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Culture and Individual Judgment and Decision Making

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Au cours des deux dernières décennies, on a beaucoup publié sur la culture et la psychologie interculturelle d'une part, sur le jugement et la prise de décision d'autre part (*judgment and decision making: J/DM*). Ces deux domaines ont été rapprochés par peu de chercheurs dont on passe ici en revue les travaux. On s'intéresse plus particulièrement à quatre thèmes J/DM qui ont été abordés d'un point de vue interculturel: l'évaluation de la probabilité, la perception du risque, l'attrait du risque et les formes de prise de décision. Notre investigation souligne une orientation positive dans les recherches J/DM interculturelles à savoir le passage d'une simple description des différences nationales à travers les comportements apparents à l'examen des processus sous-jacents qui rendent compte de ces différences grâce au recours aux valeurs et aux perceptions marquées par la culture. Pour encourager cette tendance, nous insistons pour que les futures études J/DM interculturelles soient davantage modélisées (c'est-à-dire qu'elles recherchent l'impact de V.I. changeant avec les cultures et ne se contentent pas de décrire des différences entre groupes) et adoptent une approche en mosïque dans le recueil des données (c'est-à-dire une approche qui fait appel à des méthodes diversifiées et met en évidence des preuves convergentes pour retenir ou rejeter un modèle).

In the last two decades, much has been published on the topic of culture and cross-cultural psychology and much on the topic of judgment and decision making (J/DM). However, only a few researchers have examined the intersection of the two areas. In this article, we review this body of research. Our focus is on four particular J/DM topics that have been studied cross-culturally: probability judgment, risk perception, risk preference, and modes of decision

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making. Our review reveals an encouraging trend in cross-cultural J/DM research—a shift from merely describing national differences in overt behaviour to exploring underlying processes that explain these differences by recourse to cultural perceptions or values. To reinforce this trend, we recommend that future cross-cultural J/DM research be more model-based (i.e. testing for the causal effect of independent variables shown to differ between cultures rather than simply describing group differences) and adopt a mosaic-building approach in its data collection (i.e. using multiple methodologies and seeking converging evidence to support or reject any model).

INTRODUCTION

For our assignment for this special issue—to report on research about the role of culture in decision making since culture was first discussed in the *Handbook of Industrial and Organizational Psychology* (Barrett & Bass, 1976), we embarked on two informal literature searches. First, we examined the extent to which decision making has been of interest as a topic of investigation to researchers who define themselves as cross-cultural psychologists by publishing in such specialist journals. Of the over 600 articles published in the *Journal of Cross-Cultural Psychology* since 1976, only 12 (i.e. 2%) were even loosely related to the topic of decision making. Of those 12, half appeared in a 1991 special issue on "Risk Perception and Decision Making under Risk". Research topics that enjoyed wider representation in this journal include individual differences (in particular in locus of control), attitudes, attributions, emotions, facial expressions, social interactions, and (on the cognitive side) language and visual perception.

Next, we examined the extent to which decision researchers have shown an interest in cross-cultural investigations, by searching for papers with a cross-cultural focus published since 1976 in the two main decision making specialist journals: *Organizational Behavior and Human Decision Processes* and the *Journal of Behavioral Decision Making*. Of the over 1,000 articles published within that time period in *Organizational Behavior and Human Decision Processes*, only four ($<0.5\%$) had any cross-cultural component. Three of those were contributions by Yates and collaborators on the topic of (over)confidence in judgments and decisions and its cross-national variation, with a single contribution by McGill (1995) on cross-cultural differences in causal explanations. The situation was similar for the *Journal of Behavioral Decision Making*. Of the approximately 200 articles published since the journal's beginning in 1988, only three (i.e. 1.5%) had a cross-cultural focus. One of those papers addressed cross-national variations in (over)confidence (Whitcomb, Onkal, Curley, & Benson, 1995), and two were on the topic of cultural differences in risk perception (Goszczynska, Tyszka, & Slovic, 1991; Teigen, Brun, & Slovic, 1988). Some research on the influence of culture on decision making has appeared in other journals,

including those of the American Psychological Association and the Academy of Management, but the results of our informal survey are typical for other journals. A recent review chapter on "Judgment and Decision Making" (Stevenson, Busemeyer, & Naylor, 1991) in the *Handbook of Industrial and Organizational Psychology*, for example, mentions not a single comparative cross-cultural study. The bottom line is that the topic of culture and decision making has not received a lot of attention from either decision researchers or cross-cultural psychologists.

We argue in this paper that the past and current levels of attention given to cultural determinants of decision making are not just low, but are inadequate, and that progress could be made on multiple fronts by comparative cross-cultural research. Most psychological models are solely based on the observation of American college students. Cole (1996) criticises these models and points out that failure to consider cultural variability in psychological processes makes it "impossible to know whether such processes are universal or specific to particular cultural circumstances" (p. 2). Aside from issues of generalisability, investigations of psychological theories that restrict themselves to small subpopulations of the human species (be it Americans or American college students) unduly restrict the range that the theories' predictor variables can be expected to take. In other words, comparative tests of psychological theories in cultures that have been shown to vary on the variable(s) hypothesised to affect the behaviour in question are, at a minimum, statistically more powerful. In addition, they shed better light on the adequacy and completeness of the hypothesised model of behaviour by being more likely to show the influence of other variables not yet included in the model.

There is also a practical argument to be made for more cross-cultural studies of judgment and decision making. Political, economic, and technological developments over the last two decades promise that considerable benefits can be derived from the investigations of cultural differences in perceptions, values, attitudes, and behaviours. The rapid globalisation of manufacturing, commerce, and trade, for example, has increased the need for a knowledge base of reliable cross-national differences in perceptions, beliefs, or modes of information processing. Such a knowledge base could be used, for example, to help in the creation of integrative bargaining solutions in cross-national negotiations (Bontempo, Bottom, & Weber, 1997). As Hofstede (1984, p. 277) puts it, "the survival of mankind will depend to a large extent on the ability of people who think differently to act together. International collaboration presupposes some understanding of where others' thinking differs from ours".

