The Influence of Culture and Group Membership on Learning Trustworthiness

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ABSTRACT

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The present study investigated the effects of culture on learning about trustworthiness. Prior work has focused on how culture affects the perception of trustworthiness based on facial features. A broker investment task was used to measure learning of whether different faces, tested for ingroup and outgroup members, behaved in a trustworthy, untrustworthy, or neutral manner. We found individuals across cultural groups learned to differentiate the brokers and did so better for ingroup than outgroup members.
**Introduction**

Trust is an essential element in social life. It can bring benefits to both individuals and communities (Lange, 2015). But it sometimes also means exposing someone’s weakness to other people in an attempt to elicit reciprocity. Judging trustworthiness therefore becomes a skill fundamental to forming a mutually beneficial relationship. Researchers have studied how people judge trustworthiness by investigating its relationship with facial appearance (e.g. Winston, Strange, O’Doherty, & Dolan, 2002; Engell, Haxby, Todorov, 2007), facial dynamics (facial expression) (e.g. Krumhber, et al, 2007), and behaviors (e.g., Cassidy & Gutchess, 2015).

**Culture and Trust**

In line with findings reflecting the ease with which people detect cues of trustworthiness and learn who to trust, there is some evidence that trustworthiness judgments may be universal, consistent across people from Eastern and Western cultures. For example, Zebrowitz et al (1993) first discovered that European American, African American, and Asians have consensual judgments of personality traits for faces from different cultures. Albright (1997) also found that the perception of trustworthiness is culturally universal. Building upon these findings, Rule et al (2009) furthered the results by examining the neural response of American and Japanese in their voting behaviors. It was found people from these divergent cultural backgrounds actually have high consistency in neural response to faces of candidates from both cultures. Moreover, on the behavioral level, Rule et al (2010) found that trustworthiness judgments based on faces predict the actual votes a candidate receives, regardless of culture.
Despite some evidence for equivalence in judging trustworthiness across cultures, there is some evidence for cross-cultural differences. In contrast to the results mentioned above, Walker, Jiang, Vetter, and Sczesny (2011) showed that when salience of facial trustworthiness was enhanced, Americans, compared to East Asians, were not only better but also faster at identifying trustworthiness from faces for both Eastern and Western cultures. In addition to this, Xu et al (2012) examined which facial features people from Eastern and Western cultures look at when judging trustworthiness. Results indicated that East Asians and Caucasians use different facial features in trustworthiness judgments. In their study, Chinese participants were found to use attractiveness cues as a shortcut in judging trustworthiness. On the other hand, American participants used facial cues more specific to facial trustworthiness when they made the judgments.

Even though previous cross-culture studies focused on judging trustworthiness behaviorally and neurally, there is no existing research on how culture affects learning about trustworthiness. For instance, Suzuki & Suga (2010) recruited only East Asian participants and used East Asian faces as stimuli in their study. And Webb, Hinge, and Bailey (2016) included only Australian participants. Thus, these studies cannot speak to how culture may affect learning about trust.

Aside from the small body of research on identifying trustworthiness across cultures, a large body of work shows that Eastern and Western cultures differ in a number of fundamental ways including thinking style (Nisbett & Masuda, 2003), self-concept (Markus & Kitayama, 1991), and decision making (Li, Masuda, & Russell, 2014). Specifically, East Asians are believed to have interdependent self-construals and Westerners to have more independent self-construals (Markus & Kitayama, 1991). This means that East Asians tend to view the self as
more connected to other people and their surroundings whereas Westerners emphasize uniqueness and try to maintain separation between self and other. In interdependent cultures, people generally rely more on reciprocal relationships but this is less true of independent cultures (Yang, 1993). These difference could have emerged due to differences in lifestyles. Historically, the tradition of farming led to collaboration between communities in East Asian countries (Nisbett, Peng, Choi, & Norezayan, 2001). In contrast, European countries relied on a herding lifestyle. The mobility of herding set the foundation for individualism. Additionally, recent research has shown that, in some Asian countries such as Korea where ‘we-ness’ is pronounced, trust has even become a moral obligation (Han & Choi, 2011). In Korean, the word closest in meaning to ‘trust’ is shilrae, which refers to both trust and reliance. These ideas suggest that East Asians in general may value trustworthiness-based relationships more than European Americans do. Therefore, they should be more attentive to information about trustworthiness in comparison to European Americans. Thus, the aim of this present study is to investigate how culture shapes learning of trustworthiness. We hypothesize that compared to European Americans, East Asians will learn information about trustworthiness more accurately.

