

Culture and decision-making: Investigating cultural variations in the East Asian and North American online decision-making processes

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Research in cross-cultural psychology suggests that East Asians hold holistic thinking styles whereas North Americans hold analytic thinking styles. The present study examines the influence of cultural thinking styles on the online decision-making processes for Hong Kong Chinese and European Canadians, with and without time constraints. We investigated the online decision-making processes in terms of (1) information search speed, (2) quantity of information used, and (3) type of information used. Results show that, without time constraints, Hong Kong Chinese, compared to European Canadians, spent less time on decisions and parsed through information more efficiently, and Hong Kong Chinese attended to both important and less important information, whereas European Canadians selectively focused on important information. No cultural differences were found in the quantity of information used. When under time constraints, all cultural variations disappeared. The dynamics of cultural differences and similarities in decision-making are discussed.

Key words: analytic versus holistic thinking styles, cultural difference, cultural similarity, decision-making, information search, time pressure.

Introduction

In everyday life, people must make decisions on a regular basis; some are simple decisions such as what to eat for dinner and some are life-changing decisions such as which career to pursue or whom to marry. Adding complexity to these decisions, situational constraints often surround and cloud the nature of the decisions. As one example, how we view and select an apartment can be very different when we are the only person looking at the apartment (no time constraint) compared to when other people are also looking at the apartment and may take away our choice at any time (time constraint). Furthermore, cultural background can

play an important role in how we make our decisions, with differing cultural worldviews sometimes changing the nature of decisions and the processes involved in making those decisions. The current research aims to investigate East Asian and North American decision-making processes, elucidating cultural similarities and differences in the *online processes* (the way people reach their decisions) of decision-making, in situations where time constraints are/are not evident.

Culture and thinking styles

Prior research has supported the existence of differential thinking styles between East Asians and North Americans (e.g. Nisbett, 2003; Nisbett & Masuda, 2003; Nisbett, Peng, Choi & Norenzayan, 2001; for a review, see Ishii, 2013). Whereas East Asians (i.e. Japanese, Chinese, Koreans, etc.) tend to be holistic: attending to all elements in a field, making less use of formal logic and strict categorizations, and showing 'dialectical' (contradictory, changing, and holistic) reasoning (Spencer-Rodger, Boucher, Mori, Peng, & Wang, 2009), North Americans (i.e. European Americans and European Canadians, etc.) tend to be analytic: attending mostly to focal objects, using formal logic and strict categorizations, and showing more consistent, focused reasoning patterns (Nisbett *et al.*, 2001). Numerous studies have demonstrated that these differential thinking styles influence psychological processes, including attribution (e.g. Chiu, Morris, Hong & Menon, 2000; Choi & Nisbett,

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1998), categorization (e.g. Ji, Zhang & Nisbett, 2004), reasoning (e.g. Buchtel & Norenzayan, 2008; Norenzayan, Smith, Kim & Nisbett, 2002), and attention (e.g. Chua, Boland & Nisbett, 2005; Masuda, Gonzalez, Kwan & Nisbett, 2008; Masuda & Nisbett, 2001; Miyamoto, Nisbett & Masuda, 2006).

Culture and decision-making

Evidence also shows that culture influences our psychological processes in the decision-making domain, showing clear cultural differences in final decisions made for East Asian and North American cultures (e.g. Briley, Morris & Simonson, 2000; Ji, Zhang & Guo, 2008; Lindridge & Dibb, 2003; Maddux & Yuki, 2006; Tse, Lee, Vertinsky & Wehrung, 1988). Extending these findings, recent researchers have also started to investigate how culturally specific thinking styles influence the processes of how East Asians and North Americans reach their decisions (e.g. Choi, Dalal, Kim-Prieto & Park, 2003; Chu & Spire, 2008). We contend that to truly understand differences in decision-making for these two cultures, research needs to further investigate online processes involved in their decisions. Based on previous cross-cultural research, we identified three important components of online decision-making processes: (1) information search speed, (2) quantity of information used, and (3) type of information used.

