

Culture and Cause: American and Chinese Attributions for Social and Physical Events

Michael W. Morris and Kaiping Peng

The authors argue that attribution patterns reflect implicit theories acquired from induction and socialization and hence differentially distributed across human cultures. In particular, the authors tested the hypothesis that dispositionalism in attribution for behavior reflects a theory of social behavior more widespread in individualist than collectivist cultures. Study 1 demonstrated that causal perceptions of social events but not physical events differed between American and Chinese students. Study 2 found English-language newspapers were more dispositional and Chinese-language newspapers were more situational in explanations of the same crimes. Study 3 found that Chinese survey respondents differed in weightings of personal dispositions and situational factors as causes of recent murders and in counterfactual judgments about how murders might have been averted by changed situations. Implications for issues in cognitive, social, and organizational psychology are discussed.

If causal inference is the "cement of the universe" (Hume, 1739/1987), do cultures construct their models of the universe with different kinds of cement? Do principles of causal attribution vary across cultures? Psychologists traditionally assumed that they do not: Attribution patterns were explained in terms of underlying perceptual or judgmental processes. For example, a tendency to overemphasize internal dispositions was noted by Lewin (1935) in early scientific explanations for physical events (e.g., a log floats because of its "levity") and social events (e.g., a man kills because of his "hostility"), and a similar pattern has been experimentally documented by subsequent researchers in lay persons' attributions (see reviews by Holland, Holyoak, Nisbett, & Thagard, 1986; McCloskey, 1983; Ross, 1977). This pattern was linked by Heider (1958) to perceptual gestalts (i.e., the person tends to "engulf the total field") and by Ross (1977) to

judgmental heuristics (i.e., personal dispositions have a higher "availability" and "representativeness" than situational causes of behavior). In sum, the precise mechanisms posited for this "fundamental attribution error" changed over the decades, but the assumption of cultural invariance did not change.

By contrast, anthropologists traditionally reported that attribution patterns vary, reflecting social structures or cultural symbol systems (Evans-Pritchard, 1937; Levy-Bruhl, 1910/1926). For example, ethnographers in non-Western cultures have long noted that behavior is explained with greater emphasis on the concrete situation, temporal occasion, and social context (Geertz, 1975; Hsu, 1953; Levy, 1973; Mauss, 1938/1985; Selby, 1974, 1975; Strauss, 1973). Consistent with ethnographic claims are recent findings of cultural psychologists that Indians (compared with Americans) refer more to situational factors and less to dispositions when asked to describe a person they know (Miller, 1987; Shweder & Bourne, 1982) and when asked to explain a behavior by such a person (Miller, 1984). However, these findings do not necessarily indicate different *processes* of attribution because the *objects* of attribution also differed (Americans talked about their American acquaintances, and Indians about their Indian acquaintances). In other words, findings may merely reflect that cultures differ in the actual impact of personal versus situational causes on behavior (Argyle, Shimoda, & Little, 1978). Our studies were designed to close this evidential gap and to test hypotheses about the mechanism for dispositionalism that varies across cultures. Before presenting hypotheses in detail, we review traditional psychological and anthropological approaches and recent interdisciplinary approaches to causal attribution.

Psychological Approaches

Perceptual Mechanisms

Early approaches to causal attribution were based on the Gestalt theory principle that important abstract forms are per-

Michael W. Morris, Graduate School of Business, Stanford University; Kaiping Peng, Department of Social Psychology, University of Michigan.

This article draws on a dissertation completed by Michael W. Morris under the guidance of Richard E. Nisbett at the University of Michigan, which received the 1993 Society of Experimental Social Psychology Dissertation Award. This research was supported by a National Science Foundation (NSF) grant to Richard E. Nisbett and an NSF doctoral fellowship and a University of Michigan dissertation research grant to Michael W. Morris.

Thanks to Richard E. Nisbett for sage advice and skilled assistance at every stage of this project. Thanks also to Lawrence Hirschfeld, Richard Larrick, Hazel Markus, and Edward Smith for commenting on earlier versions of the article, to Shaojian Chen, Chongkeng Cheng, Panfang Fu, Larry Quesada, and Marie Ting for assistance in the research, and to Amy Spade for assistance in preparing figures.

Correspondence concerning this article should be addressed to Michael W. Morris, Graduate School of Business, Stanford University, Stanford, California 94305-5015.

ceived with innate mechanisms that respond to patterns in the perceptual field (see Koffka, 1939). Michotte (1952) proposed that forms of physical causality may be directly perceived from trajectories of objects A and B, not necessarily derived from experience of succession of A and B, as Hume (1739/1987) had argued. After testing hundreds of displays, Michotte concluded that two evoke “universal” and “immediate” impressions of causality: *entraining*, in which A collides with stationary B and they move off together; and *launching*, in which A collides with stationary B and B alone moves off. Methodological flaws and failures to replicate cast doubt on Michotte’s evidence for universality and immediacy,¹ yet his thesis has been reincarnated in the form of proposed “modules” for causal perception. Habituation experiments (Leslie, 1982, 1987) have revealed that young children, and even infants, distinguish launching displays that conform to physical constraints from highly similar trajectories that deviate from these constraints (e.g., object B begins to move just before A collides with it).² Stewart (1984) found with similar displays that subjects perceive an object’s behavior as caused by external, situational force when it conforms to physical constraints (essentially, Newton’s laws of motion) but perceive an internal, dispositional force when object behavior deviates from these constraints.

Research on perception of *social causality* began with Heider and Simmel’s (1944) experiments involving animated displays of moving shapes. Trajectories that reliably evoked causal impressions were similar to Michotte’s: “simultaneous movements with prolonged contact . . . successive movements with momentary contact . . . simultaneous movements without contact . . . successive movements without contact” (pp. 252–255). Most striking in their results was the frequency with which subjects attributed behavior of shapes to internal personal dispositions, such as intentions, motives, and traits. Heider and Simmel offered a Gestalt account for this dispositionalism: “Just as . . . a landscape seen through the window of a moving train can only be ‘resolved,’ or made to yield a meaningful unit, by reference to distant objects laid out in space, so acts of persons have to be viewed in terms of motives” (p. 258). Heider (1944, 1958) extended this to account for disregard of external, situational causes: “Behavior . . . tends to engulf the total field, rather than be confined to its proper position as a local stimulus whose interpretation requires the additional data of a surrounding field—the situation in social perception” (1958, p. 54).

Jones and Davis (1965) proposed that dispositional causes are most clearly perceived (“the heart is on the sleeve”) when behavior deviates from expectations of a social role (Jones, Davis, & Gergen, 1961) or from a norm of social desirability (Jones & Harris, 1967). Jones and Nisbett (1972) extended the Gestalt account to explain why behavior is attributed to personal dispositions more by observers than by actors. In the perceptual field of an observer, the person is “figural” against the “ground” of the social situation. However, the actor cannot see himself as he acts; thus, in the perceptual field of the actor, it is the situation, and not the person, which is figural. Further experiments demonstrated that dispositionalism is affected by perceptual variables as mundane as perspective on the actor (S. E. Taylor & Fiske, 1975) and illumination of the actor (MacArthur & Post, 1977). Finally, some researchers have returned to Heider’s approach and have demonstrated that subjects, including young

children, distinguish the trajectories that indicate that behavior is caused by an intention (Bassili, 1976; Dasser, Ulbaek, & Premack, 1989). Modular theorists contend that “perception of intention, like that of causality, is a hard-wired perception based not on repeated experience but on appropriate stimulation” (Premack, 1990, p. 2).

Judgmental Heuristics

Others approached attribution as a complex computational problem (Kelley, 1967), which people simplify by the use of heuristics (see Kahneman & Tversky, 1973; Tversky & Kahneman, 1973, 1974). Research on *physical causality* has revealed that perceptions of force in object collisions are based on salient, single dimensions of trajectory, such as postcollision velocity, rather than on the correct multidimensional parameters (Gilden & Proffitt, 1989; Proffitt & Gilden, 1989). Patterns in attribution of *social causality* have been linked to heuristics of availability, representativeness, or consistency. Ross (1977) explained the bias toward personal dispositions in terms of their high availability (i.e., proximity of actor to act) and representativeness (i.e., similarity to the acts they are adduced to explain). After reviewing its consequences, Ross concluded that “the tendency to underestimate the impact of situational factors and to overestimate the role of dispositional factors in controlling behavior” is the “fundamental attribution error” (p. 183). Pettigrew (1979) proposed that the “consistency” of negative dispositions with stereotypes about outgroup members leads to heightened dispositionalism for deviant or undesirable behavior by an outgroup actor, which he designated the “ultimate attribution error.”

Cognitive Structures

Finally, others have modeled attribution as “top-down” application of pre-stored knowledge in the form of an implicit theory, schema, or script (Bartlett, 1932; Goffman, 1974; Minsky, 1975; Schank & Abelson, 1977). Researchers of *physical causality* have identified a tendency to overpredict persistence or consistency in object trajectories and have proposed that the lay person’s implicit theory is akin to the early scientific theory that the internal force of impetus drives a moving object (Kaiser, McCloskey, & Proffitt, 1986). The operation of an implicit theory in *social causality* attribution was suggested by Heider (1958) and Nisbett and Ross (1980). Both, in fact, drew on Ichheiser’s (1943, 1949, 1970) description of the tendency “to interpret in our everyday life the behavior of individuals in terms

¹ Evidence for universality is weakened by the fact that, in many experiments, he and his co-workers were the only subjects, and evidence for immediacy is weakened by the fact that displays were often shown repeatedly before recording the subject’s response. In replications, as few as 50% of subjects have perceived causality immediately (Beasley, 1968; Boyle, 1960; Gemelli & Cappellini, 1958; Gruber, Fink, & Damm, 1957; Powesland, 1959).

² Some have argued on this basis that perception of physical causality from object trajectories is an innate ability (Leslie & Keeble, 1987), whereas others have offered alternative explanations (see White, 1988), and others have demonstrated improvement in this ability through childhood and adolescence, which points to a substantial role for acquired knowledge (Kaiser & Proffitt, 1984).

of specific personal qualities rather than in terms of specific situations . . . based on the [ideological] presupposition of personal determination of behavior (as opposed to the situational or social determination of behavior)" (1943, p. 151). However, Heider and Nisbett and Ross did not posit that theories were the primary mechanisms underlying dispositionalism and, hence, did not limit their claims to the cultures they had researched nor suggest how attribution patterns might differ across cultures. Recently, Dweck and colleagues have traced individual differences in dispositionalism among American subjects to an implicit social theory, but the distribution of this theory across cultures has not yet been investigated (for a review, see Dweck, Hong, & Chiu, 1993).

More specific cognitive structures have been proposed to explain when dispositional attributions are made despite plausible situational attributions. Kelley (1972) proposed that attributors apply one of several schemas for causal configurations (e.g., multiple sufficient causes) that differ with regard to whether internal dispositional causes are discounted by external situational causes. Reeder and Brewer (1979) posited specific schemas for types of dispositions (e.g., capacities) to account for finer grained patterns in the discounting of dispositional causes. Others have suggested that explanations are guided by scripts for particular routine behaviors (Abelson & Lalljee, 1988; Morris & Murphy, 1990; Schank & Abelson, 1977). Because the content of scripts varies across cultures, script-based models predict cultural differences in the explanations given for particular behaviors. However, these models do not yield predictions about cultural differences in general patterns such as dispositionalism.

Anthropological Approaches

Symbol Systems

Ethnographers have long recorded patterns in causal explanation and interpreted them as reflections of cultural systems of symbols or forms of discourse. Levy-Bruhl (1910/1926) and Fauconnet (1928) described tendencies of traditional cultures to attribute disruptive events (e.g., inclement weather or unsuccessful hunts) to the presence of foreigners (e.g., missionaries or explorers). Evans-Pritchard (1937) interpreted a pattern of attributing an event to both a local, proximal cause (e.g., a pot was cracked by the fire, or a man was killed by a murderer) and simultaneously to a remote, ultimate cause (e.g., witchcraft) in terms of a Zande metaphysics of dual causation. Other Africanists have also described patterns in which disruptive events are attributed to ultimate causes in the social fabric (Marwick, 1982; Turner, 1975). An influential account is that theory-based attributions to unseen causes are found in both traditional African cultures and modern Western cultures, but patterns differ because the public discourse comprising Western scientific theory is open, whereas that comprising non-Western religious theory is closed (Horton, 1970).

Asian ethnographies were marshaled in support of Mauss's (1938/1985) thesis that the concept of a person (*personne*) guided by internal dispositions has evolved and replaced the concept of role or character (*personage*) only in modern Western social conditions. Mauss's evolutionary argument has been discredited, but the relativity of social concepts has received

considerable ethnographic support (Carrithers, Collins, & Lukes, 1985). Hsu (1953) argued that social conceptions of Americans are person-centered, whereas Chinese conceptions are situation-centered, reflecting societies based on individualism versus interdependence. According to Geertz (1975), Balinese people attribute behavior to scripted roles because social thinking occurs within forms of public discourse that direct attention to roles, not dispositions. Scholars of Indian social thought also contend that behavior is understood primarily in terms of social relations, not individuals (Dumont, 1970). Distinctive patterns of causal attribution, such as those involving the notion of *karma*, have been traced to symbols in Indian philosophical and medical systems (O'Flaherty, 1980).

Native American ethnographies have linked tendencies toward situational explanations to cultural systems (Gearing, 1970; Selby, 1974; Strauss, 1973). Selby argued that the Zapotec people understand behavior in "sociological, rather than psychological, concepts." The belief that internal traits have no "explanatory power for understanding social relations" is represented in a proverb—"We see the face but do not know what is in the heart"—which is not (as it would be to us) an expression of despair (1975, p. 21). Selby reports that even rare and deviant behaviors, such as murder, were explained in terms of the actor's social situation and context. Moreover, situationism could be seen not only in their words but in their judgments: A man who had murdered in one situation was not judged likely to do so in another, as evidenced by the fact that "within four years of his conviction for premeditated murder, he was holding a political post in the village and, ironically, it involved looking after all the children during fiestas" (1974, p. 66).

Cognitive Structures

In recent years, a number of anthropologists have shifted from the position that attribution patterns reflect disembodied symbol systems or social structures (sociocultural determinism), just as psychologists have shifted from the position that they reflect innate, culturally invariant processes (psychobiological determinism; Strauss, 1992a). Interest in models of cognitive structure has been spurred by Sperber's (1983, 1985, 1991) critique of symbolism and call for descriptions of cultural representations that are consistent with how people store, retrieve, and communicate information. For example, a tightly structured "spirit attack script" has been proposed by Nuckolls (1991) to explain Jalari Indian attributions for sudden illness. Others have found connectionist models more appealing and have proposed loosely structured networks of semantic and episodic knowledge to account for American explanations of romance (Holland, 1992) and of success (Strauss, 1992b). In short, anthropologists have increasingly posited cognitive structures, but they have focused on patterns of attribution that are specific to particular events rather than on patterns that are more general, such as the dispositionalist patterns in social explanations noted by previous ethnographers.

Cultural Psychology

Ethnographic reports that attribution is less dispositionalist in non-Western cultures have received some support in recent

cross-cultural psychological studies. Bond (1983) found that, although American and Chinese attributions fell into the same general categories, Chinese people attributed more to circumstances of a social nature and to situations involving social relationships than did Americans. Shweder and Bourne (1982) found that Hindu Indians gave more descriptions of an acquaintance's behavior as situated in a particular time, place, and social relationship, whereas Americans gave more decontextualized descriptions in terms of general, cross-situational dispositions. They proposed that, in cultures with a "holistic world view," persons and perhaps also physical objects are thought of in terms of specific occasions and concrete contexts rather than in terms of abstract dispositions.

