

# Differences in Fear of Isolation as an explanation of Cultural Differences: Evidence from memory and reasoning

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## Abstract

Previous research suggests that members of East Asian cultures show a greater preference for dialectical thinking and sensitivity to context information than do Westerners. We suggest this difference is rooted in a greater chronic Fear of Isolation (FOI) in East Asians than in Westerners. To support this hypothesis, we manipulated FOI in a group of Westerners and assessed their relative preference for dialectical proverbs and sensitivity to context. For cross-cultural validation of our hypothesis, we assessed the relationship between chronic levels of FOI and dialectical reasoning in Koreans. Consistent with our proposal, both experimentally primed FOI (Experiment 1A and 2) and chronic levels of FOI (Experiment 1B) were positively related to relative preference for dialectical proverbs. This effect was independent of participants' level of negative mood (Experiment 2). A third experiment showed that sensitivity to context was affected by FOI in a manner consistent with previous studies of cultural differences (Experiment 3). © 2005 Elsevier Inc. All rights reserved.

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There has been sustained interest in research on cultural differences in reasoning and decision making, because of observations that members of different cultures may exhibit radically different behaviors in a number of tasks that were previously thought to reflect more universal human tendencies (Hsee & Weber, 1999; Nisbett, Peng, Choi, & Norenzayan, 2001; Peng & Nisbett, 1999). Further the study of cultural differences has practical implications for international commerce and theoretical implications for claims about the universality of cognitive processing. A critical question in this work is whether cultural and individual differences can be captured in terms of variations in a small number of underlying dimensions or whether radically different theories are required to describe decision makers from different cultures.

In this paper, we begin by highlighting some key cultural differences in reasoning observed in previous re-

search. Then, we discuss limitations of approaches that suggest there are fundamental differences in the cognitive architectures of members of different cultures. We focus on the possibility that individual difference variables are at the root of many observed cultural differences (Weber & Hsee, 2000). We suggest that members of East Asian and Western cultures may differ in their chronic Fear of Isolation (FOI). We then present studies in which induced differences in FOI lead to differences in cognitive performance.

## Cultural Differences in Cognitive performance

Nisbett and his colleagues have catalogued a number of cultural differences in reasoning performance (Nisbett et al., 2001). This work suggests that East Asian and Western thought differ in style with East Asians having a more holistic style and Westerners having a more analytic style. In addition, members of East Asian cultures tend to be dialectical in their thinking. That is they re-

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tain basic elements of opposing perspectives by seeking a “middle way,” and focusing on relations among individuals. In contrast, Westerners are more comfortable with formal logic and focusing on individuals. Generally speaking, East Asians tend to seek a compromise solution when reconciling conflicts and contradictions (Briley, Morris, & Simonson, 2000).

For the purposes of this paper, we highlight two key findings from this research. First, Peng and Nisbett (1999) found that East Asians have a greater appreciation for dialectical proverbs than do Westerners. Dialectical proverbs are those that embody a contradiction such as “Sorrow is born of excessive joy,” as opposed to nondialectical proverbs such as “Half a loaf is better than none.” Presumably, the appreciation of these proverbs requires the ability to resolve the contradictory aspects described.

A second key finding is that East Asians are more strongly influenced by context in recognition memory than are Westerners. Masuda and Nisbett (2001) showed participants pictures of animals against a background. At test, people were asked whether they recognized the animal (regardless of the context in which it appeared). The test pictures used either the same background as was shown during study or a different one. East Asians were more likely to recognize an animal seen during study when it appeared in the same background context as at study than when it appeared in a different context. In contrast, Western participants were not sensitive to this change in the background.

### *Explanations of cultural differences*

Much of the research on Asian/Western cultural differences is based on the *individualism vs. collectivism* paradigm. On this view, East Asian culture is thought to value the collective work of groups and the closeness of social structures. This view suggests that members of East Asian cultures are taught to seek compromise and to explore the relationships between items and their context (Peng & Nisbett, 1999). In contrast, Western cultures are thought to value the strength of individuals. Western cultures are thought to teach their members to resolve contradictions in favor of one side or another, and to isolate objects from their context when doing causal reasoning (Nisbett et al., 2001; Peng & Nisbett, 1999).

There are clear limitations of the individualism vs. collectivism distinction. Comparisons of nationalities or of subgroups within a country indicate that the empirical basis for the conclusions from the individualism vs. collectivism dichotomy is not as firm as the paradigm suggests. For example, European Americans are not more individualistic than African Americans, or Latinos, and are not always less collectivistic than Japanese or Koreans. Among Asians, only Chinese show

large differences with Westerners, being both less individualistic and more collectivistic than Americans (Oyserman, Coon, & Kemmelmeier, 2002).

In our view, this dichotomy-based approach has limited our understanding of culture in at least three ways. First, the individualism vs. collectivism paradigm downplays variations within cultures. In fact within-culture variations are much greater than between-culture differences in many cross-cultural studies (Hong & Chiu, 2001; Shweder & Sullivan, 1993). Second, cultures that are relatively collectivistic on one dimension may be relatively individualistic on another dimension (Triandis, Mccusker, & Hui, 1990).

Third, Oyserman et al. (2002) suggest that researchers often accept a diffuse array of cross-national differences as evidence of the individualism vs. collectivism distinction. This propensity is especially evident when researchers do not directly assess individualism and collectivism, but rather use cross-national or cross-group differences to infer that these differences are due to the individualism vs. collectivism-based differences in psychological processes. On this view, any cultural difference is taken to be consistent with the paradigm.

Finally, research motivated by the individualist/collectivist distinction often treats members of different cultures as if they differ not only in their sensitivities to reasoning strategies primed by environmental factors but also in their cognitive architecture (Donald, 2000; Nisbett et al., 2001). Before concluding that members of different cultures differ at the level of their cognitive architecture, it is important to identify psychological variables that differ between cultures that would help to unify research on cultural differences with research on other kinds of individual differences. To this end, we explore the possibility that cultural differences reflect straightforward differences in chronic social factors rather than fundamental differences in knowledge gathered over years of experience within a culture.

### *Fear of Isolation as a social variable that affects reasoning*

We suggest that sensitivity to *fear of isolation* may be responsible for some observed cultural differences in cognitive performance. “Fear of Isolation” refers to anxiety or fear in situations in which one experiences loneliness, a lack of community, solitary, confinement, or a quarantine (Baumeister & Leary, 1995; Gilbert, Fiske, & Lindzey, 1998; Gilbert, 2001; Walters, Marshall, & Shooter, 1960). Communication theories define FOI as a person’s fear of being negatively evaluated by others and, consequently, a force that leads people to conceal their views when they believe they are in a minority (Kenamer, 1990; Noelle-Neumann, 1984; Shoemaker, Breen, & Stamper, 2000). This pressure is assumed to be related to their fears of being negatively evaluated by others. The theory maintains that mass

media works simultaneously with majority public opinion to silence minority beliefs on cultural issues. On this view, FOI prompts those with minority views to examine the beliefs of others and to conform to what they perceive to be a majority view. In this paper, we present three studies that address the relationship between FOI, and reasoning performance and recognition memory.

East Asian and Western cultures differ in their sensitivity to Fear of Isolation. To be clear, we are not suggesting that East Asians and Westerners differ in their state anxiety relating to social isolation. Instead, we suggest that East Asians are more sensitive to situations that might bring about social isolation than are Westerners. We refer to this sensitivity to FOI as *chronic FOI*, to distinguish it from *acute FOI*, which would be an anxiety state brought on by social isolation. Before discussing the mechanisms by which chronic FOI might influence behavior, we must first show that members of different cultures differ in their chronic FOI.