Information search speed. Past studies suggest that East Asians are chronically exposed to information-rich cultural products (e.g. Masuda *et al.*, 2008; Senzaki, Masuda, & Ishii, 2014; Wang, Masuda, Ito & Rashid, 2012) and environments (Miyamoto *et al.*, 2006), as compared to North Americans. Findings also suggest that East Asians have developed the ability to parse through complex information at great speed (e.g. Wang *et al.*, 2012): Information search speeds for mock webpages were faster for East Asians than North Americans, even when webpages were information-rich. These results suggest that chronic exposure to information-rich East Asian cultural environments leads East Asians to develop culturally appropriate cognitive skills to support fast, efficient information processing. Extending these findings, we expected that cultural variations in information search speeds would be observable in the context of decision-making, with East Asians making decisions in less time than their North American counterparts. In addition, we expected to find that East Asians would also show *efficiency* at searching through information in the decision-making process, parsing through similar quantities of information faster than European Canadians.

Quantity of information used. Cross-cultural studies in judgement and decision-making also suggest that East

Asians are more likely than North Americans to access more information before reaching decisions (e.g. Choi *et al.*, 2003; Ji *et al.*, 2008; Spina *et al.*, 2010). For example, investigating how financial decisions are made for Chinese and European Canadians, Ji *et al.* (2008) demonstrated that Chinese consider more information when making stock market decisions, both historical and recent, whereas European Canadians selectively focus on recent information. Choi *et al.* (2003) showed similar findings, looking at information taken into account to determine the motive of a hypothetical murder case, finding that Koreans tend to take into account more available information compared to Americans. Spina *et al.* (2010) also showed that in searching for causes of a given phenomenon, East Asians tend to deliberate more information by considering potential associations to multiple antecedent causes, whereas North Americans tend to focus on a few causes. We expected that East Asians would show similar processes at work in their online decision-making processes, seeking a greater amount of information, relative to North Americans, to reach their decisions.

Type of information used. In addition to these findings, previous cross-cultural research in attention has shown that East Asians tend to allocate their attention to both salient foreground objects and background information, whereas North Americans mainly focus on salient foreground objects (e.g. Masuda & Nisbett, 2001). Interestingly, Choi *et al.* (2003) showed that this attention bias extends to the decision-making domain for their murder motive study, finding that Koreans tend to consider more information, both relevant and not, whereas Americans selectively focus only on the most relevant pieces of information. These findings suggest that East Asian and North American attention styles lead the two groups to treat information in different ways. We expected that such culturally specific attention styles would also be shown in their online decision-making processes, with East Asians attending to both information they perceived to be important and less important, and North Americans focusing on information perceived to be important.

Situational constraints and culture

In order to better understand the dynamics of cultural influence, it is also important to investigate the effects of situational constraints. In fact, many cross-cultural studies suggest that cultural variation *is* sensitive to situational constraints (e.g. Ito, Masuda & Hioki, 2012; Ito, Masuda & Li, 2013; Li, Masuda & Russell, 2014; Masuda & Kitayama, 2004; Norenzayan, Choi & Nisbett, 2002; Senzaki *et al.*, 2014). With this in mind, we chose to investigate how time constraints affect cultural variations

in online decision-making processes. Time pressure seemed particularly relevant as previous research by Ito and colleagues suggested that time constraints affect judgements of emotion in facial lineups (Ito *et al.*, 2012, 2013), with non-timed constrained judgements showing cultural differences and time constrained judgements showing cultural similarities. They argued that time constraints take away opportunities for participants to categorize images in culturally specific ways.

