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Which should you use, intuition or logic? Cultural differences in injunctive norms about reasoning

Emma E. Buchtel and Ara Norenzayan
University of British Columbia, Vancouver, British Columbia, Canada

Past research has shown that tendencies to engage in holistic and analytical reasoning are differentially encouraged by East Asian and Western cultures. But little is known about cultural differences in the perceived value of analytic versus intuitive reasoning. In Study 1, Koreans and Americans ranked the importance of traits including 'intuitive' and 'logical' in work and family contexts. In Study 2, Euro-Canadians and East-Asian-Canadians read scenarios of intuitive versus rule-following business decisions. Relative to Western participants, East Asians rated intuitive reasoning as more important and reasonable than analytic reasoning. Implications for the epistemic status of reasoning modes, culture's effect on values about reasoning, and multiculturalism are discussed.

Key words: culture, intuition, logic, norms, reasoning, values.

> . . . We see an opposition of 'logic' versus common sense, which takes the place of inductive and deductive reasoning in China. Common sense is often saner because the analytic reasoning looks at truth by cutting it up into various aspects, thus throwing them out of their natural bearings, while common sense seizes the situation as a living whole . . . Logic without such common sense is dangerous . . .
>
> Dr Yutang Lin (1939, p. 88)

Introduction

Imagine that a personnel director is making an important hiring decision. He has just interviewed two applicants, and mentions to you that although one of the applicants had a stellar resume and great experience, he had a general feeling that he wanted to hire the other individual. A few days later, you ask what he decided. 'Oh, I chose the applicant with the better background, of course,' he said. 'I wouldn't make a hiring decision just because of some baseless feeling!'

What would you think of the administrator's decision to ignore his intuition? Would it lead to increased respect for his competence and rationality? Or would it make you wonder about his ability to come to the right decision? As discussed in the recent literature (Lieberman, 2000; Gladwell, 2005; Dijksterhuis & Nordgren, 2006), intuition has long been denigrated in Western society. In the present paper, we will explore whether a bias towards rule-based decision-making and against intuition may be differentially distributed across cultures.

Correspondence: Emma Buchtel, Department of Psychology, University of British Columbia, 2136 West Mall, Vancouver BC V6T 1Z4, Canada. Email: ebuchtel@interchange.ubc.ca
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Specifically, we will ask whether having a Western or an East Asian cultural background differentially influences values about the 'right way of reasoning'. Past research has detailed cultural differences in analytic and holistic thinking modes, with East Asians tending towards holistic thinking and Westerners tending towards analytic thinking (Nisbett, Peng, Choi, & Norenzayan, 2001). But, do these cultures also encourage different values about reasoning styles, such as believing that one is more important or would lead to better decisions than the other? The previous findings on thinking modes might also mean that East Asian cultures emphasize the normative value of intuitive over rule-based reasoning, whereas Western culture emphasizes the normative value of rule-based over intuitive reasoning; however, this hypothesis has not yet been tested in the psychological literature.

From holistic versus analytic to intuitive versus logical

Recent cross-cultural research has indicated that there are systematic cultural differences in the habitual ways that people reason about the world. Under identical task conditions, thinking among relatively independent North Americans (and in people participating in European-influenced cultures) tends to be more analytic; that is, attention is focused on objects and their features and reasoning is decontextualized. Conversely, thinking among relatively interdependent East Asians (people participating in cultures influenced by Chinese, Japanese and Korean cultures) tends to be more holistic, that is, attention is dispersed to the field and reasoning is contextualized (Nisbett *et al.*, 2001).

The process of reasoning holistically or analytically takes place, of course, within the mind. But, in order to form a normative judgment about a person's

decision-making process, there must be a behaviour to which to apply the judgment. What would analytic and holistic decisions look like in daily life?