The current lack of curiosity about cross-cultural similarities and differences in decision processes and outcomes among decision researchers can probably be attributed to at least two sources. The first is the relative youth

of the field of behavioural decision making; the Society for Judgment and Decision Making, for example, is less than 20 years old. As a result, there does not yet exist a common set of assumptions, methodologies, or even important questions. The second source for the lack of interest in comparative studies probably lies in the particular home disciplines of decision researchers. Cross-cultural investigations are of theoretical interest only to researchers who allow for the influence of social construction on task performance. Economists, statisticians, and management scientists tend to take a positivist perspective concerning reality and its perception, contending that there is a single reality that can be studied, captured, and understood, both by themselves and by research participants. Disciplines that take a more interpretative perspective on such issues, contending that there are, at best, multiple realities that are socially constructed—for example, anthropology or sociology—are not widely represented in decision research. A growing number of decision researchers have become interested, however, in aspects of social construction. Such researchers explain, for example, differences in the perceptions of risk by members of the lay public in different countries with reference to culture, which they conceptualise as an "orienting disposition" (Dake, 1991) or a "collective programming of the mind" (Hofstede, 1984). It would seem that work on the topic of constructive preference (e.g. Payne, Bettman, & Johnson, 1993) should and could make some predictions about differences in choices as the result of systematic cultural differences in the construal process.

In this review, we first review four representative J/DM topics that have been investigated cross-culturally. We then discuss a trend that characterises much of the cross-cultural J/DM research in the last two decades, namely, a general shift from simply establishing overt cross-national differences to exploring underlying cultural-level constructs. Finally, we make recommendations for, and speculations on, future cross-cultural J/DM research.

CROSS-CULTURAL INVESTIGATIONS OF SPECIFIC J/DM TOPICS

Broadly defined, J/DM research draws on a wide range of disciplines, including cognitive psychology, social psychology, industrial and organisational psychology, and economics. Space limitations prevent us from reviewing all cross-cultural research in those disciplines. Instead, we will focus our review only on cross-cultural investigations of mainstream J/DM. In addition, our review will restrict itself to individual judgment and choice, and will not extend to group or organisational decision making. With these restrictions, our review will centre around the following four topics: probability judgments, risk perception, risk preference, and use of different modes of making decisions.

Culture and Probability Judgments

The J/DM topic with the earliest and probably most extensive cross-cultural research record is differences in probabilistic thinking and in the quality of probability judgments. Phillips and Wright (1977; Wright & Phillips, 1980) compared British and Asian (Malaysian, Indonesian, and Chinese) groups of students and businessmen on the numerical probabilities they assigned to the likelihood that they answered two-alternative forced-choice general knowledge questions correctly. Numerical probabilities provided by the Asians were more extreme (tending towards the two end points of the scale (.5 and 1.0)) and less accurate than those provided by the British respondents. Wright and Phillips speculated that this result might be due to cultural differences in worldview, with the British holding a Laplacean probabilistic–causal view of the occurrence of events and the Chinese taking a more fatalistic point of view. Such differences in worldview are consistent with the observations that probability theory did not develop in China, that the first translated book on probability theory was not published until 1896 (Li, 1984), and that decision-analytic techniques are not easily accepted even in modern-day China (Pollock & Chen, 1986).

The most-studied special case of probability judgments are people's confidence judgments in the accuracy of their answers to general knowledge questions. Confidence and probability judgments for other events can be decomposed into different performance dimensions (Yates, 1982, 1990). The most commonly investigated of those is calibration. Probability judgments are calibrated, as a group, to the extent that, over the long run, the proportion of events that actually occur corresponds to the probability assigned to them. The most common result, both in the United States and elsewhere, is that of overconfidence. People provide confidence judgments for events that are more extreme than the events' long-run relative frequency of occurrence warrants. For example, when people say that they are 90% sure something is correct, they may in fact be correct only 60% of the time. Above and beyond this main effect, Yates and some other researchers have provided evidence of cross-national variations in the degree of overconfidence (Yates, Zhu, Ronis, Wang, Shinotsuka, & Toda, 1989; Yates, Lee, & Bush, 1997). The main result is one of greater overconfidence (worse calibration) on the part of Asian respondents, with the sole exception of Japanese who are better calibrated than Americans and Europeans.

Investigations of the calibration of probability judgments provide an illustration of the advantages of conducting (cross-cultural) research in a model-based fashion. By *model-based research* we mean that the researcher has a guiding theory about the cultural/psychology processes underlying the observed national differences, and conducts experiments to test the theory. Lichtenstein, Fischhoff, and Phillips (1982) were the first to object to the

atheoretical empiricism of calibration studies and to stress the importance of studying the cognitive processes underlying probability judgments. Subsequent cognitive process models of probability judgments distinguished between the emergence of a subjective feeling of certainty (belief processing) and the transformation of this subjective feeling into an overt response (May, 1986). Mindful of this distinction, Whitcomb et al. (1995) compared American and Turkish business students' confidence judgments for answers to general knowledge questions. American–Turkish cross-national differences were found to parallel Western–Eastern differences, using three different response formats (numerical probabilities, pie diagrams, and odds). The same results (greater overconfidence by the Turkish respondents) were obtained for all three response formats, leading the authors to conclude that previously observed cross-national differences did not simply derive from differences in the use of the numerical response scale (i.e. were not just a response bias), but were instead due to differences in belief processing.

Several researchers have made a theoretical distinction between internally generated uncertainty (e.g. about the accuracy of answers to general knowledge questions) and externally generated uncertainty (e.g. about the likelihood of occurrence of future events). Wright and Wisudha (1982), Yates et al. (1989), and Zhang (1992) all found that overconfidence is reduced for judgments of externally generated uncertainty relative to judgments of internally generated uncertainty. However, similar and significant cross-national differences in calibration (between British and Indonesians, Americans and Chinese, Dutch and Chinese bridge players) occur for both types of judgments, with the Asians in all cases showing greater overconfidence than the Westeners.

The following accounts have been suggested to explain observed cross-national differences in confidence. The fact that Japanese respondents deviate from other Asian cultures (Yates et al., 1989) and the fact that Turkish respondents show the same level of overconfidence as respondents from Asian countries (Whitcomb et al., 1995) have been interpreted as evidence for the influence of socio-economic conditions (e.g. level of technological development, which might correlate with quantitative sophistication), rather than cultural differences per se. On the other hand, some truly cultural differences have also been suggested. In particular, the social orientation of Chinese (where individuals remain integral parts of their families throughout their lives (Yang, 1981)) and their more authoritarian socialisation and upbringing relative to Americans (Hossain, 1986) have been shown to be associated with less differentiated cognitive functioning (Witkin, Goodenough, & Oltman, 1979), which in turn has been shown to result in worse calibration (Wright & Phillips, 1980).

