

"CE N'EST PAS LOGIQUE"
OR "YOU'VE GOT A
POINT THERE"?

. . . The most striking difference between the traditions at the two ends of the civilized world is in the destiny of logic. For the West, logic has been central and the thread of transmission has never snapped . . .

—PHILOSOPHER ANGUS GRAHAM

... It is precisely because the Chinese mind is so rational that it refuses to become rationalistic and ... to separate form from content.

—PHILOSOPHER SHU-HSIEN LIU

The aim of the Chinese classical education has always been the cultivation of the reasonable

man as the model of culture. An educated man should, above all, be a reasonable being, who is always characterized by his common sense, his love of moderation and restraint, and his hatred of abstract theories and logical extremes.

—LITERARY CRITIC LIN YUTANG

To argue with logical consistency . . . may not only be resented but also be regarded as immature.

—ANTHROPOLOGIST NOBUHIRO NAGASHIMA

Hard as it is for the Westerner to understand, there were only two short-lived movements of little influence in the East that shared the spirit of logical inquiry that has always been common in the West. These were the *Mingjia* (Logicians) and the Mohists, or followers of Mo-tzu, both of the classical period in antiquity. The Logicians in fact made little progress toward a formal logic, though, unlike adherents of all other traditions of Chinese philosophy, they were interested in knowledge for its own sake. The Mo-tzu tradition embraced several logical concerns, chief among them the ideas of necessary and sufficient conditions and the principle of noncontradiction and the law of the excluded middle. Nevertheless, even the Mohists stopped short of producing a rigorous system of logical inference. Moreover, despite the Mohists' advances in geometry, they never formalized it in Western fashion and never developed a set of foundational principles that would allow logical derivation of solutions.

The best explanation for the Greeks' concern with

logic is that they saw its utility in argumentation. So it seems to be no coincidence that Mo-tzu both was concerned with logic and believed that argumentation was valuable for clarifying propositions and for helping to distinguish between right and wrong. Mo-tzu wanted to develop ways of maximizing the common good and he actually developed a rough version of cost-benefit analysis. These facts put him closer in spirit to modern Western philosophy than to either ancient Chinese or ancient Greek philosophy. Even in these aspects of his work, however, he retained an Eastern orientation. Like other Chinese philosophers he made no distinction between the truth of a proposition and its morality, a position that, whatever its effects on ethics, is deadly for logic.

By the first millennium **A. D.** there were essentially no traces of a logical approach to understanding the world. Instead there was a trust in sense impressions and common sense. And there was never, even among the Logicians and Mohists, a willingness to accept arguments that flew in the face of experience—unlike the Greeks, who sometimes seemed quite delighted to deny the evidence of the senses. As we will see, the Chinese remain far more committed to reasonableness than to reason.

LOGIC vs. EXPERIENCE

Integrally related to the lack of interest in logic in the East has been a distrust of *decontextualization*, that is, of considering the structure of an argument apart from its content, as well as a distaste for making inferences on the basis of

underlying abstract propositions alone. Two studies by Ara Norenzayan, Edward E. Smith, Beom Jun Kim, and me show how this remains true for ordinary people in twenty-first-century Asia.

Consider the following two deductive arguments. Is one more convincing than the other?

1. All birds have ulnar arteries.

Therefore all eagles have ulnar arteries.

2. All birds have ulnar arteries.

Therefore all penguins have ulnar arteries.

(No need to know what an ulnar artery is. It's in effect a "blank" property, used so that real-world knowledge can't intrude into the evaluation of a deductive argument.)

One way to measure the extent to which people spontaneously rely on formal logic versus experiential knowledge in reasoning is to examine how they "project" properties—"ulnar arteries" in the above example—from *superordinate* categories (birds) to *subordinate* categories (eagles, penguins). Notice that the two arguments have identical premises but their conclusions vary in how typical the target bird is. Eagles are more typical birds than penguins. If you are in pure logical mode when you evaluate propositions like those above, you will supply the implicit middle premises of the arguments ("All eagles are birds," and "All penguins are birds"). People who do this would find the two arguments equally convincing. But people often find arguments to a typical instance to be more convincing than arguments to atypical ones. Prior

experience makes them more comfortable with regarding eagles as birds than regarding penguins as birds.

We asked Korean, Asian American, and European American participants to evaluate the convincingness of twenty such arguments, ten with typical targets like eagles in the conclusion and ten with atypical targets like penguins. We found that Koreans were more convinced by typical arguments than by atypical arguments. European Americans, in contrast, were almost equally convinced by typical and atypical arguments. Asian Americans' responses were in between those of European Americans and Koreans.

Consider the arguments below. Which ones seem to you to be logically valid?

Premise 1: No police dogs are old.

Premise 2: Some highly trained dogs are old.

Conclusion: Some highly trained dogs are not police dogs.

Premise 1: All things that are made from plants are good for health.

Premise 2: Cigarettes are things that are made from plants.

Conclusion: Cigarettes are good for health.

Premise 1: No A are B.

Premise 2: Some C are B.

Conclusion: Some C are not A.

The first argument is meaningful and has a plausible conclusion, the second argument is meaningful but its conclusion is not plausible, and the third argument is so abstract that it has no real meaning at all. But all three arguments are logically valid.

People are more likely to be correct in their judgments about the logical validity of arguments when the argument is meaningful and its conclusion is plausible. They are least likely to be correct when the argument is meaningful and its conclusion is implausible. We presented Korean and American college students with arguments that were either valid or invalid and that had conclusions that were either plausible or implausible and asked them to evaluate whether or not the conclusion followed logically from the premises for each argument. We examined four different types of syllogisms, ranging from the very simple *modus ponens* (If A is the case, then B is the case; A is the case; therefore B is the case) to the difficult structure in the third example above.

Both Koreans and Americans were more likely to rate syllogisms with plausible conclusions as valid. As expected, though, Koreans were more influenced by plausibility than Americans. There is no question of this difference being due to the Korean participants being less capable of performing logical operations than the American participants. Koreans and Americans made an equal number of errors on the purely abstract syllogisms. The difference between the two groups would seem to be that Americans are simply more in the habit of applying logical rules to ordinary events than Koreans and are therefore more capable of ignoring the plausibility of the conclusions.

East Asians, then, are more likely to set logic aside in favor of typicality and plausibility of conclusions. They are also more likely to set logic aside in favor of the desirability of conclusions.

William McGuire showed that when people are asked to judge the probability of events that bear a logical relation to one another, their probability judgments move into line with one another in such a way as to increase the logical coherence of the beliefs taken as a whole. For example, McGuire asked people how likely they thought it was that (a) there would be a drought that summer; (b) drought would mean that the beaches would be polluted because of undiluted runoff; (c) if the beaches were polluted, the authorities would close them; and (d) the beaches would be closed. McGuire found that, over time, the logical consistency among people's beliefs about the related propositions increased, merely by virtue of asking them to think about the likelihood that they were true. Two weeks after making their probability estimates for a number of items like those above, the probabilities participants gave for the various propositions were more in line with logical requirements than they had been initially, before they had had time to think about it. So although people didn't want the beaches to be closed, after thinking about it for a while in relation to other propositions that had some significant likelihood of being true, and which implied directly or indirectly that the beaches might be closed, they became more pessimistic about their summer seaside plans.

Ara Norenzayan and Beom Jun Kim guessed that East

Asians would be less likely to have their beliefs moved in an unpleasant direction by pondering information that implied some undesired outcome—because East Asians are not so accustomed to applying logic to everyday life events and therefore might be able to cling successfully to beliefs that were countered by other propositions they were asked to think about. They gave Korean and American students propositions that had a logical relation to one another, but mixed the propositions in with many others so that it was unlikely that participants would realize that consistency among their probability judgments was being tested. Spread out through the questionnaire, for example, were the following propositions:

The price of dining out will increase.

If stricter health codes for restaurants will increase the cost of hiring new staff, then the price of dining out will increase.

Stricter health codes for restaurants will increase the cost of hiring new staff.

Some of the propositions were positive: for example, "more poor people will be able to get enough food to stay healthy." Other propositions, like the one above about the increased price of dining out, were unattractive. Norenzayan and Kim asked participants about the probabilities they assigned to the various propositions at two different times: immediately after they read each proposition and a few minutes after they had read all the propositions.

Korean and American participants' beliefs showed equal consistency the first time they were tested and the

consistency of the two groups was equal—and greater for both groups—the second time around for the positive propositions. But the Americans also moved more in a consistent direction for the negative propositions and the Koreans did not. Apparently when logical push came to desirable shove, the logical implications of some beliefs for others were less likely to affect the probability judgments of Koreans than those of Americans.

EITHER/OR vs. **BOTH/AND**

Which of the following two groups of proverbs most appeals to you—the first three or the second three?

Half a loaf is better than none.

One against all is certain to fall.

"For example" is no proof.

Too humble is half-proud.

Beware of your friends, not your enemies.

A man is stronger than iron and weaker than a fly.

