

## **THE COMPLEXITY OF THINKING ACROSS CULTURES: INTERACTIONS BETWEEN CULTURE AND SITUATIONAL CONTEXT**

Lucian Gideon Conway, III, Mark Schaller, Roger G. Tweed, and Darcy Hallett  
*University of British Columbia*

How does culture impact individual's cognitive complexity? This article reviews evidence suggesting that the relationship between culture and cognitive complexity depends upon the nature of the situation in which complexity is expressed. In addition, two new investigations are summarized. One study reveals that individuals from different cultures are differentially dogmatic on different domains of knowledge. The other study reveals that individuals from different cultures are differentially likely to form simplistic stereotypes within different social contexts. We conclude that it is typically misleading to suggest monolithic cross-cultural differences for complexity of thought. An interactionist approach appears more appropriate.

The recent surge of research in culture and cognition has yielded considerable new evidence of cross-cultural differences in styles of thinking, reasoning, and mentally organizing the world—particularly differences between East Asians and Westerners. Although much of the evidence is new, this interest among psychologists has endured for years. For instance, a quarter-century ago Witkin and Berry (1975; see also Berry & Annis, 1974) suggested that different cultures—and the individuals within those cultures—differed along the dimension of psychological differentiation (the tendency of people to make distinctions between different aspects of their perceptual environment). Psychological differentiation bears on a more general construct of cognitive complexity, and so too do many of the variables measured in more recent cross-cultural studies on cognition.

The complexity of an individual's thought processes and beliefs has important influences on social psychological phenomena such as attitudes, attributions, emotions, and stereotypes (Chiu, Morris, Hong, & Menon, 2000; Linville, 1985; Schaller, Boyd, Yohannes, & O'Brien, 1995;

Address correspondence to: Lucian Gideon Conway III, Indiana State University, Root Hall, Terre Haute, In, 47809; E-mail: lconway@interchange.ubc.ca

Stalder & Baron, 1998). Moreover, because collective outcomes are the product of individual decisions, cognitive complexity influences a variety of social-political outcomes as well, including judicial decisions and the outcomes of major international crises (Conway, Suedfeld, & Tetlock, 2001; Gruenfeld, 1995). Given these important impacts of cognitive complexity, and given the accumulating cross-cultural evidence bearing on this construct, it is worth asking: Does cultural background influence cognitive complexity, and if so, how?

### THE MEANING OF COGNITIVE COMPLEXITY

Complexity is a broad construct and has been used to refer to several categories of psychological variables. Some usages refer primarily to beliefs and knowledge structures. More complex knowledge structures are more highly differentiated and are described by more distinct pieces of information. For instance, a self-concept described by four features (roles, subselves, etc.) is considered more complex than a self-concept described by two features (Linville, 1985). By the same reckoning, an attitude described by a single simple assertion (e.g., "Ice cream is good") is less complex than an attitude described by multiple assertions (e.g., "Ice cream is good, and it's also bad"). The same logic has been applied to beliefs about groups and populations; these beliefs are considered to be especially simplistic and stereotypic if they connote within-group similarity and homogeneity (e.g., "Germans are humorless"), and more complex if they connote greater within-group heterogeneity (e.g., "Some Germans are humorless, and others have wonderfully wacky senses of humor").

Other usages refer not so much to beliefs and knowledge structures, but rather to the cognitive operations and thought processes that are employed in the service of arriving at those beliefs and knowledge structures. More complex thought processes are described by the consideration of more distinct pieces of information. Decisionmaking processes are considered to be more complex if they are informed by a larger number of viewpoints and sources of information (Ceci & Liker, 1986; Schaller, 1994). Attributional processes are considered to be fairly simplistic if they attend merely to personal dispositions that might underlie a person's behavior, but more complex if they attend to situational constraints as well as personal dispositions as causes of that behavior. (Indeed, attention to both personal and situational causes of behavior is considered to be the defining feature of attributional complexity; Fletcher, Danilovacs, Fernandez, Peterson, & Reeder, 1986.)

The concepts of simplicity and complexity are also sometimes used to refer to personal dispositions or motivations to engage in sophisticated thought processes or to arrive at multifaceted beliefs. Thus, individual

differences in need for structure or closure can be conceptualized as a desire for simplicity, both in the structure of thought processes themselves and in the outcomes of those processes (Neuberg & Newsom, 1993).

There are obvious causal relations between these different conceptualizations of complexity. When individuals are more highly motivated to think complexly, they typically devote cognitive resources to considering multiple sources of information and, as a result, form more highly differentiated and complex cognitive structures. A lot of evidence is consistent with this model (Neuberg & Newsom, 1993; Suedfeld, Bluck, & Ballard, 1994; Webster & Kruglanski, 1994). For instance, need for structure/closure is negatively related to attributional complexity and to other forms of complex reasoning (Schaller et al., 1995), and is also negatively related to the complexity of self-concept, stereotypic beliefs, and other knowledge structures (Neuberg & Newsom, 1993). This causal chain of events almost certainly breaks down at times, due to the many other variables (e.g., ability) that can influence the complexity of thought. Nevertheless, the relations between complexity at the level of motivational inputs, thought processes, and knowledge structure outputs is well-demonstrated. Therefore, in this article we use the terms complexity and cognitive complexity in a manner that encompasses all three of the separate usages discussed above.