As a measure of chronic FOI, we used the Fear of Negative Evaluation scale (FNE; Watson & Friend, 1969). There are other scales that have been used to measure FOI, but these scales also ask questions about physical rather than social isolation. This 30-item instrument measures social anxiety about receiving negative evaluations from others. Specifically, it measures social anxiety arising from public evaluation, including apprehension about what others think (Monfries & Kafer, 1987). Watson and Friend (1969, p. 449) defined fear of negative evaluation as ‘apprehension about other’s evaluations, distress over their negative evaluations, avoidance of evaluative situations, and the expectation that others would evaluate oneself negatively’ and suggested that ‘fear of loss of social approval would be identical to FNE’ (p. 449). For this reason, the scale has been used for the measurement of individual differences (e.g., Gregorich, Kemple, & Leary, 1986; Shoemaker et al., 2000) and for the cross-cultural comparisons of fear of isolation (e.g., Garcia-Lopez, Olivares, Hidalgo, Beidel, & Turner, 2001).

Scores on this scale reflect a fear of the loss of social approval. Items on the measure include signs of anxiety and ineffective social behaviors that would lead to disapproval by others. We gave this scale to 41 Asians affiliated with the University of Texas at Austin. The participants were all born in East Asia (31 Korean, 6 Japanese, 4 Chinese) and had a native language other than English. Their length of stay in the US was required to be less than 5 years to participate ( $M = 3.1$  years). Western participants were 49 undergraduate students at the University of Texas (all born in the US). Both groups filled out the Fear of Negative Evaluation scale along with demographic questions. Consistent with our proposal, the East Asian Group showed significantly higher scores on the FNE ( $M = 17.54$ ) than did the Western group ( $M = 11.54$ ),  $t(88) = 11.56$ ,  $p < .01$ . To

rule out the possibility that the differences in FOI between the East Asian and American students were due to the former group’s being away from their homeland, we also ran a group of 22 foreign students from European countries. The European Group also showed significantly lower scores on the FNE ( $M = 12.82$ ) than did the East Asian group,  $t(61) = 4.48$ ,  $p < .01$ .

A related approach to the study of cultural differences focuses on cultural differences in self-construal. Self-construal is defined as the constellation of thoughts, feelings, and actions concerning one’s relationship to others, and the self as distinct from others focuses two aspects of self-concept (Singelis, 1994). This works suggest that Westerners have a relatively more independent self-construal whereas Asians have a relatively more interdependent self-construal (Markus & Kitayama, 1991).

Self-construal has been posited to mediate and explain the effects of culture on a wide variety of outcome variables (Haberstroh, Oyserman, Schwarz, Kuhnen, & Ji, 2002; Kuhnen & Oyserman, 2002; Markus & Kitayama, 1991, 1994). For example, Kuhnen and Oyserman (2002) manipulated self-construal with a priming technique, in which participants read and circled interdependent (e.g., “we,” “our,” “us”) or independent (e.g., “I,” “me,” “mine”) in a brief paragraph, and found that primed interdependent self-focus improved memory for incidentally encoded contextual information. The exact relationship between self-construal and fear of isolation has yet to be worked out, but clearly these constructs tap related aspects of people’s beliefs about their relationship to their broader social network. Consistent with this relationship, Sato and McCann (1998) studied Japanese and American students and found a positive relation between social anxiety and interdependent self-construals.

How do differences in chronic FOI affect reasoning? Social anxiety, especially FOI, motivates people to focus on social activity, to interact with other members in their social network and to consider others’ responses seriously (2001; Scheufele, Shanahan, & Lee, 2001). Thus, members of cultures with high chronic FOI should be generally more interested in relations among people and their environment than should members of individualistic cultures (Morris & Peng, 1994; Nisbett et al., 2001). A chronic attention to relationships among individuals may also extend to more general reasoning about relationships among items in the world.

Attention to relations among objects should influence both of the tasks studied by Nisbett and colleagues that we described above. Attention to relations should make people more likely to be able to find ways that seemingly contradictory beliefs are compatible. Thus, individuals high in FOI should be relatively more likely to appreciate dialectical proverbs than should individuals lower in

FOI. Furthermore, attention to relations between individuals and their environment should make people more likely to encode objects along with their contexts. Thus, we would expect individuals high in FOI to be relatively more influenced by background contexts in memory than individuals lower in FOI.

### Manipulation and measurement of FOI

In our studies, FOI was manipulated as an independent variable. The idea was to create two groups of Western participants who would differ in their chronic FOI and then to look for differences in performance on cognitive tasks between the two. To manipulate chronic FOI, participants were primed to think of themselves as someone who has been socially isolated before (the *isolatee* condition) or as someone who caused another person to be isolated (the *isolator* condition). The first group is expected to have a higher FOI overall than the other.

We are trying to prime the concept of fear of isolation without actually inducing a high level of anxiety in participants. In this way, our manipulation differs from previous studies of FOI, which have tried to induce anxiety states in participants with high levels of FOI. For example, Mansell and Clark (1999) induced social anxiety by telling participants they would be giving a speech about a controversial topic and that the speech would be evaluated.

In each study, we assessed the effectiveness of the priming method by asking people to fill out the FNE scale. This scale is typically used to identify people with high chronic FOI who will be most susceptible to techniques designed to increase state anxiety. However, members of East Asian and Western cultures do not differ in their state anxiety, but rather in their sensitivity to FOI. Thus, we prime the concept of FOI without inducing state anxiety. Experiment 2 measures both FOI and negative mood to demonstrate that only chronic FOI influences people's performance.

Our studies do not have a "no-manipulation" condition. The two groups are designed to ensure that all participants think about the concept of isolation, and differ only in their viewpoint. We are interested in the influence of FOI as a trait (rather than as a state) on cognition and behavior. A putatively neutral condition may have variation not only in FOI but also in other confounding state variables (e.g., Brown & Smart, 1991; Sinclair & Kunda, 2000).

### Overview of experiments

The goal of the present experiments is to show that some of the previously observed cultural differences in

reasoning are rooted in a greater chronic FOI in East Asians than in Westerners. Experiments 1A, 1B, and 2 investigated whether degree of dialectical reasoning is positively related to levels of FOI. The two cognitive tasks we used are preference for dialectical proverbs and the recognition memory studies described above (Masuda & Nisbett, 2001; Peng & Nisbett, 1999).

In Experiments 1A and 2, we manipulate American participants' FOI and assess their relative preference for dialectical proverbs. In Experiment 1B, we examine Korean participants' relative preference for dialectical proverbs without an FOI manipulation. If FOI accounts for degree of dialectical reasoning, then within-culture differences in dialectical reasoning among Koreans should be related to within-culture differences in FOI. At the same time, between-culture differences in dialectical reasoning should also be explained by differences in FOI between Americans and Koreans.

Finally, Experiment 3 explores the effect of FOI on sensitivity to objects and contexts. Some researchers suggest that cognitive and perceptual orientations differ in the degree to which they are analytic vs. holistic. For example, Masuda and Nisbett (2001) found that members of East Asian cultures show a greater sensitivity to context (vs. target) information than do members of Western Cultures. We suggest that this difference is rooted in a greater chronic FOI in East Asians than in Westerners. If our hypothesis is right, then the manipulation of FOI should affect Americans' sensitivity to background context in picture recognition in a manner that is consistent with the results of previous studies.