We expected a similar effect for time constraints on decision-making. While we thought people would show online decision-making processes related to their culturally specific thinking styles without time constraints, we expected that people would not be afforded the room to incorporate these thinking styles into how they made decisions under time constraints. When subject to time constraints, we *must* decide quickly and efficiently or chances *will* be lost. For example, when we take too much time choosing an apartment and others are also looking at the apartment, the apartment may be taken before we have a chance to choose. Regardless of decision-making strategies naturally learned through cultural experiences, we need to quickly make a decision, sample less information, and focus on the most important information at hand. With this reasoning in mind, we expected that time constraints would erase cultural variations in online decision-making processes.

Overview of hypotheses and design

To summarize, we hypothesized that when making decisions: East Asians would show greater information search speed – (1a) spending less time and (1b) parsing through information more efficiently – than North Americans, (2) East Asians would use more information than North Americans, and (3) East Asians would attend to both important and less important information whereas North Americans would focus on important information. We expected that these cultural variations would disappear under time constraints as this limits access to pre-existing culturally specific thinking styles.

As we were interested in investigating the ‘online’ processes of decision-making, we used the standard information board paradigm (Payne, 1976), which allows us to investigate online aspects of the information search process used during decision-making processes. We made best decisions objectively clear, in an attempt to control for possible differences in the two cultures’ final decisions – keeping both groups’ perceptions of the task as similar as possible. Similar controlling procedures have been used in other cultural psychology research to focus on differences in online psychological processes (Hedden, Ketay, Aron, Markus & Gabrieli, 2008; Masuda, Russell, Chen, Hioki & Caplan, 2014).

Method

Participants

We recruited 83 Chinese university students (42 males, 41 females; $Age_{mean} = 20.68$, $SD = 1.27$) from the Chinese University of Hong Kong and 77 European Canadian university students (24 males, 53 females; $Age_{mean} = 19.12$, $SD = 3.07$) from the University of Alberta. In addition, participants were recruited from a wide range of disciplines to allow for more representative samples from both universities.

Design and procedure

Participants arrived at the laboratory in groups of four to 15 and were individually seated in front of a computer, where they completed all tasks. On the computers, participants were randomly assigned to no time constraint and time constraint conditions. At the beginning of the task, participants were asked to imagine that they had to find an apartment to live in next semester. They were told that they first needed to rate the perceived importance of six apartment attributes (rent, suite features, size, neighbourhood, transportation, and building amenities) on a six-point Likert scale ranging from 1 (*not at all important*) to 6 (*very important*). After rating apartment attributes, participants were asked to engage in the actual apartment selection task (six times in total). Participants were provided information on how to carry out the selection tasks, in combination with a manipulation of time constraint. For the time constraint condition, participants were reminded that they needed to make their decision quickly because the best option would be taken by other people if they took a long time to make their decision – no such reference to time constraint was included in the no time constraint condition.

For each selection task, a screen displayed a grid showing five possible apartments and six apartment attributes, presented as row and column headings, respectively (see Appendix for the example). Predetermined information for each cell was initially hidden, but (secretly) contained information about the quality of apartment attributes – from *very poor* to *very good*. Participants were told that they could access as much or as little information as necessary to make their decisions by clicking target cells on the grid to reveal hidden information. During this information search process, the amount of time spent viewing apartment attributes and the information participants opened were recorded. This data were subsequently analyzed in combination with rating data to determine the time spent on decisions, and the quantity and type of information participants sought.

Results

No main effects of gender, or gender interactions with culture or time manipulation conditions were found to be significant; therefore, all analyses are collapsed across gender. In addition, as expected, no differences in final decisions were found.