Analytic and holistic thinking patterns generally correspond to dual-process accounts of cognitive reasoning strategies, namely 'rule-based' versus 'associative' thinking (Sloman, 1996; see Buchtel & Norenzayan, in press, for debate on this issue). Rule-based thinking is characterized by, among other things, the conscious use of formal, decontextualized rules, including logic, to categorize and make decisions (Sloman, 1996; Kahneman, 2003), and cross-cultural studies have shown that Western participants tend to use these processes more than East Asian participants (Norenzayan, Smith, Kim, & Nisbett, 2002). A decision that follows rules and formal logic, then, should be preferred by those with a pro-analytic stance. Associative thinking, however, is characterized by a difficult-to-verbalize process of similarity judgments, holistic processing of stimuli, and tracking of associations and pattern-matching (Sloman, 1996; Norenzayan *et al.*, 2002; Kahneman, 2003; Dijksterhuis & Nordgren, 2006). Cross-cultural studies on holistic thinking in East Asians suggest strong parallels: in comparison with European Americans, East Asians use less verbalized thought (Kim, 2002), are better at tracking associations (Ji, Peng, & Nisbett, 2000), and attend to whole objects and relationships between parts (Masuda & Nisbett, 2001). The associative thought process is often described and experienced as an intuition (Sloman, 1996), as is reflected in our definition of intuition as 'the power or faculty of attaining to direct knowledge or cognition without evident rational thought and inference' (Merriam-Webster's Collegiate Dictionary, 2003). We suggest, then, that decisions that follow intuition might be preferred by those with a pro-holistic stance.

Evidence for explicit injunctive norms?

In the social norms literature, an important distinction has been made between descriptive norms ('what is commonly done') and injunctive norms ('what is commonly approved or disapproved') (Cialdini, Reno, & Kallgren, 1990; Cialdini & Trost, 1998; Kallgren, Reno, & Cialdini, 2000). The distinction outlines separate motivational systems behind conformity, which have been shown to operate differently in shaping behaviour (Reno, Cialdini, & Kallgren, 1993). In the case of cross-cultural differences, the distinction has important implications for intercultural interactions. Differences in descriptive social norms across cultures can, by themselves, result in miscommunication and conflict (Triandis, 1994, 2000). An accompanying cultural difference in injunctive norms, however, suggests that a pejorative element will add to the misunderstanding; a mutual 'yuck' response (Shweder, 2000, p. 216). Awareness of such biases may be the first step towards better intercultural communication (Fowers & Davidov, 2006).

An injunctive norm may be understood as a cultural-level value, defining what is important, and guiding evaluation of others' behaviour (Schwartz & Bilsky, 1987). The above research suggests that descriptive social norms about reasoning may differ in Western and East Asian cultures; for example, people in a Western culture may observe holistic decision-making less often than their counterparts in an East Asian culture. But, do the cultures specifically differ in their judgments of the importance or desirability of different methods of decision-making? If there are social norms that favour holistic or analytic reasoning, then behaviours that reflect those forms of reasoning should be 'sustained by the approval and disapproval of others' (Azar, 2004). However, evidence for explicit social pressures to engage in intuitive versus analytic reasoning is thin. Research findings have hinted that holistic thinking might be a sign of wisdom in East Asia; for example, Ji, Nisbett and Su (2001) found that Chinese participants judged a holistic response to events to be more 'wise' than did Americans. Tweed and Lehman (2002) have also discussed how Western educators tend to disparage Chinese students' learning styles, because they do not emphasize critical questioning and analytical evaluation (Tweed & Lehman, 2002). East Asian educators and intellectuals, in contrast, may view Western students as oddly dogmatic and competitive (Markus & Kitayama, 2003). Given these cross-cultural differences, there has been surprisingly little systematic psychological investigation into the extent to which reasoning modes are laden with cultural values. Thus, the following studies address the question: Do East Asian and Western cultural participants have different injunctive norms about reasoning?

Overview of studies

To examine this question, we analyzed the effects of culture on the perceived importance of 'intuition' versus 'logic' for success (Study 1), and the evaluations of a decision-maker who follows an intuition versus a rule (Study 2).

It is important to note that the study of values across cultures is vulnerable to reference group effects (RGE), a methodological artifact that may obscure true cultural differences in values (Heine, Lehman, Peng, & Greenholtz, 2002). Briefly, when participants are asked to rate how much they endorse a certain abstract value on a Likert scale, they implicitly use their own cultural group as the reference group, or standard of comparison. Because people in different cultures rely on different reference groups, any direct cross-cultural comparison of value judgments may be suspect. For example, paradoxically, Japanese participants endorse the value 'respecting parents' less than Americans, because of implicit comparisons with a perception that

most other Japanese would score highly on this value (Heine *et al.*, 2002). Of course, Likert scale responses do not always create RGE; instead, this potential artifact is particularly associated with questions that allow implicit comparison to an unspecified group.

