

**VALUES OF THE PAST AND THE FUTURE:  
CULTURAL DIFFERENCES IN TEMPORAL VALUE  
ASYMMETRY**

by

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## **Abstract**

Past research has indicated that Chinese culture is more past oriented; whereas North American culture is more future oriented. Such cultural differences in temporal orientation may affect how people value future and past events. I predicted that the typical temporal asymmetry effect among European North Americans - placing more value on future events than on past ones - would be reversed among Chinese due to the cultural differences in temporal orientation.

I conducted four studies to examine how culture affects the values people attached to past and future events. Overall, the results supported my predictions. Across all four studies, I found that European Canadians attached more monetary value to an event in the future than to an identical event in the past with similar temporal distance; whereas Chinese people placed more monetary value on a past event than on an identical future event. In Study 3, I also investigated the underlying mechanisms that would account for such cultural differences. Among the three mediators believed to be affected by the past and future orientations, I found two that mediated the cultural influences on the temporal value asymmetry effect: (1) emotions associated with future and past events, and (2) mental simulations of future and past events. Specifically, European Canadians predicted stronger emotions for future events than what they recalled for past events, whereas Chinese showed an opposite trend. Emotions associated with future or past events, in turn, predicted the monetary values attached to the events. In addition, relative to Chinese Canadians, who showed clearer mental simulations for past than for future events, European Canadians had clearer mental simulations for future than for past events.

Mental simulations, in turn, showed a positive association with the monetary value assigned to the events.

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# Chapter 1

## Introduction

Temporal orientation, sometimes referred to as time orientation or time perspective, is the extent to which people focus their attention on the past, the present, and the future, and the tendency to have emotional and behavioral reactions to these temporal regions (Jones, Banicky, Pomare, & Lasane, 1996; Strathman & Joireman, 2005). People have different temporal orientations. For example, some people tend to think a lot about the past, and have strong emotional and behavioral responses to the past, whereas others may concentrate more on the present or the future.

According to Kluckhohn and Strodtbeck (1961), one's temporal orientation is largely a product of the culture to which one belongs. Although the past orientation, the present orientation, and the future orientation exist in almost all cultures, cultures differ in their preferential ordering of these orientations (Brislin & Kim, 2003). Some cultures value the past more than the future, whereas other cultures value the future more than the past. Past and future orientations are most relevant to the present research.

### *European North American Culture*

North Americans are believed to have a strong future orientation and a weak past orientation (Graham, 1981; Kluckhohn & Strodtbeck, 1961; Spears, Lin, & Mowen, 2001). For example, as Kluckhohn and Strodtbeck (p. 15) pointed out, Americans expect the future to be "bigger and better" than the past. North American's strong future orientation and weak past orientation may root in their linear notion of time, which states that the past leads to the present and then to the future. Because the future is approaching

and the past is inevitably receding, the future is viewed as much more important (Graham, 1981; Spears et al, 2001.).

Empirical research supports the notion that North Americans are more future oriented than past oriented. For example, to investigate the relationship between temporal orientation and procrastination, Specter and Ferrari (2000) measured participants' past, present, and future orientations by employing a temporal orientation scale, which was developed by Jones, Banicky, Lasane, and Promare (1996). They found that the ratings on the future orientation scale were much higher than the ratings on the past orientation scale.

Other findings indirectly suggest that North Americans are more future oriented than past oriented. For instance, Caruso and Gilbert (2006) asked American people to indicate the subjective temporal distance of future and past times with equal temporal distance, such as one week later and one week ago. They found that Americans perceived the future times as being closer to the present than the past times, suggesting that North Americans were more future oriented than past oriented. Van Boven and Ashworth (2007) studied North American's online affective responses when contemplating future and past events (i.e., how they felt when anticipating future events versus recalling identical past events with similar temporal distance). They found that the online emotion responses evoked by anticipating future events were more extreme than those evoked by the retrospection of identical past events, indicating that they focused more on the future events than on the past ones. In addition, they also investigated the predicted and recalled emotions associated with the future and past events. For example, they investigated how



happy people predicted they would be on a holiday when the holiday was in the future and how happy they remembered they had been on the same holiday when it was in the past. They found that the predicted emotions associated with the future events were more extreme than the recalled emotions associated with the identical past events, suggesting that the future events were perceived as more important than the past ones. Caruso, Gilbert, and Wilson (in press) obtained similar findings with a different scenario: those who anticipated the future winter break expected it to be more enjoyable than those who recalled about the same winter break after it had happened. Furthermore, Van Boven and Ashworth compared how North American people mentally simulated future and past events. In one study, they exposed participants to annoying noises and asked participants to mentally simulate listening to the noises either 20 minutes before or 20 minutes after actually listening to the noises. Participants then indicated to what extent they mentally simulated listening to the noises, such as to what extent they could hear the noises in their head at that moment. Participants reported that they engaged in more extensive mental simulations during the anticipation of the future noises than during the retrospection of the past noises, indicating that North Americans tend to focus their attention more on the future events than on the past ones. All of these findings indicate that North Americans are much more future oriented than past oriented.

### *Chinese Culture*

Chinese people are believed to be primarily past oriented (Brislin & Kim, 2003; Doob, 1971; Kluckhohn & Strodtbeck, 1961; Ko & Gentry, 1991; Pita, Fung, & Isberg, 1999; Spears et al., 2001; Yau, 1988), even though they also show the tendency to be

future oriented (Brislin & Kim, 2003). For example, Kluckhohn and Strodtbeck (p. 14) wrote:

Historical China was a society which gave first-order preference to the past time orientation. Ancestor worship and a strong family tradition were both expressions of this preference.

Cross-cultural psychological research provides empirical evidence showing that Chinese people have a stronger past orientation than North Americans do. For instance, consumer behavior research has shown that Chinese consumers tend to have a stronger brand loyalty than Americans do (Robinson, 1996). If a product or brand was satisfactory in the past, Chinese are not likely to switch to other products or brands. Researchers believe that the strong brand loyalty of Chinese people is due to their strong past orientation (Brislin & Kim, 2003; Yau, 1988).

Recently, Ji, Guo, Zhang, and Messervey (2007) found that Chinese people attended to a greater range of temporal information into the past than Canadians did. In their studies, European Canadian and Chinese participants read a description of a theft case with a list of clues that occurred in the remote past, recent past, or present. They found that compared with European Canadians, Chinese participants rated behaviors that took place in the remote and recent past as being more relevant to the case, whereas the cultures did not differ for the behaviors happening at present. In addition, in a subsequent free recall task, Chinese participants had a better memory of the past clues than European Canadians did. Furthermore, they found that Chinese perceived past events to be closer to the present than did European Canadians. For example, in one study, Canadian and Chinese university students reported how far away they felt a past exam was. Although

the actual temporal distance of the exams was greater for Chinese than for Canadians, Chinese perceived the past exams as being closer to the present than did Canadians. These results suggest that Chinese people have a stronger past orientation than Canadians do.

A study by Levinson and Peng (2007) also supports the notion that Chinese people are more past oriented than Americans are. In their study, participants from China and United States estimated the current value of some past objects when the past value was given, such as an antique chair valued at \$350 in 1985. They found that Chinese participants' value estimation ratio (the ratio of estimated current value to the given value in the past) was much greater than that of Americans. The effect existed even after controlling for the inflation rates across cultures. This finding indicates that Chinese people perceive the objects in the past as being much more valuable now than their American counterparts do.

As to the reason why Chinese have a strong past orientation, some researchers believe that the long history of China plays a critical role (Brislin & Kim, 2003; Burkhardt, 1953; Yau, 1988). Because the practices from the past have worked for countless generations, following the traditional practice and valuing the past is wise. One has little need to try new methods. I believe that the Chinese people's cyclical notion of time may be another reason. The cyclical notion of time states that the same events are repeated according to some cyclical patterns. The future will be similar to the past (Biao, 2001). As Kluckhohn and Strodtbeck (1961, p. 14) noted, Chinese people believe "...that nothing new ever happened in the present or would happen in the future; it had all

happened before in the far distant past.” As a result, the problems and difficulties that people face at the present or will face in the future can be solved or prepared for by focusing on the past and following the past practices and traditions.

Researchers have compared future orientations in North America and in East Asia. The findings were mixed. Some researchers believed that North Americans were more future oriented than Chinese people (Graham, 1981; Kluckhohn & Strodtbeck, 1961; Ko & Gentry, 1991; Yang, Wang, Liu, Cuskelly, & Zhang, 2005). For example, Yang et al. found that children in Australia, a Western society considered similar to American and Canadian cultures, had a higher level of delay of gratification than Chinese children did, suggesting that Australian children have a stronger future orientation than their Chinese counterparts do. In contrast, other researchers found the opposite (Cheng & O’Leary, 1995; Poole & Cooney, 1987). For example, Poole and Cooney asked participants from Australia and Singapore to list events that were likely to happen in the future and to indicate when these events would happen. They found that Australian participants listed events from the nearer future than did participants from Singapore, indicating that Australian culture is less future oriented than Singapore culture, which is believed to be similar to Chinese culture.

Despite the above controversies regarding cross-cultural comparisons on future orientation, the general consensus for within-cultural comparisons is that North Americans are more future oriented than past oriented (Graham, 1981; Kluckhohn & Strodtbeck, 1961; Spears et al., 2001; Specter & Ferrari, 2000). In addition, Chinese people are primarily past oriented (Ji et al., 2007; Kluckhohn & Strodtbeck, 1961; Spears

et al., 2001). Thus, relative to North Americans, Chinese people are more past than future oriented. If so, North Americans should value the future more than the past, whereas Chinese should value the past more than the future. In this dissertation, I explored cultural influences on the temporal value asymmetry effect - the tendency for people to attach different values to future and past events.

### *Temporal Value Asymmetry*

The value of objects and events changes over time. For example, the value of a certain computer is decreasing with time, whereas the value of a certain artwork is increasing with time. Many rational factors can influence the value of objects and events, such as technology advancement, changes in supply and demand, and so on.

Interestingly, research shows that when all these rational factors are held constant, the value of objects and events can still change according to the timing of the object and event. For instance, Caruso et al. (in press) found that with similar temporal distance American people tended to attach more value to an event if it would happen in the future than if it had happened in the past. In one study, American participants imagined completing a job either one month earlier or one month later. Participants reported the total amount of money that would be fair for them to receive for doing the job. They found that participants who imagined doing the job in the future thought they should receive more payment than did those who imagined doing it in the past.