Information search speed: time spent on decisions

We averaged the time spent viewing apartment attributes across the six selection tasks. A 2 (Culture: European Canadians vs. Hong Kong Chinese) \times 2 (Time manipulation condition: No time constraint vs. Time constraint) ANOVA revealed that the main effects of culture and time manipulation condition were significant. In general, Hong Kong Chinese participants spent less time ($M = 33.35$ seconds, $SD = 12.00$ seconds) than European Canadian participants ($M = 40.26$ seconds, $SD = 16.30$ seconds) [$F(1,156) = 8.91, p < 0.01, \eta_p^2 = 0.05$]. Also, participants in the no time constraint condition spent more time on the tasks ($M = 39.87$ seconds, $SD = 13.89$ seconds) compared to those in the time constraint condition ($M = 33.40$ seconds, $SD = 14.68$ seconds) [$F(1,156) = 8.38, p < 0.01, \eta_p^2 = 0.05$]. The interaction of culture and time manipulation condition was also significant [$F(1,156) = 4.49, p < 0.05, \eta_p^2 = 0.03$]. In the no time constraint condition, Hong Kong Chinese participants spent less time ($M = 34.23$ seconds, $SD = 9.49$) than European Canadian participants ($M = 45.38$ seconds, $SD = 15.33$), $F(1, 79) = 15.39, p < 0.001, \eta_p^2 = 0.16$. This cultural difference disappeared in the time constraint condition, $F < 1, p = 0.57$. Furthermore, European Canadian participants in the time constraint condition ($M = 34.42$ seconds, $SD = 15.58$) spent less time than those in the no time constraint condition ($M = 45.38$ seconds, $SD = 15.33$) [$F(1,75) = 9.64, p < 0.01, \eta_p^2 = 0.11$], whereas there was no difference across conditions among Hong Kong Chinese, $F < 1, p = 0.52$ (see Fig. 1).

Information search speed: information parsing efficiency

To provide a measure of information parsing efficiency, we combined data on time spent on decisions and quantity of information used. For quantity of information used, we averaged the number of cells that were opened (ranging from 0 to 30 cells for each task) between the six selection tasks, calculating information parsing efficiency by dividing the quantity of information used by the time spent on decisions, giving the quantity of information participants processed per second. We conducted a 2 (Culture: European Canadians vs. Hong Kong Chinese) \times 2 (Time

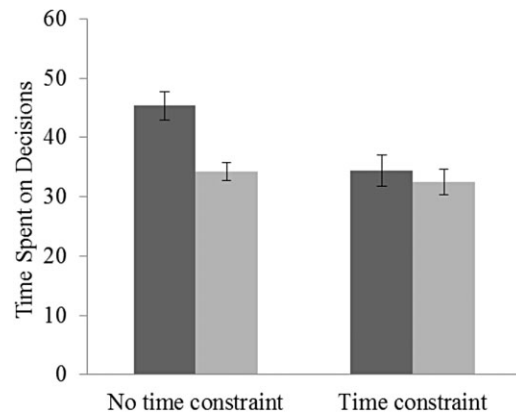


Figure 1 Participants' mean response time during the decision-making task for the no time constraint and time constraint conditions (*with standard error bars*). ■, European Canadians; ■, Hong Kong Chinese.

manipulation condition: No time constraint vs. Time constraint) ANOVA, finding a significant main effect of culture, $F(1, 156) = 6.91, p < 0.05, \eta_p^2 = 0.04$, which indicates that Hong Kong Chinese parsed information more efficiently ($M = 0.66, SD = 0.25$) than European Canadians ($M = 0.56, SD = 0.24$). The main effect of the time manipulation condition was non-significant, $F < 1, p = 0.70$. Most importantly, the interaction of culture and the time manipulation condition was significant, $F(1, 156) = 9.77, p < 0.01, \eta_p^2 = 0.06$. Without time constraints, Hong Kong Chinese parsed information more efficiently ($M = 0.71, SD = 0.28$) than European Canadian participants ($M = 0.49, SD = 0.15$), $F(1, 79) = 19.47, p < 0.001, \eta_p^2 = 0.20$. This cultural difference disappeared with time constraints, $F < 1, p = 0.74$. Moreover, European Canadian participants in the time constraint condition ($M = 0.63, SD = 0.30$) parsed information more efficiently than those in the no time constraint condition ($M = 0.49, SD = 0.15$) [$F(1,75) = 6.46, p < 0.05, \eta_p^2 = 0.08$] whereas Hong Kong Chinese participants in the time constraint condition ($M = 0.61, SD = 0.22$) parsed information marginally less efficiently than those in the no time constraint condition ($M = 0.71, SD = 0.28$) [$F(1,81) = 3.63, p = 0.06, \eta_p^2 = 0.04$] (see Fig. 2).

