries, the Western countries (e.g., US, Australia, Canada) are higher on individualism than countries with populations of Chinese background (e.g., Hong Kong, Taiwan, Singapore). In particular, on a 100-point scale, Australians scored 90 (US scored 91) on individualism, whereas Chinese had an average score of 21. In this study, we used country as a proxy for culture.

Participants were 98 Chinese students from Zhejiang University in the People's Republic of China and 86 Australians students from the University of New South Wales in Australia. Both universities were among the top five in their home countries. Most students were majoring in psychology and volunteered to participate in the experiment. The mean age of the students for both samples was 18–19 years, and about two-thirds of the students were female.

Materials and procedure

In this study, the stimuli were presented in booklets. We used the English version for both samples for three reasons. First, the stimulus material was relatively simple and easy to understand, and the crucial information (i.e., the payoff matrix) was presented in numbers, which did not involve language issues. Second, the college students in China have all been studying English for more than 10 years and have passed the national entrance exam in English before getting into college. Third, using the same version for both samples eliminates potential problems with translation. Given that both groups understand the material equally well, the differences observed in their responses would be more likely to be attributed to cultural rather than other types of difference.

The prisoner's dilemma scenario and matrix used by Bolle and Ockenfels (1990) was adopted in almost its original form. The only difference was that the participants were asked to make two decisions (instead of one) using the same payoff matrix as offered by the original problem. One decision had to be made in a hypothetical situation in which the other player was a compatriot, whereas the other decision was made in the same hypothetical situation but with the other player a non-compatriot. The location of the investment was in a foreign country: that is, for the Chinese, they were making this investment decision in Australia, whereas for the Australians, they were making this decision in China.

The problem presented to participants concerned a choice between ordering a large size or a small size

of bottle-filling machine. Essentially, the participants were told that if both producers ordered the large bottle, both would receive a payoff of 10, whereas if both ordered the small bottle, both would receive a payoff of 50 (the larger number indicates a bigger payoff). On the other hand, if one ordered a small bottle, but the other a large one, then the one who ordered the small bottle would receive nothing whereas the one who ordered the large bottle would receive a payoff of 75. They were then asked to indicate on a nine-point scale the extent to which they would like to order a large bottle-filling machine (1, definitely small bottle; 5, indifferent; 9, definitely large bottle). The reason we used a nine-point scale instead of a dichotomous choice was that we were mostly interested in their tendencies to cooperate, in addition to the benefit of making our dependent variable a continuous one.

Experimental design

The experimental design was 2 (Country: Australia vs China) × 2 (the Other Player’s Cultural Heritage: same or different, nested within participants) between-subjects repeated factorial. The order of the question presentation was counterbalanced for both Chinese and Australian participants. About half the Chinese (Australian) participants received the compatriot/non-compatriot order while the other half of the Chinese (Australians) received the non-compatriot/compatriot order.

Results and discussion

Table 1 presents the results of Study 1. The numbers on the nine-point scale participants circled in the two situations were used as indices of their cooperativeness in decision-making (the larger the number, the less cooperative). A two-way ANOVA with repeated measures on Other Player’s Cultural Heritage was conducted to test Hypotheses 1 and 2. The analysis revealed a significant main effect of

Country ($F_{1,182}=9.96, P<0.01$), and a significant interaction effect of Country × Other Player’s Heritage ($F_{1,182}=4.29, P<0.05$). Other effects were not significant at the 0.05 level.

A closer look at Table 1 indicates that these results provided support for both Hypotheses 1 and 2 in that:

- (1) the Chinese choice was less cooperative (mean=7.07) than the Australians’ (mean=5.99), and
- (2) in the foreign territory, the Chinese made a more cooperative choice when the other player was a compatriot (mean=6.63) than when the other player was a non-compatriot (mean=7.51), whereas the Australians were equally cooperative when the other player was a compatriot (mean=6.05) or a non-compatriot (mean=5.93).

The results of Study 1 provide initial support for our hypotheses, and suggest that there are considerable differences between Chinese and Australians in terms of their cooperative tendencies in making investment decisions with compatriots and non-compatriots in foreign territories. There are two potential problems with this study, however. First, the comparison of same- vs different-culture business partner was made within subjects; social desirability might lead to the obtained patterns of responses. The participants were clearly aware of the key differences in the two scenarios. In the Australian culture, which emphasizes self-consistency, it might be socially desirable to make similar decisions regardless of the ethnic background of the business partner, whereas in the Chinese culture, which emphasizes differential treatment of people of different relationships, the socially desirable answer might just be the opposite. To overcome this problem, in Study 2 we used a between-subjects design to examine whether the same pattern of results would be replicated.