Yates et al. (1989) provided another intriguing explanation for cross-national differences in overconfidence in terms of differences in cultural

traditions in education. They argued that overconfidence occurs when respondents, after forming an initial hypothesis, only look for evidence consistent with that hypothesis and fail to recruit evidence that can potentially disconfirm it. People in different cultures have differential abilities to recruit disconfirming evidence and think critically. According to Yates et al. and Zhang (1992), the Chinese education system encourages students to follow traditions and precedents rather than to criticise them, partly because the Chinese have enjoyed many great achievements in their long civilisation and believe that what has worked in the past must be good and should be followed. As a result of this education tradition, the Chinese are not accustomed to think critically—not only of past traditions, but also of their own day-to-day judgments. On the other hand, people from many other cultures, particularly Americans, are trained to be "contentious" from a very early age; they are encouraged to challenge others' and their own opinions. This critical thinking style reduces their tendency to be overconfident. Yates, Lee, and Shinotsuka (1996) found evidence for this hypothesis when they prompted American, Japanese, and Chinese respondents to generate reasons that argued either for or against the correctness of their answers to general knowledge questions. For the Japanese and American sample, 48% and 41% (respectively) of all generated reasons were reasons that critically argued *against* respondents' answers. This was only true for 24% of all reasons for the Chinese sample.

Culture and Risk Perception

In their landmark study of the relationship between risk and culture, Douglas and Wildavsky (1982) addressed the influence of culture on both the perception of risk and on its acceptability. Risk perception in this and other studies described in this section refers to people's responses to questions such as: "How risky is a given action (e.g. living for five years at the perimeter of a nuclear power station)?" or "How risky is a given decision (e.g. to engage in a lottery that may provide a gain of $3000 or result in a loss of $1000, with equal chances)?" Douglas and Wildavsky provide convincing evidence that group conflicts over risk are best understood in terms of plural social constructions of meaning, and that competing cultures confer different meanings on situations, events, objects, and relationships. In Douglas and Wildavsky's cultural theory, the perception of risk, which is viewed as a selective attending to certain kinds of dangers, is a collective phenomenon. Each culture selects some risks for attention and chooses to ignore others. Cultural differences in risk perceptions are explained in terms of their contribution to maintaining a particular way of life. This idea was further developed by Wildavsky and Dake (Dake, 1991), who identified five distinct cultural worldviews or patterns of interpersonal relationships (hier-

archical, individualist, egalitarian, fatalist, and hermitic) that differ in their perceptions of risk. Hierarchically arranged groups, for example, tend to perceive industrial and technological risks as opportunities, whereas more egalitarian groups tend to perceive them as threats to their social structure (Douglas, 1985). The significance of this approach to understanding risk perception is that it provides a way of incorporating group and culture level explanations into the behaviour of individuals. In other words, this cultural theory offers suggestions for how individuals come to know where their interests lie.

Given the growing realisation that risk perception ought to be modelled as a psychological variable with possible individual and cultural differences, two different modelling approaches have emerged. The first approach attempts to model risk as a function of attributes of the risky alternative, which is described as a probability distribution over possible outcomes. Much of this work derives from Markowitz's (1959) normative treatment of risk, which equated the riskiness of a choice option with the variance of the option's possible outcomes. Under this definition, sure options carry no risk, that is, there is no variance around the guaranteed, single, known outcome. The wider the distribution of possible outcomes (i.e. the greater the variance of outcomes), the greater an option's riskiness becomes. Yet, empirical research that assessed people's judgments of the riskiness of financial gambles that differed in their distribution of outcomes has shown that downside variability of outcomes contributes much more to the perception of an option's riskiness than upside variability, an asymmetry that is not captured by variance measures (Weber & Bottom, 1989, 1990). As a result, different axiomatic measures of perceived risk have been developed (for a review see Weber, 1988, or Brachinger & Weber, 1997). Luce and Weber (1986), for example, derived a model of risk perception, called conjoint expected risk (CER), that models the perceived risk of some risky choice option as a linear combination of the probability of breaking even, the probability of getting a positive outcome (gain), the probability of getting a negative outcome (loss), the conditional expectation of positive outcomes raised to a power k_+, and the conditional expectation of negative outcomes raised to some power k_-, where k_+, $k_- > 0$. A recent review chapter (Yates & Stone, 1992) described the CER model among a score of others as the "most viable model to describe single-dimensional risk appraisal" (p. 72). The CER model captures both *similarities* in people's risk judgments (by a common functional form by which probability and outcome information about risky options is combined) and *individual and group differences* (with the help of model parameters that reflect the relative weight given to different types of information).

Bontempo et al. (1997) fit the CER model to judgments of the riskiness of a set of monetary lotteries made by business students and security analysts

in Hong Kong, Taiwan, the Netherlands, and the USA, with the following results. Cross-national differences in model parameters followed a Chinese–Western division, with respondents from the two countries with a common Chinese cultural heritage having model parameters that were similar to each other but different from those of the two Western countries. Consistent with cultural differences in sensitivity to differences in probability reviewed earlier, the probability of a loss had a larger effect on perceived risk for the two Western samples, but the magnitude of losses had a larger effect on the risk perceptions for the two Chinese samples. Finally, cross-cultural differences in risk perception were greater than differences due to occupation (no significant difference between students versus security analysts), suggesting that cultural upbringing and environment seem to play a larger role in shaping the perception of financial risks than professional training or expertise.

The second modelling approach treats risk as a multidimensional construct and uses multidimensional scaling, clustering, and factor analysis to identify its underlying psychological dimensions (Slovic, Fischhoff, & Lichtenstein, 1986). This psychometric paradigm has found that people's perceptions of the risks of hazardous technologies or activities have often little to do with possible outcomes and their probabilities. Instead, a layperson's perceptions of risk are systematically biased (compared to experts) in the way they overweight risk associated with infrequent, catastrophic, and involuntary events, and underweight the risk associated with frequent, familiar, and voluntary events. Peters and Slovic (1996) showed that the psychological risk dimensions identified by the psychometric paradigm can be distilled into the following two: *dread,* defined by the extent of perceived lack of control, feelings of dread, and perceived catastrophic potential, and *risk of the unknown*, that is, the extent to which the hazard is judged to be unobservable, unknown, new, or delayed in producing harmful impacts. Using the psychometric paradigm methodology, various researchers have demonstrated cultural differences in risk perception for complex stimuli, such as technological hazards. Applications have been reported using respondents from Canada (Slovic, Kraus, Lappe, & Major, 1991), France (Bastide, Moatti, Pages, & Fagnani, 1989), Hong Kong (Keown, 1989), Hungary (Englander, Farago, Slovic, & Fischhoff, 1986), Japan (Kleinhesselink & Rosa, 1991), Norway (Teigen, Brun, & Slovic, 1988), the Soviet Union (Mechitov and Rebrik, 1989), and Sweden (Slovic, Kraus, Lappe, Letzel, & Malmfors, 1989). Because the cultural background of the respondents and the existing environmental and health/safety conditions in the different countries studied are confounded in these experiments, it is difficult to make causal inferences regarding the role of culture per se. Nonetheless, these cross-national comparisons show that risk perceptions of respondents from different countries or cultures share the same factor structure: respondents in all studies were affected by the *dread*

factor and by the *risk of the unknown* factor. They tended to differ in where they place particular hazards (e.g. nuclear power) within this factor space, usually in ways that are interpretable given their specific national exposures and experiences and socio-economic concerns.