In/Outgroup Effect

Although previous work rarely studied how people from different cultures learn about trustworthiness of people from other culture, there are some relevant studies that examined ingroup and outgroup face recognition. In fact, a number of studies have found that people are more likely to recognize ingroup faces than outgroup ones (for review, see Shapiro & Penrod, 1986; Meissner & Brigham, 2001). Moreover, eyewitness research has found that people are inaccurate in identifying outgroup faces that they have seen before (Wells & Olson, 2001). Chiroro and Valentine (1995) attributed this phenomenon to the fact that people in general have
more contact with ingroup members than outgroup members. Therefore, in our study, it is very possible that people are better able to learn information about trustworthiness of own-culture members than other-culture members.

However, it is also possible that the tendency to view outgroup members as more threatening, the outgroup negativity effect or outgroup prejudice (Fiske, 2002), could impact what information is remembered well for outgroup, compared to ingroup faces. Outgroup negativity is pervasive. For example, Degner and Wentura (2010) used the Implicit Association Test (IAT) to reveal that outgroup negativity appears even among 12-13 years old adolescents. Furthermore, among adults, outgroup negativity tends to be exaggerated when one’s own cultural values differ from an outgroup member’s (Schiefer et al, 2015). In relation to the current study, it has been shown that negative attitudes toward certain outgroups will be reaffirmed by negative interactions (Pettigrew, 2008). This means that when other-culture people behave in an untrustworthy manner, as expected on the basis of outgroup negativity, they will be well remembered as untrustworthy due to reaffirmation of negative stereotype. This could lead to the prediction that untrustworthy behavior from outgroup members will be well remembered, compared to the overall poorer memory for outgroup than ingroup faces. Nevertheless, another process could contribute to enhanced memory for stereotype-disconfirming information (Ensari & Miller, 2002). In other words, negative views about outgroup members can be reversed in the presence of positive information. As a result, memory for stereotype-violating individuals (e.g., outgroup individuals who behave in a trustworthy manner) could be enhanced due to expectancy violation theory (Stagnor & McMillan, 1992). According to Stagnor and McMillan, memory for stereotype-incongruent individuals will be improved by overturning the existing negativity. These findings lead to the hypothesis that people will be better at remembering trustworthy faces
from the other culture than faces from the same culture. Thus we will conduct exploratory analyses to investigate how the in- or outgroup status of the face affects memory for trustworthy, untrustworthy, and neutral behaviors.

In sum, in the present study, we will focus on two major aspects of culture and trustworthiness. First, we will study how learning about trustworthiness could differ across independent and interdependent cultures. Using the debt game paradigm adopted from Suzuki & Suga (2010), we propose that culture is a predictor of trustworthiness learning such that people from interdependent cultures will learn information related to trustworthiness better than those from independent cultures. Secondly, we will address the question that whether or not people will learn trustworthiness of own-culture faces better than other-culture faces, and how the trustworthiness of the behavior impacts memory.
Method

Preliminary Study

We collected pilot ratings in order to select the faces used in the broker investment task from 143 participants (30 Chinese, 30 Japanese, 83 Americans) and recruited through Qualtrics and residing in the US, China, or Japan. Participants completed an online questionnaire that asked them to rate trustworthiness for 60 American faces and 60 Chinese faces on a 1 to 7 Likert scale (e.g. “how trustworthy do you think this person is?”), where 1 means very untrustworthy and 7 means very trustworthy. To identify the most neutral faces, faces with mean trustworthiness score closest to 4 and with smallest standard deviation were selected. 12 male and 12 female faces from each culture were selected for our study. The average trustworthiness ratings for faces selected to be used in the task are 4.04 (SD =1.69) for Chinese faces and 4.18 (SD =1.59) for American faces.

Participants

We recruited 60 participants, 30 East Asians (Mage=20.94) and 30 European Americans (Mage=20.5) in our study. To be eligible for the study, Asian participants have to speak at least one type of Asian language as their native language and have been lived in the U.S for less than five years. Also, they need to be proficient in English so that they can understand the experiment instructions. For European Americans, they have to speak English as their native language. Finally, participants from both cultures have to be at least 18 years old to participate. Participants were recruited through the Psychology Department study pool; they received credit towards
course requirements for participating in the study. They also may receive bonus payment based on how they play the game (detailed below).