Quantity of information used

In a 2 (Culture: European Canadians vs. Hong Kong Chinese) \times 2 (Time manipulation condition: No time constraint vs. Time constraint) ANOVA analysis, we found a significant main effect of the time manipulation condition, $F(1,156) = 10.04, p < 0.01, \eta_p^2 = 0.06$, which showed a pattern of participants using less information in the time

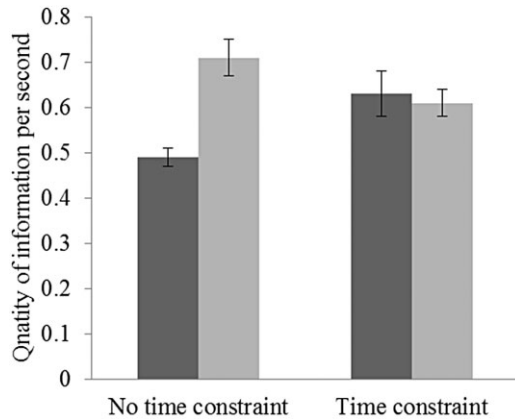


Figure 2 Quantity of information participants parsed per second during the decision-making task for the no time constraint and time constraint conditions (*with standard error bars*). ■, European Canadians; ■, Hong Kong Chinese.

constraint condition ($M = 18.63$, $SD = 6.83$) compared to those in the no time constraint condition ($M = 22.11$, $SD = 6.84$). The main effects of culture and its interaction with time manipulation were not significant, $F_s < 2$, $p_s > 0.20$.

Type of information used

Following previous work (e.g. Choi *et al.*, 2003; Masuda & Nisbett, 2001), we also examined whether the type of information (the perceived importance of information to participants) opened by Hong Kong Chinese and European Canadians differed (no cultural variation in average perceived importance of attributes was found between the two cultures, $p = 0.26$). To achieve this goal, we focused on the strength of the association between the perceived importance of attributes and the quantity of information participants sought for attributes. We created an association index for each participant, ranging from -1 to 1 , by computing the correlation value of each participant's perceived importance of attributes and the number of cells for corresponding attributes that the participant opened. A more positive index indicates that participants selectively attended to the information they perceived to be more important during their decision-making process.

A 2 (Culture: European Canadians vs. Hong Kong Chinese) \times 2 (Time manipulation condition: No time constraint vs. Time constraint) ANOVA analysis showed that the importance of attributes had a more powerful role in guiding information searches in the time constraint condition ($M = 0.56$, $SD = 0.37$) compared to the no time con-

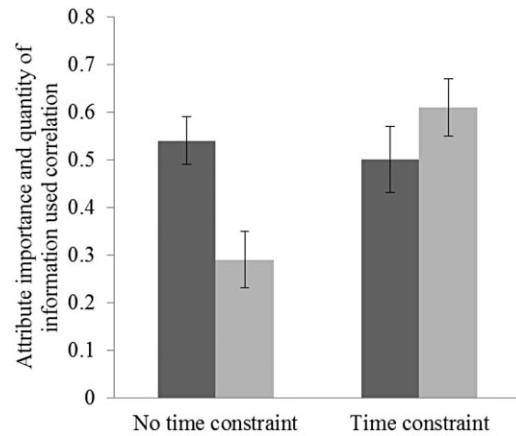


Figure 3 Correlation between perceived importance of attributes and quantity of information used during the decision-making task for the no time constraint and time constraint conditions (*with standard error bars*). ■, European Canadians; ■, Hong Kong Chinese.