The second set of proverbs express apparent contradictions: Humble is not proud and friends are just the sort of person you shouldn't have to be wary of. The first set may or may not seem very pithy, but none embody contradictions. Kaiping Peng and I found that the second type of proverbs were more common in a Chinese compendium of proverbs than in an American collection. When we asked students at the University of Michigan

and at Beijing University to rate how much they liked the proverbs, we found that the Chinese students had a preference for the proverbs with contradictions and the Americans had a preference for the proverbs without them. To make sure that it wasn't familiarity with the proverbs that was producing the differences, we conducted a study using Yiddish proverbs. We obtained similar results: Americans and Chinese were equally fond of the proverbs without contradictions, but the Chinese liked the ones containing contradictions more than did the Americans. (Here again we found a similarity between Far East and Near East traditions: Yiddish proverbs were fully as likely to embody contradictions as Chinese.)

The reasons for these differences in preference for contradiction are deep. There is a style of reasoning in Eastern thought, traceable to the ancient Chinese, which has been called *dialectical*, meaning that it focuses on contradictions and how to resolve them or transcend them or find the truth in both. At the risk of doing violence to the spirit of dialecticism, which does not make use of hard and fast rules about reasoning, we can describe three principles that are important to it, which Kaiping Peng has articulated.

The Principle of Change The Eastern tradition of thought emphasizes the constantly changing nature of reality. The world is not static but dynamic and changeable. Being in a given state is just a sign that the state is about to change. Because reality is in constant flux, the concepts that reflect reality are fluid and subjective rather than being fixed and objective.

The Principle of Contradiction Because the world is constantly changing, oppositions, paradoxes, and anomalies are continuously being created. Old and new, good and bad, strong and weak exist in everything. In fact opposites complete each other and make each other up. Taoists see the two sides of any apparent contradiction existing in an active harmony, opposed but connected and mutually controlling. "Tao is conceived as both 'is' and 'is not.'" As the founder of the Taoist School, Lao-tzu, put it: "When the people of the world all know beauty as beauty, there arises the recognition of ugliness; when they all know the good as good, there arises the recognition of evil. And so, being and nonbeing produce each other . . ." Or as Mao Tse-tung, longtime Chinese dictator who regarded himself as a philosopher and poet as well as a politician and soldier, wrote: "... On the one hand [opposites] are opposed to each other, and on the other they are interconnected, interpenetrating, interpermeating and interdependent, and this character is described as identity."

The Principle of Relationship, or Holism As a result of change and opposition, nothing exists in an isolated and independent way, but is connected to a multitude of different things. To really know a thing, we have to know all its relations, like individual musical notes embedded in a melody.

The three principles of dialectical reasoning are related. Change produces contradiction and contradiction causes change; constant change and contradiction imply that it is meaningless to discuss the individual part without considering its relationships with other parts and prior

states. The principles also imply another important tenet of Eastern thought, which is the insistence on finding the Middle Way between extreme propositions. There is a strong presumption that contradictions are merely apparent and to believe that "A is right and B is not wrong either." This stance is captured by the Zen Buddhist dictum that "the opposite of a great truth is also true."

To many Westerners, these notions may seem reasonable and even familiar. Moreover, there is a dialectical tradition of a kind that has held a place in Western thought since the time of Kant, Fichte, and Hegel. (Though the Hegelian or Marxist dialectic, with its emphasis on thesis, antithesis, and synthesis, has been held to be more "aggressive" than the Eastern variety because the effort is always toward obliterating the contradiction rather than accepting it or transcending it or using it to understand some state of affairs better.)

But Westerners tend not to be aware of the strength of their commitment to some logical principles that conflict directly with the spirit of Eastern dialecticism. These include the *law of identity*, which holds that a thing is itself and not some other thing, and the *law of noncontradiction*, which holds that a proposition can't be both true and false. The Western insistence on this pair of logical principles and the Eastern spirit of dialecticism are, on the surface at least, in direct opposition to each other.

The law of identity insists on cross-situational consistency: A is A regardless of the context. The law of noncontradiction demands that a proposition and its negation cannot both be true: A and not-A are impossible. The principle of holism, in contrast, indicates that a thing is

different in one context than in another and the principle of change indicates that life is a constant passing from one state of being to another, so that to be is not to be and not to be is to be. A man is literally a different person in the family than in his role as a businessman; wealth means poverty is around the corner.

Modern East Asians are of course perfectly well aware of the same logical principles that Westerners hold dear and make use of logic in some contexts, as we have just seen. But in the East Asian view, the law of noncontradiction applies only to the realm of concepts and abstractions. The rejection of conclusions because they seem formally contradictory can be mistaken, because concepts are merely reflections of things and it can sometimes be more sensible to admit that an apparent contradiction exists than to insist that either one state of affairs or its opposite is the true one.

The differences in the two stances toward contradiction have some interesting consequences for reasoning in many domains.

Peng and I asked Chinese and American graduate students at the University of Michigan to read stories about conflicts between people and about conflicts between a person's own opposed impulses. One story reported a value conflict between mothers and daughters and another described a conflict between wanting to have fun and having to work hard in school. We asked participants to analyze these conflicts and we coded them as to whether they were Middle Way, dialectical resolutions or nondialectical resolutions. A dialectical response usually included sen-

tences that attributed the cause of the problem to both sides and attempted to reconcile opposing views by compromise or transcendence. A response such as "both the mothers and the daughters have failed to understand each other" would have been coded as dialectical, as would an answer that pointed out that in the not-too-distant future it was likely that the two would come to see eye-to-eye. Nondialectical responses generally found exclusive fault with one side or the other.

For the mother-daughter conflict, 72 percent of Chinese answers were scored as dialectical and only 26 percent of American responses were. For the school vs. fun conflict, about half the Chinese responses were dialectical, but only about 12 percent of American responses were. In short, most of the Chinese responses tried to find a Middle Way. Most of the American responses demanded change solely in one direction.

In another study, Peng and I examined Easterners' and Westerners' preference for logical vs. dialectical arguments. We asked participants which of two arguments they preferred against Aristotle's assumption that a heavier object falls to the ground first. All of the participants were graduate students in the natural sciences at the University of Michigan, but none of them were physicists. Each argument began with: "Aristotle believed that the heavier a body is, the faster it falls to the ground. However, such an assumption might be false."

The first, logical argument, essentially Galileo's classical one, continued: "Suppose that we have two bodies, a heavy one called H and a light one called L. Under Aristo-

tie's assumption, H will fall faster than L. Now suppose that H and L are joined together. . . . Now what happens? Well, L plus H is heavier than H so by the initial assumption it should fall faster than H alone. But in the joined body . . . L [is lighter and] will act as a 'brake' on H, and L plus H will fall slower than H alone. Hence it follows from the initial assumption that L plus H will fall both faster and slower than H alone. Since this is absurd, the initial assumption must be false."

The second, holistic or dialectical argument continued: ". . . this assumption is based on a belief that the physical object is free from any influences of other contextual factors . . . which is impossible in reality. Suppose that we have two bodies, a heavy one called H and a light one called L. If we put two of them in two different conditions, such as H in windy weather (W) and L in quiet weather (Q) . . . W or Q, would make a difference. Since these kinds of contextual influences always exist, we conclude that the initial assumption must be false."

We also asked participants which of two arguments they preferred for the existence of God, a logical one or a holistic one. The "logical" argument was a version of the ancient "cosmological" one. "Whatever exists must have a cause. . . . In moving from effects to causes, therefore, we must have two options. One is to go on tracing an infinite succession . . . without any ultimate cause at all; the other is that we at last have recourse to some ultimate cause that is necessarily existent. . . . But if the whole eternal chain of succession, taken together, is not determined or caused by anything, this is absurd. . . . We must, therefore,

have recourse to a . . . Being who carries the reason of his existence in him, and who cannot be supposed not to exist, without an express contradiction."

The holistic, dialectic argument for the existence of God was the following: ". . . Just as two people watch a cup on the table, one sees a cup with a handle, the other must see a cup without a handle if he is looking from the opposite perspective . . . each one of them can only see a part of the truth. Is nothing the ultimate truth? . . . there must be a way to add up all the different perspectives. . . Such a sum or 'whole' consists of every idiosyncratic perspective, but reveals the truth as a whole. This marvelous 'whole' cannot be designed or found by any individual alone. We must, therefore, have recourse to a necessarily existent Being who is above every idiosyncratic entity . . ."

A majority of Americans preferred Galileo's logical argument against Aristotle's assumption about gravity whereas a majority of Chinese preferred the holistic, dialectical argument. A majority of Americans preferred the "logical" argument about the existence of God over the holistic argument we concocted, whereas a majority of Chinese preferred the holistic argument. My Western scientific colleagues find the Chinese preference for the holistic argument against Aristotle's views to be astonishing, since they regard Galileo's argument as knockdown. So I should note that only 60 percent of Americans preferred Galileo's argument.

What would happen if Easterners and Westerners were confronted with apparently conflicting propositions? The logical approach would seem to require rejecting one of the propositions in favor of the other in order to avoid a

possible contradiction. The dialectical approach would favor finding some truth in both, in a search for the Middle Way. In order to examine this question, Peng and I asked undergraduates at the University of Michigan and Beijing University to read what we described as summaries of the results of several social science studies. There were five different topics altogether and we asked participants either to read about a study reporting a particular finding, a study strongly implying something quite different, or both. The opposing studies did not necessarily contradict each other in a logical sense, but at least had the character that, if one was true, then the other would seem to be quite unlikely to be true. The pair of statements below was typical of the more obviously contradictory ones.