To minimize this problem, as well as increase the generalizability of our findings, we have used two different methodologies designed to reduce RGE. In Study 1, we asked participants to rank the importance of 10 personality traits–including intuitive and logical–in work (relatively impersonal) and non-work (relatively interpersonal) situations. By asking participants to rank these traits in a specific context rather than on a non-contextual Likert scale, the standard of comparison was shifted to the specified list of traits. In Study 2, we asked participants to describe a character in a vignette who made intuitive versus rule-following decisions. This is known to minimize RGE by assessing participants' reaction to a specific person engaging in concrete behaviour, rather than on rating a value in the abstract (Peng, Nisbett, & Wong, 1997).

Study 1

In Study 1, we asked participants to rank the importance of Intuitive and Logical personality traits for success at Work and with Family and Friends. We expected East Asians to rank Intuitive more highly than Logical, and Westerners to rank Logical more highly than Intuitive.

Method

Participants

Seventy-six American undergraduates (45 men, 31 women, mean age = 22 years)[1] at the University of Illinois, Urbana-Champaign, and 58 Korean undergraduates (30 men, 28 women, mean age = 21 years) at Seoul National University participated in this study.

Materials and procedure

Participants completed a questionnaire for class credit. Participants ranked 10 positively valenced personality traits in terms of importance in two contexts: 'how important each trait is to have successful relations with friends and family' and 'how important each trait is to succeed at work.' The 10 personality traits, among which the two items of interest were embedded, were as follows: Ambitious, Logical, Punctual, Adventurous, Intelligent, Sociable, Self-confident, Intuitive, Happy, Reliable. Participants ranked the traits from 1 to 10 (1 = most important). Order of context presentation was counterbalanced across participants. For Korean participants, the questionnaire was translated into Korean and checked for accuracy through back-translation.

Results

We analyzed the relative rankings of 'intuitive' and 'logical' traits by examining cultural differences across contexts (work, family and friends). In order to examine cultural differences across contexts, we first averaged each individual's ranking of 'intuitive' and 'logical' across both contexts. A Culture (Korean, American) by Context (Work, Family and Friends) repeated-measures ANOVA evaluating the difference between these rankings showed no significant interaction between Culture and Context, $F_{1,132} < 1$, thus justifying an average rank across contexts. Interestingly, there was a significant main effect for Context, such that for both cultures, the importance of 'intuitive' (relative to 'logical') was greater in the Family and Friends context than in the Work context, $F_{1,132} = 11.04$, $p = 0.001$.[2]

Figure 1 presents the average ranking of these traits among our Korean and American samples. The relative ranks of 'intuitive' and 'logical' were different in our Korean and American samples, as shown by a significant Culture (Korean, American) by Trait (Intuitive, Logical) interaction, $F_{1,132} = 9.767$, $p = 0.002$. Simple main effects for Koreans and Americans separately showed that Koreans ranked 'intuition' ($M = 6.20$; $SD = 1.64$) as more important than 'logical' ($M = 7.10$; $SD = 1.63$), $t_{57} = 2.73$, $p = 0.008$. Americans did not rank 'logical' ($M = 6.18$; $SD = 1.39$) as significantly more important than 'intuition' ($M = 6.49$; $SD = 1.53$), $t_{75} = -1.37$, $p = 0.17$, but the difference between the means was in the predicted direction. It should be noted that the same analyses carried out with non-parametric statistical tests (Wilcoxon signed-rank tests) confirmed these results.[3]

Summary

Participants ranked the importance of 'intuitive' and 'logical' personality traits for success at work and with

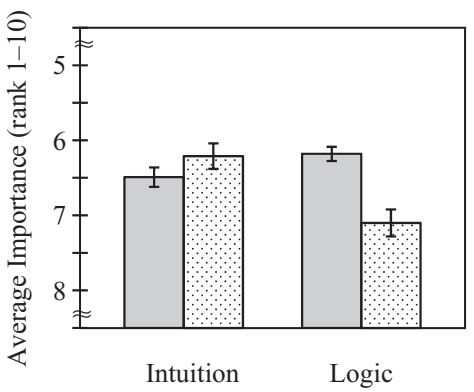

Figure 1 What traits are important for success? (Study 1.) Importance rank of 'intuitive' and 'logical' by culture. Error bars = *SEM*. ▢, American; ⬚, Korean.

family and friends. Consistent with our hypothesis, a significant Culture × Trait interaction revealed cultural differences in the relative importance of 'intuitive' and 'logical' personality traits. Koreans ranked 'intuitive' as more important than 'logical,' although Americans showed no statistically significant preference.