straint condition ($M = 0.42$, $SD = 0.37$), $F(1, 154) = 5.87$, $p < 0.05$, $\eta_p^2 = 0.04$, but the main effect of culture was not significant, $F < 2$, $p = 0.22$. A significant interaction of culture and the time manipulation condition [$F(1, 154) = 10.14$, $p < 0.01$, $\eta_p^2 = 0.06$] revealed that European Canadian participants were more likely to be guided by the importance of attributes ($M = 0.54$, $SD = 0.33$) than Hong Kong Chinese participants ($M = 0.29$, $SD = 0.37$) in the no time constraint condition [$F(1, 79) = 10.82$, $p < 0.01$, $\eta_p^2 = 0.12$] whereas no cultural difference was observed in the time constraint condition [$F < 2$, $p = 0.19$]. These effects remained when controlling for time spent viewing attributes. Furthermore, there was no difference across conditions among European Canadians, $F < 1$, $p = 0.60$, whereas Hong Kong Chinese participants were more likely to be guided by the importance of attributes in the time constraint condition ($M = 0.61$, $SD = 0.36$) than those in the no time constraint condition ($M = 0.29$, $SD = 0.37$) [$F(1, 80) = 16.30$, $p < 0.001$, $\eta_p^2 = 0.17$] (see Fig. 3).

Discussion

The current study allows a deeper understanding of how culture affects the decision-making process, finding that when not constrained by time (1a) Hong Kong Chinese spent less time on decisions than European Canadians, (1b) Hong Kong Chinese parsed information more efficiently than European Canadians, and (3) Hong Kong Chinese attended to information they perceived as both important and less important, whereas European Canadians focused on information they perceived as important. However,

unexpectedly, (2) there was no cultural variation in the quantity of information used by Hong Kong Chinese and European Canadians. In addition, we found that (4) when under time constraints, cultural variations disappeared, with both cultures showing fast decision times, less information use, and focus on perceived important information.

Culture and online decision-making processes

Conceptually replicating prior findings in attention and cultural thinking styles (Nisbett *et al.*, 2001; Wang *et al.*, 2012) in the decision-making realm, the current findings show that when there are no time constraints, East Asians are faster in their information search processes than North Americans. We interpret these findings to show the result of East Asians' chronic exposure to information-rich products and situations – East Asians are well practiced at dealing with information-rich contents, efficiently searching through vast amounts of information at great speed. On the other hand, North Americans, who are not culturally afforded extensive practice in dealing with information-rich products and situations, find themselves taking longer to attend to and take in required information (Miyamoto *et al.*, 2006; Wang *et al.*, 2012). As a default strategy, Hong Kong Chinese, as effective information searchers, spend less time on decisions and parse through information more efficiently than European Canadians.

Likewise, we show that culturally appropriate attention biases are also at work in East Asian and North American decision-making processes. East Asians, as holistic thinkers, have been shown to attend to both foreground and background information (Masuda & Nisbett, 2001). Such biases seem to generalize to how East Asians view information related to decisions. Hong Kong Chinese look at *both* perceived important (foreground) and less important (background) information when making decisions. On the other hand, North Americans, as analytic thinkers, have been shown to attend mostly to foreground information. Such a tendency also generalizes to the decision-making process, with European Canadians focusing more on important (foreground) information. Thus, we clearly demonstrate that cultural experience *does* affect East Asian and North Americans' online decision-making processes, leading to differences in information search speed and types of information used, when the two cultures lack clear time constraints.

In addition to these findings, we also show the effect of situational constraints on cultural variations in psychological processes, investigating how time constraints affect online decision-making processes. Similar to Ito and colleagues' findings (Ito *et al.*, 2012, 2013), our results show cultural differences in the no time constraint condition, but

cultural similarities under time constraints. Concerned with the possibility of losing the best apartment, participants spent little time on decisions, looked at less information, and focused on the most relevant information. The findings also suggest that people from the two cultures respond differentially to the presence of time constraints. European Canadians coped with time constraints by quickening their information processing, using other similar decision-making processes. In contrast, Hong Kong Chinese coped with time constraints by slowing their rate of processing information and focusing on more important information. These findings give evidence that the situation plays an important role in the expression of cultural tendencies, showing that culture *does not* monolithically influence psychological processes.