The second problem with Study 1 was related to the inference of ‘culture’. Although we referred the observed differences as ‘cultural’, Study 1 did not provide any empirical evidence to support such an assertion because country was used as proxy for culture. To uncover the process of how culture (a nation-level variable) influences individual behavior (an individual-level variable), in Study 2 we measured each participant’s cultural value orientation and examined whether it mediated the cultural effects on individual decision-making.

Table 1 Mean competitiveness of Australians ($n=86$) and Chinese ($n=98$) (Study 1)

Independent variable	Competitiveness		
	Australians	Chinese	Mean
Business partner			
Compatriot	6.05	6.63	6.34
Non-compatriot	5.93	7.51	6.72
Mean	5.99	7.07	



Study 2

Method

Participants

One hundred and fifty-one Chinese (42 male and 109 female) and 122 Australians (31 male and 91 female) volunteered to participate in the experiment. The Chinese were students from a major university in Hong Kong, China, who enrolled in an introductory organizational behavior course. The Australians were students from the University of New South Wales in Australia, who enrolled in a social psychology course. The majority of the students from both countries were in their second year of study and were majoring in engineering, social sciences, or business. The mean age of the Chinese was 20.23 (s.d.=1.44) and the mean age of the Australians was 20.93 (s.d.=5.66). All students received course credit for their voluntary participation.

Design

The experimental design was 2 (Country: China or Australia) \times 2 (Territory: home or foreign) \times 2 (Partner: Compatriots or non-compatriots) factorial, resulting in four experimental conditions in each culture. Because we later learned that the bottle problem used in Study 1 might suggest collusion – something that is viewed differently across countries (Trompenaars and Hampden-Turner, 1998) – we created a scenario in which a typical five-person step-level public goods dilemma was embedded.

Specifically, participants were told that they had \$10,000 that could be used to build a wind power station, which was made up of a number of individual wind-driven generators. Another four people were also interested in this project and had \$10,000 to invest. The money each person had was just enough to buy one electric generator, and everyone knew that at least three generators were needed for the power network to work well. If less than three generators were built – that is, less than \$30,000 was invested – the power supply would be unstable and useless, and the money (invested) would be wasted. If more than \$30,000 was invested, however, there would be a workable wind power station and everyone would receive \$20,000 worth of benefits from the business done in the remote area S, in addition to the money they kept for themselves. Four versions were developed to match the four experimental conditions for each country.

Procedure

Upon arrival at the laboratory, participants were given the questionnaire booklet to complete. English versions of the scenario were used in both countries for reasons discussed earlier. Participants were asked to read the scenario carefully before making decisions, and were allowed to ask any questions they had. Participants were randomly assigned to one of the four experimental conditions. All participants were asked to make a choice regarding the step-level public goods dilemma by indicating the extent to which they would like to invest the \$10,000 on a nine-point scale (1, definitely invest; 5, indifferent; 9, definitely not invest), and then were asked to complete a 32-item horizontal-vertical individualism-collectivism questionnaire (Singelis *et al.*, 1995). After finishing all these questions, they were debriefed and dismissed individually.

Measures

Vertical and horizontal individualism-collectivism. We used the 32-item scale of Singelis *et al.* (1995) to measure Horizontal Individualism (HI), Vertical Individualism (VI), Horizontal Collectivism (HC), and Vertical Collectivism (VC). Each type of I-C was measured with eight statements to which the participants responded on a nine-point Likert scale to express their degree of agreement (1, strongly disagree; 9, strongly agree). To establish the construct validity of the measure in both cultures, we first conducted a principal component factor analysis on the combined data set from the two samples, which resulted in a four-factor solution that explained 46.38% of the variance. The analysis also indicated that some items loaded more highly on an inappropriate factor. A decision was made to drop three items from each of the original HI and VI subscales, and drop five items from each of the original HC and VC subscales to improve discriminant validity. This resulted in a five-item HI scale, a five-item VI scale, a three-item HC scale and a three-item VC scale with alphas of 0.86 (on HI), 0.77 (on VI), 0.70 (on HC), and 0.77 (on VC) for the Australian sample and alphas of 0.83 (on HI), 0.72 (on VI), 0.66 (on HC), and 0.70 (on VC) for the Hong Kong Chinese sample. A simultaneous confirmatory factor analysis (van de Vijver and Leung, 1997) for the two samples revealed that the four-factor model showed a good fit ($\chi^2=306.1$, d.f.=196, CFI=0.90, TLI=0.88, RMSEA=0.046). Moreover, when equal loadings were imposed on the four-factor model, there was an adequate fit