Researchers proposed three potential factors to explain why (North American) people tend to attach more value to future events than to similar past ones (Caruso et al., in press; Van Boven & Ashworth, 2007). First, one explanation that has been tested

directly is the online affective responses evoked by the thinking processes while thinking about the future or past events (Caruso et al., in press). The online emotion responses evoked by the imagination of future events are a kind of preparations for the future events. They can help people to be ready for the future events. In contrast, the online emotion responses induced by the imagination of past events do not serve this function because the future events are approaching and the past ones are receding. From the evolutionary perspective, arguing that the imagination of future events tends to induce more extreme online emotion responses than the imagination of past ones does is reasonable (Caruso et al., in press; Van Boven & Ashworth, 2007). As discussed earlier, Van Boven and Ashworth found that the online emotion responses in the anticipation of future events were more extreme than the online emotion responses in the retrospection of the same events from the past. Caruso et al. found that the more extreme the evoked online emotion responses, the greater value people attached to the events. In one of their studies, participants imagined either that they had helped their neighbor move one week before (past condition) or that they would help their neighbor move one week later (future condition). Participants in the future condition chose to receive more expensive gifts from their neighbor for their help than those in the past condition did, indicating that participants perceived the future help as being more valuable than the same help in the past. At the same time, participants in the future condition reported more extreme imagination-induced online emotion responses than those in the past condition did. For example, participants felt more stressed when anticipating helping move in the future than when imagining the same help in the past. More importantly, the imagination-

evoked online emotion responses mediated the temporal framing effect on value judgments.

Second, as discussed earlier, in a Western context, the predicted emotions associated with a future event tend to be more extreme than the recalled emotions associated with an identical past event (Caruso et al., in press; Van Boven & Ashworth, 2007). The predicted emotions associated with future events and the recalled emotions associated with past events may influence the values people attach to those events. The emotions associated with objects and events are often used as a basis for evaluating these objects and events (Hsee & Rottenstreich, 2004). Thus people may value future events based on their beliefs about how happy or unhappy they will be when these events happen to them in the future. For example, people may be willing to pay more money for a future vacation if they predict that the vacation will be more fun than if they predict that the vacation will be less fun. In the same way, the value of past events is likely to be determined by the emotions people recall about the past. For instance, people may value a past vacation less if they remember they were less happy on the vacation than if they remember they were happier on the vacation. Furthermore, the predicted and recalled emotions are believed to cause North American people to have more extreme online emotion responses in anticipation of future events than in retrospection about past ones (Van Boven & Ashworth, 2007), which can lead to the temporal value asymmetry effect. Consequently, the predicted and recalled emotions may in part account for the temporal value asymmetry effect.

Another factor that may account for the temporal value asymmetry effect is the asymmetric mental simulations. As discussed earlier, North Americans tend to engage in more extensive mental simulations in anticipation of future events than in retrospection about similar past ones. The asymmetry in mental simulations caused North Americans to have more extreme online emotion responses while thinking about the future events than while thinking about the past ones, which presumably lead to the temporal value asymmetry effect (Van Boven & Ashworth, 2007). Furthermore, the valuation of an object and event is also directly affected by the mental simulation processes. The more extensively people mentally simulate an object or an event, the greater amount of value people tend to attach to it. For example, in the low-balling technique, a widely used technique in compliance, consumers agree to buy a product at a low price. Then they are left alone for a while to think about owning the product. Later, they are informed that the price has to be increased. Chances are that people will buy the product at the higher price. The visualization of owning the product makes people more committed to the product, which makes them willing to pay more money for the product (Brehm, Kassin, & Fein, 2005; Cialdini, 2001). Thus, the temporal asymmetry in mental simulations may account for the temporal asymmetry in value. The more extensively people think about the future objects and events than the past ones, the more value they attach to the future ones than to the past ones.

In summary, researchers have outlined three potential mechanisms to explain why North Americans tend to place more value on future events than on similar past ones: (1) the more extreme are the online emotion responses evoked by thinking about future



events than by thinking about past ones, the more value people attach to the future events than to the past ones; (2) the more extreme are the predicted emotions associated with the future events than the recalled emotions associated with the past events, the more value people place on the future events than on the past ones; and (3) the more extensively people mentally simulate the future events than the past ones, the more value people attach to the future events than to the past ones.

### *Culture, Temporal Orientation and Temporal Value Asymmetry*

I believe that the three factors that affect the temporal value asymmetry effect are influenced by one's culture. As a result, the pattern of temporal value asymmetry effect may be different across cultures.

As discussed earlier, relative to North American culture, Chinese culture is more past oriented than future oriented. They tend to focus their attention more on past objects and events than on future ones, and have more emotional and behavioral reactions to the past than to the future. As a result, thinking about past events may make Chinese people more emotional than thinking about future events. Thus, relative to North Americans, Chinese people may have more extreme online emotions when thinking about past events than when thinking about similar future ones. Similarly, because relative to North Americans, Chinese people focus their attention more on the past than on the future, a past event may be perceived as being more emotion evoking than a similar future one. As a result, they may believe that they were more emotional during a past event than they will be during the same event in the future. Thus, the predicted- recalled emotion asymmetry found in North America may be reversed in Chinese context. Furthermore,

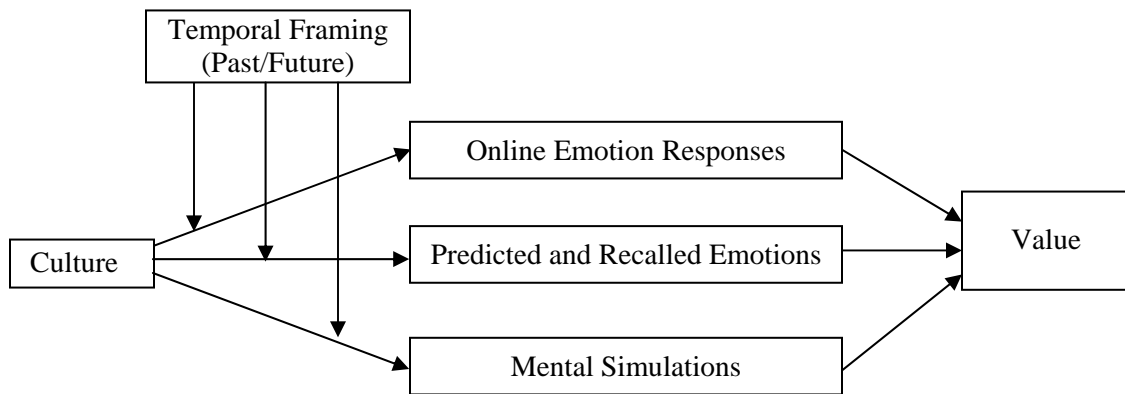
because Chinese relative to North Americans focus their attention more on the past than on the future, they may think more extensively about past events than about future ones. As a result, the asymmetric mental simulations in North America may be reversed in the Chinese context.

### *Proposed Model*

Based on the above analysis, I proposed the following model, as seen in Figure 1. I predicted that the temporal value asymmetry effect would be reversed for Chinese. That is, North Americans would attach more value to future events than to past ones, whereas Chinese would attach more value to past events than to future ones. This cultural difference may be accounted for by the differences in (1) the asymmetry in online emotion responses during the thinking processes, (2) the asymmetry in predicted and recalled emotions associated with the future and past events, and (3) the asymmetry in mental simulations of the future and past events. Relative to North Americans, Chinese people would (1) have less extreme online emotions for future events than for past ones, (2) believe the predicted emotions associated with future events would be less extreme than the recalled emotions associated with past events, and (3) mentally simulate future events less extensively than past events. The asymmetries in online emotion responses, in predicted and recalled emotions, and in mental simulations would in turn determine the amount of value people attach to the events.

I conducted four studies to test this model. The first three studies aimed at demonstrating cultural differences in the temporal value asymmetry effect. The fourth

study investigated why these cultural differences in temporal value asymmetry effect exist.



**Figure 1: Cultural influences on temporal value asymmetry (proposed model).**

## **Chapter 2**

### **Studies**

#### **Study 1a: Vacation**

In Study 1a, Canadian and Chinese participants imagined that they either had received an offer of an apartment for vacation from an acquaintance in the past or they would receive the same offer in the future. Then they reported the amount of money they planned to spend on a gift for the acquaintance. I predicted that Canadians would spend more money on the gift for the future favor than for the past favor, whereas Chinese would spend more money for the past favor than for the future favor.

#### **Method**

##### *Participants*

Ninety-nine European Canadian undergraduate students (25 men, 67 women, 7 did not report their gender) from Queen's University, Canada and 88 Chinese undergraduate students (50 men, 34 women, 4 did not report their gender) from Peking University, China participated in the study. Participants received small gifts (chocolate bars for European Canadian participants and pens for Chinese participants) for their participation.

##### *Procedure*

The vacation scenario was adapted from Caruso et al. (in press, Study 2b). Specifically, participants imagined that when they were talking with a friend about their

plan to take a week-long vacation in Vancouver (Shanghai for Chinese participants), John, an acquaintance of the participants, mentioned that he had a well-furnished apartment in Vancouver where the participants were more than welcome to stay. Participants were told that they accepted this generous offer.

Then participants were randomly assigned to one of the two conditions: past and future. Participants in the past condition imagined that they had just returned home from the week-long vacation in Vancouver, whereas participants in the future condition imagined that they were leaving for their vacation and would come back home in one week.

After reading the description of the situation, participants were told that to show their appreciation for John's generosity, they had decided to buy John a gift that would be delivered to him in 10 days.<sup>1</sup> They imagined that they had been in a store to order the gift. The participants then indicated how much they planned to spend on the gift (they also indicated what they planned to buy, but this information was not of primary interest and therefore was not analyzed). Canadian participants reported the amount of money in Canadian dollars, and Chinese participants indicated the amount of money in Chinese Yuan.