Statement A: "A survey found that older inmates are more likely to be ones who are serving long sentences because they have committed severely violent crimes. The authors concluded that they should be held in prison even in the case of a prison population crisis."

Statement B: "A report on the prison overcrowding issue suggests that older inmates are less likely to commit new crimes. Therefore, if there is a prison population crisis, they should be released first."

The pair of statements below was typical of those that were not contradictory in a logical sense.

Statement A: "A social psychologist studied young adults and asserted that those who feel close to their families have more satisfying social relationships."

Statement B: "A developmental psychologist studied adolescent children and asserted that those children who

were less dependent on their parents and had weaker family ties were generally more mature."

If it were really the case that young people who feel close to their families have more satisfying social relationships, then you would not be likely to think that it is also the case that adolescents who have weaker family ties are more mature, though admittedly this would entail no logical contradiction.

Participants rated how believable the statements were. Each pair of statements was composed of one that was more plausible (to both Chinese and Americans) than the other, which we know by looking at the ratings of participants who read only one statement or the other.

What inferences should the participants have made? That seems pretty clear. The participants who were exposed to two propositions that are apparently contradictory ought to have believed in each of them less than those who knew about only one. This should be particularly true for less plausible propositions that are countered by more plausible ones. But neither the Americans nor the Chinese behaved that way. The Chinese who saw both propositions reported about equal belief in both. They properly rated the more plausible proposition as less believable if they saw it contradicted than if they didn't. But the Chinese rated the less plausible proposition as more believable if they saw it contradicted than if they didn't. This inappropriate inference would be the consequence of feeling it necessary to find the truth in each of two contradictory propositions. The Americans, instead of converging in their belief in the two propositions, actually diverged, believing the more plausible proposition more if

they saw it contradicted than if they didn't. This seems the likely result of feeling it necessary to decide which of two conflicting propositions is correct. But it's pretty dubious inferential practice to believe something more if it's contradicted than if it isn't. My guess is that the Americans behaved the way they did because they are good at generating counterarguments—a skill that comes from a lifetime of doing just that. When confronted with a weak argument against a proposition they are inclined to believe, they have no trouble in shooting it down. The problem is that the ease with which they generate counterarguments may serve to bolster their belief in a proposition that ought to seem shakier if it is contradicted than if it is not. There is evidence in fact that Americans do tend to generate more counterarguments than Chinese do. In effect, Americans may not know their own strength, failing to understand how easy it is for them to attack an argument they find implausible.

The American tendency to avoid contradiction seems related to the long-standing Western inclination to search for principles that will justify beliefs. If I can show that some principle is guiding my beliefs, then I can demonstrate that, any appearances to the contrary notwithstanding, my beliefs are consistent with one another. Westerners' need to demonstrate that their beliefs are guided by principles appears to apply also for actual choices. Organizational psychologists Briley, Morris, and Simonson studied the consumer choices of European Americans and people from Hong Kong. All choices were among a triad of objects—computers, for example—that

differed on two dimensions. "IBM" was superior to both "Sony" and "Apple" on one dimension and "Apple" was superior to both "IBM" and "Sony" on the other dimension. Sony was always intermediate between IBM and Apple on both dimensions. On average, across the range of choices, Americans and East Asians in a control condition were about equally likely to choose intermediate Sony. In an experimental condition, Briley and colleagues had participants give reasons for their choice, anticipating that this would prompt Americans to look for a rule that would justify a given choice (e.g., "RAM is more important than hard drive space"), but would prompt people of Asian culture to seek a compromise ("Both RAM and hard drive space are important"). When asked to justify their choices, Americans moved to a preference for one of the extreme objects whose choice could be justified with reference to a simple rule, whereas Asian participants moved to a greater preference for the compromise object. Participants gave justifications that were consistent with their choices: Americans were more likely to give rule-based justifications and Chinese were more likely to give compromise-based justifications.

So there is ample evidence to indicate that Easterners are not concerned with contradiction in the same way that Westerners are. They have a greater preference for compromise solutions and for holistic arguments and they are more willing to endorse both of two apparently contradictory arguments. When asked to justify their choices, they seem to move to a compromise, Middle Way stance instead of referring to a dominating principle. The greater adherence to the principle of noncontradiction on the part

of Americans seems to produce no guarantee against questionable inferences. On the contrary, Americans' contradiction phobia may sometimes cause them to become more extreme in their judgments under conditions in which the evidence indicates they should become less extreme. This tendency mirrors complaints about hyper-logical Western habits of mind often expressed by philosophers and social critics of both East and West.

HOKUM, EMOTION, AND MATH

One of the most reliable phenomena of social psychology is the Barnum effect, named after the circus owner who gave us the expression, *There's a sucker born every minute*. If you want to make someone, anyone, think that you have remarkable insight into their character, you can just tell them something like the following: "Although generally you have an upbeat personality, sometimes you find yourself blue—without always having a clear idea why. While most people think you are reasonably outgoing, the truth is you are rather shy at the core . . ."

Most everyone thinks they are fairly upbeat but get sad at times, that they seem sociable but are really rather shy. What people don't realize is how common these self-perceptions are and so they feel that the psychologist or fortune-teller, as the case may be, has looked deep into their soul and found truth. Incheol Choi argued that this is made easier if people don't recognize the near contradictions that are carefully built into these phony personality descriptions that lend them plausibility, whatever

the person thinks about his personality. If so, then East Asians could be expected to be more susceptible to the Barnum effect, accepting apparently opposing personality descriptions of themselves. To test this, Choi asked Koreans and Americans to rate their personalities on a number of scales. Different scales were designed to tap what most people would say are opposite traits. Choi asked participants to rate how rude they were and, in another part of the questionnaire, how polite they were. Koreans who said they were more polite than others were likely to say that they were about as rude as others. Americans who said they were more polite said they were less rude, or, if they said they were less polite, tended to say they were more rude. A red flag apparently went up for Americans indicating possible contradiction, but was less likely to do so for Koreans.

In an even more striking demonstration of inconsistency, Choi gave Korean and American participants a large number of statements that were literal or near-literal opposites of each other.

- A person's character is his destiny; or
A person's character is not his destiny.
- The more one knows, the more one believes; or
The more one knows, the less one believes.

Choi gave some participants one of the opposed pair of propositions and some participants the other. If the Americans given the first statement of the pair tended to agree with it, the Americans given the other statement tended to disagree with it. But this was not necessarily

true for Koreans, who were likely to agree with whichever statement of the pair they saw.

There is a poem by William Butler Yeats called "Lapis Lazuli." It describes a gemstone with a carving showing a pair of elderly Chinese men under a pagoda roof on a mountainside.

*There, on the mountain and the sky,
On all the tragic scene they stare.
One asks for mournful melodies;
Accomplished fingers begin to play.
Their eyes mid many wrinkles, their eyes,
Their ancient, glittering eyes, are gay.*

It may be that Yeats was right to make his point with people who were Chinese, because there is evidence that the simultaneous experience of conflicting emotions is more common for Easterners than for Westerners. Kaiping Peng and his colleagues asked Japanese and American participants to look at faces and to indicate what kinds of emotions they expressed. For Americans, faces were happy or sad, angry or frightened. The more they reported seeing positive emotions, the less they reported seeing negative emotions. (Western) common sense and lots of data collected over the years by psychologists suggest things could scarcely be otherwise. But indeed they were otherwise for the Japanese participants. They were quite likely to report seeing both positive and negative emotions in the same face.

East Asians also seem to have no trouble accepting

apparent contradictions in their own emotions. Organizational psychologists Richard Bagozzi, Nancy Wong, and Youjae Yi asked Chinese, Korean, and American participants to rate their emotional states at the moment and their emotional states in general. American participants tended to report experiencing uniformly positive emotions or uniformly negative ones. But for Chinese and Korean respondents there was little relationship between the intensity of positive emotions they reported, both now and in general, and the intensity of negative emotions they reported. Reporting strong positive emotions was fully compatible with expressing strong negative emotions. Confucius was apparently speaking for at least a very large fraction of the world's people when he said, "When a person feels happiest, he will inevitably feel sad at the same time."

I am sometimes accused of a contradiction myself. Why do nonlogical Asians tend to do so much better in math and science than Americans? How can this be if East Asians have trouble with logic? There are several answers to this question.

First, it should be noted that we don't actually find East Asians to have trouble with formal logic, we just find them to be less likely to use it in everyday situations where experience or desire conflicts with it. Second, Eastern lack of concern about contradiction and emphasis on the Middle Way undoubtedly does result in logical errors, but Western contradiction phobia can also produce logical errors.

The Eastern reputation for math skills is really quite

recent. Traditional Chinese and Japanese culture emphasized literature, the arts, and music as the proper pursuits of the educated person. In research with young and elderly Chinese and Americans, we and others find that only the young Chinese outperform their American counterparts. Comparably schooled older Chinese and Americans perform similarly in math.