($\chi^2=325.34$, d.f.=208, CFI=0.90, TLI=0.88, RMSEA=0.046), and the increase of χ^2 was not significant at the 0.05 level ($\Delta\chi^2_{df=12}=19.04$, $P>0.05$). These results suggest that there is a reasonable construct equivalence of the HI, VI, HC, and VC measures across the two samples.

Cooperativeness. The likelihood (number on the nine-point scale) that the participants would invest in the wind power station was used as an index of cooperative tendency: the larger the number, the less likelihood of cooperation.

Results and discussion

Cultural orientation of the Australians and the Chinese

We first report the results of the cultural orientation profiles of the two samples. Consistent with Hypothesis 3, Chinese scored higher on the vertical dimensions of individualism–collectivism than did Australians ($t_{287}=5.39$, $P<0.001$), and Australians scored higher on the horizontal dimensions than did Chinese ($t_{287}=6.59$, $P<0.001$). We then separated the four types of values and found that the Australians scored higher on HI (mean=7.54) than the Chinese (mean=6.33) ($t_{287}=8.40$, $P<0.001$), whereas the Chinese scored higher on VI (mean=5.82) than the Australians (mean=4.68) ($t_{287}=7.50$, $P<0.001$). However, the two samples did not score significantly differently on HC (mean=7.07 vs 6.89 for Australians and Chinese, respectively) or on VC (mean=6.55 vs 6.61 for Australians and Chinese respectively).

These results suggest that the cultural orientations of Australians and Chinese are more complicated than as suggested by previous findings from Hofstede (1980, 1991). In this study, Australians were found more horizontally individualistic than Chinese, whereas Chinese were actually more vertically individualistic than Australians, indicating that Australians tend to maximize the individual outcome without really considering whether they gain more than the others, whereas Chinese are more inclined to win over others. In other words, whereas Australians are more likely to have a ‘self-interest’ mindset, Chinese are more likely to have a ‘competition’ mindset. Initially these results seemed inconsistent with prior measures of value orientation in these cultures (Hofstede, 1980, 1991; Hui, 1988), but further analysis suggested that they demonstrated face validity and consistency with some previous findings that Australians are hor-

izontal individualists (Triandis, 1995; Triandis *et al.*, 2001).

On the other hand, the finding that Australians and Chinese were equally collective came as a complete surprise. We shall discuss possible explanations for this finding in a later section.

Cooperative tendency of Australians and Chinese

Participants were asked to indicate their choice by circling a number on a nine-point scale as to what extent they would *not* like to invest their \$10,000 to build the wind-power station. This number was used as the index of their cooperative tendency (the larger the number, the less cooperative). The mean cooperativeness of the two samples is presented in Table 2. A $2 \times 2 \times 2$ three-way ANOVA revealed a significant main effect of Country ($F_{1,281}=16.74$, $P<0.001$), and a significant interaction of Partner \times Territory ($F_{1,281}=4.94$, $P<0.05$). None of the other effects was significant at the 0.05 level.

A closer examination of Table 2 indicates that in general the choices made by Chinese were less cooperative (mean=5.70) than those of their Australian counterparts (mean=4.46), replicating what we found in Study 1 and providing further support for Hypothesis 1. To further test Hypothesis 2, that Chinese will be more cooperative with their compatriots in a foreign territory than with compatriots in their home territory or with non-compatriots regardless of territories, whereas Australians will not differ across conditions, we grouped participants’ decisions in the three conditions (compatriot in home territory and non-compatriot in both home and foreign territories) together and compared this with their decision in the compatriot – foreign territory condition for the two samples separately. *T*-tests showed a significant difference (5.92 vs 5.03, $t_{147}=2.05$, $P<0.05$) for the Chinese sample, whereas for the Australian sample the difference was not significant at the 0.05 level

Table 2 Mean competitiveness of Australians ($n=122$) and Chinese ($n=151$) (Study 2)

Independent variables		Competitiveness		
Territory	Business partner	Australians	Chinese	Mean
Home	Non-compatriot	3.85	5.90	4.87
Home	Compatriot	4.68	5.78	5.22
Foreign	Non-compatriot	5.11	6.08	5.60
Foreign	Compatriot	4.18	5.03	4.60
Mean		4.46	5.70	

(4.55 vs 4.18, $t_{120}=1.13$, NS). These results provide support for Hypothesis 2.