Study 2

Study 1 suggests that exposure to East Asian culture, unlike Western culture, may increase the perceived importance of intuition over logic for success. Ranking the relative importance of logic and intuition reflects an important cultural difference in their epistemic value. However, it does not directly measure the influence of injunctive norms. How are people who follow their intuition judged by others?

In Study 2, we examined how culture affects evaluation of a person who uses holistic 'intuitions' versus analytic 'rules' to make a decision. We asked participants to read a story in which the main actor either decided to follow an intuition (while patently ignoring a company rule) or to follow a rule (while patently ignoring an intuition). We hypothesized that: (i) East Asians would believe that the intuition-following actor was more reasonable than the rule-following actor, and Westerners the opposite; and (ii) that no such Culture × Choice interaction would appear in ratings of the actor on other personality traits, such as the actor's sociability.

Method

Participants

Eighty Canadian undergraduates from a first-year undergraduate psychology course at the University of British Columbia participated in this study. Forty-seven participants were self-identified European Canadians (20 men, 27 women; mean age = 19 years) and 33 were self-identified East Asian Canadians who did not speak English at home (29 Chinese, 4 Korean; 16 men, 17 women; mean age = 19 years). The two groups had, on average, lived in Canada for the same number of years (Euro Canadians, $M = 15.07$; East Asian Canadians, $M = 15.29$ years), and so the language spoken at home (English *vs* Chinese/Korean) served as a proxy for differing levels of acculturation to Western culture. For simplicity, these two cultural groups will be referred to as 'Euro Canadians' and 'East Asian Canadians'.

Materials and procedure

Each participant read one scenario, at the end of which the actor chose to follow either an Intuition or a Rule. Following the scenario were 13 items asking the participant to judge the actor and the actor's choice (see Appendix I for scenarios and a list of items). Participants were asked to rate their agreement with the items on a five-point scale (1 = not at all, 5 = very much).

Scenarios: We created four vignettes (2 types of decision-content, crossed with 2 types of intuition) to precede the character's choice. Participants read a story either about choosing between two potential employees, or between two employee-improvement policies (2 decision-contents). Participants further read either that the actor 'had a feeling that' or 'believed that considering all factors together, it seemed like' one choice would be better than the other (2 intuitions). There were no significant effects of either of these content differences on the following analyses (i.e. including the story and reason types as between-subject factors did not influence conclusions [in all analyses, there were no significant effects of story or reason type, and the significance of the cultural differences were only slightly increased by the inclusion of these variables]). We, therefore, report results from data collapsed across these scenario differences. To avoid any effects of protagonist gender, all scenarios used only initials to identify the actor and other people in the scenario. The pairing of scenario type and choice type (see below) was counterbalanced across participants.

Actor's choice: The scenario difference of interest was the choice that the actor in the scenario made. At the end of each scenario, participants read that a company rule would lead to the opposite choice from the one suggested by the person's intuition. The actor then made a decision (the 'choice') that either agreed with the intuition or with the rule. Half of the participants read that the actor followed the intuition, and the other half that the actor followed the rule. Pretesting on a separate sample of 39 participants (18 Euro Canadian, 21 East Asian Canadian) showed no cultural differences in perceptions of specific elements of the stories (i.e. no cultural differences in how reasonable the rules seemed to be or how compelling the reasons to follow the rules were [all t's < 1]). The questionnaires were presented in English to all participants, as all of them were enrolled at an English-language university.

Results

Manipulation check: Rule-following = Logical, Intuition-following = Intuitive?

Two of the 13 questions were designed as manipulation checks of the reasoning mode represented by the choice ('How intuitive do you think X is?' and 'How logical do you think X is?'). As predicted, a Culture by Choice between-subjects MANOVA showed that, regardless of culture, participants rated the intuition-following actor as more intuitive ($F_{1,76} = 10.86$, $p = 0.001$), and less logical ($F_{1,76} = 24.39$, $p < 0.001$) than the rule-following actor.