_Broker Investment Task_

Trusting behaviors were measured via simulated investments with brokers, using a trust game adapted from previous research (Suzuki & Suga, 2010). Participants completed the broker investment task. In the task, participants were instructed to imagine they have $5 to invest. They were told that they will be interacting with 24 brokers and that a broker could be good, neutral, or bad (e.g., “good” returns $6 on a $5 investment, participant nets $1 profit; “neutral” returns $5, participant nets $0 profit; “bad” returns $6, participant nets $1 debt).

Brokers were represented by either Chinese or European American faces. Each broker was presented on screen, with the face shown throughout the entire trial. Each trial presented a face and options to invest or not invest and lasted for four seconds no matter how quickly participants made their choice. After participants made their decision, the amount of money that the participant would earn or lose was displayed. This feedback page also lasted for four seconds, sufficient for participants to become aware the trustworthiness of the broker they just encountered. Within one block of trials, 12 male and 12 female faces (24 faces in total) were used to represent brokers from different cultures. A block of trials will include only Chinese faces or only American faces. The block with only Chinese faces appeared first and repeat for three times; the order of faces within the block was randomly assigned each time it repeated, but the characteristics (good, bad, or neutral) stayed the same for each face. Then participants saw
the block that has only American faces, which will repeat for three times as well. The order of all-Chinese blocks and all-American blocks was counterbalanced across participants to address order effects. Such repeated-interactions design allowed behavior to be adjusted over time for each broker, allowing for the assessment of trust learning.

By the end of the experiment, participants may receive bonus compensation based on how they play the investment game. To be specific, one random trial will be pre-selected. After the task, 25% of earnings from that particular trial will be added to compensation. This is in line with previous literature on economic games, in which awarding money to participants makes gameplay more realistic and relevant.

**Procedures**

To match East Asian and American participants on basic cognitive ability, participants were asked to complete pattern matching task, which tests their basic speed of processing ability (Salthouse, 1996). The Broker Investment Task followed. Participants also completed the self-report format Self-Construal Scale (Singelis, 1994), as well as demographic questions. These tasks gave us information about to how much degree participants were inclined to independence or interdependence. Lastly, they completed the Propensity to Trust Scale (Evans & Revelle, 2008), which would monitor the baseline tendency to trust.

**Planned Analysis**

A 2 (cultures: East Asian/European American) x 3 (broker condition: good/bad/neutral) x 2 (group: in/out) factorial design will be used to examine between (culture) group and within participant (broker condition, group) differences. Specifically, we will use investment rate across blocks for ingroup and outgroup faces, and compare how people adjust their ‘invest’ decisions.
An increased investment rate in good brokers, or a decrease of investment rate in bad brokers, would indicate people are able to learn trustworthiness through multiple interactions.
Results

Using the self-construal scale to test independence and interdependence, we predicted that East Asians will be more interdependent (or less independent) than Americans, and vice versa. However, based on a t-test, on a scale with possible score ranging from 0 to 105, Americans ($M=73.93$, $SD=8.76$) didn’t seem to be more independent than East Asians ($M=73.42$, $SD=7.68$), $t(59)=.24$, $p=.81$, and East Asians ($M=76.35$, $SD=10.11$) were not more interdependent than Americans ($M=72.43$, $SD=9.50$), $t(59)=-1.56$, $p=.12$, although, by visual observation, these trends seemed to follow the patterns we predicted (Table-1).

Table-1

**Self-Construal Scale**

<table>
<thead>
<tr>
<th></th>
<th>Americans</th>
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<th>East Asians</th>
<th></th>
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<tbody>
<tr>
<td></td>
<td>$M$</td>
<td>$SD$</td>
<td>$M$</td>
<td>$SD$</td>
</tr>
<tr>
<td>Independence</td>
<td>73.93</td>
<td>8.76</td>
<td>73.42</td>
<td>7.68</td>
</tr>
<tr>
<td>Interdependence</td>
<td>72.43</td>
<td>9.50</td>
<td>76.35</td>
<td>10.11</td>
</tr>
</tbody>
</table>

Our propensity to trust scale (range of score: 0 to 84) indicates no significant difference in propensity to trust, $t(59)=.90$, $p=.37$, or trustworthiness, $t(59)=-1.32$, $p=.19$, between Americans and East Asians (Table-2). Also, there was no significant difference between
Americans and East Asians in their speed of processing, \( t(59) = -.40, p = .69 \), based on results from our pattern matching task.