On the other hand, the significant interaction effect of Partner \times Territory and the insignificant effect of the three-way interaction (i.e., Country \times Partner \times Territory) indicated that while Chinese were more cooperative with compatriots in foreign than in home territories (mean=5.03 vs 5.78), they treated non-compatriots equally competitively in both home and foreign locations (mean=5.90 vs 6.08). The opposite pattern was found for Australians. Specifically, they were more cooperative with non-compatriots at home than in a foreign territory (mean=3.85 vs 5.11), but treated compatriots equally cooperatively in both home and foreign locations (mean=4.68 vs 4.18).

Meanwhile, it is worth noting that both cultural groups were most competitive in the condition with non-compatriots in a foreign location. This behavior may be driven by the stronger need to protect oneself and to survive in a foreign land, or a reaction to the so-called ‘culture shock’, which might be universal for members of both cultural groups.

These results, however, were not completely consistent with the general assumption behind H2 that Australians would be equally cooperative with all others, regardless of their cultural heritage or business locations. Later, possible explanations will be discussed.

To examine the mediating effect of individual cultural value orientation in explaining the mechanism of how culture influences individual decision-making, we did the three-step regression analyses suggested by Baron and Kenny (1986). Results of this analysis are presented in Table 3. In step 1, we regressed the three independent variables (Country, Territory, and Partner) on the individual decision. In step 2, two regression analyses were performed: one with Country as IV, and the four cultural values as DVs; the other with four cultural values as IVs, and the mean cooperativeness as DV. In step 3, we entered all three independent variables and the four cultural values simultaneously as predictors of the individual decision. In addition, the two demographic variables (age and sex) were always entered first as control variables in all the regression analyses. These analyses revealed the following results:

(1) Country had a significant effect on mean cooperativeness ($\beta=0.22$, $P<0.001$).

Table 3 Results of regression analysis on mediating role of cultural value on country effects on individual cooperative decision-making

Independent variables	Dependent variables				
	Mean cooperativeness	Cultural values			
		HI β	VI β	HC β	VC β
<i>Control variables</i>					
Age	-0.11				
Sex	0.06				
<i>Step 1</i>					
Country	0.22**				
Territory	0.00				
Partner	0.07				
<i>Step 2</i>					
1. Country		-0.45*	0.40*	-0.10	0.03
2. HI	-0.20**				
VI	0.22**				
HC	-0.01				
VC	-0.05				
<i>Step 3</i>					
Country	0.09				
Territory	-0.00				
Partner	0.08				
HI	-0.16*				
VI	0.15*				
R ²	0.103*				
Overall F (9, 277)	3.55*				

N=287; ** $P<0.01$; * $P<0.05$.

- (2) Country was a significant predictor of HI and VI ($\beta=-0.45$ and 0.40 respectively, $P<0.05$), but not a significant predictor of HC or VC ($\beta=-0.10$ and 0.03 respectively, NS). Furthermore, both HI and VI were predictors of the mean cooperativeness ($\beta=-0.20$ and 0.22 respectively, $P<0.01$), whereas neither HC nor VC was significant in predicting the mean cooperativeness ($\beta=-0.01$ and -0.05 respectively, NS). HC and VC were thus dropped from further analysis.
- (3) We found that the effect of Country became insignificant ($\beta=0.09$, NS) once HI and VI were entered simultaneously, whereas the effects of HI and VI remained significant ($\beta=-0.16$ and 0.15 respectively, $P<0.05$).

These results suggest that horizontal and vertical individualism fully mediated the relationship

between Country and individual cooperativeness, providing support for Hypothesis 4.