The questionnaire was first created in English. Then it was translated into Chinese by a bilingual research assistant, and the translation was checked by two other bilingual

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<sup>1</sup> Because the receipt of the gift might influence John's decision about the offer, participants were told that it would be delivered to John's home in 10 days, suggesting that John would not receive the gift until they had returned home from the vacation in both the past and the future conditions. In addition, to reduce the difference in construal of the shipping charge, the delivery was said to be free.

researchers to ensure the equivalence. During the translation, the acquaintance's name in the English version, John, was replaced by a Chinese name. Also, Vancouver was replaced by Shanghai, a Chinese city.

## Results and Discussion

I examined the amount of money participants planned to spend on the gift. Because the question on the monetary value was open-ended, extreme outliers<sup>2</sup> were excluded from the following analysis. As a result, values that were over 250 dollars for Canadian participants ( $n = 4$ ) or over 1000 Yuan for Chinese participants ( $n = 1$ ) were excluded. One Chinese participant did not report the monetary value. Consequently, 95 Canadians and 86 Chinese were included in the final analysis. Because the measures of the amount of money were on different metrics (i.e., Canadian dollar and Chinese Yuan), I did a linear transformation to put them on the same metric. Specifically, the amounts of money were divided by the maximum amount of money participants reported within each culture after the extreme outliers were excluded. This transformation put the monetary value from different cultures into the same metric ranging from 0 to 1.<sup>3</sup> The transformed score represents the percentage one thought one should spend on the gift compared to the

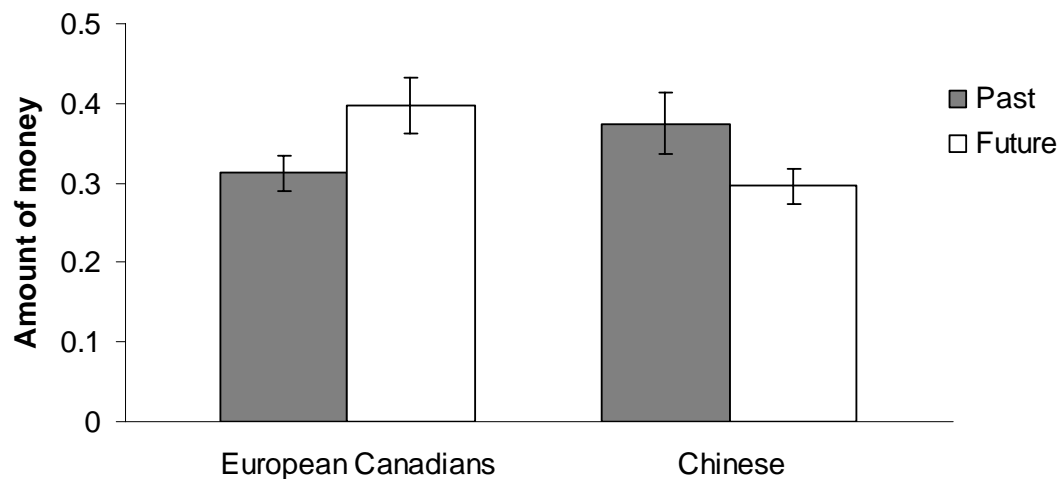
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<sup>2</sup> Values that are more than 3 interquartile ranges higher than the 75<sup>th</sup> percentile or 3 interquartile ranges lower than the 25<sup>th</sup> percentile in boxplot were identified as extreme outliers. The interquartile range was \$50.00 for Canadian participants and 300.00 Yuan for Chinese participants. The four extreme outliers for Canadians ranged from \$275.00 to \$500.00, and the one extreme outlier for Chinese was 1000 Yuan. Similar results were obtained when extreme outliers were included in the analyses with exceptions being indicated.

<sup>3</sup> I also converted the amount of money within each culture into  $z$ -score. The  $z$ -score transformation produced the same pattern of results (for both Studies 1a and 1b). The linear transformation I adopted was preferred to the  $z$ -score transformation because the  $z$ -score transformation assumed equal means and standard errors across cultures, which may not be the case. Analysis based on the raw data resulted in similar results (for both Studies 1a and 1b).

highest amount of money (after excluding extreme outliers) indicated by one's cultural group.

I predicted Canadian participants would spend more money on the gift in the future condition than in the past condition, whereas Chinese participants would spend more money in the past condition than in the future condition. Figure 2 shows the results for both Canadian and Chinese participants. A 2 (culture: Canadians vs. Chinese) x 2 (time: past vs. future) ANOVA<sup>4</sup> was conducted with the transformed amount of money participants planned to spend on the gift as the dependent variable. Neither the culture main effect nor the time main effect was significant,  $F_s < .46$ ,  $p_s > .50$ . However, as



**Figure 2: Cultural differences in the amount of money on a gift for a future favor and for a past favor.**

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<sup>4</sup> When gender was included in the analysis, the gender main effect and any interactions involving gender were not significant,  $p_s > .69$ . Thus, the gender information was excluded from the analysis. This was true for all the analysis in this thesis,  $p_s > .05$ .

hypothesized, the culture by time interaction was significant,  $F(1, 177) = 7.79, p = .01$ , partial  $\eta^2 = .04$ . Canadians spent significantly more money on the gift in the future condition than in the past condition,  $F(1, 93) = 4.35, p = .04, \eta^2 = .05$ ,<sup>5</sup> whereas Chinese spent slightly more money on the gift in the past condition than in the future condition,  $F(1, 84) = 3.51, p < .07$ .<sup>6</sup>

Thus, the results of Study 1a supported the proposed model. Specifically, Canadians showed a typical temporal value asymmetry effect: they were willing to spend more money on the gift when the favor would be received in the future than when the same favor had been received in the past, indicating that a future favor was perceived by Canadians as being more valuable than a similar past favor. In contrast, Chinese showed a somewhat reversed temporal value asymmetry effect: they were willing to spend slightly more money on the gift when they had received the favor in the past than when they would receive the same favor in the future, suggesting that they perceived the past favor as being more valuable than a similar future favor. Thus, Study 1a provided preliminary support for my main prediction that European Canadians would attach more value to a future event than to a similar past one, whereas Chinese in contrast would place more value on a past event than on a similar future one.

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<sup>5</sup> It became nonsignificant when extreme outliers were included in the analysis,  $F(1, 97) = 1.38, p = .24$ .

<sup>6</sup> It became significant when the extreme outlier was included in the analysis,  $F(1, 85) = 4.96, p = .03, \eta^2 = .06$ .



## **Study 1b: Job**

In Study 1a, an alternative, although unlikely, explanation for the results I obtained exists. Specifically, the past favor and the future one might be construed differently by people from different cultures. In Study 1a, I did not describe the apartment in detail. As a result, Chinese might perceive the offer itself to be greater in the past than in the future (i.e., they might imagine the apartment in the past condition as being larger, nicer than the apartment in the future condition). In contrast, Canadians might construe the favor to be greater in the future than in the past. The cultural difference in the temporal value asymmetry effect found in Study 1a then might be due to the cultural differences in the construal of the offer itself. In addition, gift giving may have different meanings among Chinese than among Canadians. In Study 1b, I aimed to replicate Study 1a with a different scenario that had no involvement of gift giving. Meanwhile, I described the events in detail and measured how people construed the events in the past and in the future to further rule out the alternative explanation that the past and the future events might be construed differently by Chinese and by Canadians.

### **Methods**

#### *Participants*

The same participants in Study 1a participated in Study 1b.

#### *Procedure*

The job scenario employed in Study 1b was adapted from Caruso et al. (in press, Study 1). Specifically, Canadian and Chinese participants imagined that they had agreed to work on a five-hour campus job to earn some extra money. To reduce the difference in

the construal of the job, the job was described as simply entering data from papers into a computer database, and no special skills were required. Also, participants were told that they were paid (*would be paid* in the future condition) in cash directly upon completion to avoid the difference in the construal of the delay of payment. After reading the scenario, participants indicated how much they thought they should be paid for the five hours of work.

Canadian and Chinese participants were randomly assigned to one of the two conditions: past and future. Participants in the past condition imagined that they had worked on the Saturday one month ago, whereas participants in the future condition imagined that they would work on the Saturday one month later. I used two items from Caruso et al. (in press) to measure how participants construed the job. Specifically, participants reported how difficult they thought the job would be on a scale ranging from 0 (*not difficult at all*) to 6 (*extremely difficult*) and how qualified they thought they were for the job on a scale ranging from 0 (*not qualified at all*) to 6 (*extremely qualified*).

The questionnaire was first created in English. Then it was translated into Chinese by a bilingual research assistant. The translation was checked by two other bilingual researchers to ensure the equivalence between the Chinese and the English versions.

## Results and Discussion

### *Difficulty of the Job and Personal Qualification*

To determine if the perceived difficulty of the job was affected by participants' cultural backgrounds and the temporal framing manipulations, a 2 (culture: Canadians vs. Chinese) x 2 (time: past vs. future) ANOVA was conducted with the perceived difficulty

of the job as the dependent variable. The culture main effect and the time main effect were not significant,  $F_s < 0.43$ ,  $p_s > .51$ , nor was the interaction between culture and time,  $F(1, 183) = .67$ ,  $p = .41$ . Similarly, a 2 (culture: Canadians vs. Chinese) x 2 (time: past vs. future) ANOVA was conducted with the perceived personal qualification for the job as the dependent variable. Again, the culture main effect and the time main effect were not significant,  $F_s < 1.41$ ,  $p_s > .23$ , nor was the interaction between culture and time,  $F(1, 183) = .25$ ,  $p = .62$ . Thus, as expected, the job was construed similarly across cultures and across time framing conditions.

#### *Temporal Value Asymmetry*

Similar procedures as in Study 1a were used to identify extreme outliers.<sup>7</sup> As a result, values over 65 dollars for European Canadian participants ( $n = 1$ ) and over 500 Yuan for Chinese participants ( $n = 4$ ) were excluded. Two Chinese participants did not report the amount of money. Consequently, 98 Canadians and 82 Chinese were included in the final analysis. I next conducted a similar linear transformation as in Study 1a on the amount of money people requested for doing the job (i.e., the amounts of money were divided by the maximum amount of money after extreme outliers were excluded within each culture). This transformation put the monetary value across cultures into the same metric ranging from 0 to 1.

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<sup>7</sup> The interquartile range was \$10.00 for Canadian participants and 100.00 Yuan for Chinese participants. The extreme outlier was \$200.00 for the Canadian, and the extreme outliers for the four Chinese ranged from 700 to 1500 Yuan. Similar results were obtained when extreme outliers were included in the analyses with exceptions being indicated.