Asian math education is better and Asian students work harder. Teacher training in the East continues throughout the teacher's career; teachers have to spend much less time teaching than their American counterparts; and the techniques in common use are superior to those found in America. (Asian math-education superiority to Europe in these respects is less marked.) Both in America and in Asia, children of East Asian background work much harder on math and science than European Americans. The difference in how hard children work at math is likely due at least in part to the greater Western tendency to believe that behavior is the result of fixed traits. Americans are inclined to believe that skills are qualities you do or don't have, so there's not much point in trying to make a silk purse out of a sow's ear. Asians tend to believe that everyone, under the right circumstances and with enough hard work, can learn to do math.

In short, Asian superiority in math and science is paradoxical, but scarcely contradictory!

I have presented a large amount of evidence to the effect that Easterners and Westerners differ in fundamental assumptions about the nature of the world, in the focus of attention, in the skills necessary to perceive relationships and to discern objects in a complex environment, in

the character of causal attribution, in the tendency to organize the world categorically or relationally and in the inclination to use rules, including the rules of formal logic. Two major questions arise in light of these contentions. Does it matter? Is it going to continue? Chapter 8 addresses the former question and the epilogue addresses the latter.

AND IF THE NATURE OF THOUGHT IS NOT EVERY- WHERE THE SAME?

Differences between Easterners and Westerners have been found in virtually every study we have undertaken and they are usually large. Most of the time, in fact, Easterners and Westerners were found to behave in ways that were qualitatively distinct. Americans on average found it harder to detect changes in the background of scenes and Japanese found it harder to detect changes in objects in the foreground. Americans in general failed to recognize the role of situational constraints on a speaker's behavior whereas Koreans were able to. The majority of Koreans judged an object to be more similar to a group with which it shared a close family resemblance, whereas an even greater majority of Americans judged the object to be more similar to a group to which it could be assigned by a

deterministic rule. When confronted with two apparently contradictory propositions, Americans tended to polarize their beliefs whereas Chinese moved toward equal acceptance of the two propositions. When shown a thing, Japanese are twice as likely to regard it as a substance than as an object and Americans are twice as likely to regard it as an object than as a substance. And so on.

The lesson of the qualitative differences for psychologists is that, had the experiments in question been done just with Westerners, they would have come up with conclusions about perceptual and cognitive processes that are not by any means general. And in fact just such mistaken conclusions about universality have been mistakenly reached for many of the processes reported on in this book. It seems clear that we need a reconsideration of which perceptual and reasoning processes are basic and which are subject to substantial variation from one human group to another. The fault lines are going to lie deeper, and in different locations, than has been suspected up till now.

DOES IT MATTER?

But the results reported in the body of the book are based mostly on laboratory tests: Why should we assume the findings are anything more than hothouse plants that have no counterpart in real-world thought or behavior?

The question is a fair one and it will be instructive to attempt to answer it. There are in fact many domains of life in which Easterners and Westerners think and behave

quite differently and these differences are well understood in terms of our claims about holistic vs. analytic thought.

Medicine Medicine in the West retains the analytic, object-oriented, and interventionist approaches that were common thousands of years ago: Find the offending part or humour and remove or alter it. Medicine in the East is far more holistic and has never until modern times been in the least inclined toward surgery or other heroic interventions. Health is the result of a balance of favorable forces in the body; illness is due to a complex interaction of forces that must be met by equally complex, usually natural, mostly herbalist remedies and preventives. Dissection of bodies into their component parts was practiced by the ancient Greeks and, with a hiatus during the Middle Ages, has been practiced in the West for the last five hundred years, as well. Dissection was not introduced—from the West, of course—to Eastern medicine until the nineteenth century.

Law Contemplate the following equation: First, we define a society's preference for lawyers over engineers as a ratio:

Number of lawyers in the society

Number of engineers in the society

Next, we define a ratio of such ratios as two countries' relative preferences for lawyers over engineers.

Number of lawyers/engineers in society A

Number of lawyers/engineers in society B

The number we get when we divide the lawyer-preference ratio of the United States by the lawyer-preference ratio of Japan is forty-one]

Those lawyers in the U.S. are put to good use. Conflict between individuals in Western countries is handled to a substantial degree by legal confrontations, whereas it is much more likely to be handled in the East by intermediaries. In the West, the goal is satisfaction of a principle of justice and the presumption going into the arena of conflict resolution is typically that there is a right and a wrong and there will be a winner and a loser. The goal in Eastern conflict resolution is more likely to be hostility reduction and compromise is assumed to be the likely result. Westerners call on universal principles of justice to push their goals and judges and juries feel obligated to make decisions that they believe would hold for everyone in approximately similar circumstances. In contrast, in the East, flexibility and broad attention to particular circumstances of the case are the earmarks of wise conflict resolution. As a citizen of prerevolutionary China put it: "... A Chinese judge cannot think of law as an abstract entity, but as a flexible quantity as it should be personally applied to Colonel Huang or Major Li. Accordingly, any law which is not personal enough to respond to the personality of Colonel Huang or Major Li is inhuman and therefore no law at all. Chinese justice is an art, not a science."

Debate Decision processes in Japanese boardrooms and executive councils are designed to avoid conflict and dissonance. Meetings are often little more than a ratification of consensus achieved by the leader beforehand. Japanese managers tend to deal with conflict with other

managers by simple avoidance of the situation, whereas Americans are far more likely than Japanese to attempt persuasion. What is intrusive and dangerous in the East is considered a means for getting at the truth in the West. Westerners place an almost religious faith in the free marketplace of ideas. Bad ideas are no threat, at least over the long run, because they will be seen for what they are if they can be discussed in public. There has never been such an assumption in the East and there is not today.

Science In the decade of the nineties, scientists living in the United States produced forty-four Nobel Prizes and the Japanese produced just one, despite the fact that Japanese funding for science is fully half that of the U.S. West Germany, which spends half as much on science as Japan, has produced five Nobel Prize winners. And France, with far less funding even than Germany, has produced three. The relatively slight accomplishments of Japanese science can be chalked up partially to the Confucian respect for elders that funnels support to mediocre older scientists instead of more talented younger ones. But some Japanese scientists attribute the deficit in part to the absence of debate and intellectual confrontation. Peer review and criticism are rare in Japan, where such things are considered rude and where there is not widespread acceptance of their role in clarifying and advancing thought about scientific matters. As one Japanese scientist put it: "I worked at the Carnegie Institution in Washington and I knew two eminent scientists who were good friends, but once it came to their work, they would have severe debates, even in the journals. That kind of thing happens in the United States, but in Japan, never."

Rhetoric The resistance to debate is not merely a social or ideological one, nor is it limited to purely quantitative outcomes, such as the number of scientific papers produced. The reluctance extends to the very nature of communication and rhetoric. Western rhetoric, which provides the underlying structure for everything from scientific reports to policy position papers, usually has some variation of the following form:

- background;
- problem;
- hypothesis or proposed proposition;
- means of testing;
- evidence;
- arguments as to what the evidence means;
- refutation of possible counterarguments; and
- conclusion and recommendations.

Most Westerners I speak to about this format take it for granted that it is universal: How else could one communicate findings and recommendations briskly and convincingly or even think clearly about what one is doing? The truth is, however, that this linear rhetoric form is not at all common in the East. For my own Asian students, I find that the linear rhetoric form is the last crucial thing they learn on their road to becoming fully functioning social scientists.

Contracts To the Western mind, once a bargain is struck, it shouldn't be modified; a deal is a deal. For Easterners, agreements are often regarded as tentatively agreed-upon guides for the future. These opposing views have

often caused conflict between Easterners and Westerners. Recall the bitterness between Japanese and Australian businesspeople over Australia's refusal to renegotiate a contract for sugar when the price dropped radically on the world market. The Japanese were not being hypocritical or purely self-serving. Japanese suppliers take such matters under consideration with their own customers. If it snows in Tokyo, film distributors are likely to compensate theater owners for their diminished audiences. As business professors Hampden-Turner and Trompenaars note, "Looked at analytically on an item-by-item basis, [such accommodating behavior] is not cost-effective. But looked at as strengthening the relationship between customer and supplier, it makes very good sense." In short, the Japanese take a holistic view of the business relationship, including its context over time.

International Relations An international conflict influenced by differing conceptions of causality occurred between China and the United States when a Chinese fighter plane collided with an American surveillance plane and the surveillance plane was forced to land on a Chinese island without receiving permission from the ground. The Chinese held captive the crew of the surveillance plane, demanding an apology for the incident from the U.S. The Americans, asserting that the cause of the accident was the recklessness of the fighter pilot, refused. Political scientist Peter Hays Gries and social psychologist Kaiping Peng have observed that, to the Chinese, an insistence that there was such a thing as *the* cause of the accident was hopelessly limited in its perspective. Relevant to the accident were a host of considerations, including the fact that

the U.S. was, after all, spying on China, there was a history of interaction between the particular surveillance plane and the particular fighter, and so on. Given the complexity and ambiguity of causality—taken for granted by the Chinese to be the case in this instance as in all others—the very least the United States could do would be to express its regrets that the incident occurred. The presumed ambiguity of causality may lie behind Eastern insistence on apology for any action that results in harm to someone else, no matter how unintentionally and indirectly (and the readiness of Japanese managers to resign when matters over which they could not possibly have had control go awry). Ultimately, the "regret" formula was the one that China and the U.S. hit upon to resolve the impasse, but it is not likely that many people on either side understood the role played in the conflict by the differing conceptions of causality that Gries and Peng identified.