Holtgrave and Weber (1993) demonstrated that Slovic et al.'s psychological risk dimensions have explanatory power even after controlling for the effect of probabilities and outcomes. They attempted to explain subjective assessments of a wide variety of financial and health and safety risks on the basis of both probabilities and utilities (as captured by a simplified version of Luce and Weber's 1986 CER model) and Slovic et al.'s (1981) psychometric risk dimensions. The best fits were obtained by a hybrid model that added Slovic et al.'s *dread* risk dimension to the CER model. These results suggest that even the evaluation of the risk of financial investment options has a subjective (socially constructed and partly affective) component that is not completely described by the "objective" components of axiomatic measurement models (Loewenstein, Weber, Hsee, & Welch, 1999).

Slovic (1997) summarised a series of studies that suggest that cultural differences in trust in institutions may lie at the root of differences in perceived risk. It is plausible that reduced trust in the desire and ability of social institutions to protect their citizens results in a stronger negative affective response to potential hazards. In Douglas and Wildavsky's (1982) cultural theory, risk is also seen as the other side of trust and confidence, as the result of the way in which the theory sees risk perception as being imbedded in social relations. Palmer (1996) made predictions based on this theory for how individuals with different worldviews or patterns of interpersonal relationships should perceive financial as well as health and safety risks, and risk perceptions were analysed and described by the CER model. Using the stimuli of Holtgrave and Weber (1993), she elicited risk judgments for a set of monetary and health/safety risks from respondents who held one of three of the five cultural worldviews identified by Dake (1991). These respondents from either a hierarchical, individualist, or egalitarian subculture were identified from a multiethnic population of students by pretests. (For all practical purposes, fatalists show similar patterns of behaviour to hierarchists, and hermits are very rare. Most studies of worldview thus restrict themselves to the three categories studied by Palmer.) As predicted, Palmer found that the risk judgments of people with different worldviews were described by different components of the CER model. Hierarchists, who have been described as comfortable with determining acceptable levels of risk for technologies (Thompson, Ellis, & Wildavsky, 1990), a process that explicitly considers and weighs gains and losses, provided risk judgments that reflected all predictor variables of the CER model (gains as well as losses, outcome levels as well as probabilities).

Egalitarians, on the other hand, who have been described as suspicious of technologies and viewing nature as fragile and in need of protection (Thompson et al., 1990), which suggests that they should see risk in terms of possible harm, provided risk judgments that reflected only the loss/harm predictor variables of the CER model (expected loss and the probability of loss or status quo). Finally, individualists, who have been described as viewing risk as opportunity, given their tendency to see benefits from most activities as long as they don't interfere with market mechanisms (Thompson et al., 1990), were the group that provided the lowest risk judgments for almost all of the risky investments and activities.

Culture and Risk Preference

Using different methods of assessing decision makers' degree of risk taking (e.g. pairwise choices between gambles and sure amounts; willingness to pay for risky options), Weber and Hsee (the authors of this paper) have repeatedly found that respondents from the People's Republic of China are less risk-averse in their risky financial decisions than their counterparts in the United States (Hsee & Weber, 1999; Weber & Hsee, 1998). To show the value of model-based cross-cultural research, we will reconstruct why we investigated this topic in the first place and why we used the countries that we did, before we review our methodology and results.

Risk preference within the area of judgment and decision making has traditionally been modelled within the expected utility framework, inferring risk-aversion or risk-seeking from the shape of the utility function inferred from a set of choices. However, alternative formalisations exist, and several researchers (including the first author) have suggested that risk preference may be better modelled and explained within the risk–return framework (Weber & Milliman, 1997; Sarin & Weber, 1993). Developed by Markowitz (1959) within finance and adapted by Coombs (1975) to psychology, the risk–return framework conceptualises risk preference, for example, in the form of willingness to pay (WTP) for a risky option X_i as a compromise between the option's return (V) and its risk (R):

$$WTP(X_i) = f(V(X_i), R(X_i)) = V(X_i) - bR(X_i)$$

Conceptually, this formulation describes preference as a conflict and/or tradeoff between greed (return) and fear (risk). Risk–return models in finance equate "return" with the expected value of option X and "risk" with its variance and assume that decision makers seek to minimise the risk of a portfolio for a given level of expected return. Coombs (1975) questioned the latter assumption using the following logic. Most risky situations have some upside potential (i.e. the possibility of a gain or of a payoff greater than expected) at the cost of some downside potential (i.e. the possibility

of a loss or of a payoff smaller than expected). Whether risk is considered desirable or something to be avoided will thus depend on the relative emphasis one places on the upside potential relative to the downside potential. Lopes (e.g. 1987) has provided ample evidence that people differ in the extent to which they weight those two factors when making decisions under risk. Options with a large downside potential may seem proportionately more risky to individuals who put greater weight on the downside.

Given the documented cultural differences in risk perception described in the previous section, we wondered whether cross-cultural differences in perceived risks would translate into differences in overt choice. Weber and Hsee (1998) collected data from American, German, Polish, and Chinese respondents about their willingness to pay for a set of financial investment options, and about their perception of the riskiness of these options, and found that both risk perceptions and willingness to pay differed cross-nationally. Of the four nationalities, Chinese thought that the risks were the lowest and paid the highest prices; the opposite was true for Americans. Observed cross-national differences in choice were completely accounted for by systematic differences in risk perception. In a regression model of buying prices on expected value and perceived risk, the risk–value tradeoff coefficient b (i.e. people's attitude towards perceived risk) did not differ as a function of nationality. In another study, we had American and Chinese college students make choices between options with either sure or risky financial outcomes and again found American respondents to be more risk-averse in their choices than their Chinese counterparts (Hsee & Weber, 1999). To account for these results, we proposed the *cushion hypothesis*. According to this hypothesis, members of socially collectivist cultures, such as the Chinese culture can afford to take greater financial risks because their social networks insure them against catastrophic outcomes. The social network serves as a "cushion" which could protect people if they took risks and "fell".