A closer examination of the β weights of HI ($\beta=-0.16$, $P<0.05$) and VI ($\beta=0.15$, $P<0.05$) indicated that VI had a negative effect on individual cooperative decision-making whereas HI had a positive effect. A median-split ANOVA showed that people who scored high on VI tended to make less cooperative decisions (mean=5.42) than those who scored low (mean=4.77) ($F_{1,271}=4.46$, $P<0.05$), whereas people who scored high on HI made more cooperative decisions (mean=4.74) than those who scored low on this dimension (mean=5.45) ($F_{1,271}=5.26$, $P<0.05$). These results provide empirical support for the distinction between horizontal and vertical dimensions of individualism–collectivism, and suggest the direct influence of cultural values on individual decision-making.

General discussion and conclusions

The results of the present study are intriguing. First, consistent with the institutional view of culture, we found that Chinese made less cooperative decisions in mixed-motive business situations than did Australians. These results suggest that, when moved out of the ‘group’ boundary or context where no formal or informal sanction is present, Chinese tend to focus more on egoistic interest and act accordingly. Second, somewhat unexpected, we found that Chinese actually scored higher on vertical individualism than Australians, who scored higher on horizontal individualism than Chinese. Third, the Chinese seemed to treat stranger compatriots more cooperatively in a foreign territory than they treated non-compatriots or stranger compatriots at home. Finally, we found that these observed national differences in decision-making were fully mediated by individual cultural values: more vertical individualism was associated with less cooperative decisions whereas more horizontal individualism was associated with more cooperative decisions.

The finding that the Chinese are less cooperative is somewhat contradictory to the broad view of Chinese that they are generally more collective and cooperative than people in individualistic cultures. It nevertheless echoes some other recent counter-intuitive cross-cultural research findings on decision-making. For example, in exploring whether there are systematic cross-national differences in choice-inferred risk preferences between Americans and Chinese, Hsee and Weber (1999) found that

although both Americans and Chinese *predicted* that the Americans would be more risk-seeking, the Chinese were *actually* significantly more risk-seeking in the context of financial decisions than were the Americans. Similarly, contradictory to the lay expectation that Chinese would be more humble than the Americans, Yates *et al.* (1996, 1997, 1998) found that the Chinese were more overconfident about their answers to general knowledge questions and other judgments. On the other hand, we suggest caution in generalizing the ‘Chinese are less cooperative’ finding to situations of different characteristics. Several conditions seem to be necessary for this phenomenon to occur:

- (1) cooperation must be voluntary – there is no formal or informal sanction for non-cooperation;
- (2) the business partners should be strangers to each other – there are no prior ties/relationships among them; and
- (3) the business situation involves a great deal of social uncertainty – no communication is permitted, and the information about what other business partners might do is extremely limited.

The discrepancy between our finding and others’ regarding cultural values of the Chinese and Australians is intriguing. Three explanations seem to be plausible. The first is related to the notion of cultural ‘transmission’ (Triandis, 1994). Modern communication results in cultural diffusion via films and television. Tourism, commerce, and other factors also facilitate cultural transmission. Assuming that previous findings are valid, the emphasis on teamwork in the West in the past two decades or so might have had a gradual influence on Australian culture. Following the same logic, the Chinese culture may have become more individualistic and less collective than it was after two decades of the ‘open and reform’ policy and its increasing economic development, because cultures evolve and change, especially under the influence of economic conditions.

The second explanation comes from the idea of value trumping (Osland and Bird, 2000). Osland and Bird’s sense-making model of culture states that, in a specific context, certain cultural values take precedence over others. This idea of value trumping seems to be consistent with Cialdini *et al.*’s (1990) idea of norm salience, and also with Pillutla and Chen’s (1999b) finding of the



interaction effect of norm and context on individual cooperative decision-making. We explicate that, as many values and norms exist simultaneously in an individual's mind, the context in which he or she is involved is likely to activate a specific set of values and norms. In our experiment, the mixed-motive business context might be more likely to activate the individual's awareness of competition and make the competitive value salient, and the effect was more pronounced for Chinese than for Australians.

The third explanation is that different measures of individualism–collectivism were used in previous research from the ones used in the present study. Most previous measurements excluded the vertical dimension. For example, in Hui's (1988) INDCOL scale, only one item reflects the meaning of 'vertical individualism'. Triandis *et al.*'s (2001) recent study also shows that participants' endorsement of the horizontal items on Singelis *et al.*'s (1995) scale corresponded to Hofstede's ranking of culture on individualism–collectivism, suggesting that most of the items used in Hofstede's studies that measured individualism–collectivism in fact measured only the horizontal dimension of the construct.