### Experiment 1A: The effect of FOI on dialectical thinking with proverbs

Experiment 1A was based on Peng and Nisbett's (1999) study demonstrating that Chinese participants preferred dialectical proverbs to nondialectical proverbs. Western participants showed opposite pattern preferring nondialectical proverbs to dialectical proverbs. We manipulated level of FOI in Western participants using the priming method discussed above. Then we asked people to evaluate dialectical and nondialectical proverbs drawn from Chinese, American, and Yiddish sources following Peng and Nisbett's (1999) method. To ensure that any difference between cultural groups is not due to a particular style of proverb, they selected dialectical and nondialectical proverbs from three cultures; American, Chinese, and Yiddish. We expected that the American students with the highest levels of FOI would show a larger relative preference for dialectical proverbs than would the students with the lowest levels of FOI.

## Method

### Design

The experiment used a 2 (FOI: Isolatee vs. Isolator)  $\times$  2 (proverb type: Dialectical vs. Nondialectical)  $\times$  3 (proverb nationality: American, Chinese, and Yiddish) design. FOI was manipulated between subjects. Proverb type and proverb nationality were run within subjects.

### Subjects

One hundred American undergraduate students of the University of Texas participated in the study. Half of participants were randomly assigned to the Isolatee condition and the other half were to the Isolator condition.

### Materials

Two types of proverbs from three nationalities were randomly presented to participants; dialectical proverbs (eight American, eight Chinese, and eight Yiddish) and nondialectical proverbs (five American, five Chinese, and eight Yiddish). All the dialectical proverbs focus on an inherent contradiction in reality, such as “Sorrow is born of excessive joy” (Chinese), and “Make haste slowly” (American); and all the nondialectical proverbs are without such contradiction, such as “Good friends settle their accounts speedily” (Chinese), and “Half a loaf is better than none” (American). All of these proverbs were used in Peng and Nisbett’s (1999) study (see Appendix A).

### Procedure

Participants were asked to describe their previous experiences relating to social isolation. In the Isolatee condition, participants wrote about being socially isolated from others. In the Isolator condition, participants wrote about socially isolating someone else from them or other people. After completing this priming task, participants in both conditions responded to the Fear of Negative Evaluation scale as a manipulation check. Then, the 42 proverbs were presented randomly to participants and they answered four questions for proverb: (a) How familiar is this proverb to you in exact words? (b) How well do you think you understand this proverb? (c) How much do you like this proverb? (d) How often do you use this proverb? Participants rated their responses on a 7-point scale ranging from 1 (not at all) to 7 (very much).

### Results and discussion

First, we checked the effectiveness of our FOI manipulation. Average values on the Fear of Negative Evaluation scale were significantly higher in the Isolatee condition ( $M = 15.82$ ) than in the Isolator condition ( $M = 12.40$ ),  $t(98) = 2.48$ ,  $p < .05$ .

To explore preferences for proverbs, we followed the method used by Peng and Nisbett (1999), by taking the mean of the four judgments participants made for each proverb. A reliability analysis indicated that the four judgments were consistent enough to be summed into one index (Cronbach’s  $\alpha = .78$ ). These data (presented in Fig. 1) were submitted to a three-way ANOVA of FOI  $\times$  proverb nationality  $\times$  proverb type. This analysis revealed a significant main effect of proverb nationality,  $F(1,98) = 142.6$ ,  $p < .001$ , that reflects relatively stronger preference for American proverbs than for the Chinese or Yiddish proverbs. This effect is not germane to the aim of this study, so we will not discuss it further.

Consistent with our central prediction, there was a significant FOI  $\times$  proverb type interaction,  $F(1,98) = 6.41$ ,  $p < .01$ . This interaction reflects that overall preference for dialectical proverbs was significantly higher in the Isolatee condition ( $M = 3.88$ ) than in the Isolator condition ( $M = 3.70$ ),  $t(98) = 2.11$ ,  $p < .05$ . In contrast, the preference for nondialectical proverbs in the Isolatee condition ( $M = 3.99$ ) was slightly lower than in the Isolator condition ( $M = 4.06$ ),  $t(98) = 1.43$ ,  $p = .15$ .

For completeness, we note that Peng and Nisbett (1999) found an interaction between proverb nationality and dialecticality. Americans greatly preferred nondialectical to dialectical American proverbs, and the Chinese preferred dialectical to nondialectical Chinese. As shown in Fig. 1, the differences in the preference for dialectical and nondialectical proverbs between the two FOI conditions were greatest for American proverbs, presumably because all of our participants were Americans. However, the three-way FOI  $\times$  proverb nationality  $\times$  proverb type interaction was not significant,  $F < 1$ .

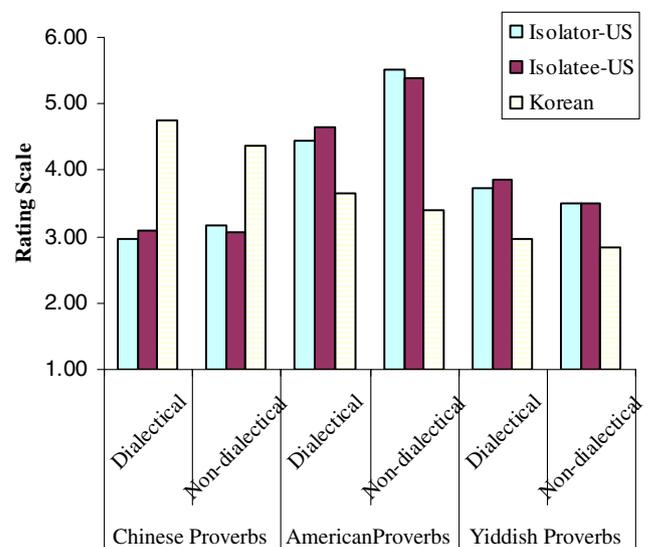


Fig. 1. Preference for dialectical and nondialectical proverbs by the two FOI groups in Experiment 1A and Korean participants in Experiment 1B.

To further examine the effect of FOI, we created a single index of each participant's relative preference for dialectical proverbs. For this index, each participant's average rating for the nondialectical proverbs was subtracted from his or her ratings of the dialectical proverbs for each nationality of proverb. This difference score provides a measure of the participant's relative preference for dialectical proverbs and it supports a test of whether FOI is a significant mediator of the observed difference in dialectical reasoning between conditions.

As expected, the relationship between FNE and preference for dialectical proverbs is positive ( $r = .26$ ,  $p < .05$ ). These results indicate that levels of FOI are positively related to the degree of dialectical thinking. A Sobel (1982) test indicated that FOI, as a mediator, was indeed responsible for the difference in dialectical reasoning between conditions (Sobel Test = 1.99,  $p < .05$ ).

The data from this study are consistent with our predictions. Within a sample of Western college students, we were able to manipulate people's average level of chronic FOI. Furthermore, the higher a participant's chronic FOI (as measured by the FNE scale), the greater their appreciation for dialectical proverbs.

### Experiment 1B: The relationship between FOI and dialectical thinking in Koreans

In Experiment 1B, we explored the relationship between relative preferences for dialectical proverbs and chronic FOI in Korean participants. We expect that scores on the FNE scale should be related to people's degree of dialectical reasoning even without a manipulation. We look both at within-culture differences and between-culture differences, by comparing the data from Experiment 1B to the results of Experiment 1A.

#### Methods

Seventy-one (34 males and 37 females) Korean undergraduate students from Korea University participated in Experiment 1B. The same 42 proverbs used in Experiment 1A were presented randomly to participants and they answered the same four questions per proverb. For Korean participants, the English questionnaire and proverbs were translated into Korean by the method of back translation (Brislin, 1970). They responded FNE scale first, and then evaluated the dialectical and nondialectical proverbs.