Miller (1984) extended this research to explanations for behavior by proposing that "individuals' acquisition of more relational conceptions of person in non-Western cultures may lead them to give less weight than Western attributers to general dispositions of the agent . . . [and more weight] to the contextual determinants of action" (p. 964). She asked subjects of various ages to explain a behavior of an acquaintance witnessed in everyday life. Explanations of children in the two cultures were alike. Yet with age (and presumably acculturation) Americans were increasingly dispositionalist and Indians were increasingly situationalist, particularly for deviant behaviors. This finding of cultural divergence was also obtained in descriptions of persons, both those known well and not known well (Miller, 1987).

Our studies were designed to complement the evidence provided by previous studies. In previous studies, the object of explanation or description was not held constant (Americans talked about their American acquaintances, and Indians talked about their Indian acquaintances). Although this design has many virtues, such as protecting against spurious cultural differences due to differential familiarity with stimuli, it has the drawback of confounding two possible sources of the effect: a difference between American and Indian subjects' attribution processes and an objective difference in the actual causes of their acquaintances' behavior.³ And research indicates such a difference between Western and non-Western cultures in the actual impact of personal versus situational causes on behavior (Argyle et al., 1978). Our studies were designed to close this evidential gap and to test hypotheses about a culturally variable mechanism for dispositionalism.

Hypotheses

We propose that dispositionalism in social attribution (the "fundamental attribution error") reflects an implicit theory about social behavior that is more widespread in individualist cultures than in collectivist cultures. We assume that an implicit theory about a domain is acquired from culturally bound experience with events in the domain and with public representations of the domain (e.g., folktales, sacred texts, laws, and works of art). Because the individualism–collectivism dimension captures substantial variation among national cultures in social experiences and representations (Hofstede, 1980, 1983, 1991; Triandis, 1990),⁴ we submit that the distribution of implicit social theories differs between cultures at opposite ends of this dimension. In highly individualist cultures, such as the United States, persons are primarily identified as individual units, they can leave groups at will, and they are socialized to behave according

to personal preferences. In highly collectivist cultures, such as China, persons are primarily identified as group members, they cannot freely leave groups, and they are socialized to behave according to group norms, role constraints, and situational scripts. The dominant social representations in individualist American culture are rooted in the Judeo-Christian notion of the individual soul and the English legal tradition of free will. Those in collectivist Chinese culture are rooted in Confucian precepts about the primacy of social relations and the virtue of role-appropriate behavior (Hsu, 1981b; King & Bond, 1985). Thus, the person-centered theory that social behavior expresses stable, global, internal dispositions is more widespread in individualist cultures; the situation-centered theory that social behavior is shaped by relationships, roles, and situational pressures is more prevalent in collectivist cultures.

From this proposal, we hypothesize that attributional differences between Americans and Chinese are *broad* in scope. The scope of implicit theories has been elucidated by developmental findings that categorization and inference rules are organized according to domains of things having the same kind of causal properties, such as physical (Keil, 1986, 1989), animate (Gelman, 1990; Gelman & Spelke, 1981), psychological (Shultz, 1980; Wellman & Gelman, 1992), and social kinds (Shultz, 1982). Some evidence suggests that boundaries of these domains are culturally invariant (see Atran, 1989; Gelman, 1990; Jeyifous, 1985) even if content of domain theories differ. Domains are marked by the way things move (animates can propel themselves, psychological creatures move on intentional paths, and social creatures move according to intentions about intentions; see Bassili, 1976; Dennett, 1983, 1987; Premack, in press). Hence, the trajectory of motion in an event may trigger the implicit theory used to process it. This would account for cases when everyday perception is animistic (a leaf swirling in the wind seems animate) and anthropomorphic (trees swaying in the wind seem to be socially interacting). Attributional patterns due to an implicit theory differ in scope from those due to

³ In an attempt to address this issue, Miller (1984) presented American subjects with narratives about behaviors that had been originally generated by Indian subjects, and she compared American explanations to the original explanations of the Indian subjects. She found, as predicted, that Americans gave more dispositional explanations. However, in this study, American culture is confounded with another factor that increases dispositional attribution: second-hand as opposed to first-hand information about behavior (Gilovitch, 1987). The finding would be expected simply because Americans were working with second-hand information.

⁴ Although Hofstede's analysis of major dimensions of cultural variation provided the catalyst for psychological research on individualism–collectivism, related constructs have been used previously by many social theorists such as de Tocqueville (1840/1946), Tawney (1926), Weber (1930), and Lukes (1973) as well as social scientists, including those concerned with culture (Hsu, 1953, 1971; Triandis, 1972), values (Kluckhohn & Strodtbeck, 1961), character (Riesman, 1950, 1954), social systems (Parsons & Shils, 1951), religion (Bakan, 1966), ecology (Berry, 1979), and so forth. The dimension has reliably emerged in subsequent studies (Bond, 1988; Hofstede & Bond, 1984; Triandis et al., 1986) and has been found to predict free-riding in group tasks (Earley, 1989), frequency of social interactions (Wheeler, Reis, & Bond, 1989), favored types of verbal abuse (Semin & Rubini, 1990), and many other social psychological phenomena (for a review, see Triandis, 1990; for a critical view, see Kashima, 1987).

other proposed mechanisms: Any event that triggers a social theory would be processed differently by Americans and Chinese people. Cultural differences due to implicit theories would extend across types of social events (unlike differences due to scripts) and across types of social actors (unlike differences due to stereotypes). Yet differences would not be so broad as to extend across domains (unlike differences due to world views).

Our studies investigated the breadth hypothesis with emphasis on types of actors, which had not been varied in previous studies. The events that subjects explained in previous studies were behaviors of acquaintances. Our studies focused on behaviors of strangers and of outgroup members. We predicted that Chinese people would commit neither the "fundamental attribution error" nor the "ultimate attribution error." Furthermore, we tested whether cultural differences extend even to nonhuman events that are interpreted as social events. Because Chinese people and Americans would interpret animal behavior with reference to different social theories, we predicted that they make different attributions. Imagine, for example, one fish swimming in front of a group. Americans might attribute the fish's behavior to an internal disposition (e.g., leadership ability), whereas Chinese people might attribute it to an external, situational force (e.g., pressure from the group). In short, where Americans might see an individual leading a group, Chinese people might see a group chasing an individual. This cultural difference, however, would not extend to physical events, as these would not trigger social theories. Imagine, for example, a soccer ball bouncing down a soccer field. Its movements can be causally attributed to internal properties (e.g., its elasticity) or to external forces (e.g., kicks) but one would not expect Americans to emphasize the former and Chinese people the latter.

Cultural differences due to implicit theories would also be cognitively *deep*. Dweck and colleagues have explored how subjects who hold the social theory predictive of dispositionalism differ from other subjects in their processing of behavior. They attend to and encode different features into the representation of the behavior (Dweck, Hong, & Chiu, 1993), which makes them more likely to infer dispositions based on limited evidence (Gervey, Chiu, & Dweck, 1992) and to overpredict the consistency of future behavior (Erdley & Dweck, 1993). Processing may result in a more decontextualized representation of behavior that hinders judgmental sensitivity to the impact of future contexts (Semin & Fiedler, 1991). In sum, because theories shape encoding, representation, and inferences drawn from behavior, cultural differences would be found not only at the level of verbal discourse about behavior but also in other modes of causal cognition.

We tested predictions about differential encoding by investigating whether Americans and Chinese people differ in their online visual perceptions of causality (Study 1). We tested whether different kinds of attributions are generated by comparing the explanations of American and Chinese newspaper reporters for the same events (Study 2). We investigated whether American and Chinese people represent events differently by comparing how they evaluate various kinds of explanations (Study 3). We also investigated whether they draw different inferences from their representations of events by comparing their judgments about counterfactual situations (Study 3).

Study 1

In Study 1, American and Chinese subjects watched cartoon displays of physical and social events and reported their causal

perceptions. The contexts chosen were familiar in both cultures: Physical events involved an object moving across a soccer field, and social events involved a group of fish swimming in a lake. For physical events, we predicted no cultural differences: An object's trajectory will be attributed to internal dispositions to the extent that it deviates from certain trajectory constraints. For social events, we predicted cultural differences: A fish's behavior that deviates from others will be attributed more to its internal dispositions by Americans and more to its external situation by Chinese subjects. All subjects were shown many events of each kind to investigate additional hypotheses about perception of dynamics from trajectories.

For physical events, we hypothesized that Americans and Chinese people have the same implicit theory that accords object motion within certain trajectory constraints to external factors and accords motion that deviates from these constraints to internal factors. One proposed constraint (Stewart, 1984) that we investigated is conservation of rest (e.g., a stationary soccer ball stays at rest). Another constraint investigated involved velocity. The constraint was not conservation of velocity, but rather Runeson's (1974) proposed constraint that terrestrial objects gradually lose velocity or decelerate. (e.g., a rolling soccer ball gradually decelerates).

For social events, we expected that trajectories would be more ambiguous as to internal versus external causation. On the basis of Heider and Simmel's finding that trajectories that resemble familiar social dynamics cue perception of social relations, we investigated whether fish trajectories akin to Chinese social dynamics would be interpreted socially (anthropomorphized) more by Chinese subjects and those akin to American social dynamics more by Americans. We attempted to vary this trajectory factor within three sets of social displays. In displays of fish compelling others to move through compliance or conformity, we expected Chinese people to be more likely to anthropomorphize those resulting in a harmonious bonding, whereas we expected Americans to anthropomorphize those resulting in a discordant division (Bond & Hwang, 1986; Hsu, 1981a). In displays of a fish changing its relation to a group, we expected Chinese subjects to be more likely to anthropomorphize events resulting in connection of individual and group, whereas Americans would be more likely to anthropomorphize events resulting in separation (Bellah, Madsen, Sullivan, Swidler, & Tipton, 1985; Hoosain, 1986; Markus & Kitayama, 1991). In displays of a group's response to the presence of an outsider, we expected Chinese subjects to be more likely to anthropomorphize dispersion and Americans more likely to anthropomorphize convergence because of different dynamics of leadership and group cohesion (Redding & Wong, 1986).

Method

High School Sample

Subjects. We sampled 100 Chinese secondary school students, half of whom we drew from a school serving a university neighborhood (Beijing University High School) and half from a school serving a worker's neighborhood in an eastern coastal city (Qingdao City High School). The Chinese experimenter (a psychology graduate student at Beijing University) accessed classrooms in the former school through psychology department channels and in the latter school through family connections with its principal. We sampled 95 American secondary

school students, whom we drew from a school serving the mixed college and factory town of Ypsilanti, Michigan (Willow Run High School). Classrooms were accessed through psychology department channels. The American sample comprised roughly equal numbers of European-American and African-American students plus a smaller number of Asian-American students. In each country, we selected several classes and recruited the participation of all students in these classes, resulting in a sample evenly divided by gender.

Materials. We produced a series of animated displays with the Macromind Director program on a Macintosh IIci computer and then transferred them to videotape so that they could be displayed on 20-inch television screens.

Physical displays featured a round object moving across a soccer field. All displays featured a solid black circle (5 cm diameter) and some also featured a yellow rectangle (10 cm × 2 cm). We produced two sets of five displays:

1. *Collision* displays resembled those of Michotte (in his Experiments 2, 1, 29, 31, and 3, respectively). The circle always began at rest, center-screen, then moved rightward; what varied was the degree to which its movement coincided with being struck by the rectangle (see diagrams in Figure 1). Across five displays, the circle increasingly deviated from conservation of rest: (a) It moved while in continuous contact with the moving rectangle (*entraining*); (b) it moved immediately on impact of the rectangle (*launching*); (c) it moved 500 ms after impact (*time gap*); (d) it moved before impact, when the approaching rectangle was still 2 cm away (*space gap*); and (e) it moved without any rectangle present (*starting*).

2. *Acceleration* displays resembled those of Stewart and Runeson. The circle always appeared from beyond the left edge and traversed the screen; what varied was its change in velocity as it crossed the screen (see diagrams in Figure 2). Across five displays, the circle increasingly deviated from the slight deceleration characteristic of inanimate objects in the terrestrial ecology: (a) It decelerated slightly as if by friction (*decelerating*); (b) it held a constant speed (*constant*); (d) it stopped suddenly (*stop*); (d) it accelerated slightly (*accelerating*); (e) it suddenly stopped, started, stopped, and started again (*stopping and starting*).

Social displays portrayed events involving a group of fish. All fish were identical in size (6 cm from gill to tail), features, and manner of swimming, but each was a different color. The blue fish (on which questions were focused) swam on a trajectory that deviated from that of others. The animations were designed to resemble a film of actual fish as much as technically possible so as not to invite anthropomorphization any more than actual fish do.⁵ We produced three sets of displays:

1. *Compulsion* displays were like collisions between the blue fish and the group. In these displays (see Figure 3), one party approached the other and compelled it to move. This compelling took the form of either *harmonious entraining* (parties swim together and in synchrony after contact) or *discordant launching* (parties swim separately and out of synchrony after contact). We varied which party compelled the other.

2. *Connection* displays showed movements that resulted in either *connecting* or *separating* the blue fish and the group. In these displays (see Figure 4), one either left or joined the other. We also varied which party made the move.

3. *Collection* displays showed the group either *collecting* or *dispersing* in the presence of the blue fish. In these displays, group members moved on radial paths and the blue fish swam in either the center or the periphery.

Groups of 5–10 subjects sat at desks in classrooms in front of a large TV and were given questionnaires in English or Chinese. The English version was translated into Chinese and back-translated successfully. The questionnaire cover stated as follows: "In this experiment you will answer questions in this booklet while watching cartoons on the television. Always try to answer quickly, based on your first impression."

Instructions for Part 1 described cartoons set on a soccer field in the evening, which feature a dark circular shape moving across the field that could be "either a soccer ball or an animal." Subjects were instructed to

observe "how much its movement is influenced by *internal* factors, such as the pressurized air inside the soccer ball that makes it bounce, or the muscles of an animal that allow it to run" and "how much the movement is influenced by *external* factors, such as a person kicking a ball or scaring an animal." Subjects were instructed to familiarize themselves with the following questions:

1. "Does the dark thing look like a soccer ball or like an animal?" answered on a 5-point scale labeled *looks like soccer ball, more like soccer ball than animal, could be either, more like animal than soccer ball, and looks like animal*.

2. "To what extent do the thing's movements seem *influenced* by internal factors?" answered on a 5-point magnitude scale labeled *hardly at all, slightly, moderately, greatly, and almost entirely*. (This scale was used with all influence questions.)

3. "To what extent do the thing's movements seem *influenced* by external factors?"

When subjects had read the instructions, the videotape was started by the experimenter. The videotape showed each display three times, each time preceded by an attention-getting beep and followed by a question then a 30-s pause. During the pause, subjects responded by marking a scale in their questionnaire. The entire running time of Part 1 was slightly over 10 min.

Instructions for Part 2 described cartoons of fish swimming in a lake. Subjects were instructed to observe the blue fish's relationship to the group and the influences on fish movements, including internal factors, "such as when a fish is hungry and swims to look for food," and external factors, "such as when one fish . . . follows another fish." Subjects were instructed to familiarize themselves with the following questions:

1. "Does the blue fish seem to be an important member of the group?" answered on a 5-point scale labeled *not at all, less than average, average, more than average, and most important member*.