Human Rights Westerners seem inclined to believe there is only one kind of relation between the individual and the state that is appropriate. Individuals are separate units and they enter into a social contract with one another and with the state that entails certain rights, freedoms, and obligations. But most peoples, including East Asians, view societies not as aggregates of individuals but as molecules, or organisms. As a consequence, there is little or no conception of rights that inhere in the individual. For the Chinese, any conception of rights is based on a part-whole as opposed to a one-many conception of society. To the extent that the individual has rights, they constitute the individual's "share" of the total rights. When Westerners see East Asians treating people as if they had

no rights as individuals, they tend to be able to view this only in moral terms. Whatever the moral appropriateness of the behavior of East Asian officials—and I share with most Westerners the view that there is such a thing as individual human rights and that they sometimes are violated in East Asia—it is important to understand that to behave differently would require not just a different moral code, but a different conception of the nature of the individual. A different conception of the individual would in turn rest on an inclination to think about the world in terms of individual units rather than continuous substances at the most basic metaphysical level.

It is also important to recognize that East Asians and other interdependent peoples have their own moral objections to Western behavior. When East Asian students become comfortable enough to speak out in Western classrooms, they will often express bewilderment at how much disorder, crime, and exposure to violent and sexually explicit images in the media Westerners are willing to tolerate in the name of freedom. They perceive these issues as entailing human rights because rights are perceived as inhering in the collectivity rather than the individual.

Religion Some of the many religious differences can be understood in terms of the "right/wrong" mentality of the West in contrast to the "both/and" orientation of the East. Eastern religions are characterized by tolerance and interpenetration of religious ideas. One can be a Confucian, a Buddhist, *and* a Christian in Korea and Japan (and in China prior to the revolution). Religious wars in the East have been relatively rare, whereas they have been endemic in the West for hundreds of years: Monotheism often car-

ries with it the insistence that everyone accede to the same notion of God. It could be argued that the Greeks should be held blameless in this (after all, they had many gods and didn't much care which ones any particular individual favored), and perhaps this is true. It is the Abrahamic religions that have been so inclined toward religious warfare. On the other hand, it has been claimed that Christianity is the only religion that finds it necessary to have a theology specifying essential aspects of God and that this insistence on categorization and abstraction is traceable to the Greeks.

Cycles and recurrences are an integral part of many Eastern religions but are less common in the West. Rebirth is part of some Eastern religions but rare in Western ones. Sin is understood to be a chronic condition and can be atoned for in many Eastern religions (as well as in Catholicism to a degree). But sin is hard to atone for or literally ineradicable in the Protestant tradition. You might say that as one moves West from India, the number of possible states after death lowers drastically—from the near infinity of reincarnations of Hinduism and Buddhism to the multiple levels of Catholic purgatory and circles of hell to the binary possibility of the Calvinist.

Finally, it should be recalled that much of the evidence discussed in this book is drawn from everyday life problem solving. Japanese managers start at the bottom of their companies and are rotated among divisions frequently so as to maintain an overview of their companies' activities. Buildings in China, even skyscrapers in Hong Kong, are built only after an exhaustive survey by *feng shui* experts who examine every conceivable ecological, topo-

logical, climatologic, and geometric feature of landscape and proposed building simultaneously and in relation to one another. It is Westerners, and Americans in particular, who pioneered the atomistic, interchangeable, uniform, modular approach to manufacturing and merchandising. And so on. My claim is not that the cognitive differences we find in the laboratory cause the differences in attitudes, values, and behaviors, but that the cognitive differences are inseparable from the social and motivational ones. People hold the beliefs they do because of the way they think and they think the way they do because of the nature of the societies they live in.

How SHOULD PEOPLE THINK?

Early in the twentieth century, philosophers and psychologists effected a division of labor. Psychologists were given the descriptive task of finding out how people thought and behaved. Philosophers were assigned the prescriptive job of telling people how they ought to think and behave. Sometimes, though not as often as might have been advisable, philosophers have looked to the work of psychologists to find out what people actually do. But even if philosophers had been paying close attention to the work of psychologists, they would have found little to disabuse them of their convictions about universality. I believe the work reported here will have that effect on psychologists and consequently on philosophers, as well.

To see how philosophy might be affected by demonstrations of nonuniversality, consider the riddle of indue-

tion, as introduced by David Hume in the eighteenth century. How are we justified, he asked, in assuming that the future will be like the past, that the food that nourished us today will nourish us tomorrow. There can be no question of a deductive solution to the problem. "This food nourished me today; therefore, it will nourish me tomorrow" has only a probabilistic status; it lacks the certainty that is required of a syllogism.

The philosopher Nelson Goodman proposed that the solution to the riddle of induction is to seek *reflective equilibrium* between rules for inductive inferences and the specific inferences that we in fact make. This is what we do with deductive rules: We would abandon any deductive rule that required us to sanction inferences that we found unacceptable, and would reject any conclusion that was prohibited by a rule we were unwilling to give up. But suppose there are cultures that don't reason as "we" do, and moreover, don't even endorse the same principles of reasoning that we do? Philosopher Stephen Stich has observed that this makes a shambles of the reflective equilibrium principle. If we don't agree about whether an inference is justified or not, we can't use the principle as a guide to correct thinking—just an expression of personal preference. One solution is just to say that we're justified in our inferences and they're justified in theirs—even if their inferences are completely different from ours. This position of extreme relativism is an easy one to take, but no one really believes it. If you tell me that you believe that both of two virtually contradictory propositions are correct, I may politely say that I'm sure you're right *for you* but I'm right *for me*. Is either of us convinced? Probably not.

But I'm not willing to lie in this bed of relativism I've helped to make. On the contrary, I find that Asian patterns of reasoning cast valuable light on some of the reasoning errors of Westerners and I believe the same mirror can be profitably reversed to look at Eastern thought.

I will focus on just a few Western habits of thought that seem particularly illuminated by contrasting them with Eastern patterns of thought.

Formalism There is enormous power in the formal, logical approach of Western thought. Science and mathematics obviously rely on it, though just how much is a matter of dispute. Francis Bacon wrote that "logic is useless; it is creation that is science." And Bertrand Russell expressed the view that the syllogisms of the twelfth-century monks were as sterile as they were. Though I'm inclined to agree, this is a puzzling statement coming from someone who believed that all human problems could be solved by logic, but could apply only formal logic to real-world questions. In my view, this rendered his analysis of political and social questions naive. The chief cause of his problem was the insistence on separation of form and content, so that reasoning could be carried out using logical principles on the form alone. This is a Western ailment. As the philosopher S. H. Liu says, "Chinese are too rational to separate form from content."

A second problem for Russell was that, like most Westerners, he was largely lacking in what may be called the "reasoning schemas" of dialecticism. Many such schemas were identified (without using the term "dialecticism") by developmental psychologists Klaus Riegel and Michael Basseches. These psychologists disagreed with

Jean Piaget's view that most reasoning was carried out by means of so-called formal operations, or logical principles, which were in place by adolescence. In their view, most high-level reasoning was carried out by means of postformal operations—reasoning schemas that are more complex and more tied to specific thought content than are logical rules. They were termed "postformal" because they were assumed to develop primarily after the formal operations were complete. Both Riegel and Basseches believed that progress in development of postformal operations continues throughout the lifespan. Some examples from Basseches's work include the following.

- The concept of movement from thesis to antithesis to synthesis.
- The ability to understand events or situations as moments in the development of a process.
- The recognition of the possibility of qualitative change as a result of quantitative change.
- The ability to take a stance of contextual relativism.
- The recognition of the value of multiple perspectives on a problem.
- The recognition of the pitfalls of formalism based on the interdependence of form and content.
- The ability to understand the concept of two-way reciprocal relationships.
- The ability to understand the concept of self-transforming systems.
- The ability to conceive of systems in terms of their equilibrium.

Oddly, neither Riegel nor Basseches seems to have made the connection in print between their notions about postformal operations and the dialectical aspects of Eastern thought, though it seems highly unlikely that they were unaware of the similarities. In fact, it is probable that they drew on Eastern ideas for developing the schemas.

The two Western vices of separation of form and content and the insistence on logical approaches often operate together to produce a lot of academic nonsense. There are plenty of examples from my field of psychology to point to. In particular, a great deal of formal modeling of psychological phenomena—most that I am aware of—fails to elucidate the phenomena it purports to. The joy lies in modeling for its own sake, not in making sense of behavior. Economist friends have told me that the macho thing in economics is to pick some implausible principle and then derive as many phenomena as possible from it.

Two-valued Logic The binary, "either/or" approach to the evaluation of propositions characteristic of the West has been lamented by many Western thinkers, but the problems are easier to see from the standpoint of the "both/and" approach of the East. For example, the Western insistence that a behavior have *a* cause, rather than a number of causes, results in people seeing behavior *either* as intrinsically caused or extrinsically caused, but not both. So someone can act out of generosity or to satisfy some self-serving motive, but not for both types of reasons. Adam Smith wrote from this perspective in his famous defense of capitalism: "It is not that he cares for you, the customer, that the brewer, the baker, or the butcher provides for your dinner, but because he cares for himself."