#### Results

Two participants whose length of stay in foreign countries (i.e., countries other than Korea) was more than 3 years before their participation were excluded

from the analyses. As we found for Asian students at the University of Texas, average values on the Fear of Negative Evaluation scale were significantly higher for the Korean participants ( $M = 18.45$ ) than for the American participants in the Isolatee condition in Experiment 1A ( $M = 15.82$ ),  $t = 2.25$ ,  $p < .05$ . This finding further supports the proposal that members of East Asian cultures have a higher chronic FOI than do members of Western culture.

To make a cross-cultural comparison of dialectical reasoning, we collapsed data of Experiment 1B and Experiment 1A. The Koreans and Americans (regardless of the FOI condition) were compared. Fig. 1 illustrates overall preference for dialectical and nondialectical proverbs by Korean participants. A three-way ANOVA of culture (American vs. Korean)  $\times$  proverb nationality  $\times$  proverb type replicated Peng and Nisbett's (1999) study. We found a significant main effect of culture such that the American participants showed the greatest preference for American proverbs regardless of whether they were dialectical or nondialectical, whereas the Korean participants' preference was the greatest for Chinese proverbs.<sup>1</sup> Further analyses revealed a significant three-way culture  $\times$  proverb nationality  $\times$  proverb type interaction, indicating that Americans significantly preferred nondialectical proverbs to dialectical proverbs, and the Koreans preferred dialectical proverbs to nondialectical Chinese proverbs,  $F(1, 167) = 50.06$ ,  $p < .001$ .

As we did for Experiment 1A, we created an index of relative preference for dialectical proverbs for each participant. As expected, the relationship between FNE and the index of the relative preference for dialectical proverbs is significantly positive ( $r = .47$ ,  $p < .01$ ) indicating that levels of FOI are positively related to preference for dialectical proverbs. This pattern is consistent with that observed in American participants in Experiment 1A. Further, the index of the relative preference for dialectical proverbs was significantly higher in Korean ( $M = .70$ ) than in American participants ( $M = -0.77$ ),  $t(167) = 7.31$ ,  $p < .01$ , suggesting that overall Koreans had a greater appreciation for dialectical proverbs. As expected, the relative preference for dialectical proverbs is related to FNE scores. A Sobel (1982) test revealed that FOI was a significant mediator for the explanation of cultural difference in dialectical reasoning between Korean and American participants (Sobel test = 3.07,  $p < .01$ ).

Finally, if FOI explains both within and between cultural variations, then Americans in the Isolatee group in Experiment 1A should display lower levels of dialectical

<sup>1</sup> In Peng and Nisbett's (1999) study, the Chinese participants who were studying in US rated the American proverbs as favorably as the Chinese ones. Peng and Nisbett (1999) explained the results that the Chinese students might be self-selected for liking American culture or had simply developed a taste for it because of their staying in US.

reasoning than should the Koreans in Experiment 1B, because even Americans who were primed to think about how they were isolated had a lower chronic FOI than did Koreans. As expected, the index of the relative preference for dialectical proverbs was significantly higher in Korean participants ( $M = .70$ ) than in American participants in the Isolatee group ( $M = -0.49$ ),  $t(117) = 6.02, p < .01$ . A Sobel (1982) test indicated that FNE was again a significant mediator of this effect (Sobel test = 3.45,  $p < .01$ ).

### Discussion

Taken together, Experiments 1A and 1B demonstrate the relationship between levels of FOI and dialectical thinking. In Experiment 1A, the Isolatee group showed a greater relative preference for dialectical proverbs than did the Isolator group. The results of Experiment 1B showed that individual differences in FOI are positively related to the degree of dialectical reasoning within a Korean sample as well. Further, overall scores on the FNE scale were higher in the Korean sample than in the US sample, and preference for dialectical proverbs was greater in the Korean sample than in the US sample.

As discussed in the introduction, however, the central motivation for our manipulation was that we wanted to prime the concept of FOI without inducing group differences in state anxiety or negative mood. In Experiment 2, we address two issues related to this motivation. First, we measure mood and anxiety to ensure that our manipulation did not lead to reliable differences in anxiety or mood between groups. Second, it is not clear whether a negative mood state will influence people's performance in a dialectical reasoning task. Some previous studies showed that negative mood leads to more analytic thinking (Bolte, Goschke, & Kuhl, 2003). For example, according to the personality systems interaction theory (Bolte et al., 2003; Kuhl & Kazen, 1999), an increase in negative affect supports a analytic processing mode whereas positive affect induce a relatively more holistic thinking. Thus, in Experiment 2 we included a negative mood induction to compare to the Isolator and Isolatee conditions.

### Experiment 2: Test of the relationship between FOI, negative emotion, and dialectical reasoning

Experiment 2 replicated Experiment 1A with the addition of a negative mood condition as well as measurements of mood. To induce a negative mood, we asked participants to write down sad episodes. If the observed difference in the relative preference for dialectical proverbs between the two FOI groups in Experiment 1A was mediated by a difference in the level of negative

mood, the Isolator group should show a higher level of negative mood than should the Isolatee group. Further the negative mood group should show a lower relative preference for dialectical proverbs than should the other two FOI groups. Finally, we examined whether other categorical variables (e.g., gender) influenced participants' dialectical reasoning with the collapsed data of Experiments 1A and 2.

### Method

#### Design

Experiment 2 used a 3 (manipulation type: Isolatee, Isolator, and Negative Mood)  $\times$  2 (proverb type: Dialectical vs. Nondialectical)  $\times$  3 (proverb nationality: American, Chinese, and Yiddish) design. As in Experiment 1A, FOI was manipulated between subjects in the first two experimental groups but those in the negative mood condition were given only manipulation of negative emotion. Proverb type and proverb nationality were within subjects.

#### Subjects

One hundred fifty American undergraduate students of the University of Texas participated in the study. Participants were randomly assigned to one of the Isolatee, the Isolator, or the negative mood condition. There were additional 15 participants who responded only to a mood scale (UWIST) as a baseline.

#### Materials

To measure participants' levels of negative mood, we used a simple version of the UWIST mood adjective checklist (Matthews, Jones, & Chamberlain, 1990). This 24-adjective checklist comprises three factorial scales of hedonic tone (HT), e.g., "happy" and "sad," tense arousal (TA), e.g., "tense" and "calm," and energetic arousal (EA), e.g., "vigorous" and "unenterprising," plus the composite general arousal scale (GA).<sup>2</sup> Because the general arousal scale includes the two specific arousal scales, we compared scores on the hedonic tone and general arousal. Scores on the hedonic tone scale are negatively related to the level of negative mood whereas positive values reflect a greater negative mood on the other two scales. The same proverbs were used in Experiment 2.

#### Procedure

As in Experiment 1A, participants in the Isolatee condition wrote about being socially isolated from others, whereas those in the Isolator condition wrote about socially isolating someone else from them or other peo-

<sup>2</sup> The three factorial scales consist of four positive and four negative items. The GA scale consists of six positive and six negative items.

ple. Participants in the negative mood condition were asked to write about their own sad experiences. After completing this self-descriptive priming task, all participants responded to the Fear of Negative Evaluation scale and the UWIST mood adjective checklist as manipulation checks. Then the same 42 proverbs used in Experiment 1A were presented randomly to participants and they answered the same four questions for each proverb.