Scale construction

The eleven remaining items measured different judgments of the actor. The 11 items were created to reflect two kinds of positive evaluations: three items measuring 'social friendliness' (henceforth Social) and eight items measuring 'competence/rationality' (henceforth Reasonable). The Social scale asked participants to rate the actor on how social, talkative and friendly the actor was. The Reasonable scale asked participants to rate the actor on characteristics such as intelligence, competence and reasonability (items listed in full in Appendix I). Cronbach's alphas indicated that the items held together well, $\alpha = 0.78$ for the Social scale and $\alpha = 0.84$ for the Reasonable scale.[4] Ratings for Social and Reasonable were calculated by averaging across the items of each scale for each participant.

Analysis

We predicted that Reasonable ratings would depend on an interaction between participants' culture (East Asian Canadian *vs* Euro Canadian) and the actor's choice (following intuition *vs* following the rules), whereas Social ratings would not be influenced by participants' culture. An overall MANOVA predicting Reasonable and Social ratings from Culture and actor's Choice indicated significant main effects for Culture ($F_{2,75} = 3.66$, $p = 0.03$) and Choice ($F_{2,75} = 17.49$, $p < 0.001$), which were qualified by a significant Choice × Culture interaction, $F_{2,75} = 8.14$, $p = 0.001$. Results for the Social and Reasonable ratings are reported separately. For Social ratings, as predicted, the Culture × Choice interaction was not significant, $F_{1,76} = 1.73$, $p = 0.19$. Instead, Social ratings were predicted by a main effect of Culture, $F_{1,76} = 5.01$, $p = 0.03$, and of Choice, $F_{1,76} = 34.28$, $p < 0.001$. Euro Canadians rated the actor as more social than did East Asian Canadians ($M = 3.18$ [$SD = 0.89$] and $M = 2.79$ [$SD = 0.71$] respectively, $t_{78} = 2.07$, $p = 0.04$). Participants from both cultures rated the Intuition-following actor as more social than the Rule-following actor ($M = 3.51$ [$SD = 0.63$] and $M = 2.56$ [$SD = 0.75$] respectively, $t_{78} = 6.15$, $p < 0.001$). More pertinent to our hypotheses, however, was a significant Culture × Choice interaction on the Reasonable ratings, $F_{1,76} = 5.835$, $p = 0.02$. As seen in Figure 2, East Asian Canadians judged an actor to be more reasonable when he/she went with intuition, $t_{31} = 2.17$, $p = 0.04$, whereas Euro Canadians did not change their judgments depending on which decision was taken, $t < 1$. Seen from another angle, Euro Canadians rated the rule-following actor as marginally more reasonable than did East Asian Canadians, $t_{39} = 1.81$, $p = 0.08$, whereas the cultural difference showed a trend in the opposite direction in judgments of the intuition-following actor, $t_{37} = -1.61$, $p = 0.12$.

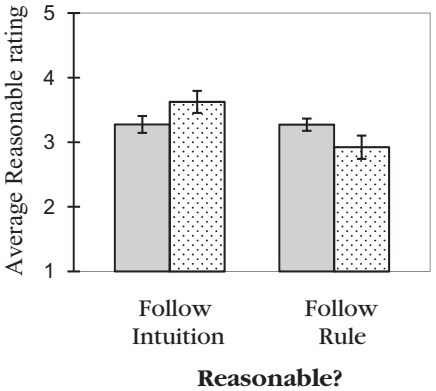

Figure 2 Reasonable scale ratings (Study 2). Ratings of the actor on an eight-item Reasonable scale, by participants' culture and actor's choice (to follow intuition *vs* to follow a rule). Error bars = *SEM*. ▢, Euro Canadian; ⬚, East Asian Canadian.

The cultural differences in judgment of intuition- versus rule-following behaviour were particularly apparent in two of the Reasonable items that seem especially important for cross-cultural judgments, that of being Wise and Competent (Fig. 3). Cultural differences followed the same pattern as above, with significant Culture × Choice interactions for both Wise ($F_{1,76} = 4.12$, $p = 0.046$) and Competent ($F_{1,76} = 6.9$, $p = 0.01$). As in the general Reasonable score, East Asian Canadians rated the intuition-following actor as more Wise ($t_{31} = 3.80$, $p = 0.001$) and Competent ($t_{31} = 2.03$, $p = 0.05$) than the rule-following actor, whereas the Euro Canadians did not show any reliable difference (both $t_{45} < 1.60$, p's > 0.12).