But on reflection, why not both motives? Surely many merchants are primarily in business to feed their own families but also like the fact that they are helping to feed others, as well. This was recognized by Smith himself but has been ignored or unappreciated by many of his followers.

There is a cynicism about the motives of politicians that is characteristic of Americans which, however healthy it might be for maintaining personal freedoms, is likely to produce some incorrect assessments. Neither Lyndon Johnson nor Richard Nixon is among my favorite politicians, but both were widely seen as having acted for political gain when they did things that in fact they believed would lead to serious loss. Johnson was seen by many as trying to enhance his political capital by fighting for Kennedy's civil rights bills, but in fact he knew—better than Kennedy could have—that he was signing over the South to the Republican Party for a generation. Nixon was thought by many to be seeking personal political gain by the opening to China when in fact he and many of his aides feared it would be an extremely unpopular move.

There is a bit of evidence that Westerners may be more susceptible to this "single-motive fallacy" than other people. Developmental psychologists Joan Miller and David Bersoff told American and East Indian children about cases in which one person helped another person. In some instances, the helper expected reciprocation and in other cases did not. The Indian children assumed that the helper was intrinsically eager to help, regardless of expectations about reciprocation. The American children believed there was an intrinsic motive to help only if there was no expectation of reciprocation.

The Fundamental Attribution Error One of social psychology's most important and best demonstrated phenomena is the fundamental attribution error—the tendency to assume that the behavior of another person has been produced by personality traits or abilities and to slight important situational factors. Critics have sometimes held that this tendency doesn't constitute an error at all. But East Asians are less susceptible to the error than Americans in some cases and the error is more readily corrected for them when the situation is highlighted in some way. The critic can't have it both ways. Either Westerners are wrong in those cases when they ignore the implications of the situation or Asians are wrong when they take them into consideration. The more plausible position, especially in light of the data showing that Americans are prone to attend only to salient objects and to ignore contexts, is to say that it is the Americans who are wrong and the Asians who are right in these cases.

Research on the fundamental attribution error has philosophical implications beyond the epistemological. The work is also important for ethics, a point emphasized by philosophers including John Doris, Gilbert Harman, and Peter Vranas, as well as by many psychologists. They note that Aristotle's ethics, which has played a large role in the history of Western philosophy, is similar to his physics. People, like objects, behave as they do because of their properties—virtues or vices in the case of the ethically relevant behavior of people. Aristotle's "virtue ethics" is more consistent with lay Western thought about moral behavior than with Eastern beliefs. Aristotle's system encourages you to assume that people are incorrigible or

to take the stance that behavior must be altered by changing people's attributes—a difficult thing to do at best and counterproductive at worst. If you want to get people to behave as you (and often they) believe they ought, an easier route is to encourage them to seek out situations that will bring out the best behavior in them and to shun those that will encourage bad behavior. Such an approach to encouraging ethical behavior is more obvious from an Eastern viewpoint than from a Western viewpoint.

Turnabout is fair play, and it is also possible to use Western principles as a platform for criticizing Eastern thought. A sketch of what that enterprise might look like follows.

Contradiction The heuristic "there's truth on both sides" may very well be a good one to use as a first approach to understanding any apparent contradiction. It may also be a good place to end up much of the time. It is not an algorithm best followed relentlessly, however. Sometimes one proposition has all or most of the truth on its side and the other has little or none. We have seen that Easterners are more willing to grant credence to each of two propositions that bear a contradictory relationship to each other than Americans are, and that they can be led into the serious error of believing a given proposition more when they see it contradicted by a more plausible proposition than when they merely see it by itself. This is almost impossible to defend on logical grounds but can readily be seen as the result of an insistence on finding the Middle Way. Incheol Choi maintains that the relative insensitivity of Easterners to contradiction makes it less likely that they will have sufficient curiosity to become

scientists. Whether this is a good or bad thing is a matter of preference, but it is certainly relevant that the people who run Eastern societies at the moment happen to want to be able to produce scientists.

Debate and Rhetoric I share the Western conviction about the efficacy of debate for bringing out the truth or, at any rate, for keeping on the table hypotheses that may be useful. Western debate style, and the mental habits it encourages, are important for keeping societies open and open-minded. Debate also goes hand in hand with standard hypothesis-evidence-conclusion rhetoric, which science and mathematics rely on heavily. Earlier I quoted physicist Alan Cromer to the effect that "a geometric proof is the ultimate rhetorical form." Statistician and psychologist Robert Abelson has written a lovely book describing statistics essentially as rhetoric. I believe the metaphors are deep and correct.

Complexity A Western thinker has said that "if the universe is pretzel-shaped, then we must have pretzel-shaped hypotheses." True enough, but if we start with a pretzel-shaped hypothesis, the universe had better be pretzel-shaped or there's no chance we'll find out just what shape it *is*. For any shape other than a pretzel, you're better off starting with a straight line and modifying it as it becomes clear that the linear hypothesis is too simple. Asians are surely right in their belief that the world is a complicated place and it may be right to approach everyday life with this stance. In science, though, you get closer to the truth more quickly by riding roughshod over complexity than by welcoming onboard every conceivably relevant factor.

Of course, prescriptive observations like those in this

section only make sense if we think that people's habits of mind can be altered readily. Can they be?

TEACHING AND TESTING

Should educators seek to give other cultures' skills to its children or should they focus on what is defined as important in their own culture?

Americans are so used to hearing about the educational successes of Asians and Asian Americans both in Asia and in the U.S. that it comes as a shock to hear about children of U.S.-based Japanese businessmen who are labeled "learning disabled" in American schools and put back. Their inability to perform causal analysis—for example, in history classes—in the most rudimentary way expected of American children leads to the belief that they are cognitively impaired.

Causal analytic skills are not the only respect in which Asians are sometimes held deficient by American educators. Debate is an important educational tool for learning analytic thinking skills and for forcing self-conscious reflection on the validity of one's ideas. This view is shared increasingly by non-Westerners. Debate training is becoming a minor American export industry, with young people from all over the world, but especially Asia, coming to debate camps in the U.S.

A few years ago, Heejung Kim, a graduate student from Korea studying psychology at Stanford, became exasperated with the constant demand from her American instructors that she speak up in class. She was told repeat-

edly that failure to speak up could be taken as an indication of failure to fully understand the material and that, in any case, speaking up and hearing the reactions of the instructor and classmates would help her to understand it better. Kim didn't believe it. Instead, she felt that she and her fellow Asian and Asian American students would not benefit from speaking because their fundamental way of understanding the material was not verbal. There is certainly a long tradition in the East of equating silence rather than speech with knowledge. As the sixth-century **B.C.** sage Lao-tzu said, "He who knows does not speak, he who speaks does not know." Kim explains the difference by calling on the distinction made in our work between analytic and holistic thought. Analytic thought, which dissects the world into a limited number of discrete objects having particular attributes that can be categorized in clear ways, lends itself to being captured in language. Holistic thought, which responds to a much wider array of objects and their relations, and which makes fewer sharp distinctions among attributes or categories, is less well suited to linguistic representation.

To test the possibility that Asians and Asian Americans in fact find it relatively difficult to use language to represent thought, Kim had people speak out loud as they solved various kinds of problems. This had no effect on the performance of European Americans. But the requirement to speak out loud had very deleterious effects on the performance of Asians and Asian Americans. This work is as convincing as any in this book about the different nature of thought for Asians and Westerners and its practical implications are extremely important. How should one

educate Asians and Asian Americans in American classrooms? Is it a form of "colonialism" to demand that they perform verbally and share their thoughts with their classmates? Would it have the effect of undermining the skills that go with a holistic approach to the world? Or is it merely common sense to prepare them for a world in which verbal presentation skills, even if it might be difficult to achieve them, will come in handy?