## Results

### Manipulation checks

Five participants (1, 2, and 2 in the Isolatee, Isolator, and negative mood condition, respectively) whose native language was not English were excluded from the analyses.

First, we checked the effectiveness of our FOI manipulation and mood induction with participants' scores on the FNE scale and the UWIST, respectively. For the FNE scale, a one-way ANOVA of manipulation type showed a significant effect of condition,  $F(2,142) = 4.16, p < .05$ . Planned  $t$  tests revealed that there was a significant difference in FNE scale value only between the Isolatee group ( $M = 15.06$ ) and the Isolator group ( $M = 11.31$ ),  $t(95) = 3.06, p < .01$ . Neither the difference in the scale value between the Isolator group and the negative mood group ( $M = 13.38$ ),  $t(94) = -1.57, p = .11$ , nor the difference between Isolatee group and the negative mood group,  $t(95) = 1.24, p = .22$ , were significant (see Fig. 2).

Further analyses revealed that there were no significant differences in either of the emotion scales between the Isolatee ( $M = 3.33$  (HT),  $M = 2.19$  (GA)) and the Isolator groups ( $M = 3.31$  (HT),  $M = 2.20$  (GA)),  $t(95) = .22, p = .83$  (HT);  $t(95) = -.28, p = .78$  (GA). As expected, both the Isolatee and the Isolator groups showed a significant difference with the negative mood

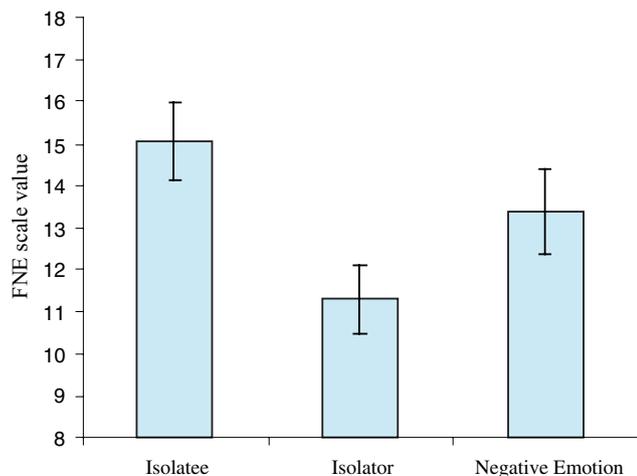


Fig. 2. Participants' scores on the FNE scale in Experiment 2.

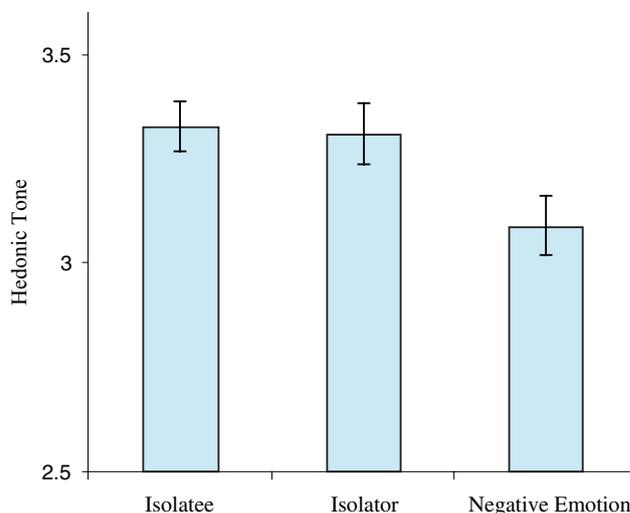


Fig. 3. Participants' scores on the Hedonic Tone scale in Experiment 2.

group in Hedonic Tone ( $M = 3.09$ ),  $t(95) = 2.42, p < .05$  (Isolatee vs. negative mood);  $t(94) = 2.01, p < .05$  (Isolator vs. negative mood) (see Fig. 3). The three groups were not significantly different in the general arousal scale. Further, there was no significant difference in either of the emotion scales between participants in the two FOI conditions and those who responded only to the UWIST (in all cases,  $p > .3$ ). These results indicate that the cross-cultural differences observed in the data of Experiment 1A and 1B should not be attributed to differences in state anxiety between American and Korean participants.

Overall the results of the manipulation checks indicated that the two FOI groups did not differ in affect. The negative mood group, which showed a significantly higher level of negative emotion, had an intermediate level of FOI between the two FOI groups. Thus, there does not appear to be a correlation between FOI and negative emotion, and our FOI manipulation did not produce an important change in emotion.

### Dialectical reasoning

As for Experiment 1A, we examined participants' overall preferences for dialectical and nondialectical proverbs. The data were analyzed with a three-way ANOVA of Condition (Isolatee, Isolator, and Negative Mood)  $\times$  Proverb Nationality  $\times$  Proverb Type. The means are illustrated in Fig. 4.

In this study, there was no significant three-way FOI  $\times$  proverb nationality  $\times$  proverb type interaction,  $p = .13$ . However, as seen in Fig. 4, the differences in the preference for dialectical and nondialectical proverbs between the two FOI conditions appear to be largest for American proverbs. Most importantly, we found a significant two-way FOI  $\times$  proverb type interaction; the Isolatee group greatly preferred dialectical proverbs to nondialectical proverbs,  $F(1,142) = 3.3, p < .05$ . This

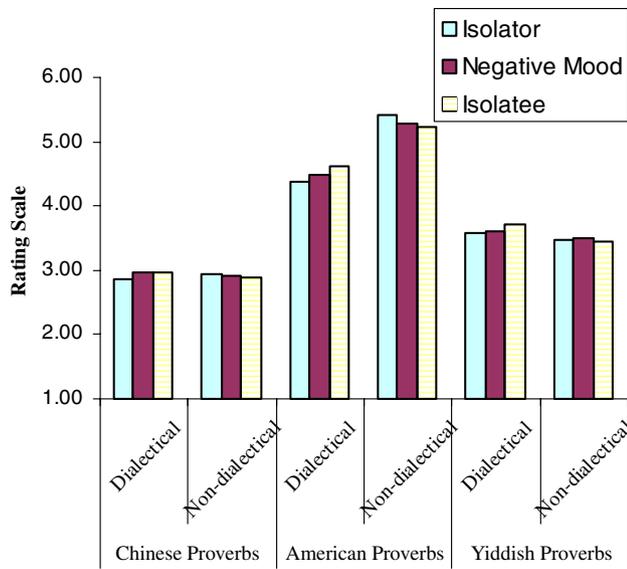


Fig. 4. Relative preference for dialectal proverbs in Experiment 2.

interaction reflects that overall preference for dialectal proverbs was significantly higher in the Isolatee group ( $M = 3.77$ ) than in the Isolator group ( $M = 3.61$ ),  $t(95) = 2.22$ ,  $p < .05$ . In contrast, the preference for non-dialectical proverbs in the Isolatee condition ( $M = 3.87$ ) was slightly lower than in the Isolator condition ( $M = 3.95$ ),  $t(95) = 1.30$ ,  $p = .19$ .

Once again, we created an index of relative preference for dialectal proverbs for each participant to further explore the relationship between FOI and dialectical reasoning. As expected, the relationship between FNE and preference for dialectal proverbs is positive ( $r = .24$ ,  $p < .01$ ). Furthermore, a Sobel test indicates that the indirect effect of Condition on dialectical reasoning was significant only with FNE as a mediator (Sobel Test = 2.13,  $p < .05$ ). Additional Sobel (1982) tests indicated that neither of the two emotional variables was a significant mediator, Sobel Test = .94,  $p = .35$  (HT), Sobel Test = .44,  $p = .66$  (GA). These results indicate that only levels of FOI are positively related to the degree of dialectical thinking, rejecting the possibility the current results are mediated by negative mood.