General discussion

Two studies were designed to test whether East Asian and Western cultures encourage different attitudes towards logic versus intuition. In the first study, Korean participants ranked intuition as more important than logic for success at work and in relationships, whereas Americans did not show any preference, instead showing a trend in the opposite direction. In a second study among Canadian participants, East Asian participants rated intuition-following employees as more reasonable than rule-following employees, whereas acculturated European-background participants did not show any reliable difference. Taken together, the results lend support to the hypothesis that East Asian and Western cultures encourage different injunctive norms for intuitive versus analytic decision-making, although it is notable that this effect is mostly due to the stronger preferences of East Asians for intuitive reasoning over analytic reasoning.

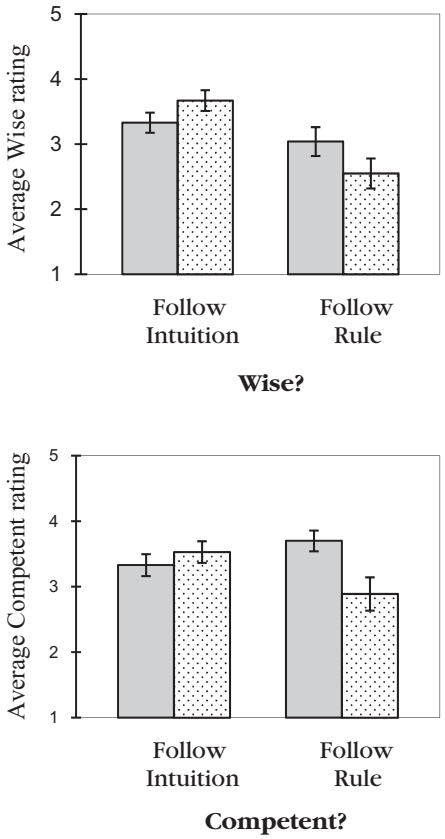

Figure 3 Single items Wise and Competent (Study 2). Ratings of the actor on the single items Wise and Competent, by participants' culture and actor's choice. Error bars = *SEM*. ▢, Euro Canadian; ⚀, East Asian Canadian.

Why might intuition be valued differently in East Asian and Western cultures?

A fruitful direction for future research would be to examine why East Asian culture might encourage a stronger pro-intuition injunctive norm than Western culture. Recent debates on the source of cultural differences have suggested foci on two potential routes: 'situated culture', which emphasizes how cultural differences in the content of situations interact with universal mental processes, and 'cultural systems', which emphasizes the importance of culture-specific constellations of norms, beliefs and meanings (Kitayama, 2002; Miller, 2002; Oyserman, Kemmelmeier, & Coon, 2002). We elaborate on their implications for our findings below.

Universal interpersonal-intuition link as source of values?

Among those factors believed to create and sustain the cultural differences in analytic/holistic cognition is the degree to which different cultures encourage interpersonal modes of being (Fiske, Kitayama, Markus, & Nisbett, 1998; Nisbett *et al.*, 2001). Cultures such as those of East Asia may require greater attention to 'relationships and subtle changes in social situations' (Masuda & Nisbett, 2001, p. 923), thus favouring holistic habits of thinking. Consistent with this reasoning, Western subjects exhibit increases in holistic cognitive processing after being primed with an interdependent self-construal, whereas East Asian subjects move towards analytic thinking when primed with independent self-construal (Kühnen, Hannover, & Schubert, 2001; Kühnen & Oyserman, 2002; Cha, Oyserman, & Schwarz, 2005). Moreover, recent studies have suggested that, in complex situations, intuitive, holistic thinking has a distinct advantage over conscious, analytic reasoning (Dijksterhuis, 2004; Dijksterhuis & Nordgren, 2006; Dijksterhuis & van Olden, 2006; Dijksterhuis, Bos, Nordgren, & van Baaren, 2006). As a result, societies in which success depends more on attentiveness to complex social cues may develop stronger injunctive norms to encourage thinking that leads to better detection of such cues, namely intuition.