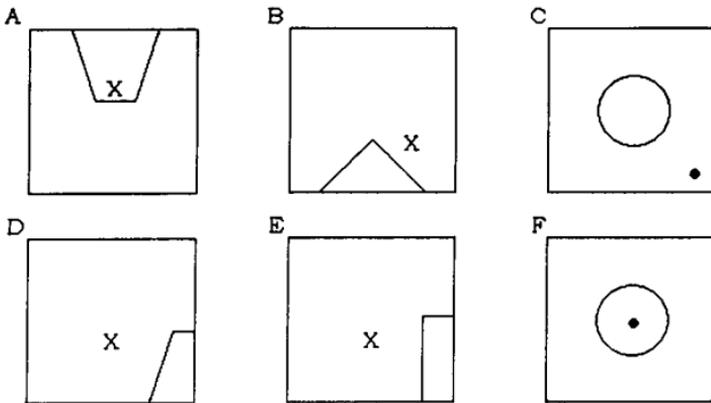
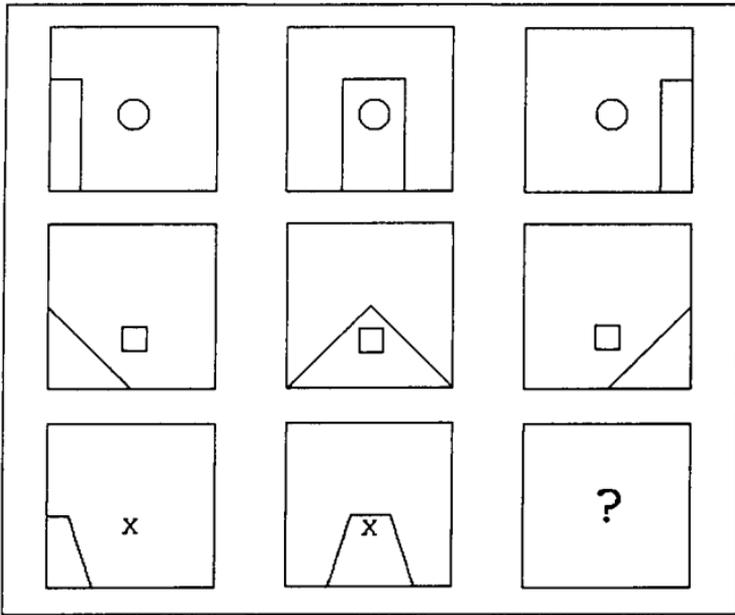
Two advantages of Asian cognition stand out: (1) the fact that Asians see more of a given scene or context than Westerners do; and (2) the holistic, dialectic, Middle Way approach to problems. Leaving aside for the moment the question of whether one should attempt to teach these skills to Westerners, there are some hints from the work of cognitive psychologists David Meyer and David Kieras that it might be surprisingly easy to open "bottlenecks" in perceptual and perceptual-motor performance. People can be taught to attend to a broader range of different stimuli, and respond to them more quickly and accurately, with only modest amounts of training. The cognitive aspects of holistic, dialectic approaches to reasoning seem to me to be a different matter entirely. They are so embedded in perception, philosophy, and even temperament that it seems doubtful that much in the way of change could be achieved. But I would be delighted to be proved wrong.

An unchallenged assumption of intelligence testing for the past century is that it is possible to test intelligence in a culture-fair way. The experts agree that cultural biases can creep into language-based intelligence tests. Even within a given culture, people of different socioeconomic status

have different exposure to words, and certainly across cultures and across languages, comparisons become almost meaningless. But there is consensus that if intelligence is tested without the use of words, it is reasonable to compare people from different cultures.

Have a look at the illustration on page 214 with its many boxes. It shows a problem similar to those found on well-known tests purporting to be culturally unbiased, such as the Cattell Culture-Fair Intelligence Test and Raven's Progressive Matrices Test. The task for the person being tested is to look at the first few objects in the matrix at the top and figure out what the next object, among the six options shown beneath the matrix, should be. Everyone has been exposed to circles and rectangles and triangles, so there would seem to be no question of unfair advantage there. It should just be raw intelligence that is being measured. But viewed in the light of ideas proposed in this book, the test can be seen to play to the strengths of Westerners. It consists of identifying relevant features, deciding how to categorize them, and finding the rule that best accounts for the way the categories are manipulated.

With a research team headed by Denise Park and Trey Hedden at the University of Michigan and Qicheng Jing of the Chinese Institute of Psychology, I tested the intelligence of American and Chinese college students and elderly people in three different ways: by means of speed and memory tests that are correlated with IQ scores (at least in Western populations where the question has been examined); by percentile score for general information in the relevant comparison population (also highly correlated with IQ scores); and by the Cattell Culture-Fair Intelli-

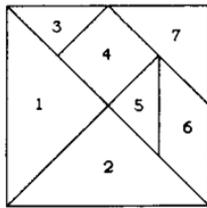


Example of "culture-fair" IQ test item.

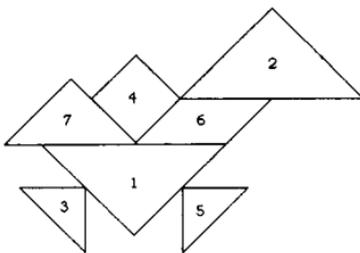
gence Test. We equated each of the groups for speed and memory, so that young Americans and Chinese had identical scores on average, as did older Americans and Chinese

(the young are much faster and have better memories, so it was not possible to equate across age groups for these variables), and had identical percentile scores for information as well (the elderly, in our samples as is usually the case, had somewhat higher information scores than the young). Despite this matching on two very different measures of intelligence, the Americans, both young and old, scored substantially better on the "culture-fair" test than the Chinese. The difference was very substantial (more than four-fifths of a standard deviation, for readers familiar with statistics). If we took the results of the Cattell Test seriously, and didn't have the other information about abilities, we would have to conclude that Americans were a lot smarter than Chinese (or would if we had any claims to having a random sample of the relevant populations, which we don't).

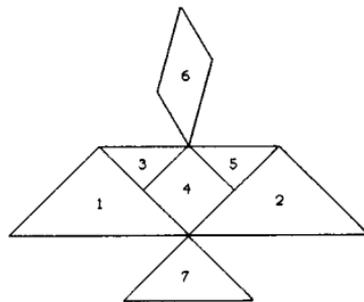
Now have a look at the illustration on page 216. The person being tested is told to look at the block at the top and produce a "running bird" and a "flying bird" by proper arrangement of the numbered pieces. (To save the reader the trouble of doing this, I've provided the answers at the bottom!) This item looks like it might have been produced by the Educational Testing Service for measuring the spatial relations aptitude of high school seniors. In fact, the problem is more than a thousand years old, having been designed for the purpose of selecting the mandarinates of China. For whatever reason, Chinese and Japanese today teach elementary students how to solve problems like this. In addition, the particular kinds of spatial analysis required to read and write ideographs, and the holistic nature of Asian cultures, seem likely to foster spatial skills. And



Problem: Make a running bird and a flying bird out of the shapes above



A running bird



A flying bird

"Seven-Coincidence Board."

indeed, Asians and Asian Americans are generally found to outperform European Americans on spatial tasks. (The differences are usually quite large—typically the better part of a standard deviation.) If there were any reason to assume that populations were being sampled randomly (which there isn't), this might encourage some people to contend that East Asians are more intelligent than people of European culture. And indeed it has. Just such an assertion is included among the myriad dubious propositions in the book *The Bell Curve* by Richard Herrnstein and

Charles Murray—together with the assertion that the finding is strong evidence of a genetic basis for the difference, since such spatial tests are obviously culture fair.

Ethnic diversity has been acclaimed for all sorts of reasons, among them that educational and work environments are enriched by having people of different backgrounds. Our work does strongly support the contention that diverse views should be helpful for problem solving. The cognitive orientations and skills of East Asians and people of European cultures are sufficiently different that it seems highly likely that they would complement and enrich one another in any given setting. We would expect that for most problems one would be better off having a mix of people from different cultures than having people who are all from one culture.

Whether such an advantage to diversity will endure depends on whether we are engaged in a worldwide homogenizing process.

E P I L O G U E

THE END OF PSYCHOLOGY OR THE CLASH OF MENTALITIES?

Social scientists in many fields are now debating two very different views of the future. One view, championed by political scientist Francis Fukuyama, assumes convergence of world political and economic systems, and consequently of values, and the other predicts continued difference. Fukuyama has written of "the end of history," meaning that capitalism and democracy have won and that there are no forces on the horizon that can generate interesting events (as in the Chinese curse, May you live in interesting times). The other view, championed by political scientist Samuel Huntington, predicts continued difference. Far from accepting Fukuyama's vision of societal convergence, Huntington has pronounced the world to be on the brink of a "clash of civilizations," with major cultural groups

including East Asia, Islam, and the West locked in opposition to one another due to irreconcilable differences in values and worldviews: "In the emerging world of ethnic conflict and civilizational clash, Western belief in the universality of Western culture suffers three problems: it is false, it is immoral, and it is dangerous."

Of course, if economies and governmental forms are to be everywhere the same, this would suggest that the psychological characteristics of peoples will be the same, as well. On the other hand, a clash of civilizations suggests the possibility of a continued divergence in habits of thought. So will the cognitive differences documented in this book turn out to be of mere historical interest? Are they going to be gone in fifty or one hundred years because social systems and values have converged? Will the universalists then turn out to be right, though for the wrong reasons? (Right because everyone will think in the same way, wrong because the reasons for it will not be biological but cultural.) Or will they persist—as they have for thousands of years?

WESTERNIZATION?

Fukuyama's views capture those of many in the West—perhaps especially Americans, who tend to assume that everyone is really an American at heart, or if not, it's only a matter of time until they will be. There is plenty of superficial evidence to back up this belief. People in every country wear jeans and T-shirts and Nike shoes and drink Cokes and listen to American music and watch American

movies and TV. (Even France felt it necessary recently to ration the amount of TV of American origin to 25 percent of the total. On the other hand, they've thrown in the language towel and all French elementary schoolchildren will henceforward learn English.) Asian scholars have assured me that higher education in Asia is ever more Western in nature—emphasizing analysis, criticism, logic, and formal approaches to problem solving.

There is some evidence that socialization of children in the East is moving toward the Western pattern. Harold Stevenson and his colleagues monitored the mothers of children in a particular elementary school in Beijing for more than a decade beginning in the mid-eighties, asking them what it was that they wanted for their children. When the study began, the mothers' concerns were for their children's relational skills—their ability to fit in harmoniously with others. Ten years later, the mothers were interested mostly in the same things that Western mothers are: Does my child have the skills and the independence to get ahead in the world?