#### *The relationship between FOI and other factors*

Differences in levels of holistic and analytic reasoning have been studied not only between cultures but also between other demographic groups including gender and age (Goldberger, Tarule, Clinchy, & Belenky, 1996). For example, Belenky (1986) suggested that women are more likely to seek connected knowing, in which people understand the world based on connections with other. In contrast separate knowing, which weights objectivities rather than relationships, is more typical of males. These two modes of thinking are consistent

with dialectical and analytic reasoning, respectively. We were particularly interested in effects of gender because we did not equate the gender ratio in the current study. Across the two experiments, 88 males and 109 females participated. The Isolatee group had relatively more females ( $n = 60$ ) than did the Isolator group ( $n = 49$ ), whereas more males were in the Isolator group ( $n = 49$ ) than in the Isolatee group ( $n = 39$ ). This difference in gender balance between conditions may have systematically influenced the results.<sup>3</sup>

To test this possibility, we collapsed the data of Experiment 1A and Experiment 2 (the High and Isolator groups only). A three-way ANOVA of Experiment  $\times$  FOI  $\times$  proverb nationality revealed that there was no significant interaction between Experiment, FOI, and proverb nationality,  $F(2, 193) = 1.54$ ,  $p = .22$ . Because, in this collapsed version of data, all results of analyses about the two FOI conditions and their relative preferences for dialectal proverbs were exactly consistent with Experiment 1A and 2, we do not present details here.

A planned  $t$  test indicated that average values of the Fear of Negative Evaluation scale were significantly higher for females ( $M = 14.56$ ) than for males ( $M = 12.56$ ),  $t(195) = 2.11$ ,  $p < .05$ . A two-way ANOVA of gender and proverb showed a marginally significant effect of gender,  $F(1, 195) = 1.85$ ,  $p = .06$ , that reflects a relatively stronger preference for dialectal proverbs in females ( $M = -.57$ ) than in males ( $M = -.89$ ). Thus, females have a greater relative preference for dialectical reasoning than do males.

An ANCOVA, which included the Fear of Negative Evaluation scale score as a covariate, revealed that the effect of the Fear of Negative Evaluation scale score was significant,  $F(1, 195) = 16.85$ ,  $p < .01$ , and the gender effect was reduced in significance,  $F(1, 195) = 1.65$ ,  $p = .20$ . As expected, the relationship between FNE and preference for dialectal proverbs is positive ( $r = .30$ ,  $p < .01$ ). A Sobel (1982) test indicated that FOI, as a mediator, was responsible for the gender difference in dialectical reasoning (Sobel Test = 2.02,  $p < .05$ ).

We also examined the gender distribution in the Korean data in Experiment 1B. There were about the same number of males and females in this sample (33 males and 36 females). A planned  $t$  test indicated that the average value of the Fear of Negative Evaluation scale was nonsignificantly higher for females ( $M = 19.08$ ) than for males ( $M = 17.76$ ),  $t(67) = 1.03$ ,  $p = .30$ . Consistent with the pattern for American males and females, a two-way ANOVA of gender and proverb showed a marginal effect of gender,  $F(1, 67) = 2.94$ ,  $p = .09$ , that reflects a relatively stronger preference for

<sup>3</sup> We collected also other types of demographic information but, for example, age was not an available variable with the participant pool of college student in the current study.

dialectical proverbs in females ( $M = -.44$ ) than in males ( $M = -.93$ ). An ANCOVA, which included the Fear of Negative Evaluation scale score as a covariate, revealed that the effect of the Fear of Negative Evaluation scale score was significant,  $F(1,66) = 17.81$ ,  $p < .01$ , and the gender effect was reduced in significance,  $F(1,66) = 1.78$ ,  $p = .15$ . A Sobel (1982) test indicated that FOI, as a mediator, was responsible for the gender difference in dialectical reasoning (Sobel Test = 2.09,  $p < .05$ ). Taken together, these results suggest that the effect of gender in the Korean sample is also mediated by gender differences in FOI.

### Discussion

Experiment 2 replicated the effect of FOI on dialectical reasoning. Consistent with Experiment 1A, the Isolatee group showed a greater relative preference for dialectical proverbs than did the Isolator group. There was no systematic influence of mood or arousal on preference for dialectical proverbs. The overall results reconfirmed the positive relationship between level of FOI and dialectical thinking.

As discussed, we did not have a “no-manipulation” condition, because it is more reasonable to make the experimental treatments as homogeneous as possible except for the target variable of manipulation. However, the negative mood condition did not have a manipulation of FOI. Performance of this group was intermediate between that of the Isolator and Isolatee groups.

Additional analyses revealed a significant effect of gender in these data, but this effect is explained by gender differences in FOI. It would be interesting to know whether FOI explains gender differences in reasoning observed in previous studies. Few experimental studies provided a causal mechanism between a root variable to the observed differences probably mediated by the demographic categories.

In sum, an experimentally induced difference in FOI in members of a single culture led to differences in the degree of dialectical reasoning. We now turn to a third study that explores whether the manipulation of FOI influences attention and memory.

### Experiment 3: The effect of FOI on recognition memory

In Experiments 1 and 2, we showed that higher levels of FOI were associated with a relatively greater preference for dialectical proverbs than were lower levels of FOI. In Experiment 3, we explore whether differences in FOI are also reflected to differences in attention to objects and their context that were observed in the study of cross-cultural differences in recognition memory described in the introduction (Masuda & Nisbett, 2001). In these studies, Masuda and Nisbett (2001) showed

Japanese and American subjects pictures of animals and fish with a surrounding background (see Fig. 5A). Later, subjects were shown pictures of animals or fish they had seen as well as new animals and fish appearing either with the same background (e.g., Figs. 5A and B) or in a new background (e.g., Figs. 5C and D). Japanese (but not American) subjects were more likely to correctly recognize an old animal when it appeared with the original background than when it appeared in a new context. If a high level of FOI leads people to attend to relationships between objects and their context, then inducing a high level of FOI should make Americans less likely to attend to target information, which in turn should increase their memory for context vs. target information.

### Method

#### Participants

Eighty-nine American undergraduate students of the University of Texas (all born in the US) participated in the study. Half of the participants were randomly assigned to the Isolatee condition and the other half were to the Isolator condition.

#### Materials

In the first phase of the study, 24 animal pictures were presented. Each picture showed an animal in a particular background (see Fig. 5A).

In the second phase, participants saw 96 pictures. Twenty-four of them were same as the pictures seen in the first phase (old animal and old background). To create the rest of the 72 pictures, an additional 24 animals (new animal) and 24 backgrounds (new background) were used and the combination of the animal and the background information was manipulated. Because each animal could have one of two different backgrounds—the original background or a novel background, there were four different conditions: (a) old background and old animal, (b) old background and new animal, (c) new background and old animal, and (d) new background and new animal (see Fig. 5). All of these pictures were used in Masuda and Nisbett’s (2001) study.

#### Procedure

Once again, the manipulation of FOI asked participants to describe their previous experiences relating to an anxiety producing situation. In the Isolatee condition, participants wrote about being socially isolated from others. In the Isolator condition, participants wrote about socially isolating someone else from them or other people. After completing this self-descriptive priming task, participants in both conditions responded to the Fear of Negative Evaluation scale as a manipulation check.