Table 2

*Propensity to Trust Scale*

<table>
<thead>
<tr>
<th></th>
<th>Americans</th>
<th></th>
<th></th>
<th>East Asians</th>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>( M )</td>
<td>( SD )</td>
<td>( M )</td>
<td>( SD )</td>
<td></td>
</tr>
<tr>
<td>Trust</td>
<td>56.03</td>
<td>6.89</td>
<td>54.48</td>
<td>6.53</td>
<td></td>
</tr>
<tr>
<td>Trustworthiness</td>
<td>61.00</td>
<td>6.79</td>
<td>63.32</td>
<td>6.95</td>
<td></td>
</tr>
</tbody>
</table>

To test our hypothesis regarding the effect of culture and group membership on learning trustworthiness information, we ran a 2 (Culture: American/East Asian) x 2 (Group Membership: In-Group/Out-Group Broker) x 3 (Broker Type: Good/Bad/Neutral) x 3 (Block Number: 1, 2, or 3) mixed factorial design model, in which culture is a between-subject factor and broker type, group membership, and block number are within-subject factors. We found a significant main effect of broker type, \( F(2, 118) = 7.89, p = .001, \eta^2_p = .12 \), with good brokers receiving the most investments (\( M = .54 \)), bad brokers receiving the least (\( M = .49 \)), and neutral brokers in the middle (\( M = .50 \)). In addition, the main effect of group membership is significant, \( F(1, 59) = 7.91, p = .007, \eta^2_p = .12 \), with out-group brokers (\( M = .53 \)) receiving more investments than in-group ones (\( M = .49 \)). Furthermore, the significant interaction between broker type and block number, \( F(4, 236) = 47.16, p < .001, \eta^2_p = .44 \), indicates that people learned to differentiate the different broker types across the blocks. Finally, there is also a significant four-way interaction, \( F(4, 236) = 3.12, p = .014, \eta^2_p = .05 \).
To further understand how the learning of trustworthiness differed across cultures, we broke down the four-way interaction by first separately examining the effects by culture. For Americans, there was a significant three-way interaction of broker type, group membership, and block number, \( F(4, 116)=3.446, p<.011, \eta^2_p=.11 \). However, this was not the case for East Asians, who did not exhibit a three-way interaction, \( F(4, 120)=1.07, p=.373 \).

Visually inspecting the graphs (figure 1 through 4.), we observed that among Americans, investment rates significantly dropped for the in-group bad broker condition from block 2 to block 3, whereas this did not happen for the good broker or the out group conditions. To better understand the apparent difference across cultures, we focused on the results from the second and third block. We excluded the first block because participants could not evidence learning of
faces and behavior until the second block; results from the first block are not illustrative of how participants remember faces and behaviors. Following up on this line of thinking, we focused on bad brokers, and conducted a 2 Group (in/out) x 2 Block (2 vs. 3) ANOVA on the Americans. We found the investment rate for out-group bad brokers dropped significantly more for in-group than for bad brokers, $F(1, 29)=8.24$, $p<.01$, $\eta_p^2=.22$. This difference between in- and out-group did not occur for the good brokers, $F(1,29)=.104$, $p=.75$. Nor did it emerge in a 2 Group (in/out) x 2 Block (2 vs 3) analysis for East Asians, $F(1,30)=.302$, $p=.59$. 
Discussion

Previous work has investigated the perception of trustworthiness. However, it is very rare for one to interact with another person just once. Our study broadens this line of research by exploring the learning of trustworthiness across multiple interactions. Specifically, this is the first study that examined how culture and group membership can influence this learning process, mainly because both factors have a shaping force on cognitive processing, including learning and memory. For example, out-group negativity bias implies that a negative behavior from an out-group member will be best recalled because the initial hostility toward an out-group member would be reaffirmed (Fiske, 2002). In addition to that, expectancy violation theory suggests that when the initial positive image of an in-group member is collapsed by negative behaviors, he/she will be well remembered (Stagnor & McMillan, 1992). Given the divergence of evidence from previous works, we therefore predicted that either the in-group untrustworthy broker or the out-group untrustworthy members will be most well remembered. We also predicted that interdependent East Asians, due to their interconnectedness and sensitivity to trust, will be better at learning trustworthiness information, compared to the more independent Americans.

In terms of the effect of group membership, consistent with the expectancy violation theory, our findings revealed that untrustworthy in-group members were well remembered, but only among Americans. East Asians, in contrast to our prediction that in-group or out-group bad brokers would be most well remembered due to out-group negativity bias and expectancy violation theory, showed no advantage in remembering any particular type of brokers (in or out group). This suggests that the shaping force of culture to some extent weakens the effect the
group membership on learning trustworthiness. In other word, the factor that affects the learning of trustworthiness among Americans exhibited a lesser effect for East Asians. This finding is more complex than we previously hypothesized: rather than affecting the speed or accuracy of learning trustworthiness, culture in fact influence the underlying mechanism of the process: the absence of the bias in learning in/out-group members (which is present among Americans) indicates that East Asian use may different cues, other than in-group or out-group membership, to remember trustworthiness information.