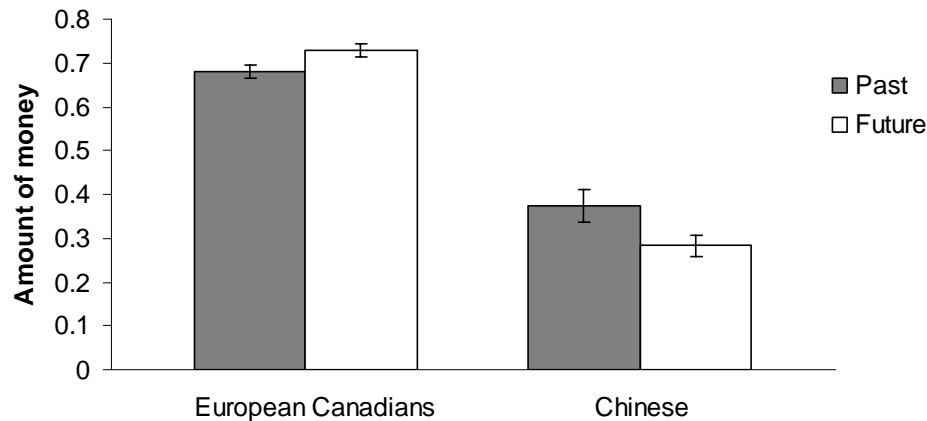
A 2 (culture: Canadians vs. Chinese) x 2 (time: past vs. future) ANOVA was conducted with the transformed amount of money participants thought they should receive as the dependent variable. The culture main effect was significant,  $F(1, 176) = 273.17, p < .001$ . Canadians had a higher score than Chinese. Thus, compared to Chinese, the amount of money indicated by Canadians were closer to the highest value they indicated. The time main effect was not significant,  $F(1, 176) = 0.95, p = .33$ . But as predicted, the interaction between culture and time was significant,  $F(1, 176) = 9.13, p = .003$ , partial  $\eta^2 = .05$  (see Figure 3).<sup>8</sup> As hypothesized, compared with Canadians, Chinese were more likely to think that they should receive more money for doing the job in the past than doing the same job in the future. The simple effect analysis showed that Canadians thought they should receive more money for doing the job in the future than for doing it in the past,  $F(1, 96) = 4.55, p = .04$ , partial  $\eta^2 = .05$ ,<sup>9</sup> whereas Chinese thought they should receive more money for doing the job in the past than for doing it in the future,  $F(1, 80) = 4.52, p = .04$ , partial  $\eta^2 = .05$ .

The results of Study 1b supported the proposed model. Specifically, Canadians showed a typical temporal value asymmetry effect: they asked for more payment when they would do the job in the future than when they had done the same job in the past, indicating that the future job was perceived as being more valuable than the similar past job. In contrast, Chinese showed a reversed temporal value asymmetry effect: they asked

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<sup>8</sup> The interaction became marginally significant when extreme outliers were included in the analysis,  $F(1, 181) = 3.12, p = .08$ , partial  $\eta^2 = .02$ .

<sup>9</sup> It became nonsignificant when the single extreme outlier was included,  $F(1, 97) = 0.002, p = .97$ .



**Figure 3: Cultural differences in the amount of payment requested for a future job and for a past job.**

for more money when they had done the job in the past than when they would do the same job in the future, indicating that they attached more value to the job in the past than to a similar job in the future. Furthermore, in Study 1b, the possibility of construing the past and future jobs differently across cultures was reduced by defining the jobs in detail. Indeed, based on the manipulation checks, people from different cultures and in different time conditions actually construed the job similarly. Thus, Study 1b supported the idea that the observed cultural differences in the temporal value asymmetry were not caused by different construal of the job in different cultures and time conditions. Overall, I successfully replicated the findings of Study 1a with a different scenario.

## **Study 2: Reading Week Break**

In Studies 1a and 1b, I found that in hypothetical scenarios, Canadians attached more value to a future event than to an identical event in the past, whereas Chinese

attached more value to future than to past events. In Study 2, to improve the external validity of my research, I investigated people's real world expectations and experiences by employing a real world event - the reading week break. Canadian universities have a one-week reading week break in the winter term (similar to Spring breaks in the United States). Participants in Study 2 answered questions about the reading week break at two different times: two weeks before the reading week and two weeks after it.

Compared to Studies 1a and 1b, Study 2 employed a within-subject design. Caruso et al. (in press) reported that the temporal value asymmetry effect disappeared with a within-subject design where participants received the past and future scenarios at the same time. To account for such null effect, Caruso et al. argued that in a within-subject design, participants had the chance to directly compare the similar events in the past and in the future, and they wanted to be consistent. In my study, however, people did not get the past and future events at the same time. The two test sessions had a five week gap. Thus, the chance for participants to directly compare the past and future events was minimal. I predicted that the reading week break would be attached with more value by European Canadians when it was in the future than when it had been in the past, whereas it would be perceived as being more valuable by Chinese when it had been in the past than when it was in the future.

## Methods

### *Participants*

Email invitations were sent to the introductory psychology class at Queen's University for an online study. Ninety-seven European Canadian undergraduate students

(19 male, 78 female) and 39 Chinese Canadian undergraduate students (16 male, 23 female) from Queen's University volunteered to participate in the study. Among the 39 Chinese Canadian undergraduate students, 13 were born in Canada and the other 26 had lived in Canada at least for 2 years and 5 months (average time in Canada was 10 years). The European Canadian participants and the Chinese Canadian participants did not differ in their age (for European Canadians, mean age = 18.64 years,  $SD = 1.30$ ; and for Chinese Canadians, mean age = 18.64 years,  $SD = 1.18$ ). Participants received course credit or were entered into a lottery for their participation. The study was conducted in English.

#### *Procedure*

I created online questionnaires for this study. To reduce the possibility of duplicate participations, a valid university e-mail address was required for each participant (each student had one and only one university e-mail address). To ensure that the responses could not be traced back to any individual participant, the email address was deleted from the database after it was used for matching up responses before and after the reading week break and for awarding course credit or lotteries. Participants also indicated if they were interested in seriously participating in the study or just wanted to have a look at the questionnaires. Data from those who indicated that they just wanted to take a look at the questionnaires were excluded from further analysis. Participants were asked to concentrate on the study and turn off any background stimuli, such as music and videos.

The online questionnaires had two versions: future and past. Participants received the future version of the questionnaire two weeks before the beginning of the reading week and the past version of the questionnaire two weeks after the end of the reading week. In the future (past) version, participants were first informed that the reading week was about two weeks away (ago) from now. Then they were asked to spend a few minutes contemplating their future (past) reading week as vividly as they could, such as what they would do (had done), where they would go (had gone), and whom they would meet (had met) during the reading week. Participants then wrote down the things that came to their mind.

To measure the value people attach to the reading week, participants indicated how much they were willing to pay to extend their reading week by three days, assuming that they could extend their reading week without missing any other obligations (cf. Caruso et al., in press).

## Results and Discussions

### *Temporal Value Asymmetry of Reading Week*

I predicted that European Canadians would be willing to pay more money for extending their future reading week than for extending their past reading week, whereas Chinese Canadians would be willing to pay more for extending their past reading week than for extending their future reading week. Again, extreme outliers were identified by the same procedure as in Study 1a.<sup>10</sup> Values larger than \$300 on the monetary amount

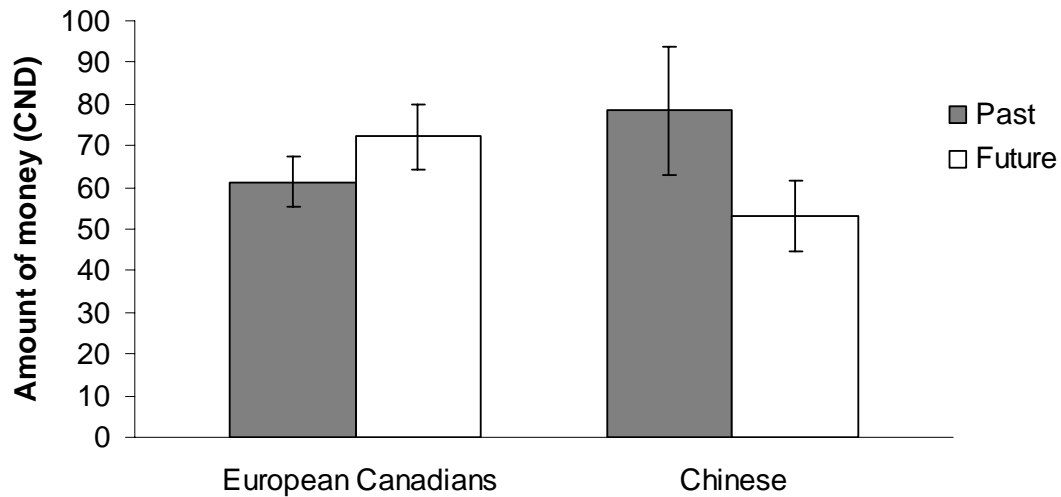
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<sup>10</sup> The interquartile range was \$81.25. Similar results were obtained when extreme outliers were included in the analyses.



were excluded. Four European Canadians and one Chinese Canadian were not included in the final analysis. One Chinese did not report the monetary value in the future condition. As a result, 93 European Canadians and 37 Chinese Canadians were included in the analysis. Figure 4 shows the results for both European Canadian students and Chinese Canadian participants. A 2 (culture: European Canadian vs. Chinese Canadian) X 2 (time: future vs. past) repeated measure ANOVA was conducted with the monetary value people were willing to pay as the dependent variable. Neither of the main effects of time and culture was significant,  $ps > .24$ . However, the culture by time interaction was significant,  $F(1, 128) = 8.76, p < .01, \text{partial } \eta^2 = .06$ . As expected, European Canadians were willing to pay slightly more for extending their future reading week than for extending their past reading week,  $F(1, 92) = 3.10, p = .08, \eta^2 = .03$ , suggesting that the future reading week was perceived as being more valuable by European Canadians than the past reading week was. Chinese Canadians, on the other hand, were willing to pay more money for extending their past reading week than for extending their future reading week,  $F(1, 36) = 4.84, p = .03, \eta^2 = .12$ , indicating that the past reading week was perceived by Chinese Canadians as being more valuable than the future reading week.