2. "To what extent do the blue fish's movements seem *influenced* by internal factors?"

3. "To what extent do the blue fish's movements seem *influenced* by the other fish?"

4. "To what extent do the other fish's movements seem *influenced* by the blue fish?"

Each of the 12 cartoons was shown four times, each time preceded by a beep and followed by a question then a 30-s pause. The entire running time of Part 2 was just over 15 min. Half of subjects saw the forward-order videotape and half saw the reverse-order videotape. In the forward tape, the five physical displays in each set were ordered by increasing deviation from natural trajectories (as in Figures 1 and 2), and the four social displays in each set were ordered randomly. In the reverse tape, the order of displays within each set was reversed.

Graduate School Sample

Subjects. Subjects were students in the mechanical engineering and chemistry graduate programs at the University of Michigan. We contacted all Chinese students (citizens of the People's Republic of China [P.R.C.], Hong Kong, or the Republic of China [R.O.C.]) in the 2nd and 3rd year cohorts and an equal number of randomly selected American students (U.S. citizens). They were offered \$10 for participating. A total of 22 (of 28) Chinese and 22 (of 29) American students participated.

Materials and procedure. The same materials were used as in Study 1. Sessions were held in the Institute for Social Research laboratory. American and Chinese natives were both tested in English. For each

⁵ We used a sequence of computer graphic images showing a fish in four phases of its swimming motion, each with different fin and tail positions. In the 100 frames of each animation, we cycled through this sequence (a film loop) as we translated the fish along its trajectory.

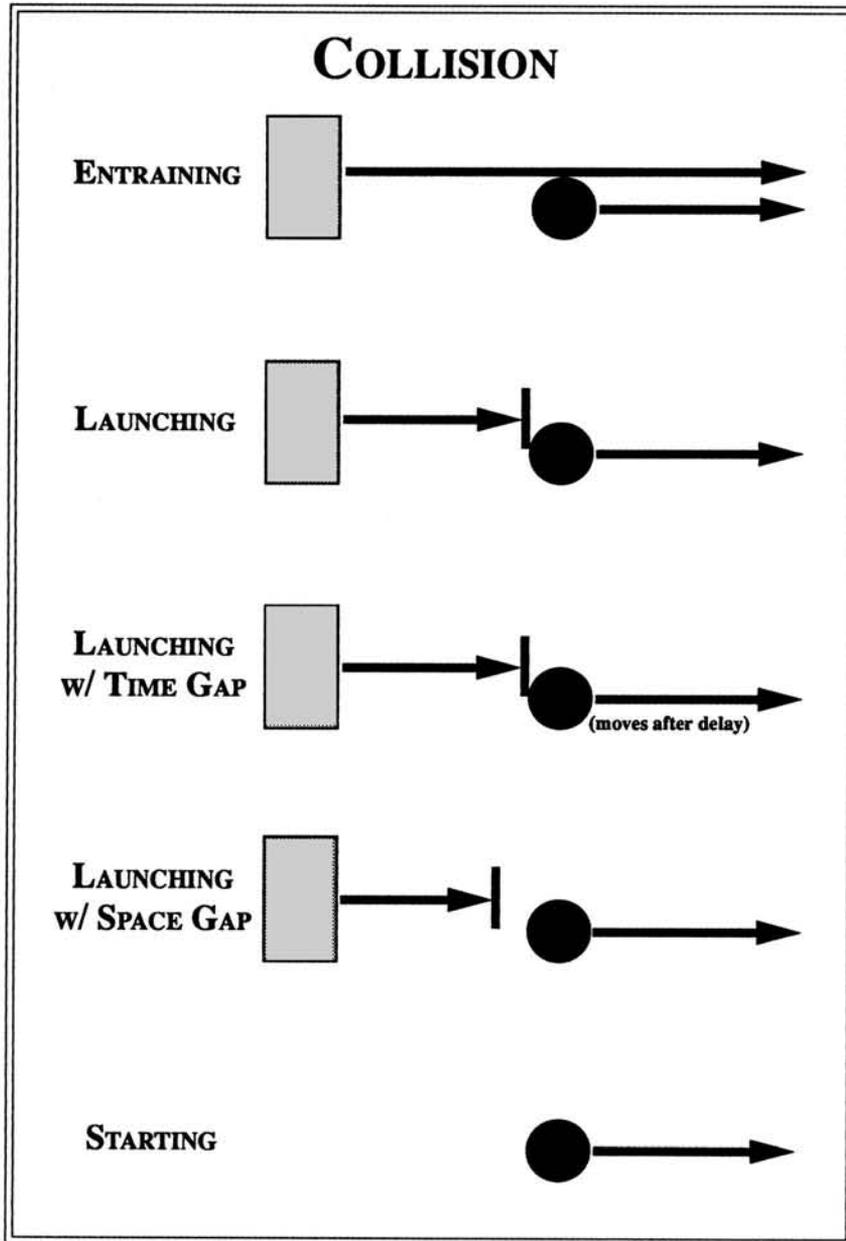


Figure 1. Diagrams showing trajectories of objects in collision displays. Arrowed lines show direction of movement; vertical lines show where the object stopped, if it stopped.

session, one American and one Chinese graduate student were seated near opposite ends of a long table, each in front of a TV and VCR (videocassette recorder). One of them watched a forward-order videotape and the other a reverse-order tape. They controlled the pace of the experiment by pausing the VCR with a remote control as needed.

Results

Physical Events

We predicted that causal perceptions of physical events by American and Chinese subjects would not differ. As predicted,

there were no cultural differences in perception of internal force or external force. As Table 1 shows, American and Chinese perceptions did not differ with either set of displays or with either sample of subjects. The lack of cultural differences in the physical domain suggests that we successfully translated the questionnaire into Chinese and supports interpretation of culture effects in the social domain as differences in perception, not failures of communication (Campbell, 1964).

We predicted that perception of internal force, external force, and animacy would be cued by an object's trajectory. Specifically, we tested the prediction that deviation from natural tra-

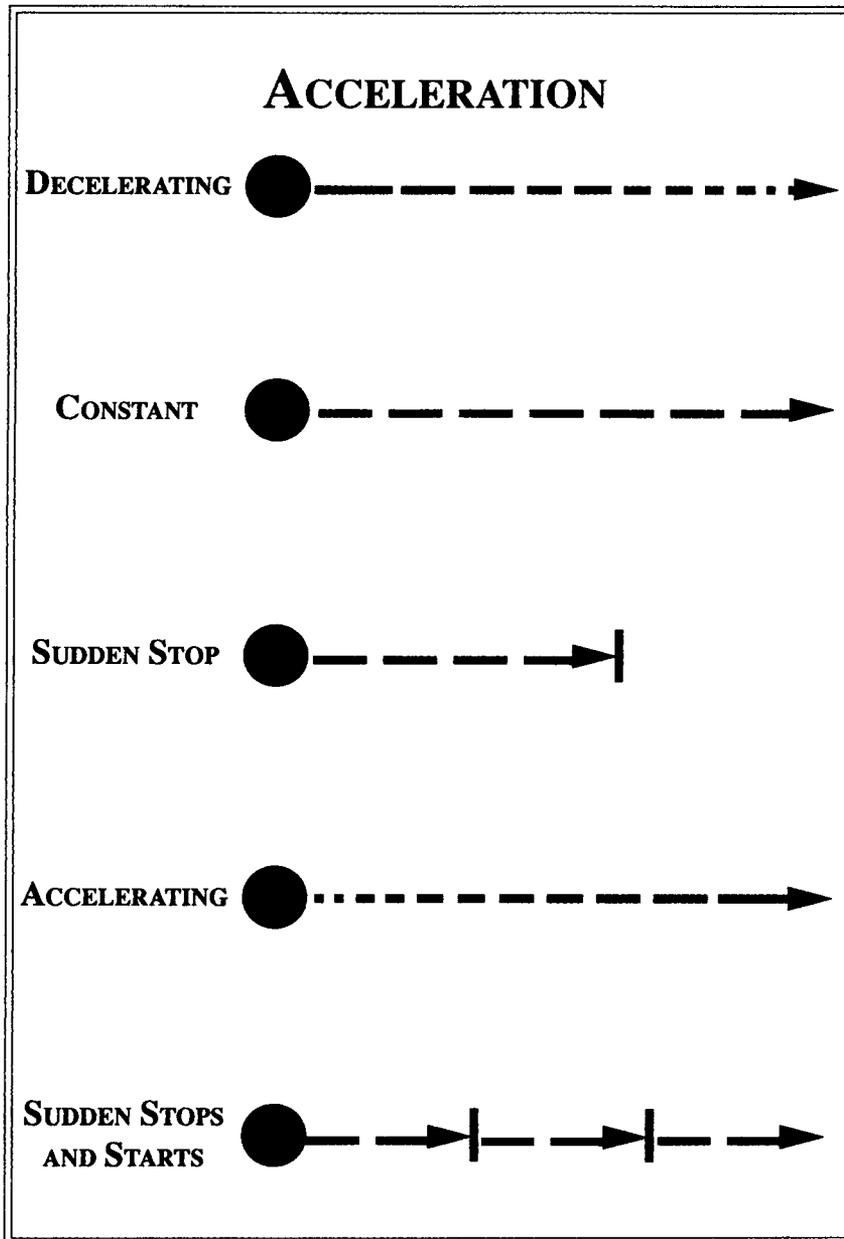


Figure 2. Diagrams showing trajectories of objects in acceleration displays. Dashes of constant length represent constant velocity; dashes of increasing length indicate acceleration; dashes of decreasing length indicate deceleration; vertical lines show where the object stopped, if it stopped.

jectory constraints increases perception of internal force, decreases perception of external force, and increases perception of animacy. Across the five collision displays, in which the circle increasingly deviated from conservation of rest, subjects perceived more internal force, less external force, and more animacy (see Figure 5). Across the five acceleration displays, in which the circle increasingly deviated from gradual deceleration, subjects showed the same predicted pattern (see Figure 6).⁶ This general pattern might also be predicted from a perceptual module, but the fact that science graduate students were relatively more responsive to trajectory cues inclines the evidence in favor

⁶ Slopes of the functions in Figures 5 and 6 (estimated by linear contrasts) differed from zero in the predicted direction and did not differ by culture. We excluded the entraining display from analyses on learning that it is perceived as physical causation only with square objects like Michotte's, not with round objects like ours (Beasley, 1968). Because they are tangential to the central thesis of the article, details of slope computations and comparisons are omitted here and can be obtained by writing to Michael W. Morris.

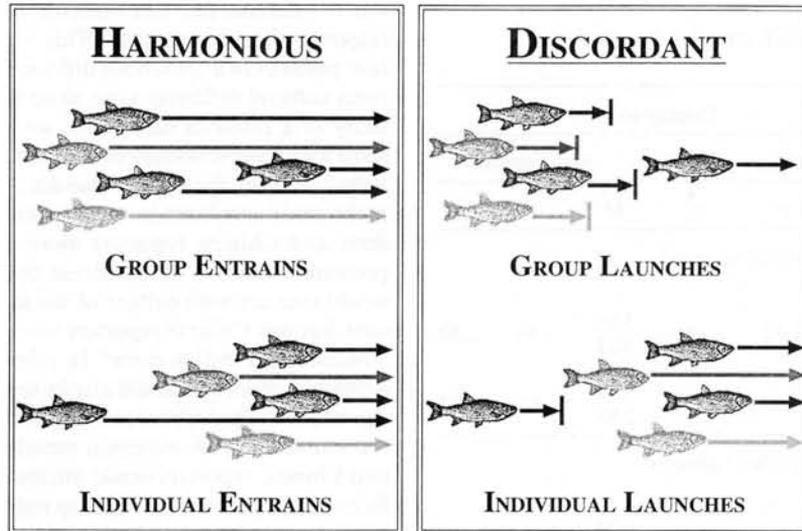


Figure 3. Diagrams showing trajectories of fish in compulsion displays. Vertical lines show where the fish stopped, if it stopped. The blue fishes have the darkest arrows in these diagrams.

of an implicit theory shaped by experiences and public representations.

Social Events

We predicted that causal perception of social behavior by American and Chinese subjects would differ in emphasis on internal versus external causes. Our predictions were borne out for the high school sample: Americans perceived more influence of internal factors and Chinese perceived more external influence on the blue fish's motion. Americans attributed more to internal force than did Chinese subjects in compulsion, connection, and collection display sets, an effect highly significant

for the first of these (see Table 2, top panel). Chinese subjects attributed more to external force in compulsion, connection, and collection display sets, an effect significant for all three display sets (see Table 2, top panel). These effects are not likely to be translation artifacts because the analogous task produced no cultural difference in the physical domain (compare Table 2 to Table 1). We expected that these main effects of culture might be attenuated among graduate students, who have more in common culturally than high school students. We found, however, that cultural effects were entirely absent in our graduate student sample (see Table 2, bottom panel).

We also predicted interactions of culture and trajectory in that perception of social relations among fish (anthropomorphi-

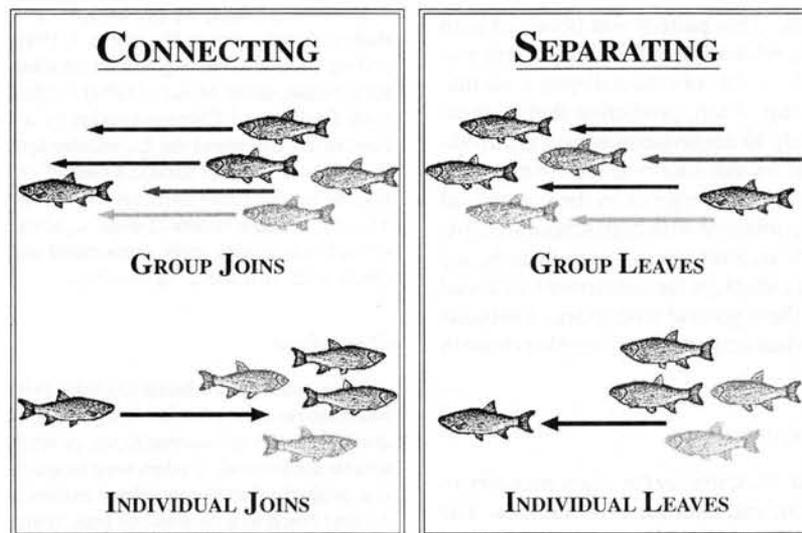


Figure 4. Diagrams showing trajectories of fish in connection displays. Vertical lines show where the fish stopped, if it stopped. The blue fishes have the darkest arrows in these diagrams.