Interestingly, our findings regarding quantity of information used seem to be in conflict with previous research, which suggests that East Asians consider greater quantities of information than North Americans (e.g. Choi *et al.*, 2003; Ji *et al.*, 2008; Spina *et al.*, 2010). We speculate that this may be due to the nature of our task. In previous research most similar to ours, Choi *et al.* (2003) found cultural variations in quantity of information selected for a hypothetical murder case when participants were asked to *exclude* irrelevant information whereas cultural variation was absent when participants were asked to *include* relevant information. They argued that because holistic thinkers perceive that 'everything is related,' it makes it difficult for holistic thinkers to exclude presented information. In contrast, they argue that possible relationships between pieces of information are less salient when participants are asked to include information. In our task, participants had to decide how much hidden information to view before making final decisions, which is a more natural decision-making experience in real life, and also more similar to the inclusion condition in Choi *et al.*'s study. In turn, our results seem to replicate previous findings that quantity of information used does not differ among East Asians and North Americans for *inclusion*-type decision-making processes.

Limitations and future directions

While we maintain that our interpretation under the rubric of analytic vs. holistic thought is the most simple and parsimonious explanation for the current findings, we also consider other alternative interpretations to assess the validity of our interpretations. First, impression management could be one possible alternative explanation for why Hong Kong Chinese were motivated to process information faster than North Americans. However, some cross-cultural research indicates that relative to East Asians, North Americans are more motivated to make themselves look good to maintain their sense of high self-esteem after experiencing

failure (e.g. Heine, Kitayama, Lehman, *et al.*, 2001; Pualengco, Chiu & Kim, 2009) and to show greater self-enhancement as an adaptive strategy in the interpersonal relationship domain (Falk, Heine, Yuki & Takemura, 2009), which could suggest a pattern in conflict with the current findings. Further studies could examine this competing explanation by including private and public conditions, observing whether cultural variation in the time spent on decisions is only observed in public conditions where impression management motivation should be greatest. Second, promotion versus prevention regulatory focus is another alternative explanation as East Asians have been found to be more prevention-focused than North Americans (e.g. Hamamura, Meijer, Heine, Kamaya & Hori, 2009; Lee, Aaker & Gardner, 2000). Owing to this difference, East Asians may be more motivated to view a wider breadth of information due to prevention-based anxiety over missing useful information. However, some studies have also indicated that promotion-focused people consider more alternatives and options compared to prevention-focused people (e.g. Crowe & Higgins, 1997; Friedman & Förster, 2001; Liberman, Molden, Idson & Higgins, 2001; Pham & Higgins, 2005), suggesting an opposite pattern. Future research should more directly examine how regulatory focus affects people's information search tendencies during the online decision-making process and how regulatory focus interacts with holistic versus analytic thinking styles in the decision-making domain.

There are some limitations to the current research. First, we did not find a consistent, decrease in response times corresponding to the time constraint manipulation for the two cultures; while European Canadians responded faster in the time constraint condition, Hong Kong Chinese did not. The lack of change for Hong Kong Chinese could be due to a floor effect in which Hong Kong Chinese are already answering as fast as they can, making it difficult to observe noticeable differences. Despite the lack of decrease in response times for Hong Kong Chinese for the time constraint manipulation, we *did* still find cultural variations in information parsing efficiency and types of information processed, suggesting that the manipulation did have an effect. Second, while we found that our manipulation clearly affected cultural patterns, we cannot be sure if it effectively models realistic time constraints. Future studies should test whether the same pattern can be replicated when participants are put in situations with more realistic constraints. For example, we should investigate participants' decision-making processes in a situation where they only receive rewards if they make good decisions within a given, short period of time. As another limitation, we cannot be sure of the generalizability of these findings as we only used apartment selection tasks in an effort to make the task as culturally neutral as possible in order to focus on the

influence of culture on the online process of decision-making. Future studies should investigate the generalizability of these findings by using various types of selection tasks (i.e. choosing a romantic partner, searching for a job, etc.). While similarities are likely to be found among tasks, interactions between task types and culture might also exist.