Other than explaining cross-cultural differences in risky choices, the cushion hypothesis yields a number of other predictions. First, according to the cushion hypothesis, cross-cultural differences in risk preferences are mediated by differences in social networks. To test this hypothesis, we measured the size and quality of American and Chinese respondents' social network. As expected, the Chinese had a larger social network of family and friends who could and would render them help. Moreover, in a regression model that tested the effect of a respondent's nationality on risk preferences, the nationality variable, which was originally a significant predictor of risk preference, became insignificant once the social network information was added to the model (Hsee & Weber, 1999). This result suggests that social network indeed serves as a mediating factor between culture and risk preference.

Another prediction implied in the cushion hypothesis is that there would be more cross-cultural risk-preference differences in decisions involving monetary consequences than in decisions involving other outcomes. The reason is that the social network in a collectivist culture can more easily provide financial remedy than fix other problems. To test this prediction, Hsee and Weber (1999) assessed Chinese and Americans' risky choices in three decision domains—financial, academic, and medical. The financial decision was about whether to invest money in a savings account or in stocks. The academic decision was about whether to write a term paper on a conservative topic so that the grade would be predictable or to write the paper on a provocative topic so that the grade could be either very high or very low. The medical decision concerned whether to take a pain reliever with a moderate but sure effectiveness or a pain reliever with a high variance in effectiveness. Our results confirmed the cushion hypothesis prediction: the Chinese were significantly more risk-seeking than the Americans only in the financial decision domain, and not in the other two domains.

Weber, Hsee, and Sokolowska (1998) used a comparative content analysis of national proverbs to gain further insight into the sources of cross-cultural differences in risk taking. There were three main findings. First, regardless of the nationality of the raters, Chinese proverbs seem to provide greater risk-taking advice than American proverbs. Our other studies (Hsee & Weber, 1999; Weber & Hsee, 1998) showed that Chinese participants are less risk-averse in financial and other material decisions than their American counterparts, but did not conclusively answer whether these differences in behaviour reflect long-standing differences in cultural values or differences in the current socio-economic or political situation between these countries. The finding that Chinese proverbs (which have been accumulated over many centuries) endorse risk-taking more than American proverbs suggests that observed differences in risk-taking stem, at least in part, from long-standing differences in cultural values. Second, regardless of the cultural origin of the proverbs, Chinese raters perceived the same proverbs to provide greater risk-taking advice than did American raters, but only for the domain of financial risks and not for the domain of social risks. Thus Chinese raters perceived the same proverbs as providing significantly more risk-seeking advice in the context of financial risk than social risk, whereas American raters did not show such sensitivity to the decision domain. Long-standing cultural differences in social connectedness predict the direction of the observed differential attitude of Chinese raters to social and financial risk, since collective financial (or material) risk insurance requires that social networks will be maintained and social risks avoided. A related result was that American proverbs were systematically judged to be more applicable to financial risk decisions than to social risk decisions, whereas Chinese proverbs are much closer to being considered equally applicable to the

two domains. The proverbs produced by these two cultures over time reflect the fact that social concerns rate equal to financial or materialistic concerns in collectivist cultures, but are of smaller importance in individualist cultures.

Culture and Modes of Decision Making

Descriptive decision-making research over the past two decades has shown that people use a much broader range of decision modes than traditionally studied in economics, philosophy, and decision analysis. Yates and Lee (1996) coined the term *decision modes* in their description of culture-specific preferences for particular methods or strategies for arriving at decisions and distinguished between analytic, rule-based, and automatic decision modes. Others have also distinguished between analytic decision strategies (which have received the lion's share of theoretical and empirical research attention) and intuitive decision strategies (Hammond, 1996).

Weber, Tada, and Blais (1999) provide a broader and more differentiated taxonomy of the qualitatively different decision modes by which people have been shown to arrive at decisions. They distinguish between:

1. *Analytic or cost-benefit-based decision making*, which involves the evaluation and combination of probability and outcome information for the purpose of maximising the expected (multi-attribute) utility (i.e. benefits) of one's choice (e.g. von Winterfeldt & Edwards, 1986) and minimising its costs (Payne et al., 1993). Such decisions are typically made in a joint (comparative) evaluation mode (cf. Hsee, 1996b; Hsee, Loewenstein, Blount, & Bazerman, 1999).
2. *Category-based decision making,* where the decision maker recognizes the situation as a member of a category for which a judgment or action has already been stored (Simon, 1990). Once the situation has been classified, an if–then rule is activated which dictates the behaviour or choice. The following are all examples and special cases of category-based decision making: *Nondeliberative decision making* for routinised decisions, *stereotype-based decision making* (where a judgment or action is already stored in memory in association with the stereotyped group and is retrieved rather than computed), *case-based decision making* of experts for whom a presenting problem evokes similar situations in the past, and *role-based decision making,* where certain social roles are associated with rules and expectations of behaviour, and situations that prime a particular social identity also prime those behavioural norms (March, 1994).
3. *Reason-based or argument-based decision making*, by which the alternative is chosen for which the most compelling reasons can be marshalled

(Shafir, Simonson & Tversky, 1993; Hogarth & Kunreuther, 1995; Hsee, 1995, 1996a; in press; Tyszka, 1998).

4. *Affect-based decision making*, where people base their decisions on their holistic affective reactions to different choice alternatives (Damasio, 1993; Epstein, 1994; Hsee & Kunreuther, 1998; Loewenstein et al., 1999).
5. *Story-based or schema-based decision making*, where people arrive at a decision by constructing and evaluating sets of alternative "stories" of what might happen if particular courses of action are taken in a situation (Goldstein & Weber, 1995; Pennington & Hastie, 1988, 1993).

Decision makers' culture or subculture may affect their selection of decision mode either as a main effect or as an interaction with decision domain or context, which may be interpreted in different ways by members of different cultures. Main effects of culture on the frequency of use of different decision modes may be the result of cultural differences in cognitive style, motivations, or values. It is somewhat surprising that one of the most vociferous proponents of decision analysis (i.e. of analytic or cost-benefit-based decision making par excellence), Ron Howard, has voiced scepticism about the cultural universalism of this decision mode: "The idea of a 'decision' is a quintessentially Western idea, an act of hubris to a believer in Eastern philosophy and a joke to the enlightened. Can you imagine Buddha or Lao-Tzu making a decision?" (Howard, 1980, p. 1). Cross-cultural differences in the acceptability and use of decision analysis, that is, Western rationalistic-normative decision making, have also been reported. Pollock and Chen (1986, p. 35) went to the PRC to help plan a water pollution control system for the Huangpu River and describe finding "a decision environment that was almost completely devoid of a formal concern for uncertainty".