Table 1
Causal Perception of Physical Events by American and Chinese Subjects

Perception	Display set					
	Collision			Acceleration		
	<i>M</i>	<i>F</i>	<i>p</i>	<i>M</i>	<i>F</i>	<i>p</i>
High school subjects ^a						
Internal force						
American	2.56			3.04	.46	.50
Chinese	2.70	1.82	.18	3.11		
External force						
American	3.40	.88	.35	2.74	.96	.33
Chinese	3.11			2.85		
Graduate school subjects ^b						
Internal force						
American	2.80			3.58		
Chinese	2.71	.23	.63	3.77	.23	.63
External force						
American	3.77	.88	.35	2.40	.88	.35
Chinese	3.61			2.21		

^a *df* = 1, 193. ^b *df* = 1, 42.

zation) would be greater for trajectories that resemble a social dynamic from the perceiver's culture. We measured anthropomorphization with an index of ratings 1, 3, and 4 (blue fish's relationship to the others, influence by the others, and influence on the others). In compulsion displays, we manipulated the harmony of trajectories, predicting that Chinese subjects would be more likely to anthropomorphize harmonious events and that Americans would anthropomorphize discordant events. This pattern was obtained with both high school students and graduate students (see Table 3). In connection displays, we manipulated the outcome of trajectories, predicting that Chinese subjects would be more likely to anthropomorphize events resulting in connection and that Americans would anthropomorphize events resulting in separation. This pattern was obtained with high school students (nonsignificantly) and with graduate students (significantly; see Table 3). In collection displays, we manipulated the flow of the group of fish, predicting that Chinese subjects would be more likely to anthropomorphize group divergence in the presence of an outsider and that Americans would anthropomorphize group convergence in the presence of an outsider. This pattern was obtained with high school students (significantly) and with graduate students (nonsignificantly; see Table 3). The validity of fish displays for assessment of social perception is supported by these general tendencies of subjects to perceive social relations when trajectories resembled those in familiar social dynamics.

Study 2

In Study 2, we compared attributions for mass murders in newspapers serving American and Chinese communities. The reason for studying attributions generated spontaneously in this natural context rather than in response to a researcher's request (e.g., Lau & Russel, 1980; Schoeneman & Rubanowitz, 1985)

was to establish that attributional patterns are not artifactual responses to research tasks. This is a crucial step in studying how patterns of attributions differ across cultures because spurious cultural differences can arise from the differential familiarity of a research task. First, we predicted that Americans show a stronger tendency toward the "fundamental attribution error." That is, for a given murder, American reporters would make more attributions to personal dispositions of the murderer and Chinese reporters more attributions to situational pressures. Second, we predicted that culture of the reporter would interact with culture of the murderer, such that Americans but not Chinese reporters would show the pattern of the "ultimate attribution error." In other words, we expected that American reporters would attribute murder to personal dispositions rather than situational pressures to a greater extent when the murderer is an outgroup member. However, we expected that Chinese reporters would attribute primarily to situational factors for ingroup and outgroup murderers alike.

Method

Materials

We compared articles about murders in the leading English-language (*The New York Times*) and Chinese-language (*World Journal*) U.S. newspapers. Both newspapers are based in New York and circulated worldwide. We focused on attributions for mass murder because unusual, negative behaviors evoke the most spontaneous attribution (Weiner, 1985). We selected two comparable crimes committed in autumn 1991 by Chinese and American murderers, respectively:

1. Gang Lu was a Chinese physics student who had recently lost an award competition, unsuccessfully appealed it, and subsequently failed to get an academic job. On October 31, he entered the University of Iowa Physics Department and shot his advisor, the person who handled his appeal, several fellow students and bystanders, and then himself.

2. Thomas McIlvane was an Irish-American postal worker who had recently lost his job, unsuccessfully appealed the decision with his union, and had failed to find a full-time replacement job. On November 14, he entered the Royal Oak, Michigan, Post Office and shot his supervisor, the person who handled his appeal, several fellow workers and bystanders, and then himself.

From each paper, we photocopied every article about the murders that appeared between November 1, 1991, and December 31, 1991. For coding purposes, we segmented articles into units corresponding to each clause, using Miller's (1984) method. The unitizing was done for both English and Chinese articles by a bilingual psychologist: Three English articles about the Lu murder totaled 206 units, and one about the McIlvane murder totaled 84 units; 17 Chinese articles about the Lu murder totaled 1,099 units, and one about the McIlvane murder totaled 41 units. We gave coders 22-page booklets consisting of an enlarged copy of each article with units demarcated and numbered as well as coding sheets with corresponding numbers.

Procedure

We constructed a scheme to enable exhaustive coding of units. A unit was coded as an attribution to a *personal disposition* of the murderer, an attribution to a *situational factor*, or neither (nonattribution or unclassifiable attribution). Coders were instructed that a personal disposition is a property that the murderer carries across time, place, and social context (such as a personality trait, temperament, stable value or attitude, long-standing goal, habit, chronic pathology, general capability, physical characteristic, character flaw, etc.). We instructed coders that a situational factor is tied to a particular time (such as an emotional crisis,

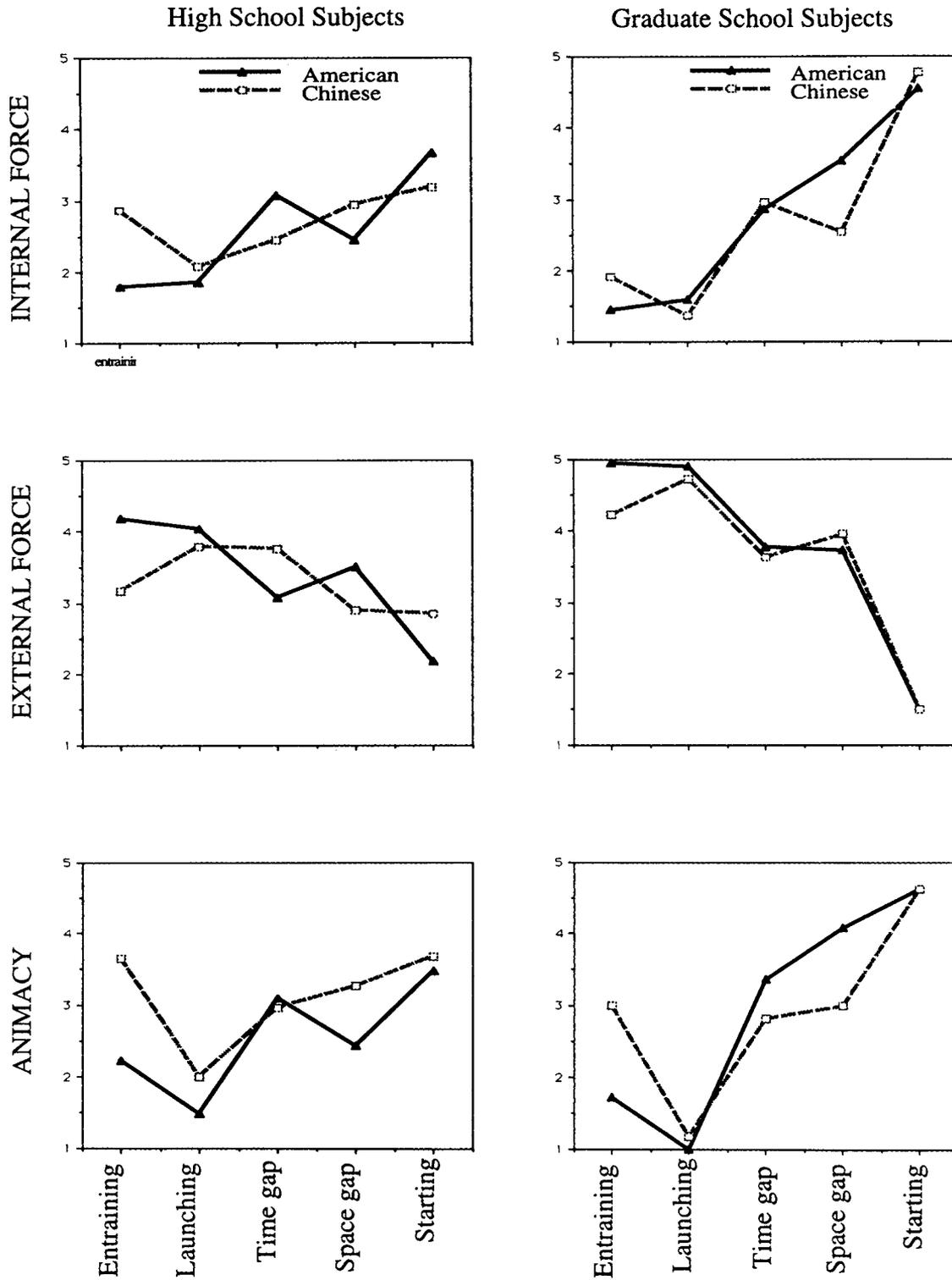


Figure 5. Perceptions of high school subjects (left panel) and graduate school subjects (right panel) across the five collision displays. As the displays increased in deviation from conservation of rest (from entraining to starting), perceived internal force rose, perceived external force fell, and perceived animacy rose.

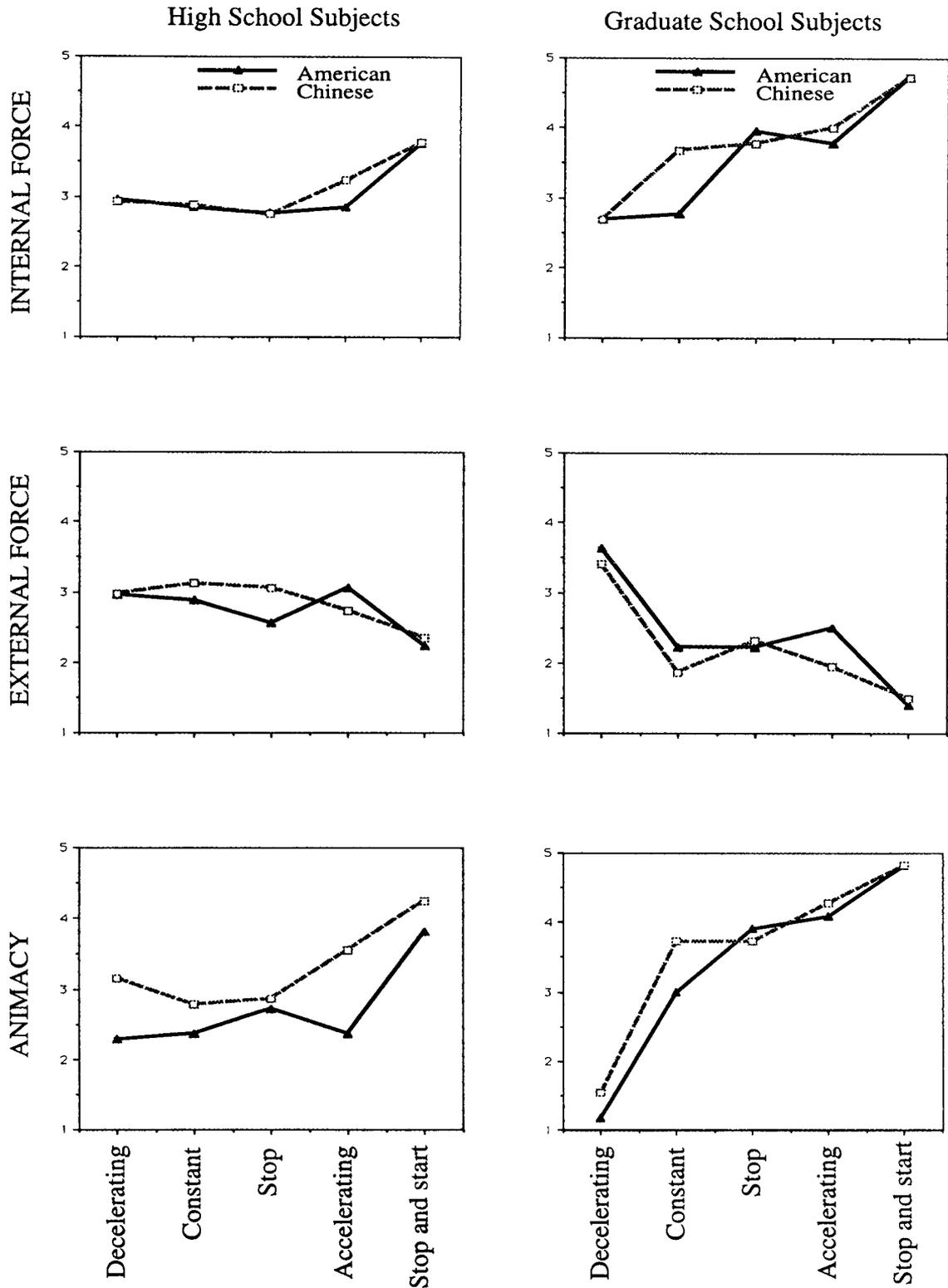


Figure 6. Perceptions of high school subjects (left panel) and graduate school subjects (right panel) across the five acceleration displays. As the displays increased in deviation from gradual deceleration (from decelerating to stops and starts), perceived internal force rose, perceived external force fell, and perceived animacy rose.

Table 2
Causal Perception of Social Events by American and Chinese Subjects

Perception	Display set									
	Compulsion			Connection			Collection			
	<i>M</i>	<i>F</i>	<i>p</i>	<i>M</i>	<i>F</i>	<i>p</i>	<i>M</i>	<i>F</i>	<i>p</i>	
High school subjects ^a										
Internal force										
American	3.17			3.28	1.54	.22	3.13			
Chinese	2.56	29.73	.001	3.13			3.05	.28	.60	
External force										
American	3.27			2.14	8.69	.004	1.91			
Chinese	3.61	10.49	.001	2.42			2.15	4.98	.03	
Graduate school subjects ^b										
Internal force										
American	3.07			1.94	1.50	.23	3.44			
Chinese	3.00	.09	.77	2.11			3.84	1.41	.24	
External force										
American	3.77			3.95	.22	.64	1.69			
Chinese	3.82	.07	.79	3.84			1.38	2.21	.15	

^a *df* = 1, 193. ^b *df* = 1, 42.

mood, temporary mental state, etc.), tied to a particular *place* (such as stress at the workplace, homesickness, discomfort in an environment, etc.), or tied to a particular social context (such as a relationship, social role, institutional requirement, personal grudge, a group norm, etc.). We emphasized to coders that a personal disposition must be (a) stable across time, place, and social interactions; and (b) a disposition of the person rather than a group norm to which the person adheres (such as a class, gender, generational, or cultural norm).

Five University of Michigan graduate students, fluent in English and Chinese, coded the articles. The group comprised the second author, two other P.R.C. natives, and two U.S. natives. The latter four were unaware of our hypotheses. The coders met for a 2-hr session, during which they discussed the coding scheme in English and Chinese and practiced coding together on articles not used in the study.

Results

Coder Reliability

We analyzed the intercoder reliability at the article and item levels. For each of 22 articles, we calculated the proportion of units coded as personal dispositions and as situational factors. Assessed by Kendall's coefficient of concordance, the proportion of dispositional causes ($W = .87, p < .001$) and of situational causes ($W = .86, p < .001$) was very reliable across the five coders. Average correlations between pairs of same-culture coders were no different than those between pairs of different-culture coders (Chinese-Chinese pairs, $r = .81$; American-American pairs, $r = .73$; mixed pairs, $r = .84$). Across 1,430 items, we calculated the percentage on which a pair of coders agreed. The average percentage agreement was high with both English articles (.81) and Chinese articles (.70).

Cultural Differences

As predicted, American reporters attributed more to personal dispositions and Chinese reporters attributed more to sit-

uational factors. Causes of the Lu murder emphasized by American reporters were personality traits (e.g., "very bad temper," and "sinister edge to Mr. Lu's character well before the shootings"), attitudes (e.g., "personal belief that guns were an important means to redress grievances"), and psychological problems (e.g., "darkly disturbed man who drove himself to success and destruction," "psychological problem with being challenged," and "whatever went wrong was internal"). Causes emphasized by Chinese reporters were Lu's relationships (e.g., "did not get along with his advisor," "rivalry with slain student," and "isolation from Chinese community"), pressures in Chinese society (e.g., "Lu was a victim of the 'Top Students' Education Policy," and "tragedy reflects the lack of religion in Chinese culture"), and aspects of American society (e.g., "murder can be traced to the availability of guns"). Likewise, American reporters made reference to McIlvane's personal dispositions (e.g., "man was mentally unstable," "had repeatedly threatened violence," "martial arts enthusiast," and "he had a short fuse"), whereas Chinese reporters stressed situational factors (e.g., "gunman had been recently fired," "post office supervisor was his enemy," and "followed the example of a recent mass slaying in Texas").