A few years ago Kaiping Peng, Nancy Wong, and I began to realize that many value surveys were actually showing that Easterners were reporting that they held certain "Western" values more strongly than Westerners did. Indeed, we ourselves found that Beijing University students reported valuing equality, imaginativeness, independence, broadmindedness, and a varied life more than did University of Michigan students, whereas Michigan students reported valuing being self-disciplined and loyal, even having respect for tradition and honoring parents and elders, more than did Beijing students! (My experience as

a parent of two University of Michigan students makes me particularly dubious about this last finding.) The odd results are probably partly due to the fact that value checklists, and even attitude scales, are not very good ways of getting at values. When we described scenarios that tacitly pitted values against one another and asked participants how they would behave in those situations, or would prefer for others to behave, we got results that matched the intuitions of Asian and American scholars who study Asia. But if there is any truth to the idea that people tend to become what they are trying to become, or what they say they are, the value surveys may be an augury of the future.

CONTINUED DIVERGENCE?

In Huntington's opinion, the assumption that the world's cultures will be assimilated to those of the West is an illusion bred of myopia and ethnocentrism. The societal differences are sufficiently great that future international conflicts will be more nearly cultural in origin than economic or political as in the past. Islam, the East (especially China), and the West are on divergent cultural paths and the relative influence of the West, because of the economic advances of the Far East and the demographic growth of Islam, is going to decline. The world is not necessarily going to be safe for democracy or free markets.

There is certainly evidence that one can call upon in support of this view.

Japan has had a capitalist economy for more than one

hundred years and capitalism can be expected to promote values of independence, freedom, and rationalism. Yet there are numberless signs that Japan has changed little in many social respects and we find large differences between the way Japanese and Westerners perceive the world and think about it. Capitalism itself has been altered to cohere with Japanese social values. Company loyalty and team spirit, consultative management, and cooperativeness across industries all arose from Japanese social values; many held them to be largely responsible for the "Japanese miracle" of economic development in the post-World War II period. Indeed, it was widely assumed fifteen years ago that the West would have to move toward Japanese forms of management and business practices in order to be able to compete. Of course, Japan's current economic woes are widely attributed to essentially the same social values as its former success. Many Western observers (some of the same ones, in fact!) now regard those values as liabilities resulting in too much reluctance to downsize and too much readiness to make loans to friends in companies having dubious economic prospects.

Japan has had a democratic form of government since shortly after World War II, but its constitution was written for it by Americans and many would say that the government more nearly resembles an oligarchy than a democracy—at least until very recently. And, in any case, it's not clear how long a nation has to be a democracy before one can say it is likely to remain that way, especially when there are serious economic strains.

China, of course, shows little interest in democracy at this point—or, at any rate, it certainly looks like its adher-

ents have an enormous job cut out for them. China's embrace of capitalism is also less than convincing at this point. Korea seems to take more wholeheartedly to free market practices, but democracy is scarcely five years old in that country. And both countries of course remain heavily Eastern in a cognitive sense.

As Huntington has observed, Westerners tend to confuse modernization—defined as industrialization, a more complex occupational structure, increased wealth and social mobility, greater literacy, and urbanization—with Westernization. But societies other than Japan have become modern without becoming very Western. These include Singapore, Taiwan, and, to a lesser degree, Iran. Anyone assuming that modernization can only bring more Westernization should be given pause by the current estimate that by 2007 the most common language used on the Internet will be Chinese and the prediction by some economists that within a few years as much as half the world's international air traffic will involve travel through Pacific Asia.

In short, values continue to diverge and anyone who thinks not is confusing the drinking of Cokes and the building of computers with Westernization.

CONVERGENCE?

But a third view should be considered, which is that the world may be in for convergence rather than continued divergence, but a convergence based not purely on Westernization but also on Easternization and on new cognitive forms based on the blending of social systems and values.

There are certainly indications that the West finds attractions in the East. While the rest of the world drinks Cokes and wears jeans, Westerners are rapidly fusing their cuisines with Eastern ones. Korea's populace is now one-third Christian, but the countless resorts in the Catskill Mountains formerly catering to a middle-class Jewish clientele are rapidly transforming themselves into centers for the study of Buddhism—which is gaining U.S. adherents at a much more rapid rate than mainline Protestantism. Many mainstream Western doctors accept some of the general notions of holistic medicine, even recommending ancient Asian treatments in lieu of modern Western ones for ailments ranging from headache to nausea. More importantly, the need to treat the whole person rather than attack "the" problem has gained wide currency. Millions of Americans, many of them not otherwise trendier than the soccer mom or insurance agent next door, now practice yoga and tai chi. Many Americans who find the traditions of individualism to be alienating look to Eastern forms of community as possible cures for social anomie. Whole industries now practice Japanese-pioneered forms of employer-employee relations. While Easterners learn to emphasize debate in education, Westerners experiment with logical systems that do not require that a proposition be either true or false. Great twentieth-century physicists, such as Nils Bohr, have attributed their progress in quantum mechanics to an appreciation of Eastern ideas. At a time when Western primatologists believed that only the mother-infant bond was an important relationship for chimpanzees, Japanese primatologists were seeing complex interrelationships in stable chimpanzee

societies. Initially dismissed, the Japanese view is now the universally accepted one in the field. And, although I have not stressed the point, it should be clear that the ideas in this book owe as much to Eastern thinkers and experimentalists as to Western. I firmly believe that the entry of East Asians into the social sciences is going to transform how we think about human thought and behavior across the board.

If social practices, values, beliefs, and scientific themes are to converge, then we can expect that differences in thought processes would also begin to evaporate. There is in fact evidence that changes in social practices, and even changes in temporary states of social orientation, can change the way people perceive and think.

Recall that many of our studies included Asian Americans. Since they have very different social experiences from those of Asians, we would expect that their perceptions and patterns of thought would resemble those of other Westerners to a substantial degree. And in fact the perceptual patterns and reasoning styles of such participants were always intermediate between those of Asians and European Americans and sometimes were actually indistinguishable from those of European Americans.

Other work suggesting that cognitive modifiability is possible comes from the study of genuinely bicultural people. Evidence suggests that such people do not merely have values and beliefs that are intermediate between two cultures, but that their cognitive processes can be intermediate, as well—or at least that they can alternate between forms of reasoning characteristic of one culture versus another. Recall the studies on causal perception showing

that people from Hong Kong can be "primed" by showing them Western symbols such as Mickey Mouse and the U.S. Capitol, and that this prompts them to answer causal questions in a more Western fashion than if they are primed by Eastern symbols, such as temples and dragons. Similarly, Asian Americans answered questions about physical causality in a more Western fashion if they first were asked to recall an experience that made their identity as an American apparent to them than if they recalled an experience that made salient their identity as an Asian.

Shinobu Kitayama and his colleagues found evidence that cognitive processes could be modified even after relatively limited amounts of time spent in another culture. In a particularly elegant demonstration, they presented Japanese and American participants with several examples of a line drawn within a square. Then they were taken to another part of the room and shown a square of a different size than the one they had just seen. They were asked to draw a line inside the square either of the same length they had just seen or that was proportionally the same. Americans were more accurate in drawing a line that was the same absolute length, showing that they were more capable of ignoring the context. Japanese were more accurate in drawing a line that was the same relative length, showing that they were more capable of relating object to context. Then Kitayama and colleagues went a step further and looked at the behavior of Americans who had been living in Japan for a period of time (usually a few months) and Japanese who had been living in America for a period of time (usually a few years). Americans living in Japan were shifted in a decidedly Japanese direction.

Japanese living in America were virtually indistinguishable from native Americans. The study does not really prove that time in another culture produces such dramatic changes in behavior; other interpretations are viable, including the possibility that people who go to live in another culture are very much like them before they ever get there. But the results are strongly suggestive that cognitive processes can be modified by dint of merely living for a time in another culture.

In a sense, we are all "bicultural" with respect to social constraints and social interest. Our awareness of connections with other people, as well as how much we want to associate with other people, varies from time to time. Are these fluctuating differences in the relevance of other people associated with differences in perception and thought? Social psychologist Ulrich Kiihnen and his colleagues have conducted some remarkable studies that indicate that simple laboratory manipulations of social orientation have an effect on the way we think. For example, they tried to "prime" an interdependent, collectivist orientation by having their participants read a paragraph and circle all first-person plural pronouns (we, us, our) and tried to prime an independent, individualist orientation by having them circle all first-person singular pronouns (I, me, mine). They found that interdependence-primed participants were more field dependent than were independence-primed participants as indicated by the Embedded Figures Test; that is, they found it harder to recognize a simple figure that was enmeshed in a more complicated context. Kiihnen and Daphna Oyserman, using the same manipulation, found that people were able to remember the contexts in

which they had seen particular objects—the result of perceptual "binding" of object and field—better after interdependence priming than after independence priming.

Thus we all function in some respects more like Easterners some of the time and more like Westerners some of the time. A shift in characteristic social practices could therefore be expected to produce a shift in typical patterns of perception and thought.

So I believe the twain shall meet by virtue of each moving in the direction of the other. East and West may contribute to a blended world where social and cognitive aspects of both regions are represented but transformed—like the individual ingredients in a stew that are recognizable but are altered as they alter the whole. It may not be too much to hope that this stew will contain the best of each culture.