There are many reports about cultural differences in thinking styles, particularly between Westerners and Chinese. While some of them have an empirical basis, many are ungrounded, stereotypical speculations. The main reason we review the latter is to argue for the utility of exploring cross-national differences in preferred decision modes in a culturally more sensitive manner. Northrop (1946) describes the Chinese mind as nonanalytic and less interested in abstract reasoning than the Western mind. Nakamura (1960) describes the Chinese way of thinking as utilitarian and pragmatic. Graham (1967) also notes the neglect of logic in Chinese philosophy. He notes that (with the exception of the short-lived Moist school in the 5th century BC) almost all Chinese philosophical systems are practical, moral, or mystical, and indifferent to abstract speculation. He conjectures that this may be a consequence of characteristics of the Chinese language, which organises uninflected words (characters) solely according to word order,

turning the Chinese into lexicographers rather than grammarians. Given that different decision modes require analytic thinking and abstract reasoning versus case-based reasoning to different degrees, these results suggest that cultural differences in thinking styles may well result in cultural differences in the frequency with which different decision modes are employed.

Based on Zhang's (1992) work, Yates and Lee (1996) suggest that the Chinese frequently use a unique decision-making mode, which they refer to as the folk-precedent-matching method. The basic idea of this method is as follows: when confronted with a decision problem, the decision maker searches for precedents. More often than not, these precedents are stories and legends in the past. If the current decision problem is deemed similar to the past situation, the appropriate action is simply to do what was done before. This folk-precedent-matching decision mode is related to the idea discussed earlier—that the Chinese are encouraged to follow traditions rather than to think critically. In some sense, a folk-precedent is just like a rule for a particular category of decisions or a previous case of a similar decision with a known solution. In this way, the folk-precedent-matching decision mode is just a variant of category-based or case-based decision making. These decision modes are, of course, not uniquely Chinese decision-making styles. However, what the folk-precedent-matching hypothesis suggests is that the Chinese are more likely to make their decisions this way than their Western counterparts. In addition, the rules and case histories used by the Chinese seem to find their origins and justifications in folk history (Yates & Lee, 1996).

Hsu (1970) and Markus and Kitayama (1991) examined differences in the Chinese–Western conceptions of the self, suggesting that the Chinese perceive the world as based on a network of relationships which makes them socio-oriented and situation-centred, in contrast to Westerners' self-orientation and individual-centredness. Roland (1988) also reports evidence that the individualistic view of self that underlies much of personality theory has only limited application in Asian cultural groups (India and Japan). The latter seem to be better characterised by a familial view of self that emphasises empathy and receptivity to others. Different definitions of self are most likely associated with differences in the importance of goals (e.g. social connectedness versus individual accomplishment). Weber, Tada, and Blais (1999) suggest that people's choice of decision mode may be influenced by such meta-goals, because decision modes are differentially effective in satisfying different goals. For example, role-based decision making will foster social connectedness, whereas cost-benefit-based decision making will be more effective in maximising individual profit.

In a related line of research, Morris and Peng (1994) found that Americans and Chinese have distinctively different attribution styles, with the result that the fundamental attribution error (overattribution to person-centred

rather than situation-centred explanations of behaviour), which is well established using American subjects, is much weaker among Chinese subjects. This cross-national difference in attribution also seems to be mediated by the two cultures' differences in individualism versus collectivism (Hofstede, 1984). Americans' strong individualism predisposes them towards person-centred attributions of behaviour.

Ji, Schwarz, & Nisbett (1998) provided evidence of Chinese–American differences in attention and memory encoding, which result in different judgment strategies being more prevalent in the two groups. Ji et al. assumed that people in interdependent cultures like China assign more importance to social relations, a conjecture for which Weber, Hsee, and Sokolowska (1998) provided some support in their comparative analysis of proverbs from Germany, the United States, and China. As a result, people in an interdependent culture such as China will pay more attention to their social environment and thus will be more aware of their own daily behaviours and those of others around them and encode them in memory. When asked about the frequency of some behaviour, Chinese can use their memory to make such judgments, resulting in fairly accurate judgments. People, such as Americans, for whom their social environment is less important and thus less attended and remembered, will have to make such judgments in other ways, for example estimating them from first principles, which is much more susceptible to context manipulations.

Blais and Weber (1999) investigated the effect of gender, culture, and decision content on decision mode in a comparative study using French-Canadian and American undergraduates. Respondents completed questionnaires about their likelihood of using different decision modes (cost-benefit-based, affect-based, and three versions of a reason-based mode) in 10 decision situations that reflected five domains (money, relationships, health, ethics, and career). There were main effects of both gender and culture on decision mode selection, and both gender and culture was found to interact with content domain to determine the likelihood with which respondents indicated that they would use different decision modes. French-Canadians, for example, were more likely to make decisions by means of cost-benefit considerations than Americans, and especially so in some content domains (e.g. relationships).

DOCUMENTING BEHAVIOURAL DIFFERENCES VERSUS EXPLORING UNDERLYING CULTURAL DIFFERENCES

Cross-cultural research can be conducted at two different levels. On the first level, the goal is to secure differences in overt behaviours between members of different cultures. On the second level, the goal is to identify underlying cultural values that drive overt behavioural differences. McDaniels and

Gregory (1991) have rightly voiced concern that many researchers fail to distinguish between these two levels. That is, national differences are often treated as cultural in origin without any attempt to distinguish between cultural versus situational determinants. Johnson (1991) suggested that culture should have a pervasive effect and that cross-national differences in a given behaviour should only be considered as cultural in origin if they are paralleled by differences in other, related behaviours that can be expected to have different situational determinants. In other words, a particular cultural difference in belief or value should affect a range of judgments and actions in different situations, making it the most parsimonious single explanation of these observed group differences. Following this strategy, Weber and Hsee (1998), for example, developed predictions of their cushion hypothesis for behaviours other than risk taking, in particular for perceptions of the riskiness of choice options. As discussed above, their research demonstrated cross-cultural differences in risk perception that were consistent with those predictions, namely lower perceptions of the riskiness of financial choice options by members of socially collectivist cultures.