In addition, although the current findings suggest that time constraints can attenuate cultural variations in behaviour, research carried out by Chiu and his colleagues on Need for Cognitive Closure (Chao, Zhang & Chiu, 2010; Chiu *et al.*, 2000; Fu *et al.*, 2007) has also shown that cultural differences in norm adherence can become more salient under time constraints (time pressure). However, Chiu *et al.* (2000) examined how culturally valued specific information (dispositional versus situational information) is used, whereas we examined how general information is searched for and processed. It is possible that time constraints would accentuate cultural differences if the task assessed how culturally valued knowledge is used, but time constraints attenuate cultural differences when the task assesses online information processes. Furthermore, differences in the effect of time constraints (or pressures) may be seen depending on the nature of the task (decisions to adhere to norms vs. decisions to purchase), the cognitive processes involved (deliberate vs. automatic processes), and the types of choices people must make (simple vs. complex). Future studies should further examine these factors to better elucidate how cultural differences in the decision-making process play out in various contexts.

Conclusion

We found evidence for cross-cultural differences and similarities in the online decision-making processes for East Asians and North Americans, and how time constraints can eliminate these differences. These findings are important as they help create a more nuanced understanding of cultural differences and similarities in the online decision-making process. These findings are also important to cross-cultural psychology in general as they support a shift of emphasis in empirical research from an outcome-oriented approach to a more nuanced and descriptive, process-oriented approach (Li *et al.*, 2014). Culture is infinitely complex, and process-oriented research is necessary to better understand its complexities.

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Appendix

Participants were asked to view as much (or as little) information necessary and to take as much (or as little) time necessary to view information before making decisions on what apartment to select. They were told to click the ‘?’ to view hidden information. Below is an example of an apartment selection task at the beginning of the task when all attribute information was hidden.

Please find a list of apartments below to decide between. You can view as many attributes as you wish before making your choice. You can begin in the cell of your choice and access as much or as little information as is necessary to make your decision. When you have made a decision, please go to the next page to indicate the apartment you chose. Click on the boxes with question marks (?) to reveal more information. When you have made your decision, click on the ‘Finish’ button below.

Apartment	Noise Level	Neighbourhood	Apartment Size	Rent	Suite Features	Building Amenities
Apartment A	?	?	?	?	?	?
Apartment B	?	?	?	?	?	?
Apartment C	?	?	?	?	?	?
Apartment D	?	?	?	?	?	?
Apartment E	?	?	?	?	?	?
Finished?						

An example of how information was presented when all information was revealed.

Please find a list of apartments below to decide between. You can view as many attributes as you wish before making your choice. You can begin in the cell of your choice and access as much or as little information as is necessary to make your decision. When you have made a decision, please go to the next page to indicate the apartment you chose. Click on the boxes with question marks (?) to reveal more information. When you have made your decision, click on the ‘Finish’ button below.

Apartment	Noise Level	Neighbourhood	Apartment Size	Rent	Suite Features	Building Amenities
Apartment A	Moderate	Very poor	Very good	Good	Moderate	Very poor
Apartment B	Moderate	Poor	Good	Very good	Moderate	Poor
Apartment C	Very good	Good	Very poor	Poor	Very poor	Moderate
Apartment D	Poor	Poor	Very good	Moderate	Good	Good
Apartment E	Poor	Very poor	Very good	Good	Moderate	Moderate
Finished?						