Thus, in Study 2, employing an event in the real world, reading week break, I found that Chinese Canadians attached more value to the past event than to the similar future one, which is a theoretical replication of the findings of Studies 1a and 1b. The less robust finding that European Canadians attached more value to the future reading week than to the past reading week might be caused by the within-subject design of the study. Although a five-week gap occurred in between the two sessions, participants might still



**Figure 4: Cultural differences in the amount of money for extending the future reading week break and the past reading week.**

be able to compare the two events and try to be consistent with their judgments. This might be particularly true for European Canadians because they should be more motivated to be consistent with themselves than Chinese were (English & Chen, 2007; Heine & Lehman, 1997). Notably, the results from Chinese Canadians in this study showed a similar pattern as the results from Chinese students in China in Studies 1a and 1b, suggesting the pervasiveness of the cultural influence. In summary, with a real-world event and a within-subject design in Study 2, I conceptually replicated the findings in Studies 1a and 1b. European Canadians attached greater value to future events than to similar past ones, whereas Chinese Canadians attached greater value to past events than to similar future ones.

### **Study 3: Thanksgiving Day**

In Studies 1a, 1b, and 2, I found that Canadians attached more value to a future event than to an identical past event, whereas Chinese attached more value to a past event than to an identical future event. In Study 3, I employed another real-world event, Thanksgiving Day, to explore the possible underlining mechanisms of such cultural differences. I proposed that the online emotion responses evoked by the thinking processes, the predicted and recalled emotions associated with the future and past events, as well as the mental simulations of the future and past events in people's mind would account for the cultural differences in valuing future and past events.

#### **Methods**

##### *Participants*

Study 3 was conducted online. Twenty-three European Canadian undergraduate students (6 male and 17 female) and 32 Chinese Canadian undergraduate students (6 male and 26 female) from Queen's University, Canada participated in the study. Because Thanksgiving Day is a traditional Western holiday, I purposely selected Chinese Canadian students who had lived in Canada for 5 years or more, so that they were familiar with the holiday. Among the 32 Chinese Canadian undergraduate students, 14 were born in Canada, 12 were born outside of Canada but moved into Canada before age of 10 (with an average time in Canada for 11 years and 4 months), and 6 did not report this information.<sup>11</sup> European Canadian participants and Chinese Canadian participants did

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<sup>11</sup> The six Chinese Canadian participants were recruited by research assistants who knew them personally. The research assistants ensured that they had stayed in Canada for at least 5 years. The responses (including

not differ in their age (for European Canadians, mean age = 18.17 years,  $SD = 0.98$ ; and for Chinese Canadian participants, mean age = 18.25 years,  $SD = 0.88$ ). No participants in Study 2 participated in Study 3. Participants received course credit or a small gift for their participation.

### *Procedure*

Similar to Study 2, I created online questionnaires. I took similar precautions as in Study 2 to ensure that all participants were taking the task seriously<sup>12</sup> and none of them completed the task more than once.

The online questionnaires had two versions: future and past. Participants received the future version of the questionnaire two weeks before Canadian Thanksgiving Day in 2007, which was on October 8, 2007, and they received the past version of the questionnaire two weeks after Thanksgiving. In the future (past) version, participants were first informed that Thanksgiving Day was about two weeks away (ago) from now. Then they were asked to spend a few minutes contemplating their future (past) Thanksgiving Day as vividly as they could, such as what they would do (had done), where they would go (had gone), and whom they would meet (had met) on that day. Participants then wrote down the things that came into their mind.

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the perceived importance of the Thanksgiving Day, the asymmetry in online emotion responses, the asymmetry in predicted and recalled emotions, the asymmetry in mental simulation, and the temporal value asymmetry) from the six Chinese Canadian participants were not different from those of the other Chinese Canadian participants,  $ps > .10$ .

<sup>12</sup> One European Canadian participant and two Chinese Canadian participants were excluded from further data analysis because they indicated that they just wanted to take a look at the questionnaire.

In both the past and the future version of the questionnaires, participants reported how happy thinking about the future (past) Thanksgiving Day made them feel at that moment on a scale ranging from 1 (*not happy*) to 9 (*very happy*). The one item measure of online emotion responses has been used in previous research and is believed to be sufficient (Van Boven & Ashworth, 2007).

Taken from Van Boven and Ashworth's study (2007), three questions were employed to measure the predicted and recalled emotions on Thanksgiving Day. Specifically, on the future (past) version of the questionnaire, participants reported (a) how happy they would be (had been) on the future (past) Thanksgiving Day on a scale ranging from 1 (*not happy*) to 9 (*very happy*); (b) how much they would enjoy (had enjoyed) the future (past) Thanksgiving Day on a scale ranging from 1 (*not enjoy*) to 9 (*enjoy very much*); and (c) how much fun the Thanksgiving Day would be (had been) on a scale ranging from 1 (*not fun*) to 9 (*very fun*).

Two questions were designed to measure to what extent participants mentally simulated the Thanksgiving Day. Specifically, participants reported how vivid their imagination (recall) of the future (past) Thanksgiving Day was on a scale ranging from 1 (*not vivid*) to 9 (*very vivid*) and how clearly they could see their future (past) Thanksgiving Day in their head at that moment on a scale ranging from 1 (*not clear*) to 9 (*very clear*).

To measure the value people attached to the future and past Thanksgiving Day, participants indicated how much they wanted to be paid if they could not spend the

Thanksgiving Day the way it was predicted or recalled due to a commitment to stay in an office without doing any work on that day. Specifically, participants read:

Imagine that you will stay (stayed) in a small company's office for 8 hours on this upcoming (past) Thanksgiving Day because you have (had) agreed to a request from the company. You will not (did not) really have to do anything other than staying in the office. As a result, you will not be (were not) able to do things you thought about (recalled) above on this upcoming (past) Thanksgiving Day. Now the company wants to pay you for not being able to enjoy this upcoming (past) Thanksgiving Day. How much do you think is reasonable for you to be paid (give a specific amount, not a range)?

Because Thanksgiving Day is traditionally a Western holiday, it may be more important to European Canadian students than to their Chinese counterparts. The importance of Thanksgiving Day is very likely to have an impact on the value people attach to it. Therefore, I measured the importance of the Thanksgiving Day to explore any potential influence it may have on the temporal value asymmetry effect. Specifically, in both the future and the past version of the questionnaire, participants reported as a holiday, how important Thanksgiving Day was to them in general on a scale ranging from 1 (*not important*) to 9 (*very important*).

In the end, participants reported their gender, age, ethnicity, and their major in university. The study was conducted in English.

## Results and Discussion

### *Importance of Thanksgiving Day*

Participants rated the importance of Thanksgiving Day twice, once before the Thanksgiving Day and once after it. The two ratings were highly correlated,  $r = .86, p < .001$ . Thus, I calculated the mean of the two ratings and entered it into an ANOVA with culture as the independent variable. As expected, Thanksgiving Day was a more important holiday for European Canadian students ( $M = 6.45, SD = 1.68$ ) than for Chinese Canadian students ( $M = 4.47, SD = 2.32$ ),  $F(1, 50) = 11.67, p < .01$ , partial  $\eta^2 = .19$ . Therefore, I included this variable as a covariate in the analyses.

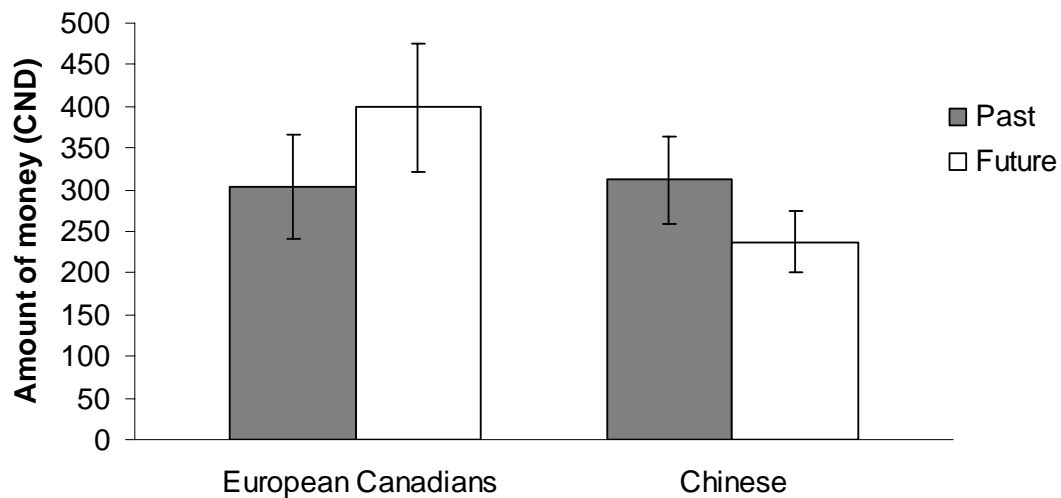
#### *Temporal Value Asymmetry of Thanksgiving Day*

I predicted that European Canadians would request more money for not being able to enjoy a future than a past Thanksgiving Day, whereas Chinese Canadian students would request more money for missing a past than a future Thanksgiving Day. Extreme outliers were identified by the same procedure as in Study 1.<sup>13</sup> Values larger than \$1200 on the monetary amount were excluded. As a result, one European Canadian and one Chinese Canadian were not included in the final analysis. Figure 5 shows the results for both European Canadian students and Chinese Canadian participants. A 2 (culture: European Canadian vs. Chinese Canadian) X 2 (time: future vs. past) repeated measure ANCOVA was conducted with the monetary value people requested as the dependent variable and importance of Thanksgiving Day as a covariate. The importance of Thanksgiving Day and the importance by time interaction were not significant,  $ps > .25$ ,

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<sup>13</sup> The interquartile range was \$386.00. The extreme outlier for the European Canadian was \$2000 at Time 2, and the extreme outlier for the Chinese Canadian was \$3000 at Time 2. The culture by time interaction became nonsignificant when extreme outliers were included in the analysis,  $F(1, 50) = 1.46, p = .23$ .

nor were the culture main effect and the time main effect,  $ps > .43$ . However, the culture by time interaction was significant,  $F(1, 47) = 5.69, p = .02, \text{partial } \eta^2 = .11$ . As expected, European Canadians requested more money for missing their future Thanksgiving Day than for missing their past Thanksgiving Day at a non-significant level,  $F(1, 20) = 2.19, p = .16$ , whereas Chinese Canadians requested slightly less money for missing their future Thanksgiving Day than for missing their past Thanksgiving Day,  $F(1, 28) = 3.14, p = .09, \text{partial } \eta^2 = .10$ .