Multimethod Mosaics

Weber and Hsee (in press) reiterated Johnson's (1991) demand for multiple dependent measures and added the use of multiple research methodologies to the list of desirable features for cross-cultural research. They argued that the establishment of a convincing and conclusive causal connection between a cultural variable and some target behaviour can be likened to the creation of a mosaic. The individual tiles of the mosaic do not allow the viewer to infer the full picture, which becomes apparent only after all the tiles have been arranged in a particular spatial pattern. In the same way, specific studies of cross-national differences on some dimension are often individually inconclusive, in the sense that each one allows for alternative explanations of the obtained results. It is not easy to establish whether observed national differences in behaviour are truly cultural, that is, are the result of long-standing differences in cultural norms and values which are not readily modified, or whether they are more malleable and transient because they result from current situational circumstances. It is only in combination—where model-based connections between various dependent and predictor variables dictate the particular "spatial" pattern of arrangement—that a *set* of studies may provide more conclusive evidence about factors (be they cultural or otherwise) that contribute to the target behaviour.

An example of the mosaic-building approach to distinguish long-standing cultural value differences from more transient situational national differences is the investigation of cultural products. Norms and values operating

in a given culture affect the behaviour of members of that culture. In addition to that, the events and circumstances that—over many generations—create those values as a cultural adaptation leave their trace and are reflected by a variety of cultural products. Collective products that store and transmit cultural wisdom include a culture's proverbs that provide advice about recommended courses of action, its literature, and its philosophy and art. If national differences in some behaviour are the consequence of long-standing differences in cultural values rather than in current economic or political circumstances, they should also be reflected in cultural products such as the culture's proverbs. If they are exclusively the product of the current environment, they will not be reflected in cultural documents, especially if the instrumental characteristics of the current environment are of recent origin. As described above, Weber, Hsee, and Sokolowska (1998) used national proverbs as historical informants about long-standing cultural differences in risk preference.

There are other examples of the utility of analysing cultural products to provide converging evidence for cultural difference hypotheses. One is the work of McClelland (1961), who found independent support for cultural differences in need for affiliation in his content analysis of elementary school primers from different countries. Another example of the creative use of cultural products, this one in the area of decision making, is the work of Gaenslen (1986). He examined how cultures might differ in the effect that power differentials between disputants have on the processes and outcomes of contentious decision problems, and did so by analysing contemporary (20th century) novels from different cultures (Chinese, Japanese, Russian, and American). To test the validity of the use of cultural products (i.e. novels) in making inferences about actual behaviour, Gaenslen culled 36 well-established findings on conflict resolution and dispute settlement from the social psychological and anthropological literature. One example was the finding that the more equal disputants are in status, the more likely a contested good will be divided according to the principle of equality rather than equity. He then examined whether these findings were supported by the fictional conflicts described in the four bodies of literature. While there was less correspondence between the social science results and fictional accounts of behaviour in censored (Chinese and Soviet) novels, an average of 87% of the social science findings were supported in each of the four sets of uncensored novels. Having established that novels seem to provide an accurate picture of human conflict resolution in general, Gaenslen then analysed the four sets of novels for cultural *differences* in described decision processes and outcomes. Based on established cultural differences between the four countries on individualism–collectivism, he postulated differences between American (individualist) decision processes in contentious decision situations on the one hand, and Chinese, Japanese, and Russian (collecti-

vist) decision processes on the other hand. Using coders' evaluations of contentious decision situations depicted in the four bodies of literature, Gaenslen found evidence for postulated collectivist–individualist cultural differences in (a) the effect of normative arguments on resolving a conflict in favour of the superior or subordinate (both outcomes equally likely in American novels, but not in the other novels where subordinates are less likely to win); (b) the effect of public settings (subordinates are significantly less disadvantaged by conducting the conflict in a public setting in American novels); and (c) the effect of power differential on the decision making and persuasion tactics used by disputants (with fictional Americans—more than Chinese, Japanese, and Russians—not discriminating between people at different power levels in their choice of persuasion tactics).

Szalay and Deese (1978) described another creative methodology that utilises collective responses provided in the present (rather than the past). The Associative Group Analysis (AGA) Method, developed by their research group at the Institute for Social and Cultural Studies, assesses differences in cultural perceptions and conceptualisations of particular categories through an evaluation of the spontaneous word associations generated by a large number of people from a given culture in response to category cues. A comparison of the collective associative structures generated by American, PRC, Hong Kong, and Taiwanese cultural groups for key terms within the domains of family relations and the economy, for example, showed that long-standing cultural values were responsible for differences in the associative structures (with the three culturally Chinese groups generating similar associations that differed from those of the Americans), rather than more recent ideological influences on people's conceptualisations of these issues, which would have predicted that Chinese from the PRC should have generated different associations than those from Hong Kong and Taiwan (Szalay et al., 1986; Szalay, Strohl, Fu, & Lao, 1994).

These results suggest that the AGA method is a useful tool for diagnosing cultural differences. Within the area of judgment and decision making, for example, Peters and Slovic (1996) used an extension of the AGA method to examine the effect of differences in Dake's (1991) worldviews on perceptions of the risk from nuclear power and support for nuclear technology. Respondents in a large national telephone survey were identified as subscribing to one of three worldviews (hierarchical, individualist, or egalitarian) based on their responses to a small set of diagnostic questions. They also generated three word or image associations to the word "nuclear power" and subsequently rated the affective valence of these images (on a scale ranging from very negative to very positive). Affective valence of the free associations was related to worldview, with hierarchists and individualists reporting more positive associations than egalitarians. While

related, affect and worldview also contributed independently to the prediction of support for nuclear technology, suggesting that affect is shaped by determinants above and beyond worldview and that the effect of worldview, conceptualised as an orienting response or filter that guides information evaluation, is mediated by affective processes but also other processes (e.g. cognitive filtering).

Model-based Research

We have argued elsewhere that cross-cultural research ought to be model-based (Weber & Hsee, in press). That is, investigators should commit themselves to a model of the behaviour under study that explicitly specifies possible causal constructs or variables hypothesised to influence the behaviour, as well as the relationship between those variables. Furthermore, the model should allow for individual, group, or cultural differences in either the value of one or more of these variables or in the relationship between them. Models help researchers to identify and measure the variables that are causal in bringing about cross-national differences in beliefs, attitudes, and behaviour. Ideally, cultural differences on a model variable should be shown to be mediators or moderators of the behaviour under investigation. An example of a demonstration of a cultural difference as a mediator of behaviour was provided by Hsee and Weber (1999), who measured the size of the social networks of American and Chinese respondents. While replicating their previous result that risk preference was significantly different between cultures, culture became a non-significant predictor after they added to the equation the size of respondents' social networks. An example of a cultural difference that acted as a *moderator* of behaviour was provided by Brockner and Chen (1996), who demonstrated the importance of self-construal as a variable that moderates people's behaviour in response to negative feedback by virtue of studying them in two countries (the US and the PRC) with cultural differences in self-construal. Similarly, Chen, Brockner, and Katz (1998) showed that cultural differences in individual–collective primacy (i.e. the relative weight individuals give to their personal interests rather than to their in-group's interests) moderated how respondents from the PRC and the US reacted to discrepancies between their own performance and their in-group's performance. In both studies, the identification of a causal moderating variable on which members of different cultures can and have been shown to differ not only put into question the generality of results obtained from American respondents, but provided a more general theoretical understanding of the behaviour under investigation.