Although our study designs did not allow a full investigation of such a hypothesis, a cross-cultural link between intuition and social situations is suggested: in Study 1, the importance of 'intuitive' (relative to 'logical') was greater in the Family and Friends context than in the Work context for both cultures and, in Study 2, both cultures rated the intuitive actor as more social than the rule-following actor. Such a link may also explain why, in these studies, Western participants did not significantly prefer analytic over intuitive modes of reasoning. In both studies, we chose contexts that varied somewhat in their level of interpersonal complexity. It is possible that our Western participants felt that the situations' social nature was somewhat ambiguous (leading to no overall preference for logic or intuition), whereas our East Asian participants viewed both situations as relatively interpersonal, leading to a preference of intuition over logic (e.g. Sanchez-Burks *et al.*, 2003). Such 'situated culture' findings (Oyserman *et al.*, 2002) might suggest that if there were no cultural differences in the perceived interpersonality of a situation, there would be no cultural difference in values for reasoning.

Culture-specific sources of values?

Alternatively, values about intuitive versus logical thinking may be culture-specific. For example, strong pro-intuition values may depend on the extent to which a society has been exposed to philosophies that describe intuition in a positive way. Generally speaking, a differential emphasis on the usefulness of intuition versus logic has been noted in East Asian versus Western philosophy (Becker, 1986; Lloyd, 1990, 1996). The concept of expert intuitive thinking may have been better developed in the East than in the

West. For example, the Taoist and Confucian spiritual ideal of 'wu-wei' or 'effortless action' is a kind of intuition, and yet is more complex and sophisticated than the Western idea of intuition as a 'snap judgment' (Slingerland, 2000, p. 300; Dijksterhuis & Nordgren, 2006, p. 106). Epitomized by Confucius' reputed ability, perfected at the age of 70, to perform rituals and to interact with others in an effortlessly harmonious and flexible way, 'effortless action' is a kind of expert intuition that allows one to engage in perfect, effortless deliberation and immediate response. Intuitive decision-making, then, may be held in higher regard in East Asian society because of philosophical traditions in which intuition is understood as complex and based on expert knowledge. Unfortunately, the results of these studies are not subtle enough to speak to such a hypothesis. An interesting future direction might lie in measuring endorsement of more culturally specific beliefs about intuition, and showing how these influence endorsement of the use of intuition.

Philosophical implications

The elaboration of different cultural patterns of injunctive norms about reasoning has important implications for epistemic values about reasoning. Within philosophy, ongoing debate on the definition of 'good justification' has resulted in a school of thought that appeals to 'evaluative notions embraced by everyday thought and language' as the ultimate arbiter – essentially, common sense (Stich, 1998, p. 109). As noted by philosopher Stephen Stich, culturally different norms about good reasoning would complicate this solution (Stich, 1990, 1998). Stich argues (1990; see also Resnick, 1994) that if there are culturally diverse systems of justification, then the reasonable philosophical position would be a relativistic one: to evaluate thinking in terms of local standards of justification. Although our findings do not show cultural differences quite as extreme as those imagined by Stich, they do lend support to the assertion that definitions of 'reasonable' can and do differ between cultures. Cultural variation in acceptable justification should be taken seriously in the search for systems of epistemic evaluation.

Limitations and conclusion

The two studies described in the present paper provide an initial step in outlining cultural differences in reasoning-related values. The next step is to determine how they develop and how best to deal with their consequences. Studies such as these that show an average difference between groups ignore, by statistical design, the existing within-culture diversity. They also do not take into account the dynamic nature of cultural change,[5] nor indicate what specific aspects of culture have caused the differences. In the case of values about reasoning, it would be particularly interesting to explore further the causes of different values for reasoning at both the cultural and the individual level. Specifically, do universal or culture-specific processes best predict the development of different reasoning values across cultures, or is the development of such values determined by multiple influences?

Increased knowledge of cultural differences, especially when judged through one's own norms of behaviour, can lead to negative impressions, misunderstanding and conflict (Triandis, 2000). However, attention to cultural differences can also be an opportunity to learn new ways of thinking (Fowers & Davidov, 2006). Much recent work has pointed out that both analytic and holistic thinking have their own advantages and disadvantages. One may hope that by bringing to light the relative values that other cultures assign to analytic or intuitive reasoning, we may pause in our own automatic evaluations of the reasoning patterns of these other cultures, thereby allowing us to become 'slow to judge' the other (Sager, 2002; Shweder, Minow, & Markus, 2002).