**Figure 5: Cultural differences in the amount of money people requested for missing the future and the past Thanksgiving Day.**

*Online Emotion Responses of Anticipating and Recalling Thanksgiving Day*

I predicted that European Canadians' online emotion responses were higher at the time of anticipating the future Thanksgiving Day than at the time of recalling the past Thanksgiving, whereas Chinese Canadians would report higher online emotion responses



at the time of recalling than at the time of anticipating. A 2 (culture: European Canadian vs. Chinese Canadian) X 2 (time: future vs. past) repeated measure ANOVA was conducted with the online emotion responses as the dependent variable. The culture main effect was not significant,  $F(1, 48) = 0.05, p = .83$ . The main effect of time was significant,  $F(1, 48) = 6.74, p = .01$ , partial  $\eta^2 = .12$ . Participants were happier during the anticipation of the future Thanksgiving ( $M = 7.58, SD = 1.30$ ) than during the retrospection of the past one ( $M = 7.10, SD = 1.34$ ). Contrary to my hypothesis, the culture by time interaction was not significant,  $F(1, 48) = 0.17, p = .68$ . Although both European Canadian students and Chinese Canadian students might have felt better when anticipating Thanksgiving Day (for European Canadians,  $M = 7.67, SD = 1.28$ ; and for Chinese Canadians,  $M = 7.52, SD = 1.33$ ) than when recalling the same holiday (for European Canadians,  $M = 7.10, SD = 1.30$ ; and for Chinese Canadians,  $M = 7.10, SD = 1.40$ ), one post-hoc explanation is that it happened to be the mid-term exam period when participants were recalling their past Thanksgiving two weeks after it. Chinese students, who are well known for emphasizing school achievements (Pearce & Lin, 2007), might feel stressful about the exams, resulting in reporting lower online happiness.

#### *Predicted and Recalled Emotions on Thanksgiving Day*

The three items employed to measure the predicted and recalled emotions on the Thanksgiving Day were highly correlated (Cronbach's Alpha is .91 for predicted emotions and .91 for recalled emotions). Mean ratings on the predicted emotions and on the recalled emotions were calculated. A 2 (culture: European Canadian vs. Chinese Canadian) X 2 (time: future vs. past) repeated measure ANOVA was conducted with the

predicted and recalled emotions as the dependent variable. Neither the culture main effect nor the time main effect was significant,  $F_s < 1.60, p > .21$ . However, the culture by time interaction was significant,  $F(1, 48) = 8.33, p = .01$ , partial  $\eta^2 = .15$ . As expected, European Canadian students believed that they would be happier on the future Thanksgiving Day ( $M = 7.63, SD = 0.93$ ) than on the past Thanksgiving Day ( $M = 6.94, SD = 1.46$ ),  $F(1, 20) = 6.73, p = .02$ , partial  $\eta^2 = .25$ , whereas Chinese Canadians believed that they would be less happy on the future Thanksgiving Day ( $M = 7.24, SD = 1.24$ ) than on the past Thanksgiving Day ( $M = 7.52, SD = 1.09$ ), although the difference was not significant statistically,  $F(1, 28) = 1.71, p = .20$ .

#### *Mental Simulations of the Future and the Past Thanksgiving Day*

I used two items to measure the clarity of participants' mental simulations of Thanksgiving Day in anticipation and in retrospection. Ratings on the two items were highly correlated,  $r = .80, p < .001$  for anticipation and  $r = .84, p < .001$  for retrospection. Mean ratings on the clarity of the mental simulations before Thanksgiving Day and those after it were calculated. A 2 (culture: European Canadian vs. Chinese Canadian) X 2 (time: future vs. past) repeated measure ANOVA was conducted with the clarity of the mental simulations as the dependent variable. The culture main effect was significant,  $F(1, 48) = 10.50, p = .001$ , partial  $\eta^2 = .18$ . Overall, European Canadians ( $M = 7.33, SD = 0.77$ ) mentally simulated Thanksgiving Day more clearly than Chinese Canadians ( $M = 6.07, SD = 1.66$ ) did. The time main effect was not significant,  $F(1, 48) = 0.65, p = .42$ . However, the culture by time interaction was significant,  $F(1, 48) = 8.74, p = .01$ , partial  $\eta^2 = .15$ . As expected, European Canadian students mentally simulated the future

Thanksgiving Day ( $M = 7.62$ ,  $SD = 0.79$ ) more clearly than the past Thanksgiving Day ( $M = 7.05$ ,  $SD = 1.34$ ) at a close to marginal significant level,  $F(1, 20) = 2.79$ ,  $p = .11$ , whereas Chinese Canadians mentally simulated the future Thanksgiving Day ( $M = 5.57$ ,  $SD = 2.08$ ) less clearly than the past Thanksgiving Day ( $M = 6.57$ ,  $SD = 1.81$ ),  $F(1, 48) = 7.00$ ,  $p = .01$ , partial  $\eta^2 = .20$ .

### *Mediation Analysis*

I investigated three possible mediators for the cultural influences on the temporal value asymmetry effect. They were (1) online emotion responses during the thinking processes, (2) predicted and recalled emotions, and (3) mental simulations. As discussed earlier, the online emotion responses of the thinking processes might have been contaminated by other life events, such as the exams participants had when they were recalling the Thanksgiving Day. Thus, I did not examine the mediation effect of the online emotion responses in the current study.

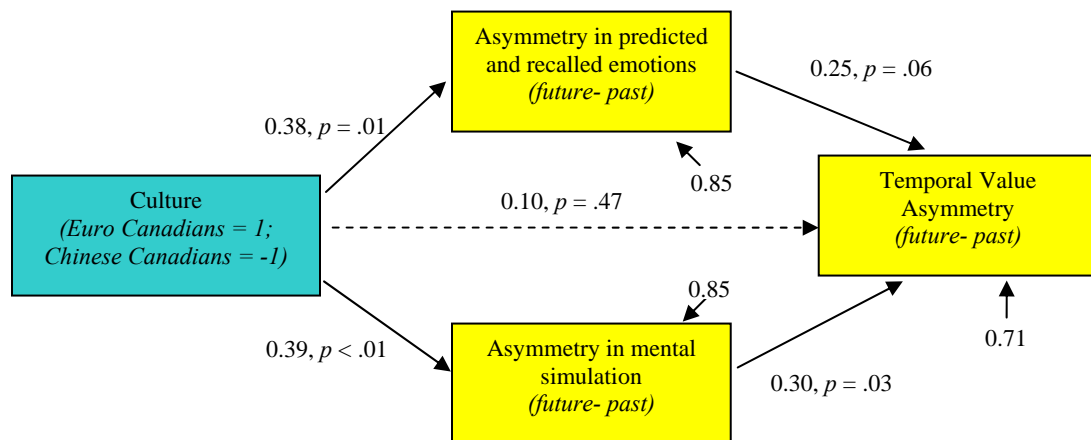
I proposed that culture had significant influences on the predicted-recalled emotion difference and on the difference in the mental simulations, which in turn determined the value people placed on the future and past Thanksgiving Day. The direct influences of culture on the temporal value asymmetry effect would be weak. To test this model, I calculated the monetary difference between past and future by subtracting the amount of money people requested in the past condition from the amount of money they requested in the future condition. A positive number means that participants requested more money for the future than for the past Thanksgiving Day, whereas a negative number means that participants requested more money for the past than for the future.

Similarly, I calculated the predicted-recalled emotion difference by subtracting the recalled emotions from the predicted emotions. A positive number means that participants predicted they would be happier on the future Thanksgiving Day than they recalled they had been on the past Thanksgiving Day, whereas a negative number means that the predicted happiness was lower than the recalled ones. I also calculated the difference between the mental simulations of anticipation and those of retrospection by subtracting the latter from the former. A positive number means that participants mentally simulated the future Thanksgiving Day more clearly than the past one, whereas a negative number means that participants simulated the future Thanksgiving less clearly than the past one. Culture was contrast coded (Chinese Canadians = -1 and European Canadians = 1). A structural equation modeling was conducted to test the mediation model. In the structural equation modeling, each latent variable was indicated by one measured variable.<sup>14</sup> Figure 6 shows the results of the mediation model. As expected, culture had a significant effect on the asymmetry in the predicted and recalled emotions. Relative to Chinese Canadians, European Canadians predicted greater happiness for the Thanksgiving Day than what they recalled,  $t = 2.91, p = .01$ . Similarly, culture had a significant effect on the asymmetric mental simulations. Relative to Chinese Canadians, European Canadians mentally simulated the Thanksgiving Day more clearly in their mind when that day was in the future than when it was in the past,  $t = 2.99, p = .01$ . Furthermore, the asymmetry in the predicted and recalled emotions, in turn, had a

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<sup>14</sup> One limitation of using one measured variable for each latent variable in structural equation modeling is that it turns the analysis into path analysis, which includes measurement error into the analysis and may make the results less stable.