As predicted, the proportion of units coded as dispositional attributions was higher in American ($M = .14$) than Chinese articles about the Lu murder ($M = .08$), paired-sample test across coders, $t(4) = 4.24, p < .01$, and for American ($M = .10$) than Chinese articles about the McIlvane murder ($M = .03$), $t(4) = 3.15, p < .05$. The proportion of units coded as situational attributions was higher in Chinese ($M = .19$) than American articles about the Lu murder ($M = .11$), $t(4) = 2.46, p < .07$, but there was no difference between Chinese and American articles about the McIlvane murder (M s = .22 and .26), $t(4) = 1.33, p > .25$. The cultural difference is most manifest when the overall ratio of personal to situational attributions in the Chinese newspaper ($M = .40$) is contrasted with that in the English newspaper

($M = .78$), $t(4) = 7.34$, $p < .002$. In short, Chinese reporters showed less tendency toward the “fundamental attribution error.”⁷

In addition, as predicted, American reporters showed the pattern of the “ultimate attribution error,” whereas Chinese reporters did not. We contrasted ingroup versus outgroup attributions, separately for each newspaper (the standard test; see Hewstone, 1989). American reporters attributed more to personal dispositions and less to situational factors for the outgroup (Chinese) actor than the ingroup (American) actor (see Figure 7, upper panel). Their ratio of personal to situational attributions was significantly higher for outgroup ($M = 1.23$) than ingroup ($M = .29$), $t(4) = 3.66$, $p = .02$. Chinese reporters did not show more dispositional attributions for the outgroup (American) actor (see Figure 7, lower panel). Their ratio of personal to situational attributions was not higher for outgroup ($M = .15$) than ingroup ($M = .43$), $t(4) = 2.19$, $p = .09$.

Study 3

In a final study, American and Chinese graduate students were surveyed about their attributions for murders. The survey presented a summary of media reports about a recent murder and then presented two sets of questions about it. First, causes of the murder that had been suggested in the media were listed, and subjects were instructed to weight the importance of each. This task tested whether Americans and Chinese subjects differentially evaluate dispositional and situational explana-

Table 3
Perceived Social Relations as a Function of Fish Trajectories
(Tests That Subjects Anthropomorphize Trajectories
Resembling Familiar Cultural Dynamics)

Perception	Display set		
	Compulsion	Connection	Collection
High school subjects			
Trajectories that fit American dynamic			
American	2.92	2.03	2.63
Chinese	2.90	1.92	2.84
Trajectories that fit Chinese dynamic			
American	3.27	2.74	1.93
Chinese	3.54	2.81	2.45
$F(1, 193)$	7.39	2.27	7.05
p	.007	.13	.009
Graduate school subjects			
Trajectories that fit American dynamic			
American	2.99	1.63	2.56
Chinese	3.05	1.45	2.49
Trajectories that fit Chinese dynamic			
American	3.29	2.30	2.05
Chinese	3.71	2.89	2.28
$F(1, 42)$	3.86	8.27	1.93
p	.056	.006	.17

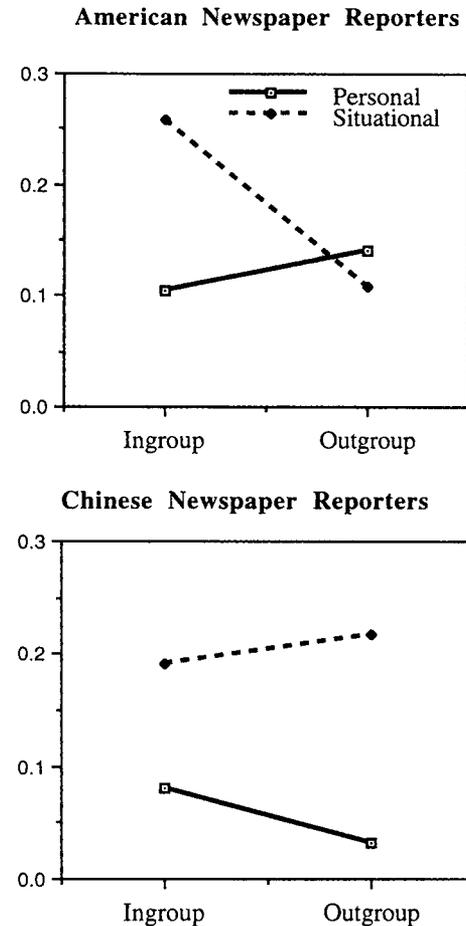


Figure 7. Proportions of total items coded as personal and as situational attributions in American newspapers (*New York Times*) and Chinese newspapers (*World Journal*) broken down by whether the murderer was ingroup or outgroup (relative to the reporter).

tions (in addition to differentially generating them). Second, subjects were presented with a list of counterfactual scenarios, each differing from the actual scenario by the change of one causal factor. Subjects were requested to imagine or simulate whether the murder would have occurred in each counterfactual scenario—whether the change of one causal factor would have made a difference. We expected that Americans would judge murder to be less likely in scenarios with altered personal dispositions and Chinese would judge it less likely in scenarios with altered situational pressures. This task tested the causal status of dispositional and situational factors in subjects’ representations of the murder event (see Kahneman & Miller, 1986; Kahneman & Tversky, 1982; Wells & Gavanski, 1989).

⁷ Because the actual cause of murder is unknown, we have no grounds to argue that dispositional attribution is erroneous in these cases. However, the fact that there have been 10 mass murders at U.S. post offices by employees in the last decade suggests that situational attributions may be called for. Recently, post office murders in California and Michigan occurred on the same day (May 6, 1993), and this coincidence spurred a *New York Times* article (May 17, 1993) analyzing situational pressures on post office workers.

Method

Subjects

Subjects were students in the physics graduate program at the University of Michigan. We distributed questionnaires through campus mail to all Chinese students (citizens of P.R.C., Hong Kong, or R.O.C.) and to a slightly higher number of randomly sampled American students (U.S. citizens). Half of the students from each culture received a questionnaire about the Lu murder and half received a questionnaire about the McIlvane murder. A total of 11 (of 18) Chinese and 14 (of 24) American students returned the Lu questionnaire; 11 (of 17) Chinese and 19 (of 24) American students returned the McIlvane questionnaire. Students who returned completed questionnaires were sent \$5 compensation.

Procedure

Our survey was mailed to subjects under the guise of an Institute for Social Research study about homicide so that they would be unaware of our interest in cultural differences. Our recruitment letter provided a rationale for why their opinion was sought. The letter explained that social scientists "cannot, of course, do experiments to investigate what causes someone to engage in mass murder" and, hence, must search for clues about possible causes by surveying people who "share experiences of the persons involved—i.e., because they live in the same region of the United States, or because they are employed in the same line of work." It explained that the physics graduate students were one of the various groups in the Ann Arbor community to be surveyed, and it stressed the importance of their participation as a step toward "combating the national epidemic of mass murders."

The questionnaire presented subjects with a brief report about a murder (either the Lu or McIlvane murder) and then two sets of questions about it. Reports were based on descriptions given in the English- and Chinese-language media. They were of equal length and contained equivalent amounts of information about the murderer's personal dispositions, situational pressures, and actions. The purpose of these was to balance the information subjects had about the two murders so that we could pose parallel questions about them. For example, we mentioned the fact that Lu had failed his first dissertation defense because this fact was featured in Chinese newspapers but absent in English newspapers; this balanced information across American and Chinese subjects. We mentioned McIlvane's Irish ethnicity because Lu's Chinese ethnicity was emphasized in the media; this balanced information across murders. Immediately after subjects read the description of the murder, they were asked to write a brief explanation of the murderer's behavior. This open-ended question was designed to prime their thoughts about the murder.

Causal judgment task. The first task presented subjects with a series of 28 possible causes of the murder, drawn from media reports. Parallel items were used for the Lu and McIlvane murders, tailored as necessary to fit each case. For example, we drew from a Chinese article one possible cause of the Lu murder—"The advisor failed in his duties to help Gang Lu and respond to his increasing frustration"—and tailored a parallel cause for the McIlvane murder—"The supervisor and labor relations specialist failed in their duties to respect McIlvane and respond to his increasing frustration." We found more situational factors (19) than personal dispositions (9) that could be tailored to fit both murders. Subjects were presented with the possible causes in random order after the following instructions:

We want to ask your opinion about some explanations for the murder that have been given by the news media. We are not simply asking whether you think each statement is true or false. We want to know your opinion about *to what extent* each of these factors was a *cause* of the shooting.

Subjects were asked to rate each factor by using the following scale: 1 = *not a cause at all*, 2 = *a minor cause*, 3 = *one of many causes*, 4 = *a major cause*, 5 = *a very important cause*, 6 = *an extremely important cause*, 7 = *the most important cause*.

Counterfactual judgment task. Subjects were presented with a series of 16 counterfactual scenarios. Each scenario was designed to alter one personal or situational factor in the actual scenario so as to remove one possible cause of the murder. Subjects were asked to judge the likelihood of murder in this counterfactual scenario. In other words, subjects judged whether murder would have occurred if only *x* had been different, where *x* stands for either a personal disposition or a situational factor. Items were based on suggested causes of the murder that met the following criteria: (a) The factor was definitely known to have been present in the actual scenario, so the task of imagining the scenario with it absent made sense; (b) the factor could be removed without unraveling other aspects of the scenario, so the task of imagining it changed in one way only, was possible. We found it easy to construct 10 situational items by changing facts reported in the news about the murderer's social network, working conditions, etc. For example, subjects in one condition were asked, "What if Lu's advisor had worked harder to prepare him for his defense and for the job market?" and, in the other condition, "What if McIlvane's supervisor had worked harder to motivate him and explain the post office rules to him?" However, we found it difficult to construct personal disposition items that met the criteria, mostly because there are few absolute facts about personal dispositions. For example, it would be anomalous to ask "What if Lu had not been mentally imbalanced?" because we do not know that mental imbalance was in fact present. This problem arises for most personal dispositions because they are imputed, not directly observed. As a compromise, we created 6 items that changed the murderer's situation in ways that might indirectly affect his personal dispositions, for example, "What if Lu had talked to a therapist or counselor about his unhappiness?" Subjects were presented with the scenarios in random order after the following instructions.

Now we want your opinion about some hypothetical questions—questions about whether this person would have murdered had things been slightly different. We want you to imagine that the world was different in one way only. Would this difference matter? If everything was the same except for this factor, would he have murdered?

The rating scale was as follows: 1 = *definitely not*, 2 = *very likely not*, 3 = *probably not*, 4 = *an even chance*, 5 = *probably*, 6 = *very likely*, 7 = *definitely*.

Results

Causal Judgment

Subjects weighted the importance of various possible causes for the murder, some of which were personal dispositions and some of which were situational factors. As predicted, personal dispositions were given greater weight overall by American than Chinese subjects, $F(1, 54) = 5.61, p < .05$. For the Lu murder, Americans ($M = 3.70$) weighted them much more than Chinese ($M = 2.32$), $t(23) = 3.48, p < .002$, and for the McIlvane murder there was no difference between American ($M = 3.23$) and Chinese weightings ($M = 3.22$), $t(28) = .02, p > .90$. Situational factors were given greater weight overall by Chinese than American subjects, $F(1, 54) = 6.65, p < .05$. For the Lu murder, Chinese ($M = 2.86$) weighted them more than Americans ($M = 2.42$), $t(23) = 1.99, p < .06$, and likewise for the McIlvane murder, Chinese ($M = 3.38$) weighted them more than Americans ($M = 2.86$), $t(28) = 2.18, p < .05$. It is instructive to consider the particular items that evoked the strongest cultural differ-

Table 4
Some Causes of Murder That Were Weighted Differently Across Cultures (Study 3: Causal Judgment Task)

Lu murder		McIlvane murder	
Personal dispositions		Personal dispositions	
Lu was mentally imbalanced because his life consisted only of work, without other activities which relieve stress.	A 4.5**** C 1.8	McIlvane was mentally imbalanced because his life consisted only of violent activities such as hunting and martial arts.	A 2.4 C 2.5
Lu drove himself crazy by putting too much pressure on himself.	A 4.6**** C 2.4	McIlvane drove himself crazy by worrying too much about getting his job back.	A 2.9 C 3.1
Lu had chronic personality problems.	A 4.2* C 2.4	McIlvane had chronic personality problems.	A 4.3 C 3.7
Lu was a psychological time bomb—someone with a hidden mental illness that suddenly explodes.	A 3.1* C 1.8	McIlvane was a psychological time bomb—someone with a hidden mental illness that suddenly explodes.	A 2.8 C 2.8
If Lu couldn't win, he didn't care about anything else.	A 4.1* C 2.6	If McIlvane couldn't get his way, he didn't care about anything else.	A 3.2 C 4.2
Lu was obsessed with the award and lost his grip on reality.	A 4.5 C 3.5	McIlvane was obsessed with getting his job back and lost his grip on reality.	A 4.1 C 3.8
Situational factors		Situational factors	
America's extremely individualistic, selfish values corrupt foreign students.	A 1.2** C 2.5	This was an extreme example of behavior that follows from America's individualistic, selfish values.	A 1.8** C 3.5
American movies and television glorify violent revenge tactics.	A 1.5*** C 3.6	American movies and television glorify violent revenge tactics.	A 2.7* C 3.8
The advisor failed in his duties to help Gang Lu and respond to his increasing frustration.	A 2.4**** C 4.6	The supervisor and labor relations specialist failed in their duties to respect McIlvane and respond to his increasing frustration.	A 4.1 C 4.4
The ruthless and brutal behavior of Chinese Communists set an example for him.	A 1.5 C 1.3	The daily violence of the Detroit area set an example for him.	A 2.4*** C 4.0
The chaotic times of the Cultural Revolution in China (persecution of intellectuals, etc.) created a generation lacking traditional morals and respect for others.	A 1.8 C 2.2	The chaotic times of the 1960s in America (hippie culture, drugs, sexual freedom) broke down families and traditions, creating a generation without self-discipline and respect.	A 1.8*** C 3.8
The recession has hurt the job market, which places stress on people seeking a new job.	A 2.4* C 3.5	The recession has hurt the job market, which places stress on people seeking a new job.	A 3.6 C 3.6

Note. A = American; C = Chinese. Shown are the six items of each kind with greatest cultural differences in ratings of causal importance. Ratings can be interpreted with scale labels: 1 = *not a cause at all*, 4 = *a major cause*, 7 = *most important cause*.

* $p < .05$. ** $p < .01$. *** $p < .005$. **** $p < .001$.

ences. As can be seen in Table 4, Americans particularly emphasized chronic psychological problems related to work and Chinese particularly emphasized corruption by bad example and disruption by social change.

Next, we tested our predictions about the "ultimate attribution error" by comparing attributions for ingroup versus outgroup actors. We predicted that Americans would give more weight to personal dispositions and less weight to situational pressures for the outgroup murderer, whereas Chinese would not differentiate on the basis of the culture of the murderer. As predicted, Americans placed more weight on personal dispositions and less on situational factors for the outgroup murderer; the spreading interaction shown in Figure 8 (upper panel) was significant, $F(1, 31) = 7.06, p < .02$. As predicted, Chinese subjects did not differentially weight personal and situational causes for outgroup and ingroup murderers; the roughly parallel lines of Figure 8 (lower panel) reveal the lack of interaction, $F(1, 31) = 1.80, p = .19$.