Another notable finding from this current study is that Americans and East Asians did not show difference in independence or interdependence based on our explicit measure (self-construal scale). Although this can lead to a speculation that East Asians may not be as interdependent as research on culture once suggested, the lack of difference can be explained by social factors as well as findings from previous work. One possible explanation is globalization. In particular, the increasing amount of contact between eastern and western countries in the past three decades has introduced the social norms (independence or interdependence) to one another. This trend can possibly make social norm from the other culture more appreciated, resulting in a bias in explicit measurement. In addition, our East Asian sample consists mostly of 20 to 25 years old Chinese participants. Due to the globalization process, they were exposed to independent culture more than previous generations, a fact that may further lead them to be less likely to explicitly show their interdependence than the prior generations. In fact, using explicit measures, previous studies (e.g Kitayama et al, 2009 & Oyserman et al, 2002) also did not usually find the difference in independence and interdependence. Such a scarcity in finding may seem to undermine our findings related to culture, indicating East Asians and Americans are essentially same and the effect of culture is not present. However, the lack of pattern in explicit
measure does not reflect a shift in social norm, neither for East Asian nor for Americans. A more recent study (Park, Uchida, and Kitayama, 2015) that tested the implicit attitude toward independence and interdependence suggested that East Asians remain more inclined to interdependence than Americans, even though these patterns were still ambivalent when using explicit measures. Using a more implicit measure (self-description task), Americans tended to list personal attributes (e.g., I’m extroverted), whereas East Asians were more likely to write social identities in the same task (e.g., I’m a college student). Their findings suggested that East Asians nowadays are still more interdependent than Americans, but in an inherent rather than expressive manner. As a result, our finding concerning the effect of culture on learning trustworthiness can still hold, even in the absence of explicit difference in interdependence and independence.

Finally, we noticed that American good brokers, compared to brokers of other types, were far less invested by both Americans and East Asians in the first block. Because characteristics of brokers were not notified to the participants until they made their investment decision, results from the first block mainly stemmed from the judgment of trustworthiness. However, given that stimulus was tested to be neutral in the preliminary study, we believe this happened mainly due to a bias in face ratings: faces rated to be neutral on the trustworthiness scale were not necessarily neutral. A follow-up study will flip the traits associated with each face and observe whether the pattern will be reversed (American bad brokers get least investment in the first block). A reverse in pattern will suggest a bias in preliminary study. Then another round of face-selection for subsequent studies on this topic will be required. If a reversed pattern is not found, then it is more likely that the particular group of subjects we ran had a tendency to recognize those selected Americans faces to be untrustworthy. Despite the initial split in
trustworthiness judgment, our results indicate that once starting to learn trustworthiness information, people were not affected by their initial judgment.
Future Directions

To extend the findings from the current study, future study may focus on the underlying neural mechanism of trustworthiness learning. For instance, amygdala has consistently been found to associate with the trustworthiness judgment/perception in previous research (e.g. Adolphs et al, 1998 & Winston et al, 2002). And a more recent study found that in evaluating trustworthiness, an increase in amygdala response is associated with a lower perceived facial trustworthiness (Todorov & Engell, 2008). In these studies, trustworthiness is enhanced or lowered by manipulating facial features, whereas in our line of research trustworthiness is manipulated by behaviors. Therefore, future research can combine these two methods by examining amygdala activity during the process of learning trustworthiness. A study as such will provide a sense of whether amygdala is responsible for learning trustworthiness information or it is simply attuned to certain facial features when judging trustworthiness. Taking this one step further, mounting evidence has shown a possibility that brain activity might show difference in trustworthiness-learning between East Asians and Americans. For example, Kitayama & Park (2010) found that a long-term engagement in cultural practice or tasks can significantly shape brain pathways. Also, previous research indicated people from different cultures experience difficulties in recognizing emotion expression from the other culture, accompanied by an increased amygdala activation (e.g Hart et al, 2000 & Chiao et al, 2008). Moreover, Derntl et al (2012) found that among East Asians, a greater activation in amygdala predicts lower recognition accuracy. However, research on culture has not been conducted in the trustworthiness domain. As a result, many questions remain unanswered in the area, but we need to first find out whether
amygdala activity is related only to the initial judgment of trustworthiness, or an increased activation can be observed whenever trustworthiness information is present during the learning process.
Reference