Whereas both the institutional *vs* individualistic view of culture (Yamagishi, 2003) and the individualism–collectivism theory (Triandis, 1995) made similar predictions regarding Chinese and Australians' cooperative tendencies in mixed-motive business contexts with in-group *vs* out-group members, the institutional view of culture provided a deeper understanding of why the Chinese would be less cooperative in situations where no formal or informal sanction systems were present. A deeper assumption behind this view rests on the general trust level of the two groups of people. As Yamagishi discussed in his 2003 article, it was the lack of general trust that led the Japanese to want to establish sanction systems before making their contribution to public goods. Following the same line of reasoning, we contend that it is the lack of general trust of the Chinese that led them to be less likely to cooperate with 'strangers' in our experiment. The lack of general trust in Chinese society has been discussed by some insightful social observers such as de Tocqueville (1945) and Fukuyama (1995), who have characterized American society as having a high level of general trust, and have argued that the strong family ties in societies such as China, France, and southern Italy prevent trust from developing beyond the confines

of the family. Future studies may examine this trust hypothesis in explaining the in-group–out-group phenomenon in different societies.

Limitations

The present study has several limitations. First, it was conducted in a laboratory in which many factors were manipulated and the situation was overly simplified. Second, our participants were university students, who might be more competitive and individualistic than the general population. This is especially so in China, where only a small percentage of the population gets admitted into college. Third, hypothetical business scenarios were used; participants might not be as engaged as in real business situations. Finally, we did not check whether our experimental manipulations achieved the intended effects on participants' perception. These features of the present study arouse some concerns regarding the external validity of the findings.

On the other hand, there are certain features of the experimental task and our research participants that reflect the global business reality. Our participants were students with part-time work experience, and the experimental task reflected certain key features of an international business situation. Furthermore, it is also clear that we could not ever simulate the psychological processes involved in real international business situations in a laboratory setting. Although the consequences of decisions for our research participants were not as dramatic as they would be in real business, the experimental task was psychologically engaging.

There is always a tradeoff between an experiment and a natural setting field study, but we believe that the experimental manipulation and design allowed us to rigorously test our hypotheses and to draw causal linkages between the variables of interest, which often cannot be achieved by adopting other research methods (e.g., field survey). However, 'a strong case can be made that external validity is enhanced more by many heterogeneous small experiments than by one large experiment employing random selection of subjects, tasks, and times' (Cook and Campbell, 1979: 80). Thus we hope that the generalizability of the findings reported in this study will become evident as other researchers replicate this study with other small experiments using different samples and tasks, and conducted at different times.



Implications

The current research shows that cooperative decision-making in mixed-motive situations is among the variables that seem to have consistent cross-national variations. In addition, these variations seem to be consistent with both the institutional vs individualistic view of culture and the theory of individualism–collectivism. We hope that this work will inspire further research:

- (1) to examine whether the institutional vs individualistic view of culture is indeed the underlying mechanism that explains the in-group vs out-group phenomenon of the collectivist culture;
- (2) to clarify which of these two theoretical accounts provides a better explanation of individual differences in intra- vs inter-cultural business situations; and
- (3) to determine the antecedents and consequences of cross-national differences in cooperative decision-making.

At the same time, we hope that our findings will help decision-makers in practical applications. For example, after knowing that Australians tend to be cooperative with non-compatriots in their home land, a foreign person who does business in Australia should probably adjust his/her natural competitive tendency and be more willing to cooperate so that a long-term cooperative and trusting relationship can be built. Moreover, as formal or informal sanctioning is one of the major forces for Chinese to cooperate, it may be useful for

foreigners to establish relationships with the Chinese before doing business (as a way to build the informal system), especially when formal systems are not viable.

The mediating effect of horizontal and vertical individualism found in the present study also indicates the importance of understanding people at the individual level. Individuals from the same country may have different cultural values, as demonstrated by studies that investigated within-culture variances (e.g., Triandis, 1995; Vandello and Cohen, 1999). It is the individual-level values that directly influence one's cooperative tendency, not where the individual comes from. Identifying individual values will help collective members to achieve optimal solutions, because one can then more effectively incorporate structural and motivational mechanisms (for detailed discussion see Yamagishi, 1986) to induce cooperation. Our findings suggest that, in order to get maximum benefit from business and cultural exchanges between nations and individuals, people need to be aware of both cultural and individual differences, and that predictions based on stereotypes can be seriously misleading.

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