Counterfactual Judgment

We predicted that Americans would judge murder to be less likely in counterfactual scenarios that altered personal dispositions of the murderer and that Chinese would judge it less likely

in scenarios that altered situational pressures the murderer faced. Results with personal disposition items did not support our prediction. Overall, there was a marginally significant effect in the reverse direction: Chinese subjects judged murder to be less likely than did Americans, $F(1, 53) = 3.76, p = .06$. However, because these items did not directly alter personal dispositions and because items with the strongest reverse-predicted-direction results (e.g., "What if Lu had talked to a therapist . . .") can also be interpreted as alterations to the murderer's situation, this result is somewhat inconclusive. Results with situational items strongly supported our prediction: Chinese judged murder to be far less likely than did Americans, $F(1, 53) = 28.49, p = .001$, in scenarios where situational factors were changed. McIlvane was judged to be far less likely to murder by Chinese subjects ($M = 2.47$) than by Americans ($M = 3.43$), $t(28) = 4.64, p > .001$. In addition, Lu was judged to be far less likely to murder by Chinese subjects ($M = 2.75$) than by Americans ($M = 4.20$), $t(23) = 4.00, p < .001$. The strength and consistency of this effect can be seen by the item results (see Table 5). This finding provides evidence for the hypothesis that Chinese people represent behavior as situationally caused and Americans represent it as dispositionally caused. In sum, Chinese subjects simulated that the person would have taken a less bloody course of action in different situations, whereas Ameri-

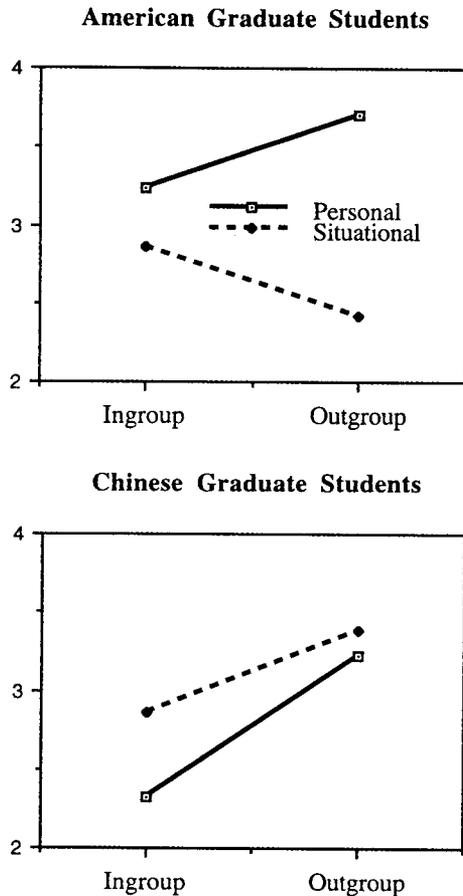


Figure 8. Mean weightings of personal and situational causes by American and Chinese graduate students, broken down by whether the murderer was ingroup or outgroup (relative to the student).

cans simulated that the person's murderous disposition would have inexorably expressed itself, regardless of changes in the situation.

General Discussion

Summary of Hypotheses and Evidence

We proposed that dispositional attribution for behavior reflects an implicit theory that is more widespread in individualistic than in collectivist cultures. Hence, we hypothesized that differences between attributions of individualist Americans and collectivist Chinese people are broad in scope (evoked with any event coded as social deviance) and cognitively deep (permeating below the surface of verbal explanation to perception, reasoning, and other modes of causal cognition). Our studies provide novel kinds of evidence in support of these hypotheses.

Hypotheses about the *breadth* of cultural differences contrast with those from alternative proposals about the cognitive structures underlying dispositionalism. Attributional patterns due to scripts would be restricted in scope to particular routine behaviors. For example, cultural differences in restaurant scripts might lead an American abroad to make unfounded disposi-

tional attributions for specific behaviors that are culturally unfamiliar, such as removing shoes at a restaurant. But scripts would not lead to a general pattern of greater dispositionalism across everyday behavioral settings, which Miller (1984) reports. Moreover, scripts guide attributions for routine behaviors, not highly unusual behaviors such as were used in Studies 2 and 3. Attributional patterns due to stereotypes would be restricted in scope to particular types of social actors or groups. Evidence that cultural differences in attribution are broader comes from Studies 2 and 3: American stereotypes about post office workers might account for dispositions attributed to the postman McIlvane but not the physicist Lu. Chinese stereotypes about American society might account for situational attribution to factors in the American social context (e.g., selfish values or violent movies) but not to factors in the Chinese (e.g., the Cultural Revolution) or the Irish social contexts (e.g., tradition of violent resistance).⁸ Attributional patterns due to more general structures such as world views would extend across domains of events. Evidence in favor of our hypothesis—that cultural differences in dispositionalism reflect knowledge structure that extends broadly within the social domain but not beyond—comes from Study 1 findings that American and Chinese subjects differed in causal perceptions of social animals but not in perceptions of physical objects.

It is important to clarify, however, that a broad social theory does not preclude narrower cognitive structures that also affect cultural differences in dispositional attribution. Indeed, ongoing research is investigating factors that potentially moderate the culture effect reported here due to their evocation of more specific knowledge structures. In a conceptual replication of Study 3, Choi (1994) compared American and Korean undergraduates in attributions for murders by a young student, by a random stranger, and by a mature professor. Albeit Americans were relatively more dispositional in all three conditions, the difference was least for the professor murder, as predicted from the greater Korean emphasis on age and role in conceptions of personal responsibility.

Hypotheses about the *depth* of cultural differences contrast with those from alternative interpretations for cultural differences. First, an alternative interpretation for differences in everyday explanations (Miller, 1984) is that cultures differ in the actual causes of behaviors, not in the cognitive processes by which subjects attribute behaviors to causes. This noncognitive interpretation is ruled out by our studies, which compared explanations for the same events. Second, cultural differences in explanations can be interpreted in terms of cognitively superficial, linguistic factors. On the one hand, same-language comparisons are vulnerable to the interpretation that groups differed in their command of the language; for example, that Miller's American subjects made greater reference to dispositions because they could draw on a greater repertoire of English disposition terms. On the other hand, cross-language comparisons are vulnerable to a linguistic relativity interpretation

⁸ Some factors related to Chinese society that were widely cited in Chinese newspapers, such as pressures on Chinese students to achieve academically, were weighted surprisingly low by Chinese students. It may be that the vulnerable political position of People's Republic of China students at the time made them reluctant to endorse any item that could be interpreted as a criticism of the government.

Table 5
Some Counterfactual Situations That Were Simulated Differently Across Cultures (Study 3: Counterfactual Judgment Task)

Lu murder		McIlvane murder	
Lu's advisor had worked harder to prepare him for his defense and for the job market.	A 3.9*** C 1.8	McIlvane's supervisor had worked harder to motivate him and explain the post office rules to him.	A 4.3*** C 2.5
Lu belonged to a religious group.	A 4.6 C 3.0	McIlvane belonged to a religious group.	A 4.4*** C 2.5
Lu had many friends or relatives in China also studying in Iowa.	A 3.5* C 2.4	McIlvane had many friends or relatives in Royal Oak.	A 3.7* C 2.8
Lu had gotten a job.	A 3.5*** C 1.3	McIlvane had won his appeal and gotten his job back.	A 2.1 C 1.6
Lu had been a student from Ireland rather than from China.	A 4.2 C 3.8	McIlvane had been a Chinese-American rather than an Irish-American.	A 4.8*** C 2.7
Lu had stayed in China for his PhD studies.	A 3.9*** C 1.5	McIlvane had stayed in the Marines (and been removed from a job there).	A 3.8 C 3.6
Lu was married and had children.	A 3.6** C 2.1	McIlvane was married and had children.	A 3.7 C 3.0
The student nominated had been American, not Chinese.	A 5.6** C 3.7	McIlvane had lost his job due to the Royal Oak post office closing rather than due to being fired.	A 2.3 C 1.8
Lu's advisor had been Chinese, not American.	A 5.2 C 4.5	McIlvane's supervisor had been more caring and sympathetic.	A 2.8* C 2.0

Note. A = American; C = Chinese. Shown are the nine items with greatest cultural differences in ratings of the likelihood of murder in the counterfactual situation. Ratings can be interpreted with scale labels: 1 = *definitely not*, 4 = *an even chance*, 7 = *definitely*. * $p < .05$. ** $p < .005$. *** $p < .001$.

(Whorf, 1956); for example, that Americans are more dispositional because the grammar or lexicon of English facilitates generation of dispositional explanations. Our studies succumb to neither Scylla nor Charybdis of linguistic interpretations because cultural differences were obtained in both cross-language (Study 1, high school sample, and Study 2) and same-language comparisons (Study 3). A related, alternative interpretation is that the task of explaining an acquaintance's behavior to a researcher differs in its social connotations across cultures. For example, in some cultures it may be impolite or immoral to describe negative dispositions of an acquaintance to a stranger. This account, however, would not apply to cultural differences in the unsolicited spontaneous explanations of newspaper reporters. Furthermore, from all of these linguistic interpretations it follows that cultural differences would be found in the generation of verbal explanations but not in other modes of causal cognition. By contrast, from our proposal that cultures differ in implicit theories that guide encoding and representation of behavioral information, it follows that cultural differences would be found in perceptions, evaluations, and judgments involving causality. Evidence favoring our hypothesis are findings of differences in on-line visual perception of behavior (Study 1), in evaluation of media explanations of behavior (Study 3, causal judgment task), and in simulation of behavior in counterfactual scenarios (Study 3, counterfactual judgment task).

Relation to Other Cultural Differences in Social Cognition

Counterfactuals, Problem Solving, and Situational Solutions

Cross-cultural research has centered on Bloom's (1981, 1984) thesis that because Chinese grammar has no simple device to mark counterfactual sentences (such as the English sub-

junctive tense), Chinese speakers are less disposed to counterfactual reasoning. Along with previous findings that Chinese subjects engage in counterfactual reasoning (Au, 1983, 1984; Cheng, 1985), the Study 2 finding that Chinese simulated more changed outcomes in counterfactual scenarios weighs against Bloom's thesis. This effect was predicted from the assumption that Chinese people process behavior with a situation-centered theory that produces a mental representation that preserves contextual information. We contend that reasoning about behavior in counterfactual situations is fostered by this form of representation.

This cultural difference may have consequences for problem solving. In particular, if Chinese people are more likely to react to a problematic behavior by mentally simulating counterfactual situations in which the behavior does not occur, then they would be more aware of situational interventions for the problematic behavior. Some evidence for this can be seen in Chinese versus American approaches to mathematics education. Americans attribute mathematics performance primarily to a disposition (ability), whereas Chinese people attribute it primarily to a situational factor (effort of student and assistance of family; Hess, Chang, & McDevitt, 1987; Stevenson, Lee, & Stigler, 1986). There is evidence that the American dispositional pattern is mediated by an implicit theory (Dweck, 1991). Hence, American counterfactual reasoning about a student's failure in math might run as follows: "If only this student had better genes, he would not have failed the math test"; whereas Chinese counterfactual reasoning might run as follows: "If only this student and his family had put in more effort, he would not have failed the math test." Unlike the American line of reasoning, the Chinese line of reasoning suggests an approach to solve the problem, and there is evidence that they take this approach. Chinese children are assigned more homework, do more homework, and get more assistance from family members with home-

work than do American children (Chen & Stevenson, 1989). Moreover, there is evidence that this difference is consequential: Chinese children show higher achievement than American children of similar intellectual capacity (Stevenson, Stigler, Lee, & Lucker, 1986). In this case, the Chinese tendency seems to have greater problem-solving utility. Situational attribution, whether or not it provides a "correct" account of math achievement, almost surely serves to increase it. Of course, in other cases, there may be unique utilities associated with dispositional attribution of behavior.

Intergroup Attributions

Pettigrew (1979) proposed the ultimate attribution error as a universal tendency resulting from the bias toward information consistent with pre-stored knowledge, in this case, pre-existing beliefs about negative personal dispositions of outgroup members. The evidence for this pattern came almost entirely from research in individualistic cultures (e.g., studies of Black and White Americans), with the notable exception of D. M. Taylor and Jaggi's (1974) study of ethnocentric attribution among Hindus and Muslims in India. However, it was eminently reasonable to expect that the pattern would be found in highly collectivist cultures such as China, where the ingroup-outgroup boundary tends to be stronger and more consequential (see Leung & Bond, 1984; Triandis, 1972, 1990; Triandis, Bontempo, Villareal, Asai, & Lucca, 1988). Yet studies of Chinese subjects have repeatedly found no evidence for this pattern. Hewstone and Ward (1985) replicated D. M. Taylor and Jaggi's (1974) design (with methodological refinements) in a study of Malay and Chinese groups in Malaysia, but they found no outgroup dispositionalism by Chinese subjects. Suspecting that this might reflect the fact that Chinese are a minority group, they replicated the study in Singapore (where Chinese are the majority) but again found no outgroup dispositionalism by Chinese subjects. Likewise, in Studies 2 and 3, Chinese reporters and students in the United States did not display the ethnocentric pattern of attribution. Our interpretation is that Chinese attributors' previous beliefs do not center on personal dispositions of outgroup members, so a consistency bias does not lead them to dispositional attributions for negative outgroup behavior. However, this is not to say that Chinese people lack ethnocentrism or that their ingroup and outgroup attributions are identical. Clearly, conclusions about this topic must await further research. One particular issue that needs to be considered more carefully is the scope of the ingroup: Our studies have followed the tradition in attribution research of treating an actor who shares the subject's nationality as an ingroup actor, but research on the ingroup in collectivist cultures suggests that it is a much smaller circle of kith and kin (Wheeler, Reis, & Bond, 1989). Hence, results may indicate that Chinese subjects viewed both actors as outgroup members. In sum, the scope of the relevant ingroup, itself, may vary across cultures or vary depending on the type of behavior involved.

Organizational Decision Making

Several differences between individualist and collectivist cultures in organizational decision making seem consistent with the different theories of social behavior we have identified. A

first difference is that Americans prefer to resolve disputes through procedures such as arbitration or adjudication in which a third party decides on the settlement (Houlden, LaTour, Walker, & Thibaut, 1978; LaTour, Houlden, Walker, & Thibaut, 1976). Chinese people prefer procedures in which the two disputants reach the settlement through compromise, such as mediation or bargaining (Leung, 1987; Leung, Bond, & Schwartz, 1990; Leung & Lind, 1986). This difference might reflect that Americans attribute an adversary's initial behavior to a disposition (e.g., stubbornness or hostility) and hence despair of compromise, whereas Chinese attribute it to situational factors, which can be altered and hence foresee a possibility of compromise.

Second, the criteria used to select and reward workers in individualist cultures seem predicated on the theory that work behavior reflects dispositions and that dispositions can be inferred from small samples of work behavior, whereas those in collectivist cultures seem predicated on the theory that social and situational forces determine individual performance. Individualists are more likely to select applicants on the basis of diagnostic tests and interviews, and collectivists are more likely to select on the basis of applicants' social ties to current workers (Redding & Wong, 1986). Individualists are more likely to reward short-term, individual output, and collectivists are more likely to reward long-term output and group output (Hofstede, 1991).