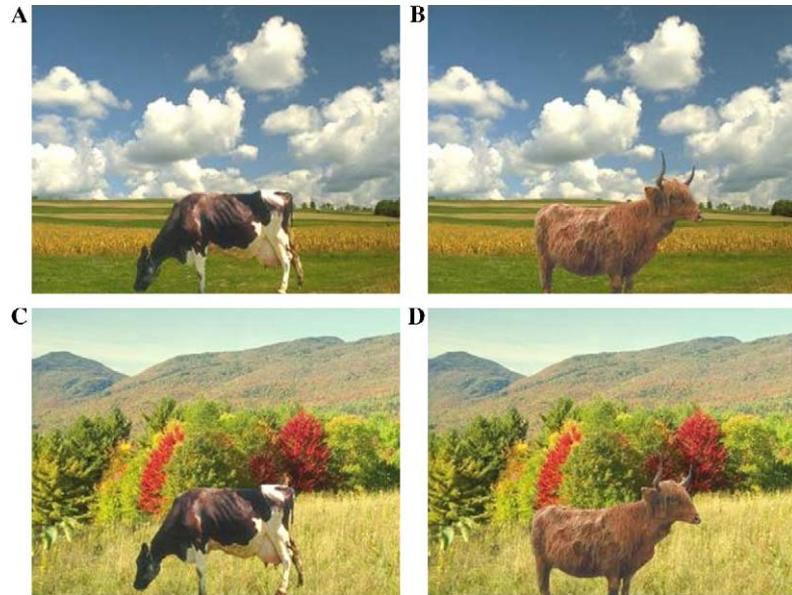


Fig. 5. Sample pictures used in Experiment 3. (A) A study picture. (B) A new animal in the old background. (C) An old animal in a new background. (D) A new animal with a new background.

Then participants viewed 24 photos of animals in naturalistic environments. Each photo was presented for 5 s. Participants were then shown a question that asked them to rate how much they liked each animal on a 9-point scale ranging from 1 (extremely unlikable) to 9 (extremely likable). After a 2-min delay of a distraction task, in which they subtracted 7 from 1000 and repeated the procedure, participants viewed 96 photos in a recognition memory test that varied whether the animals were old or new and whether the background was old or new. Participants were told to respond to on the basis of whether they had seen the animal in the photo regardless of the background of the test photo.

### Results

There was no significant difference in likeability in the learning phase between the two FOI groups,  $t(87) < 1$ . Average values on the Fear of Negative Evaluation scale were significantly higher in the Isolatee condition ( $M = 15.61$ ) than in the Isolator condition ( $M = 10.60$ ),  $t(87) = 3.92$ ,  $p < .01$ .

Masuda and Nisbett's (2001) found that Americans correctly recognized a previously seen animal whether the background was the same or different. In contrast, Japanese subjects were more likely to say they had seen a studied animal when it appeared with its original context than when it appeared with its new context. As seen in Fig. 6, our data are consistent with this pattern. A two-way ANOVA of FOI condition (Isolatee vs. Isolator)  $\times$  background (Original vs. Novel) revealed a significant interaction between these factors,  $F(1, 87) = 7.52$ ,  $p < .01$ . The patterns indicated that the Isolatee group

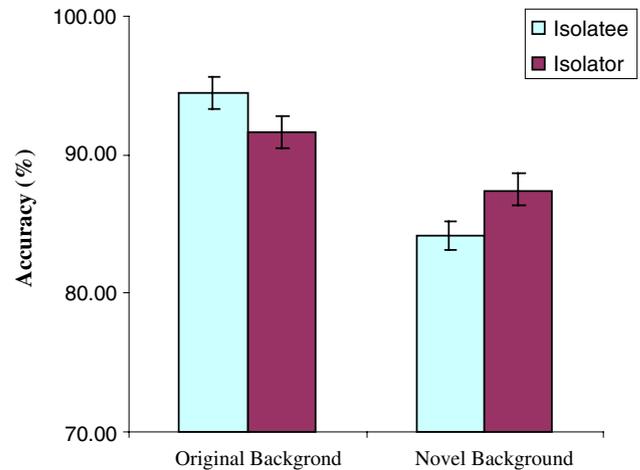


Fig. 6. Recognition accuracy for previously seen animals in Experiment 3.

( $M = 94.5\%$ ) showed relatively greater accuracy than did the Isolator group ( $M = 91.6\%$ ) when they were given original background information,  $t(87) = 2.42$ ,  $p < .05$ , whereas the Isolatee group ( $M = 87.5\%$ ) was better in recognition than was the Isolator group ( $M = 84.2\%$ ) with novel background,  $t(87) = 2.14$ ,  $p < .05$ .

Masuda and Nisbett's (2001) found no effect of background for new items in the test phase. We analyzed responses to new items with a two-way ANOVA of FOI condition  $\times$  background. Consistent with Masuda and Nisbett's results, the interaction of these factors was not significant,  $F(1, 87) = 1.38$ ,  $p = .24$ . This analysis did reveal a main effect of background,  $F(1, 87) = 45.13$ ,  $p < .01$ . Both the Isolator and Isolatee groups made fewer

mistakes than when they saw novel objects with the original backgrounds. Finally, the Isolatee and Isolator groups do not differ in their overall response sensitivities. A calculation of  $d'$  shows no difference for the Isolatee condition ( $M = 1.74$ ) and the Isolator condition ( $M = 1.76$ ),  $F(1, 87) = .01$ ,  $p = .92$ .

To further explore the difference in the relative sensitivity to background information between the two FOI conditions. We created a single index for “old” responses (i.e., previously seen animals). For this analysis, we subtracted people’s accuracy for the pictures with the new background from their accuracy with the original background. Positive scores indicate sensitivity to the context. The pattern for this index is consistent with the overall accuracy data. There was a significant correlation between FNE and the response index ( $r = .33$ ,  $p < .01$ ). A Sobel (1982) test indicated that the effect of FOI on the recognition was mediated by FNE scale values (Sobel Test = 2.11,  $p < .05$ ).

### Discussion

This experiment demonstrated an influence of fear of isolation on attention and memory by replicating Masuda and Nisbett’s (2001) observed cultural difference in sensitivity to background context in recognition memory. We found that higher levels of FOI were associated with recognition memory performance like that of East Asians. Participants in the Isolatee condition showed greater influence of context information on recognition memory than did those in the Isolator condition. When Fear of Negative Evaluation scale values were incorporated into the analyses as a covariate, they were significantly related to the degree of sensitivity to context, and the strength of the effect of FOI manipulation was decreased.

### General discussion

These experiments demonstrated the influence of fear of isolation on dialectical reasoning (Experiment 1A, 1B, and 2) and recognition memory (Experiment 3). Inducing a higher level of FOI in American college students made their cognitive performance more similar to that of East Asian students observed in previous studies. In Experiment 1A, participants in the Isolatee group exhibited a relatively greater preference for dialectical proverbs than did those in the Isolator group. Further chronic FOI in Koreans was positively related to relative preference for dialectical reasoning in Experiment 1B. Also, as expected Koreans generally scored higher on the FNE than did Americans, and their preference for dialectical proverbs was relatively greater than those of Americans. Experiment 2 suggested that negative mood did not systematically influence the rel-

ative preference for dialectical reasoning. In Experiment 3, participants in the Isolatee condition showed greater accuracy for the memory of background information than did those in the Isolator condition. When FNE scale values were incorporated into the analyses as a covariate, they were significantly related to the degree of dialectical reasoning (Experiments 1 and 2) and sensitivity to context (Experiment 3). Subsequent analyses suggested that the observed effects of our Isolator/Isolatee manipulation were mediated by scores on the FNE.