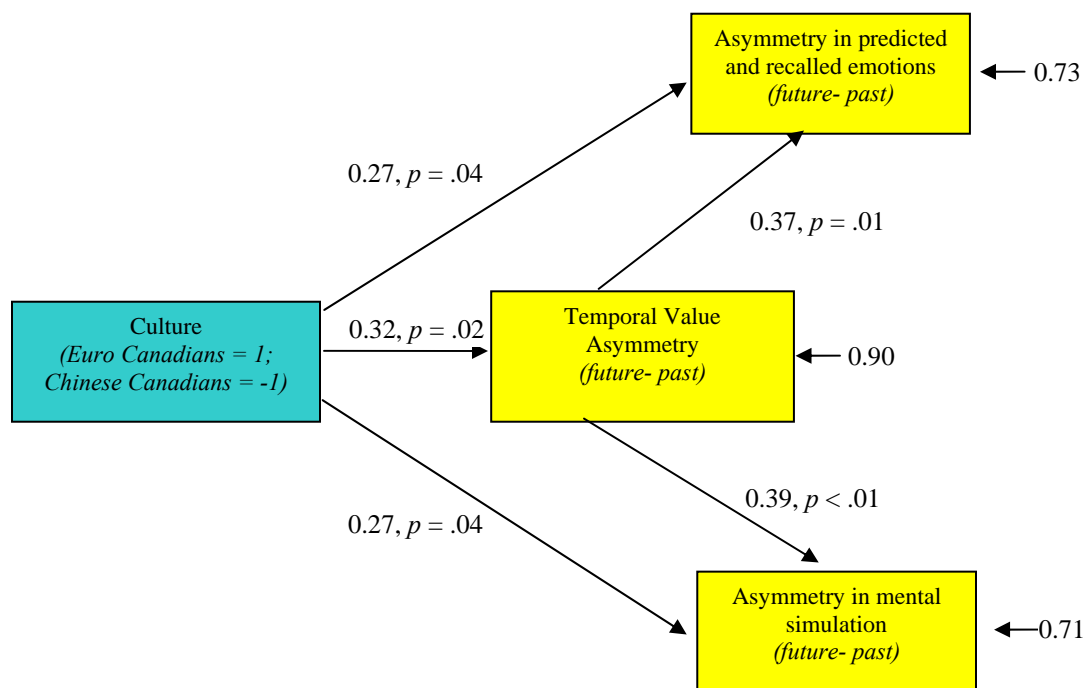
marginal effect on the temporal value asymmetry. To the extent that participants predicted that they would be happier on the future Thanksgiving Day than they remembered they were on the past Thanksgiving Day, they requested slightly more monetary compensation for not being able to enjoy the future Thanksgiving Day than for not being able to enjoy the past Thanksgiving Day,  $t = 1.91, p = .06$ . Similarly, the asymmetric mental simulations, in turn, had a significant effect on the temporal value asymmetry. The more clearly they mentally simulated the future Thanksgiving Day than the past Thanksgiving Day, the more value they attached to the future Thanksgiving Day than to the past Thanksgiving Day,  $t = 2.26, p = .03$ . When the mediation effect of the predicted and recalled emotions, and that of the mental simulations were taken into account, the cultural influence on the temporal value asymmetry was not significant,  $t = 0.73, p = .46$ , indicating that the cultural differences in the temporal value asymmetry effect were fully mediated by the two mediators.



**Figure 6: Cultural influences on the temporal value asymmetry effect.**

I proposed that culture had influence on the predicted and recalled emotions, as well as on the mental simulations, which in turn caused the temporal value asymmetry effect. Because I did not manipulate the predicted and recalled emotions, and the mental simulations, the reversed causal relationship (i.e., culture caused temporal value asymmetry, which in turn caused the predicted and recalled emotions, as well as the mental simulations.) was not ruled out by the design. Therefore, I tested the model where the causal directions were reversed. In the reversed model, each latent variable was indicated by one measured variable. Figure 7 shows the results of the reversed model. Culture had a significant effect on the temporal value asymmetry effect,  $t = 2.32, p = .02$ . Relative to Chinese Canadians, European Canadians asked more monetary compensations for missing the future Thanksgiving Day than for missing the past Thanksgiving Day. Furthermore, the temporal value asymmetry, in turn, had a significant effect on the asymmetry in predicted and recalled emotions,  $t = 2.91, p = .01$ . To the extent that participants asked more compensation for missing the future Thanksgiving Day than the past Thanksgiving Day, they believed that they would be happier on the future Thanksgiving Day than on the past Thanksgiving Day. Similarly, the temporal value asymmetry had a significant effect on the asymmetry in mental simulations,  $t = 3.11, p < .01$ . To the extent that participants requested more compensation for missing the future Thanksgiving Day than missing the past Thanksgiving Day, they mentally simulated the future Thanksgiving Day more clearly than the past Thanksgiving Day. Culture had significant effect on the asymmetry in predicted and recalled emotions after controlling the temporal value asymmetry,  $t = 2.08, p = .04$ . Relative to Chinese

Canadians, European Canadians predicted that they would be happier on the future Thanksgiving Day than on the past Thanksgiving Day. Culture also had a significant effect on the asymmetry in mental simulations when the temporal value asymmetry was controlled for,  $t = 2.13, p = .04$ . Relative to Chinese Canadians, European Canadians mentally simulated the future Thanksgiving Day more clearly than the past Thanksgiving Day.



**Figure 7: Cultural influences on the temporal value asymmetry (reversed model).**

Statistically, the proposed model and the reversed model were equally plausible. However, because past research has shown that people in North America value objects and events based on emotions and mental simulations (Caruso et al. in press; Cialdini, 2001; Hsee & Rottenstreich, 2004; Van Boven & Ashworth, 2007), it is reasonable to assume that the causal direction also goes from emotions and mental simulations to

values in a cross-cultural context. Thus, although the reversed model is plausible, I argue that cultural effects on temporal value asymmetry were accounted for by predicted and recalled emotions, and by mental simulations.



## Chapter 3

### General Discussion

Among the four studies, I had a few simple comparisons between the amount of money participants attached to the future events and the past events within each culture that were either at marginal significant levels, or didn't reach significant levels. Rosenthal (1991) argued that meta-analyses can be conducted based on as few as two studies. Thus, I conducted meta-analysis with the four studies I had to examine if the temporal value asymmetry effect is reliable within each culture. I adopted the combining  $z$ 's approach to combine the levels of significance for the temporal value asymmetry effect within each culture across the four studies. Specifically, I calculated the  $z$ -scores associated with each significant level and combined them. Because the directions of the temporal value asymmetry across the four studies were same within each culture, I assigned the same sign for the  $z$ -scores in the combination within each culture. The combined sample has 308 European Canadians and 236 Chinese or Chinese Canadians. I weighted the four studies equally. The results showed that overall, European Canadians attached more value to future events than to identical past events,  $z$  for combination = 3.66,  $p < .001$ , mean Cohen's  $D = .47$ . In contrast, Chinese and Chinese Canadians attached more value to past events than to identical future events,  $z$  for combination = 3.84,  $p < .001$ , mean Cohen's  $D = .56$ . The analysis also provided *fail-safe number*, which refers to the number of studies with zero effect size that need to have to eradicate the observed effect. The fail-safe number is 15.82 for European Canadians and 17.85 for Chinese and Chinese Canadians, indicating that one need to have 15.82 unpublished studies with zero effect size to eradicate the typical temporal value

asymmetry effect for European Canadians and 17.85 unpublished studies with zero effect size to eradicate the reversed temporal value asymmetry effect for Chinese and Chinese Canadians.

Thus, the four studies provided converging evidence that European Canadians tend to attach more value to future events than to past ones, whereas Chinese and Chinese Canadians tend to attach more value to past events than to similar future ones. This pattern was true for hypothetical scenarios such as purchasing a gift to show appreciation (Study 1a) and receiving payment for doing a job (Study 1b), as well as for real life events such as the reading week break (Study 2) and the Thanksgiving holiday (Study 3). Furthermore, the cultural effects existed not only for scenarios in which people received money (Studies 1b and 3) but also for scenarios in which people gave away money (Studies 1a and 2), suggesting that the cultural effects on the temporal value asymmetry was not affected by the perspective (gaining or losing money) that people took. I also examined potential mechanisms for the cultural differences in the temporal value asymmetry effect and found two factors, the emotions and the mental simulations associated with future and past events, mediated the cultural influences on the temporal value asymmetry effect.

I believe that one important reason why the asymmetric predicted-recalled emotions and mental simulations found in North America were reversed in the Chinese context was the different temporal orientations. Relative to European Canadians, Chinese Canadians were more past oriented than future oriented. Therefore, they focused more on the past Thanksgiving Day than on the future one. As a result, they believed that they

were happier on the past Thanksgiving Day than on the future one and mentally simulated the past Thanksgiving Day more clearly than the future one.

Affective forecasting, the tendency to overestimate the duration and strength of affective reactions to future events (Buehler & McFarland, 2001; Lam et al., 2005), might also contribute to the reversed asymmetry in the predicted-recalled emotions in Chinese context. East Asians, including Chinese, Japanese, and Koreans, are less susceptible to the affective forecasting bias. East Asians tend to predict less extreme affective responses to future events than European North Americans do. Thus, the affective forecasting bias might have contributed somewhat to the cultural differences in the asymmetry in the predicted and recalled emotions.

The reversed asymmetry in the mental simulations for Chinese Canadians is consistent with Ji et al.'s (2007) finding on cultural differences in mental representations of the past. As mentioned earlier, they found that compared to Canadians, Chinese had a more detailed mental representation of a past day, which may partially explain why the asymmetric mental simulations among European Canadians were reversed for Chinese people.

### *Implications*

I found that European Canadians tend to attach more value to future events than to similar past ones with equal temporal distance, whereas Chinese tend to place more value on past events than on similar future ones. The finding has important theoretical and practical implications.

Based on the temporal value asymmetry effect in North America, Caruso et al. (in press) argued that the temporal value asymmetry effect should be added as the third dimension to the classical prospect theory of valuation that was proposed by Kahneman and Tversky (1979). Prospect theory specifies how the magnitude and valence (gain or loss) of a future event affect our valuation on it. My findings suggested that we should be very cautious to add the temporal value asymmetry effect into the prospect theory of valuation because the temporal framing effect on the valuation was completely different in Chinese culture and in North American culture. The fit between culture and the temporal framing (past versus future) determines how people value an event. People tend to attach more value to an event when the culture one belongs to fits the time condition (i.e., Chinese culture with a past event or North American culture with a future event) than when the culture and the time condition do not fit (i.e., Chinese culture with a future condition or North American culture with a past condition). More research is needed to extensively examine the fit function and how it can be integrated into the prospect theory of valuation.

The finding has significant practical implications as well. For example, in advertisements, information regarding the past may be perceived by Chinese as being more important than information regarding the future. Cheng and Schweitzer (1996) compared television commercials in United States and in China and found that compared with American TV advertisements, advertisements on Chinese TV were more likely to emphasize the past and being historical.