Some Issues for Future Research

Distribution of Implicit Theories Across and Within Cultures

A limitation of the studies reported here is that the proposed mechanism for cultural differences—a subject's implicit theory of social behavior—was not measured directly. However, the development of an instrument to measure implicit social theories by Dweck and colleagues (Dweck, Hong, & Chiu, 1993) will allow direct measurement of subjects' theories in future studies. It will be important to check that the implicit theory related to dispositionalism is, indeed, less widespread in Chinese than in American populations and that the cultural difference in dispositionalism is, in fact, mediated by the differential prevalence of this implicit theory. It will also be interesting to investigate how implicit theories are distributed within a given national culture. Miller's (1984) finding that dispositionalism among American subjects increases from childhood to adulthood suggests that person-centered theories are acquired with age. In a similar vein, Newman's (1991) finding that Hispanic students are less dispositionalist than others suggests that person-centered implicit theories may be less widespread among members of more collectivist ethnic groups. Finally, the research of Triandis and colleagues on a dimension of individual difference, idiocentrism-allocentrism, akin to the cultural dimension of individualism-collectivism, suggests another possible predictor of within-culture variation in implicit social theories.

Causal Versus Descriptive Uses of Dispositions

A question particularly important in cross-cultural comparisons is what subjects mean by the disposition or trait terms they generate when asked to describe or explain behavior. The domi-

nant view of attribution theorists has been that subjects use disposition terms to refer to causes of behavior (Jones & Davis, 1965). However, others have contended that trait terms simply are descriptions or summaries of behavior (Buss & Craik, 1983; Shoda & Mischel, 1993). A suggestion by Dweck, Hong, and Chiu (1993) is that different implicit theories entail different uses of disposition terms. An extension of their argument would be that individualists tend to use dispositions to explain causes of behavior, and collectivists use them to describe trends of behavior. Consistent with this possibility is the interesting finding by Y. Kashima, Siegal, Tanaka, and E. S. Kashima (1992) that attitude attributions of individualist Australians were associated with endorsement of the theory that attitudes cause behavior, but attitude attributions of collectivist Japanese subjects were not. It may be that Japanese subjects use dispositional attitude statements ("He is an environmentalist") as descriptions of a target person's behavior rather than as causal explanations of his behavior. Also consistent with the notion that collectivists use dispositions to summarize behavioral trends are findings from self-description tasks. Collectivist subjects use fewer dispositions than individualists when asked to describe themselves across situations (Bond & Cheung, 1981), yet they use more dispositions when asked to describe themselves in specific situations, such as at home or at work (Cousins, 1989). Whether these dispositions summarize situationally contingent behavior or refer to internal causes of behavior, which are operational only in one situation, is a difficult question for future research to untangle.

Cultures and Attribution Errors

Finally, because we have used the terms *bias* and *error*, which connote inaccuracy, it is worth denoting what can and cannot be concluded about accuracy. An accurate attribution for an event is one that refers to the actual cause of that event. Because we have no way of objectively knowing what actually caused the Lu and McIlvane murders, we cannot say whether it was the Americans, the Chinese, or both, who were inaccurate. Because the fish behaviors were cartoons rather than real events with actual causes, the question of accuracy does not apply. Hence, our studies demonstrate that each culture was biased relative to the other culture but not that either was biased relative to the truth. American attributions followed the dispositionalist pattern that leads to errors in many contexts of social perception (Ross, 1977), but we cannot conclude whether or not these attributions were inaccurate in the contexts we studied.

Of course, experiments could be designed to probe the issue of accuracy in attribution across cultures. It would be necessary to collect attributions about a behavior for which the actual cause is known, such as a behavior manipulated previously in an experiment. Cross-cultural studies of this sort will probably reveal that accuracy of attributions depends on several factors. One factor might be the culture of the actor: It is most likely that Chinese behavior is actually caused by situational factors more than American behavior, and vice versa. If so, then Chinese attributors will be relatively more accurate about Chinese actors than will be American actors, and vice versa. Another factor might be the type of behavior. Situation-driven behaviors, such as compliance, conformity, and contagion, may fall in the blind spot of American attributors. For example, college stu-

dents shown a film of Milgram's (1963) experiment on compliance to authority mistakenly attributed the shocking behavior of Milgram's subjects to personal dispositions rather than to the situational pressure (Safer, 1980). Our prediction is that Chinese students shown this film would more accurately attribute the subjects' behavior to situational pressure (which, from Milgram's experiments, we know to be the actual cause). Future research may discover blind spots of collectivist attributors, but at present much more is known about regions of the social domain where individualists' social perception is myopic and judgment is flawed. Research can now investigate whether collectivists (looking through the lens of a different implicit theory) have acuity and acumen for those regions where individualists blindly flounder. In the long run, researchers may identify a number of culturally variable social theories, each affording accuracy in some regions and distortion in others.

References

- Abelson, R. P., & Lalljee, M. (1988). Knowledge structures and causal explanation. In D. Hilton (Ed.), *Contemporary science and natural explanation: Commonsense conceptions of causality*. Brighton, England: Harvester Press.
- Argyle, M., Shimoda, K., & Little, B. (1978). Variance due to persons and situations in England and Japan. *British Journal of Social and Clinical Psychology*, *17*, 335-337.
- Atran, S. (1989). Basic conceptual domains. *Mind and Language*, *4*, 5-16.
- Au, T. K. (1983). Chinese and English counterfactuals: The Sapir-Whorf hypothesis revisited. *Cognition*, *15*, 162-163.
- Au, T. K. (1984). Counterfactuals: In reply to Alfred Bloom. *Cognition*, *17*, 289-302.
- Bakan, D. (1966). *The duality of human existence*. Chicago: Rand McNally.
- Bartlett, F. A. (1932). *A study in experimental and social psychology*. Cambridge, England: Cambridge University Press.
- Bassili, J. N. (1976). Temporal and spatial contingencies in the perception of social events. *Journal of Personality and Social Psychology*, *33*, 680-685.
- Beasley, N. E. (1968). The extent of individual differences in the perception of causality. *Canadian Journal of Psychology*, *22*, 399-407.
- Bellah, R. N., Madsen, R., Sullivan, W. M., Swidler, A., & Tipton, S. M. (1985). *Habits of the heart: Individualism and commitment in American life*. Berkeley: University of California Press.
- Berry, J. W. (1979). A cultural ecology of social behavior. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 12, pp. 177-207). New York: Academic Press.
- Bloom, A. (1981). *The linguistic shaping of thought*. Hillsdale, NJ: Erlbaum.
- Bloom, A. (1984). Caution—the words you use may affect what you say: A reply to Au. *Cognition*, *17*, 281.
- Bond, M. H. (1983). A proposal for cross-cultural studies of attribution processes. In M. H. Hewstone (Ed.), *Attribution theory: Social and applied extensions* (pp. 144-157). Oxford: Basil Blackwell.
- Bond, M. H. (1988). Invitation to a wedding: Chinese values and global economic growth. In D. Sinha & H. S. R. Kao (Eds.), *Handbook of cross-cultural psychology* (pp. 197-209). New Delhi: Sage India.
- Bond, M. H., & Cheung, T. (1981). College students' spontaneous self-concept: The effects of culture among respondents in Hong Kong, Japan, and the United States. *Journal of Cross-Cultural Psychology*, *14*, 153-171.
- Bond, M. H., & Hwang, K. K. (1986). The social psychology of Chinese people. In M. H. Bond (Ed.), *The psychology of the Chinese people* (pp. 213-264). New York: Oxford University Press.

- Boyle, D. G. (1960). A contribution to the study of phenomenal causality. *Quarterly Journal of Experimental Psychology*, 12, 171-179.
- Buss, D. M., & Craik, K. H. (1983). The act frequency approach to personality. *Psychological Review*, 90, 105-126.
- Campbell, D. T. (1964). Distinguishing differences of perception from failures of communication in cross-cultural studies. In F. S. C. Northrop & H. H. Livingston (Eds.), *Cross-cultural understanding: Epistemology in anthropology* (pp. 308-336). New York: Harper and Row.
- Carrithers, M., Collins, S., & Lukes, S. (1985). *The category of the person: Anthropology, philosophy, history*. Cambridge, England: Cambridge University Press.
- Chen, C., & Stevenson, H. W. (1989). Homework: A cross-cultural examination. *Child Development*, 60, 551-561.
- Cheng, P. W. (1985). Pictures of ghosts: A critique of Alfred Bloom's *The linguistic shaping of thought*. *American Anthropologist*, 87, 917-922.
- Choi, I. (1994). Unpublished data. Department of Social Psychology, University of Michigan.
- Cousins, S. (1989). Culture and selfhood in Japan and the United States. *Journal of Personality and Social Psychology*, 56, 124-131.
- Dasser, V., Ulbaek, I., & Premack, D. (1989). Perception of intention. *Science*, 243, 365-367.
- Dennett, D. (1983). Intentional systems in cognitive ethology: The "Panglossian paradigm" defended. *Behavioral and Brain Sciences*, 6, 343-390.
- Dennett, D. (1987). Evolution, error, and intentionality. In D. Dennett, *The intentional stance* (pp. 287-320). Cambridge, MA: Harvard University Press.
- de Tocqueville, A. (1946). *Democracy in America*. New York: Knopf. (Original work published 1840)
- Dumont, L. (1970). *Homo hierarchicus*. Chicago: University of Chicago Press.
- Dweck, C. S. (1991). Self-theories and goals: Their role in motivation, personality, and development. In R. Dienstbier (Ed.), *Nebraska Symposium on Motivation, 1990*, 199-235.
- Dweck, C. S., Hong, Y., & Chiu, C. (1993). Implicit theories: Individual differences in the likelihood and meaning of dispositional inference. *Personality and Social Psychology Bulletin*, 19, 644-656.
- Early, P. C. (1989). Social loafing and collectivism. *Administrative Science Quarterly*, 34, 565-581.
- Erdley, C. A., & Dweck, C. S. (1993). Children's implicit personality theories as predictors of their social judgements. *Child Development*, 64, 863-878.
- Evans-Pritchard, E. E. (1937). *Witchcraft, oracles, and magic among the Azande*. Oxford: Clarendon Press.
- Fauconnet, P. (1928). *La responsabilité*. Paris: Alcan.
- Gearing, F. (1970). *The face of the fox*. Chicago: Aldine.
- Geertz, C. (1975). On the nature of anthropological understanding. *American Scientist*, 63, 47-53.
- Gelman, R. (1990). First principles organize attention to and learning about relevant data: Number and the animate-inanimate distinction as examples. *Cognitive Science*, 14, 79-106.
- Gelman, R., & Spelke, E. (1981). The development of thoughts about animate and inanimate objects: Implications for research on social cognition. In J. H. Flavell & L. Ross (Eds.), *Social cognitive development: Frontiers and possible futures* (pp. 43-66). Cambridge: Cambridge University Press.
- Gemelli, A., & Cappellini, A. (1958). The influence of the subject's attitude in perception. *Acta Psychologica*, 14, 171-179.
- Gervy, B. M., Chiu, C., & Dweck, C. S. (1992, June). *What constitutes evidence in juridical judgment? The role of implicit theories*. Paper presented at the 4th Annual Convention of the American Psychological Society, San Diego, CA.
- Gilden, D. L., & Proffitt, D. R. (1989). Understanding collision dynamics. *Journal of Experimental Psychology: Human Perception and Performance*, 15, 372-383.
- Gilovich, T. (1987). Secondhand information and social judgment. *Journal of Experimental Social Psychology*, 23, 59-74.
- Goffman, E. (1974). *Frame analysis*. New York: Doubleday.
- Gruber, H. E., Fink, C. D., & Damm, V. (1957). Effects of experience on perception of causality. *Journal of Experimental Psychology*, 53, 89-93.
- Heider, F. (1944). Social perception and phenomenal causality. *Psychological Review*, 51, 358-374.
- Heider, F. (1958). *The psychology of interpersonal relations*. New York: Wiley.
- Heider, F., & Simmel, M. (1944). An experimental study of apparent behavior. *American Journal of Psychology*, 57, 243-259.
- Hess, R. D., Chang, C.-M., & McDevitt, T. M. (1987). Cultural variations in family beliefs about children's performance in mathematics: Comparisons among People's Republic of China, Chinese-Americans, and Caucasian-American families. *Journal of Educational Psychology*, 79, 179-188.
- Hewstone, M. (1989). *Causal attribution: From cognitive processes to collective beliefs*. Cambridge, MA: Basil Blackwell.
- Hewstone, M., & Ward, C. (1985). Ethnocentrism and causal attribution in Southeast Asia. *Journal of Personality and Social Psychology*, 48, 614-623.
- Hofstede, G. (1980). *Culture's consequences: International differences in work-related values*. Beverly Hills, CA: Sage.
- Hofstede, G. (1983). National cultures revisited. *Behavior Science Research*, 18, 285-305.
- Hofstede, G. (1991). *Culture and organizations*. Beverly Hills, CA: Sage.
- Hofstede, G., & Bond, M. (1984). Hofstede's culture dimensions: An independent validation using Rokeach's value survey. *Journal of Cross Cultural Psychology*, 15, 417-433.
- Holland, D. C. (1992). How cultural systems become desire: A case study of American romance. In R. G. D'Andrade & C. Strauss (Eds.), *Human motives and cultural models*. Cambridge, England: Cambridge University Press.
- Holland, J. H., Holyoak, K. J., Nisbett, R., & Thagard, P. R. (1986). *Induction: Processes of inference, learning and discovery*. Cambridge, MA: MIT Press.
- Hoosain, R. (1986). Perceptual processes of the Chinese. In M. H. Bond (Ed.), *The psychology of the Chinese people* (pp. 38-72). New York: Oxford University Press.
- Horton, R. (1970). African traditional thought and Western science. In B. R. Wilens (Ed.), *Rationality* (pp. 131-171). Oxford: Basil Blackwell.
- Houlden, P., LaTour, S., Walker, L., & Thibaut, J. (1978). Preference for modes of dispute resolution as a function of process and decision control. *Journal of Experimental Social Psychology*, 14, 13-30.
- Hsu, F. L. K. (1953). *Americans and Chinese: Two ways of life*. New York: Schuman.
- Hsu, F. L. K. (1971). Psychological homeostasis and *jen*: Conceptual tools for advancing psychological anthropology. *American Anthropologist*, 73, 23-44.
- Hsu, F. L. K. (1981a). *American and Chinese: Passage to differences* (3rd ed.). Honolulu: University of Hawaii Press.
- Hsu, F. L. K. (1981b). The self in cross-cultural perspective. In A. J. Marsella, B. De Vos, & F. L. K. Hsu (Eds.), *Culture and self* (pp. 24-55). London: Tavistock.
- Hume, D. (1987). *A treatise of human nature*. Oxford: Clarendon Press. (Original work published 1739)
- Ichheiser, G. (1943). Misinterpretations of personality in everyday life and the psychologist's frame of reference. *Character and Personality*, 12, 145-160.
- Ichheiser, G. (1949). Misunderstandings in human relations: A study in false social perception. *American Journal of Sociology* (Supplement), 55, 1-70.
- Ichheiser, G. (1970). *Appearances and realities: Misunderstanding in human relations*. San Francisco: Jossey-Bass.