These findings are consistent with our hypothesis that chronic differences in FOI in members of East Asian and Western cultures lead to the differences in attention and reasoning observed in the previous studies (Masuda & Nisbett, 2001; Peng & Nisbett, 1999, 2000). We are not claiming that FOI is the only cause of cultural differences in reasoning. Indeed, differences in culturally accessible concepts such as collectivism and individualism may influence cognition either by affecting level of FOI through some other route (Aaker & Lee, 2001; Hsee & Weber, 1999). This issue has been much discussed in communication theories, which have yielded no clear consensus on whether FOI is an antecedent or an intervening variable. For example, Shoemaker et al. (2000) tested whether FOI is antecedent to opinion formation or an intervening variable between opinion formation and willingness to voice the opinion. Their path analysis suggested that FOI is an antecedent variable, but they could not exclude possibility that it is an intervening variable. Nonetheless, our results suggest that FOI is a robust causal factor explaining previously observed difference between cultures.

The mechanisms that relate FOI to these reasoning differences are an important topic of future research. We speculate that high levels of FOI lead people to think more about their relationship to others, and hence lead them to be more open to compromise in reasoning and more attentive to contextual and situational factors that guide behavior.

### Individual differences factors

These studies suggest that differences in FOI (as measured by the FNE) are associated with cognitive differences frequently observed across cultures. In this section, we briefly discuss two other individual differences factors that have been explored as possible causes of cultural differences, and compare them to FOI.

The first factor is self-construal. This research suggests that people may have an independent self-construal, in which case they define themselves in terms of attributes that are independent of other people (e.g., psychologist) or an interdependent self-construal, in which case they define themselves in terms of attributes

that depend on others (e.g., mother). Previous work suggests that East Asians tend to have relatively more interdependent self-construals than do Westerners (who typically have a more independent self-construal). Further, like individuals with high levels of chronic FOI, people with an interdependent self-construal tend to focus on relationships among individuals in the environment.

Clearly, Fear of Isolation and Self-construal are highly related constructs, though we do not believe that they are the same. Self-construal is much more sensitive to contextual manipulations than is FOI. Studies that manipulate self-construal often lead to changes in measures of self-construal that are as large as those observed in cross-cultural studies (e.g., Gardner, Gabriel, & Lee, 1999). Of importance, studies of this type reduce the size of the cross-cultural difference, but do not eliminate it.

In contrast, while our manipulations changed FNE scores in American undergraduates, we could not create differences that were as large as those observed across cultures. It is possible, of course, that this is a result of the poverty of our manipulation. However, our manipulation used the same kinds of priming methods that are used in the self-construal literature. Furthermore, the higher levels of FOI observed in Koreans in Experiment 1B were associated with a greater preference for dialectical proverbs than we observed in Americans in the Isolatee conditions of our studies.

A complete analysis of the relationship between FOI and self-construal is beyond the scope of this paper, but we have begun work to explore this issue in more detail. This preliminary work suggests that FOI is not strongly related to self-construal. Scores on the FNE scale do not have a reliable correlation with any of the six sub-factors of self-construal; Autonomy, Individualism, Behavioral consistency, Primacy of self, Esteem for group, and Relational interdependence (Hardin, Leong, & Bhagwat, 2004).

A second individual differences variable that has been explored extensively in the context of cultural differences is mortality salience (Greenberg et al., 1990; Rosenblatt, Greenberg, Solomon, Pyszczynski, & Lyon, 1989). Research on terror management theory suggests that people use their social networks to protect them against fears of death. Mortality salience tends to increase people's identification with their culture. For example, increasing mortality salience tends to lead people to punish those who transgress cultural norms and to reward those who maintain them (Rosenblatt et al., 1989). Mortality salience seems much less related to FOI than does self-construal. For example, Singelis, Bond, Sharkey, and Lai (1999) demonstrate that variables derived from terror management theory are not correlated with self-construal. Thus, terror management theory focuses primarily on factors that influence the

strength of a person's cultural identification, while FOI and self-construal influence the degree to which people attend to relationships among objects in the environment.

### *Implications and future directions*

This research suggests that we can account for significant variation in cognitive performance within and between cultures with people's chronic fear of isolation. Furthermore, this same variable is reliably associated with the observed gender differences in performance in these tasks. This work is consistent with the view that many cultural differences are reflections of individual differences that are promoted by elements of the culture rather than fundamental differences in the cognitive architectures of members of different cultures (Barrett et al., 2004; Briley & Wyer, 2001).

There are a number of important avenues for further work in this arena. First, as discussed in the previous section, more work needs to be done to explore the relationship between FOI and self-construal. In addition, it would be useful to refine the measures of FOI. In this study, we used the FNE scale. This scale was designed to provide a measure of chronic FOI. What we are doing is priming people's concept of being isolated, which in turn affects their score on the FNE. An examination of the questions on the FNE scale suggests that about 12 questions were sensitive to the FOI manipulation. Future research should develop a measure of FOI that distinguishes between trait measures of FOI (which should not be sensitive to priming manipulations) and situational measures that capture current accessibility of the concept of FOI.

In conclusion, it is important to bear in mind that we induced significant differences in memory for objects based on a simple manipulation of a participant's level of fear of isolation. As these findings demonstrate, a straightforward change in motivational state can lead to a large difference in basic cognitive functioning. This work highlights the need to include more research on the influence of motivation on cognitive processing within the canon of research in Cognitive Science.

### **Acknowledgments**

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## Appendix A. The complete set of proverbs from Experiments 1A, 1B, and 2

### Chinese dialectical proverbs

A wise man may look like a great fool.  
 It is easy to govern a kingdom but difficult to rule one's family.  
 Bitter words are medicine, sweet words bring illness.  
 Sorrow is born of excessive joy.  
 The great tree attracts greater wind.  
 Garden flowers are not as fragrant as the flowers of the field, but the flowers of the field do not last as long.  
 Straight trees are chopped first; sweet wells are drained fast.  
 The tongue is soft and remains; the teeth are hard and fall out.

### Chinese nondialectical proverbs

The melon-seller shouts that his melons are sweet.  
 Don't lose the falcon until you see the hare.  
 The light of a hundred stars does not equal the light of the moon.  
 Money hides a thousand deformities.  
 Good friends settle their accounts speedily.

### American dialectical proverbs

Actions speak louder than words.  
 Every cloud has a silver lining.  
 The bigger they come, the harder they fall.  
 The child is father to the man.  
 Truth is stranger than fiction.  
 Absence makes the heart grow.  
 All that glitters is not gold.  
 Make haste slowly.

### American nondialectical proverbs

Don't put all your eggs in one basket.  
 Half a loaf is better than none.  
 Look before you leap.  
 Practice what you preach.  
 Where there's a will, there's a way.

### Yiddish dialectical proverbs

Every uphill has its downhill.  
 Too humble is half proud.  
 Better an eloquent silence than an eloquent speech.  
 Half a truth is still a whole lie.  
 Beware of your friends, not your enemies.  
 A man is stronger than iron and weaker than a fly.

There is a new question to every answer.  
 Too much honor is half a shame.

### Yiddish nondialectical proverbs

"For example" is no proof.  
 A wounded spirit is hard to heal.  
 One against all is certain to fall.  
 If there is room for question, something might be wrong.  
 You can never catch up with a fool in his folly.  
 If things don't get better, they surely will get worse.  
 What we speak of by day we dream of by night.  
 A man should live if only to satisfy his curiosity.

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