The following is another good example of how a cross-cultural investigation of a phenomenon can contribute to basic knowledge about

its underlying processes and regularities. Erev, Wallsten, and Budescu (1994) recently demonstrated that a certain amount of apparent overconfidence in probability judgments can arise as the result of random error in the assessment of objective and subjective probabilities, giving rise to regression towards the mean. Given that there is evidence that cross-national differences in self-report dependent variables are sometimes the result of differential use of response scales (e.g. Chun, Campbell, & Yoo, 1974; Hui & Triandis, 1989), Yates, Lee, and Bush (1997) set out to test whether differences in response-scale usage were the cause of cross-national differences in overconfidence. They compared directly reported confidence judgments with those inferred from decisions made by American and Chinese respondents about wagers in which they could earn actual, material goods. The results for respondents of both cultures showed convincingly that overconfidence and cross-national variations in overconfidence are indeed "real" consequential phenomena, and not just a response-scale or data-analytic artifact.

Research reviewed in this paper has focused primarily on cross-national differences in judgment and decision making and has used value differences only to explain those differences in behaviour. Other researchers (e.g. Hofstede, 1984; Kluckhohn & Strodtbeck, 1961; Schwartz, 1992) have taken a somewhat different approach by conducting large, multicountry value surveys to document cultural differences in values without any immediate concern for resulting behavioural differences. Betancourt and Lopez (1993) refer to this distinction as a top-down versus bottom-up approach towards cross-cultural research. Using a *top-down* approach, researchers begin with a substantive theory and then move to observations both within and between cultures, examining the role of culture and searching for universals. Illustrations of the power of this approach come from the work of Brockner and Chen as well as Weber and Hsee, described above. Betancourt and associates (e.g. Betancourt, Hardin, & Manzi, 1992) provide another example in the area of causal attributions, which is further discussed at the end of this section. *Bottom-up* research, on the other hand, begins by postulating dimensions of cultural variation, develops measures for these dimensions, and then assesses cultural variation along these dimensions. An example of the bottom-up approach is the work of Schwartz and Sagiv (1995), who undertook a very ambitious analysis of the extent to which respondents from 40 countries endorsed a long list of values, collected from recent value theories (Schwartz, 1992). Ten motivational types of values, which form a system of compatible and conflicting motivations, appeared to be recognised by all cultures: power, achievement, hedonism, stimulation, self-direction, universalism, benevolence, tradition, conformity, and security. These values formed a space with two virtually universal, orthogonal dimensions. The first dimension could be interpreted as an openness to change versus conservatism continuum; the second one as a continuum from self-transcendence

to self-enhancement. Finally, 44 specific values had highly consistent meanings across cultures, which makes them candidates in cross-cultural comparisons of the importance attributed to each value type.

Undoubtedly the most commonly used dimension to explain cross-cultural differences in behaviour is that of individualism–collectivism. Measured in a variety of ways (e.g. Hofstede, 1984; Schwartz, 1992; Triandis, 1989), cultural differences on the individualism–collectivism continuum have been used to explain differences in risk preference (Hsee & Weber, 1997, 1999), career preferences (Jaccard & Wan, 1986), causal attributions (McGill, 1995), social responsibility (Keltikangas-Jaervinen & Terav, 1996), preferred ways of coping with difficult decisions (Gaenslen, 1986; Radford, Mann, Ohta, & Nakane, 1993), decision goals and methods of risk adjustment (Tse, Lee, Vertinsky, & Wehrung, 1988), definitions and constructions of the self (Kitayama, Markus, Matsumoto, & Norasakkunkit, 1997) and judgments of own and others' performances (Chen, Brockner, & Katz, 1998).

Related to the importance a culture attributes to individualist versus collectivist values and behaviour is the quality of its social networks. Ruan, Freeman, Dai, Pan, & Zhang (1997), and Hsee and Weber (1999) recently compared the size and nature of social networks of students in the United States, the People's Republic of China, and a range of other Western countries. Results generally support the cushion hypothesis: that is, people's social networks are larger in more collectivist countries than in individualist countries. Ruan and collaborators found, furthermore, that the roles played by different types of relationships (e.g. relationships with parents versus with coworkers) were fairly similar in all Western countries, but different in the PRC, where coworkers played a significantly larger role than in any other country.

Even though exploration of the role of cultural differences in individualism and collectivism on judgment and decision processes has been extremely fruitful, the effects of other cultural differences in beliefs and value orientation on behaviour have been studied very little. A noteworthy exception is the work of Betancourt, Hardin, and Manzi (1992) who examined the influence of a different belief dichotomy (perceived controllability of nature versus fatalistic subjugation to nature, on which Kluckhohn and Strodtbeck, 1961, identified cross-cultural variation) on causal attributions. In particular, Betancourt et al. found that actors in a vignette who experienced a success were evaluated more positively by control-oriented respondents than by subjugation-oriented respondents, but that the opposite was true for actors who experienced a failure. Explorations of the implications of cross-cultural differences on the mastery over nature versus harmony with nature variable as well as other variables (e.g. uncertainty avoidance (Hofstede, 1984)) are an important next step in the area of judgment and decision making.

CONCLUSION

Rigorous cross-cultural investigation of behaviour is a difficult enterprise. Numerous theoretical and practical obstacles need to be overcome, among others the necessity of conducting research in several languages, with the associated problems of translations of instructions and instruments and equivalent interpretations of key concepts (Brislin, 1970). Our review of research on culture and decision making in this article suggests, however, that the full potential of cross-cultural research for model building and model verification is not being realised. Similar arguments have been made by others in the context of theory building in clinical (Betancourt & Lopez, 1993), social (Bond, 1988), and developmental psychology (Miller, 1999). We hope that our interpretive summary of the role of culture in the area of judgment and decision making will add to these voices and stimulate greater interest in cultural psychology, in particular in the intersection of culture and decision making.

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