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End notes

1. By reported ethnicity, the American sample consisted of 52 Caucasians, four African Americans, five Hispanics, 12 Asian Americans, and three other. As expected with such small sample sizes, within-American analyses indicated that there was no significant effect of ethnicity on the analyses of interest. We therefore combined the data under a general 'American' grouping.
2. Analyses were carried out to rule out any influence of gender on our results. In neither Study 1 nor Study 2 did gender interact with culture in our analyses, and including gender as a covariate in fact slightly increased the effect of culture in our analyses. In Study 1, women ranked 'intuitive' as more important than 'logical' relative to men, $F_{1,132} = 8.55$, $p = 0.004$, but in Study 2, there were no significant effects of gender. These findings echo past inconsistent effects of gender on analytic and holistic thinking (e.g. Norenzayan *et al.*, 2002, footnote 4).
3. For Koreans, the rank sums (927 for intuition more important than logic [positive ranks], 399 for logic more important than

intuition [negative ranks]) indicated that intuition was ranked more highly than logic, $N = 58$, Z (positive ranks) = −2.47, $p = 0.013$. For Americans, there was no significant difference (rank sums: 1003.5 for intuition more important than logic [positive ranks], 1342.5 for logic more important than intuition [negative ranks], $N = 76$, Z [negative ranks] = −1.04, $p = 0.298$), although the difference was in the predicted direction.

4. An exploratory unweighted least squares (ULS) factor analysis with oblique rotation, carried out on the within-culture mean-deviated scores, also largely confirmed these two factors. The Kaiser-Guttman rule (number of eigenvalues above 1) suggested a two-factor solution. Using a 0.40 cut-off for salient loadings, the variable, Moral, did not load on either factor. All other variables loaded as predicted above.
5. The Japanese National Character Survey, for example, has surveyed a nationally representative sample of Japanese every 5 years since 1953, tracking how cultural norms change over time. Answers to one relevant question ('Do you prefer someone who does things socially harmoniously or someone who does things rationally?') have been consistent in direction but varying in degree: a slight majority of Japanese prefer someone who is socially harmonious to someone rational, ranging from a low of 50% in 1978 to a high of 56% in 1993 (Institute of Statistical Mathematics, 2006).

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Appendix I

Scenarios and items, Study 2

Two potential employees vignette

Fleet Bank has a company rule that when making hiring decisions, the decision must be based on the objective criteria of the candidate's amount of work experience, the strength of their recommendation letters, and how well they performed on some interview testing tasks. After the final round of interviews, J. has chosen A. and B. as the best candidates for the job. Both A. and B. did equally well in the interview tasks; they both have been working as account managers before; and they both came strongly recommended by past employers. However, B. has a stronger resume – B. has worked for several years longer than A. Nevertheless, during the interview, J. had a feeling that (or: believed that considering all factors together, it seemed like) A. would be a better person for the job.

Intuitive decision. Therefore, despite the rule, J. offered A. the job.

Rule-following decision. However, because of the rule, J. offered B. the job.

Two employee-improvement policies vignette

In a meeting today at Jones & Jones Law Firm, two different ways to increase the quality of newly hired associates were being discussed. R. must decide which method to use next year. One way is to give training classes to the new associates. The second way is to use a certain test when

hiring that will show who is most likely to succeed in the company. Testing takes less time than training, and both ways have been shown to be equally effective. It is also company policy to be efficient whenever possible, which favours testing. However, when considering the two options, R. had a feeling that [or: believed that considering all factors together, it seemed like] training is the better option.

Intuitive decision. Therefore, despite the rule, R. decides to choose training.

Rule-following decision. Nevertheless, because of the rule, R. decides to choose testing.

13 items

How much do you agree with R's decision?
How good do you think R's reason was for that decision?
How reasonable do you think R. is?
How good of a manager do you think R. is?
How much do you think you'd like R. as a friend?
How moral do you think R. is?
How logical do you think R. is?
How wise do you think R. is?
How social do you think R. is?
How competent do you think R. is?
How talkative do you think R. is?
How intuitive do you think R. is?
How intelligent do you think R. is?