The results may shed light on the cultural influences on the acceptance of innovations. Because European North Americans tend to assign greater value to future objects and events and over predict the emotions associated with these future events, they may be willing to pay more money for innovations and upgraded products. For example, Zhao and Meyer (2005) found that American consumers exhibited excessive willingness to pay for new features of an innovated product before they owned the product than after owning it. In contrast, Chinese people tend to value past events and experiences more than future ones. As a result, they may be willing to stick to the products they used before (Yau, 1988) and show less willingness to pay for the innovations.

The finding also suggests that people can adopt different strategies in different cultures to benefit themselves when estimating the value of an object or event. For example, accident victims in North America may be wise to ask for compensation before they recover (the suffering is in the future), whereas accident victims in China may get more money if they request the compensations after they recover from the injury (the suffering is in the past). Indeed, Caruso et al. (in press) found that American participants awarded a greater amount of compensation for a car accident victim when the decision was made before the victim's recovery than when it was made after the recovery. Similarly, consumers in North America may be able to take advantage if they can use a product or service first and negotiate the price later assuming North American consumers as well as the salespeople tend to devalue the past products or service, whereas Chinese consumers may end up paying more if they do the same thing because Chinese consumers and salespeople tend to attach more value to past products or service.

People should be made aware of the cultural differences in the temporal value asymmetry effect in international collaborations. Otherwise, it may cause conflict. North Americans may tend to focus on the future and ignore the issues in the past, whereas Chinese may insist that the past is the basis for the development of the future. For example, Chinese people may believe that a contribution in the past is very important and that the person who contributed in the past should receive higher payment. In contrast, North Americans may argue that the money should go to the person who can make contributions in the future.

#### *Limitations and Future Research*

The four studies I conducted have some limitations. First, I did not directly measure people's temporal orientations. I argued that the reason why culture had an impact on the temporal value asymmetry effect was because of the different temporal orientations in different cultures. However, I did not directly test this hypothesis. Future research should include the temporal orientation measure in this line of research.

Second, in Study 3 where I tried to examine the mediation effect of the online emotion responses on the cultural differences in the temporal value asymmetry, the online emotion responses were potentially contaminated by other events, such as the exams they had at that time. I do not know if Chinese people, just like European Canadians, also had more extreme online emotion responses while thinking about future events than while thinking about past ones. Future research should investigate the effect of online emotion responses with a better design and a better timing for data collection.

Third, in Study 3, I didn't rule out the reversed causal directions in the model. It is possible that culture has a direct effect on temporal value asymmetry, which in turn has impact on predicted and recalled emotions, and on mental simulations. Future research needs to examine the causal directions by different designs, such as manipulating the predicted and recalled emotions, and mental simulations.

Another limitation is that the number of participants in Study 3 was very small, which might make the mediation analysis less reliable. The number of participants should be increased when conducting similar studies in the future.

Future research also may examine how the temporal value asymmetry effect may be variant within a culture. Across my four studies, participants were all undergraduate students who were probably more future oriented and less past oriented than other people in the same culture. Thus, generalizing the findings based on undergraduate students to other populations is questionable. For example, older people may be less future oriented and more past oriented than young people are. As a result, the typical temporal value asymmetry effect among European North American students may disappear or even be reversed for elder North American people. Similarly, the reversed temporal value asymmetry effect among Chinese students may become stronger for elder Chinese people.

Future research may examine how people from different cultures may differ in their global value judgment for a group of events. Oishi (2002) found that compared to Japanese participants, European Americans tended to recall stronger positive emotions when a group of past events were judged globally. Because recalled emotions play a role

in the temporal value asymmetry effect, the cultural differences in temporal value asymmetry for single events observed in the current research may be different when people value a group of events globally.



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## Appendix A: Questionnaires for Study 1a

Past condition:

**Read the scenario below carefully and answer the following questions**

### A Vacation

Imagine that you were talking with a friend about your plan to take a week-long vacation in Vancouver. John, your acquaintance, happened to overhear your conversation. He mentioned that he had a well-furnished apartment in Vancouver that you were more than welcome to stay in. You felt that this was a wonderful opportunity for your vacation and agreed to this generous offer.

Now you have just returned home after the week-long vacation in Vancouver. In order to show your appreciation for John's generosity, you decide to get him a gift. You go to a store to order the gift and it will be delivered to John's house for free in 10 days. How much do you plan to spend and what do you plan to buy for John?

How much do you plan to spend? \$\_\_\_\_\_ (give a specific amount, not a range)

What do you plan to buy? \_\_\_\_\_

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Questionnaire for Study 1a, future condition:

**Read the scenario below carefully and answer the following questions**

**A Vacation**

Imagine that you were talking with a friend about your plan to take a week-long vacation in Vancouver. John, your acquaintance, happened to overhear your conversation. He mentioned that he had a well-furnished apartment in Vancouver that you were more than welcome to stay in. You felt that this was a wonderful opportunity for your vacation and agreed to this generous offer.

Now you are about to leave for your vacation and will return home in one week. In order to show your appreciation for John's generosity, you decide to get him a gift. You go to a store to order the gift and it will be delivered to John's house for free in 10 days. How much do you plan to spend and what do you plan to buy for John?

How much do you plan to spend? \$\_\_\_\_\_ (give a specific amount, not a range)

What do you plan to buy? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## Appendix B: Questionnaires for Study 1b

Past condition:

**Read the scenario below carefully and answer the following questions**

### A Job

Imagine that you agreed to work on Campus for 5 hours to earn some extra money. You worked on the Saturday one month ago and were paid in cash right upon completion. The job entailed entering data from a stack of papers into a computer data base. There were no special skills required.

(a) How much do you think you should have been paid for the five hours of work you did? Please indicate the total amount of money that would be fair for you to have received for the work below?

\$ \_\_\_\_\_ (give a specific amount, not a range)

(b) How difficult do you think the job is? (Check one circle)

0	1	2	3	4	5	6
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Not difficult at all						Extremely difficult

(c) How qualified do you think you are for the work? (Check one circle)

0	1	2	3	4	5	6
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Not qualified at all						Extremely qualified

Questionnaire for Study 1b, future condition:

**Read the scenario below carefully and answer the following questions**

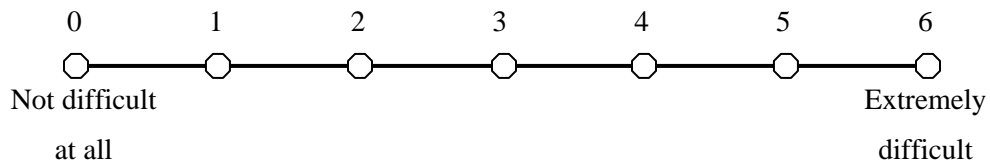
**A Job**

Imagine that you agreed to work on Campus for five hours to earn some extra money. You will work on the Saturday one month from now and will be paid in cash right upon completion. The job entails entering data from a stack of papers into a computer database. There are no special skills required.

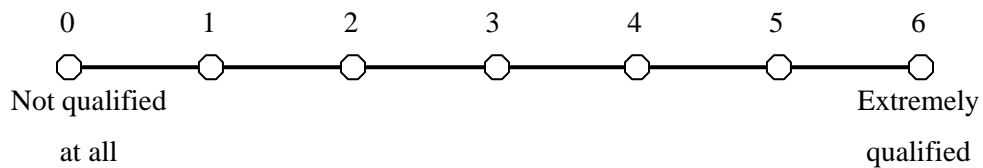
(a) How much do you think you should be paid for the five hours of work you will do? Please indicate the total amount of money that would be fair for you to receive for the work?

\$ \_\_\_\_\_ (give a specific amount, not a range)

(b) How difficult do you think the job is? (Check one circle)



(c) How qualified do you think you are for the work? (Check one circle)





## Appendix C: Questionnaires for Study 2

Past condition:

1. How do you intend to participate in this study?

\_\_\_\_\_ I would like to seriously participate.

\_\_\_\_\_ I would like to look at the pages only.

2. Leave your Queen's email (for example, 4tg4@queensu.ca) here. The email address is used for giving course credit or lottery according to your choice in the first part of the study. Thanks!

\_\_\_\_\_

**We need your complete concentration. If you have music or video in the background, please turn them off. Read carefully and follow the instructions. Do not skip any questions or pages. Don't talk to other person when you work on the questionnaire. Thanks!**

3. The past Reading Week (Feb 18 to 22, 2008) is about two weeks ago from now. Please spend a few minutes to contemplate your past Reading Week. Think about your past Reading Week as vividly as you can. For example, what did you do, where did you go, and whom did you visit during that week? Please write down the things that come to your mind below:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

4. How much are you willing to pay to extend your Reading Week by three days, assuming that you could extend your Reading Week without missing any of your other obligations? (give a specific number in dollars, not a range)? \_\_\_\_\_

5. Gender: \_\_\_\_\_

6. Age: \_\_\_\_\_

7. Ethnicity: \_\_\_European North Americans; \_\_\_ Chinese/Chinese North Americans; \_\_\_ Others (if so, please specify): \_\_\_\_\_

Future condition:

1. How do you intend to participate in this study?

\_\_\_\_\_ I would like to seriously participate.

\_\_\_\_\_ I would like to look at the pages only.

2. Which compensation do you want to choose (Select one)?

\_\_\_\_\_ 0.5 Course Credit

\_\_\_\_\_ Lottery to win one of four \$25.00 cash

3. Leave your Queen's email (for example, 4tg4@queensu.ca) here. The email address is used for giving course credit or lottery. Thanks!

\_\_\_\_\_

**We need your complete concentration. If you have music or video in the background, please turn them off. Read carefully and follow the instructions. Do not skip any questions or pages. Don't talk to other person when you work on the questionnaire. Thanks!**

4. Reading Week (Feb 18 to 22, 2008) is about two weeks away from now. Please spend a few minutes to contemplate your upcoming Reading Week. Think about your upcoming Reading Week as vividly as you can. For example, what will you do, where will you go, and whom will you visit during that week? Please write down the things that come to your mind below:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

5. How much are you willing to pay to extend your Reading Week by three days, assuming that you could extend your Reading Week without missing any of your other obligations? (give a specific number in dollars, not a range)? \_\_\_\_\_

6. Gender: \_\_\_\_\_

7. Age: \_\_\_\_\_

8. Ethnicity: \_\_\_European North Americans; \_\_\_ Chinese/Chinese North Americans; \_\_\_ Others (if so, please specify): \_\_\_\_\_