- Jeyifous, S. (1985). *Atimodemmo: Semantic conceptual development among the Yoruba*. Doctoral dissertation, Cornell University.
- Jones, E. E., & Davis, K. E. (1965). A theory of correspondent inferences: From acts to dispositions. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 2, pp. 219–266). New York: Academic Press.
- Jones, E. E., Davis, K. E., & Gergen, K. J. (1961). Role playing variations and their informational value for person perception. *Journal of Abnormal and Social Psychology*, *63*, 302–310.
- Jones, E. E., & Harris, V. A. (1967). The attribution of attitudes. *Journal of Experimental Social Psychology*, *3*, 1–24.
- Jones, E. E., & Nisbett, R. E. (1972). The actor and the observer: Divergent perceptions of the causes of behavior. In E. E. Jones (Ed.), *Attribution: Perceiving the causes of behavior* (pp. 79–94). Morristown, NJ: General Learning Press.
- Kahneman, D., & Miller, D. T. (1986). Norm theory: Comparing reality to its alternatives. *Psychological Review*, *93*, 136–153.
- Kahneman, D., & Tversky, A. (1973). On the psychology of prediction. *Psychological Review*, *80*, 237–251.
- Kahneman, D., & Tversky, A. (1982). The simulation heuristic. In D. Kahneman, P. Slovic, & A. Tversky (Eds.), *Judgment under uncertainty: Heuristics and biases* (pp. 201–210). New York: Cambridge Press.
- Kaiser, M., McCloskey, M., & Proffitt, D. R. (1986). Development of intuitive theories of motion: Curvilinear motion in the absence of external forces. *Developmental Psychology*, *22*, 67–71.
- Kaiser, M. K., & Proffitt, D. R. (1984). The development of sensitivity to causally relevant dynamic information. *Child Development*, *55*, 1614–1624.
- Kashima, Y. (1987). Cultural conceptions of person: Implications in individualism/collectivism research. In C. Kagitcibasi (Ed.), *Growth and progress in cross-cultural psychology*. Lisse, The Netherlands: Swets & Zeitlinger.
- Kashima, Y., Siegal, M., Tanaka, K., & Kashima, E. S. (1992). Do people believe behaviors are consistent with attitudes? Towards a cultural psychology of attribution processes. *British Journal of Social Psychology*, *31*, 111–124.
- Keil, F. (1986). The acquisition of natural kind and artifact terms. In A. Marrar & W. Demopoulos (Eds.), *Conceptual change*. Norwood, NJ: Ablex.
- Keil, F. (1989). *Concepts, kinds, and cognitive development*. Cambridge, MA: MIT Press.
- Kelley, H. H. (1967). Attribution theory in social psychology. In D. Levine (Ed.), *Nebraska Symposium on Motivation* (pp. 192–238). Lincoln: University of Nebraska Press.
- Kelley, H. H. (1972). Causal schemata and the attribution process. In E. E. Jones (Ed.), *Attribution: Perceiving the causes of behavior* (pp. 151–174). Morristown, NJ: General Learning Press.
- King, A. Y. C., & Bond, M. H. (1985). The Confucian paradigm of man: A sociological view. In W. S. Tseng & D. Y. H. Wu (Eds.), *Chinese culture and mental health* (pp. 29–46). New York: Academic Press.
- Kluckhohn, F., & Strodtbeck, F. (1961). *Variations in value orientations*. Evanston, IL: Row, Peterson.
- Koffka, K. (1939). *Principles of gestalt psychology*. New York: Harcourt, Brace, and Co.
- LaTour, S., Houlden, P., Walker, L., & Thibaut, J. (1976). Some determinants of preference for modes of conflict resolution. *Journal of Conflict Resolution*, *20*, 319–356.
- Lau, R. R., & Russel, D. (1980). Attributions in the sports pages. *Journal of Personality and Social Psychology*, *39*, 29–38.
- Leslie, A. M. (1982). The perception of causality in infants. *Perception*, *11*, 173–186.
- Leslie, A. M. (1987). Do infants perceive causality? *Cognition*, *22*, 127–139.
- Leslie, A. M., & Keeble, S. (1987). Do six-month-old infants perceive causality? *Cognition*, *25*, 265–287.
- Leung, K. (1987). Some determinants of reaction to procedural models for conflict resolution: A cross-national study. *Journal of Personality and Social Psychology*, *53*, 898–908.
- Leung, K., & Bond, M. H. (1984). The impact of cultural collectivism on reward allocation. *Journal of Personality and Social Psychology*, *47*, 793–804.
- Leung, K., Bond, M. H., & Schwartz, S. (1990). How to explain cross-cultural differences: Values, valences, and expectancies? *International Journal of Psychology*, *27*, 211–225.
- Leung, K., & Lind, E. A. (1986). Procedure and culture: Effects of culture, gender, and investigator status on procedural preferences. *Journal of Personality and Social Psychology*, *39*, 643–653.
- Levy, R. I. (1973). *Tahitians: Mind and experience in the Society Islands*. Chicago: University of Chicago Press.
- Levy-Bruhl, L. (1926). *How natives think*. London: Allen & Unwin. (Original work published 1910 as *Les fonctions mentales dans les coïneties inferieures*)
- Lewin, K. (1935). *Dynamic theory of personality*. New York: McGraw-Hill.
- Lukes, S. (1973). *Individualism*. Oxford: Basil Blackwell.
- MacArthur, L. Z., & Post, D. L. (1977). Figural emphasis and person perception. *Journal of Experimental Social Psychology*, *13*, 520–535.
- Markus, H. R., & Kitayama, S. (1991). Culture and the self: Implications for cognition, emotion, and motivation. *Psychological Review*, *98*, 224–253.
- Marwick, M. (1982). The sociology of sorcery in a Central African tribe. In J. Middleton (Ed.), *Magic, witchcraft, and curing*. Austin: University of Texas Press.
- Mauss, M. (1985). A category of the human mind: The notion of person; the notion of self [W. D. Halls, Trans.]. In M. Carrithers, S. Collins, & S. Lukes (Eds.), *The category of the person: Anthropology, philosophy, history* (pp. 1–25). Cambridge, England: Cambridge University Press. (Original work published 1938)
- McCloskey, M. (1983). Intuitive physics. *Scientific American*, *24*, 122–130.
- Michotte, A. E. (1952). *The perception of causality*. New York: Basic Books.
- Milgram, S. (1963). Behavioral study of obedience. *Journal of Abnormal and Social Psychology*, *46*, 961–978.
- Miller, J. G. (1984). Culture and the development of everyday social explanation. *Journal of Personality and Social Psychology*, *46*, 961–978.
- Miller, J. (1987). Cultural influences on the development of conceptual differentiation in person description. *British Journal of Developmental Psychology*, *5*, 309–319.
- Minsky, M. (1975). A framework for representing knowledge. In P. H. Winston (Ed.), *The psychology of computer vision* (pp. 211–277). New York: McGraw-Hill.
- Morris, M. W., & Murphy, G. L. (1990). Converging operations on a basic level in event taxonomies. *Memory & Cognition*, *18*, 407–418.
- Newman, L. S. (1991). Why are traits inferred spontaneously? A developmental approach. *Social Cognition*, *9*, 221–253.
- Nisbett, R. E., & Ross, L. (1980). *Human inference: Strategies and shortcomings of social judgment*. Englewood Cliffs, NJ: Prentice Hall.
- Nuckolls, C. (1991). Culture and causal thinking: Diagnosis and prediction in a South Indian fishing village. *Ethos*, *19*, 3–51.
- O'Flaherty, W. (1980). *Karma and rebirth in classical Indian traditions*. Berkeley: University of California Press.
- Parsons, T., & Shils, E. A. (1951). *Toward a general theory of action*. Cambridge, MA: Harvard University Press.
- Pettigrew, T. F. (1979). The ultimate attribution error: Extending Allport's cognitive analysis of prejudice. *Personality and Social Psychology Bulletin*, *5*, 461–476.
- Powesland, P. F. (1959). The effect of practice upon the perception of causality. *Canadian Journal of Psychology*, *13*, 155–168.

- Premack, D. (1990). The infant's theory of self-propelled objects. *Cognition*, 36, 1-16.
- Premack, D. (in press). A module for perceiving the social domain. In G. Lewis, D. Sperber, & D. Premack (Eds.), *Causal cognition: Proceedings from the 6th Fyssen Foundation Symposium*. London: Oxford University Press.
- Proffitt, D. R., & Gilden, D. L. (1989). Understanding natural dynamics. *Journal of Experimental Psychology: Human Perception and Performance*, 15, 384-393.
- Redding, G., & Wong, G. Y. Y. (1986). The psychology of Chinese organizational behavior. In M. H. Bond (Ed.), *The psychology of the Chinese people*. New York: Oxford University Press.
- Reeder, G. D., & Brewer, M. B. (1979). A schematic model of dispositional attribution in interpersonal perception. *Psychological Review*, 86, 61-79.
- Riesman, D. (1950). *The lonely crowd*. New York: Doubleday.
- Riesman, D. (1954). *Individualism reconsidered*. Glencoe, IL: Free Press.
- Ross, L. D. (1977). The intuitive psychologist and his shortcomings: Distortions in the attribution process. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 10, pp. 173-220). New York: Random House.
- Runeson, S. (1974). Constant velocity—not perceived as such. *Psychological Research*, 37, 3-23.
- Safer, M. A. (1980). Attributing evil to the subject, not the situation: Student reactions to Milgram's film on obedience. *Personality and Social Psychology Bulletin*, 11, 315-325.
- Schank, R., & Abelson, R. (1977). *Scripts, plans, goals, and understanding*. Hillsdale, NJ: Erlbaum.
- Schoeneman, T. J., & Rubanowitz, D. E. (1985). Attributions in the advice columns: Actors and observers, causes and reasons. *Personality and Social Psychology Bulletin*, 11, 315-325.
- Selby, H. A. (1974). *Zapotec deviance: The convergence of folk and modern sociology*. Austin: University of Texas Press.
- Selby, H. A. (1975). Semantics and causality in the study of deviance. In M. Sanches & B. Blount (Eds.), *Sociocultural dimensions of language use* (pp. 11-24). New York: Academic Press.
- Semin, G. R., & Fiedler, K. (1991). The linguistic category model, its bases, applications and range. In W. Stroebe & M. Hewstone (Eds.), *European review of social psychology* (Vol. 2, pp. 1-30). New York: Wiley.
- Semin, G. R., & Rubini, M. (1990). Unfolding the concept of person by verbal abuse. *European Journal of Social Psychology*, 20, 463-474.
- Shoda, Y., & Mischel, W. (1993). Cognitive social approach to dispositional inference: What if the perceiver is a cognitive social theorist? *Personality and Social Psychology Bulletin*, 19, 644-656.
- Shultz, T. R. (1980). Development of the concept of intention. In W. A. Collins (Ed.), *The Minnesota Symposium on Child Psychology* (Vol. 13, pp. 131-164). Hillsdale, NJ: Erlbaum.
- Shultz, T. R. (1982). Causal reasoning in the social and non-social realms. *Canadian Journal of Behavioral Science*, 14, 307-322.
- Shweder, R. A., & Bourne, E. J. (1982). Does the concept of the person vary cross-culturally? In A. J. Marsella & G. M. White (Eds.), *Cultural conceptions of mental health and therapy*. New York: Kluwer Academic Publishers.
- Sperber, D. (1983). *On anthropological knowledge*. New York: Cambridge University Press.
- Sperber, D. (1985). Anthropology and psychology: Towards an epidemiology of representations. *Man*, 20, 73-90.
- Sperber, D. (1991). The epidemiology of beliefs. In C. Fraser (Ed.), *Psychological studies of widespread beliefs* (pp. 25-44). Oxford: Oxford University Press.
- Stevenson, H. W., Lee, S. Y., & Stigler, J. W. (1986). Mathematics achievements of Chinese, Japanese, and American children. *Science*, 236, 693-698.
- Stevenson, H. W., Stigler, J. W., Lee, S.-Y., & Lucker, G. W. (1986). Cognitive performance and academic achievement of Japanese, Chinese, and American children. *Annual Progress in Child Psychiatry and Child Development*, X, 324-450.
- Stewart, J. (1984, November). *Object motion and the perception of animacy*. Paper presented at the meetings of the Psychonomic Society, San Antonio, Texas.
- Strauss, A. S. (1973). Northern Cheyenne ethnosociology. *Ethos*, 1, 326-357.
- Strauss, C. (1992a). Models and motives. In R. G. D'Andrade & C. Strauss (Eds.), *Human motives and cultural models* (pp. 1-20). New York: Cambridge University Press.
- Strauss, C. (1992b). What makes Tony run? Schemas as motives reconsidered. In R. G. D'Andrade & C. Strauss (Eds.), *Human motives and cultural models* (pp. 197-224). New York: Cambridge University Press.
- Tawney, R. H. (1926). *Religion and the rise of capitalism*. London: Penguin Books.
- Taylor, D. M., & Jaggi, V. (1974). Ethnocentrism and causal attribution in a South Indian context. *Journal of Cross-Cultural Psychology*, 5, 162-171.
- Taylor, S. E., & Fiske, S. T. (1975). Point-of-view and perceptions of causality. *Journal of Personality and Social Psychology*, 32, 439-445.
- Triandis, H. C. (1972). *The analysis of subjective culture*. New York: Wiley.
- Triandis, H. C. (1990). Cross-cultural studies of individualism and collectivism. In J. J. Berman (Ed.), *Nebraska Symposium on Motivation, 1989* (pp. 41-133). Lincoln: University of Nebraska Press.
- Triandis, H. C., Bontempo, R., Betancourt, H., Bond, M., Leung, K., Brenes, A., Georgas, J., Hui, C. H., Marin, G., Setiadi, B., Sinha, J. B. P., Verma, J., Spangenberg, J., Touzard, H., & de Montmollin, B. (1986). The measurement of etic aspects of individualism and collectivism across cultures. *Australian Journal of Psychology*, 38, 257-267.
- Triandis, H. C., Bontempo, R., Villareal, M. J., Asai, M., & Lucca, N. (1988). Individualism and collectivism: Cross-cultural perspectives on self-ingroup relationships. *Journal of Personality and Social Psychology*, 54, 323-338.
- Turner, V. (1975). *Revelation and divination in Ndembu ritual*. Ithaca, NY: Cornell University Press.
- Tversky, A., & Kahneman, D. (1973). Availability: A heuristic for judging frequency and probability. *Cognitive Psychology*, 5, 207-232.
- Tversky, A., & Kahneman, D. (1974). Judgment under uncertainty: Heuristics and biases. *Science*, 185, 1124-1131.
- Weber, M. (1930). *The protestant ethic and the spirit of capitalism*. London: Allen & Unwin.
- Weiner, B. (1985). "Spontaneous" causal thinking. *Psychological Bulletin*, 97, 74-84.
- Wellman, H., & Gelman, S. (1992). Cognitive development: Foundational theories of core domains. *Annual Review of Psychology*, 43, 337-375.
- Wells, G. L., & Gavanski, I. (1989). Mental simulation of causality. *Journal of Personality and Social Psychology*, 56, 161-169.
- Wheeler, L., Reis, H. T., & Bond, M. H. (1989). Collectivism-individualism in everyday life: The middle kingdom and the melting pot. *Journal of Personality and Social Psychology*, 57, 79-86.
- White, P. A. (1988). Causal processing: Origins and development. *Psychological Bulletin*, 104, 36-52.
- Whorf, B. (1956). *Language, thought, and reality*. Cambridge, MA: MIT Press.

Received July 7, 1993

Revision received April 8, 1994

Accepted April 11, 1994 ■