Although there are some inferential risks in pulling these different specific conceptualizations together under this broader umbrella of complexity, there are some advantages as well. The principle advantage is that it allows one to consider together specific elements of thought that, although superficially different, are conceptually related. This is very useful in attempting to understand the deeper lessons evident in the sometimes puzzling empirical literature pertaining to culture and complexity.

### **CROSS-CULTURAL DIFFERENCES IN COGNITIVE COMPLEXITY**

What does recent evidence reveal about cultural differences in variables bearing on cognitive complexity? The evidence does not compel any simple conclusion. On the one hand, there is evidence implying that, compared to persons in Western (e.g., North American) cultures, persons in certain East Asian cultures are more likely to engage in complex thinking. For instance, when asked to offer resolutions to debates and arguments, American students are more likely to take one side or the other, whereas Chinese students are more likely to hold that both sides of the argument may be right and to offer resolutions that take the two opposing ideas into account (Peng & Nisbett, 1999). Similarly, Koreans are more likely than Americans to endorse the view that behavior is an

outcome of the interaction between personality and situational factors (Choi, Nisbett, & Norenzayan, 1999), suggesting that Koreans have a more attributionally complex orientation than Americans. Although the authors of these studies did not draw conclusions about any broad construct of cognitive complexity, these and other similar results (Blinco, 1992; Nisbett, Peng, Choi, & Norenzayan, 1999; Peng, Ames, & Knowles, *in press*) imply that individuals in East Asian cultures may be more complex in their thinking than those in Western cultures.

On the other hand, there is other evidence that suggests a quite different conclusion. Chiu et al. (2000) observed that Chinese scored higher than Americans on measures of preferences for predictability, discomfort with ambiguity, and close-mindedness. Each of these specific measures is a component of the need for structure/closure that is inversely related to complex thinking and to the formation of complex cognitive structures. More directly, Huang, Sisco, and Chao (1995) found that American men scored more highly than Chinese men on the Role Construct Repertoire Test, a commonly used measure of the complexity of cognitive style. Again, these authors did not draw any broad conclusions about cultural differences in cognitive complexity, but these results would seem to imply that Chinese individuals are actually less cognitively complex than Westerners.

At first glance, these two lines of evidence present a puzzle. Why have East Asians appeared to be more cognitively complex than Westerners in some research contexts, and less so in others? This is not a question that is easily answered, and it is not our goal here to provide an answer that elucidates every one of those previous studies. Rather, our goal is to attend to the broader challenge implicated by these puzzling sorts of contradictions in the literature on culture and cognition: To understand why apparent cross-cultural differences in cognitive complexity observed in one situation fail to emerge, and may even be reversed, in another situation. In addressing this issue, we suggest that cross-cultural differences in cognitive complexity are more subtle and complex than they first appear, and discuss some of the deeper (and perhaps universal) psychological processes that underlie these complicated phenomena. Our inquiry is guided by an interactionist perspective that appears to offer a useful means of uncovering the psychological processes underlying these and other cross-cultural differences in cognition.

## AN OVERVIEW OF THE INTERACTIONIST APPROACH

It has been well-documented in the study of personality that aspects of a person's social or environmental context importantly qualify many effects of personality on cognition and behavior (e.g., Mischel & Shoda, 1995). For instance, Romer, Gruder, and Lizzadro (1986) found that indi-

viduals with a particular helping style were especially helpful in one situation but unhelpful in another, whereas individuals with a different style showed the reverse effect. This "Person  $\times$  Situation" interaction appeared to reflect a deeper commonality in the effects of idiosyncratic values and preferences: In general, individuals were most likely to offer help in situations that most clearly allowed them to exercise the form of helping that they most preferred.

This Person  $\times$  Situation interaction effect illustrates two important lessons to researchers who wish to draw conclusions about differences between different individuals. One lesson is that of the situational-specificity of observed effects. If one happened to examine helping responses in just one of the situations identified by Romer et al. (1986), one might easily draw the conclusion that individuals with a particular helping style are, in general, more helpful than others. That conclusion would be overly simplistic and misleading. Effects observed in one situation may not generalize to another. A second lesson is that of deeper psychological similarities underlying apparent individual differences. If one simply described the form of the Person  $\times$  Situation interaction, one might predict individuals' different behaviors in different situations, but one might fail to detect the common psychological processes underlying these superficially different patterns of responding.

The study of cultural differences is analogous to the study of individual differences. (At an empirical level, culture almost always implies a set of individual differences that are clumped according to some geographic or demographic variable.) The inquiry into culture and cognition can profitably be informed by an interactionist perspective. In this paper, we discuss various aspects of situational context that appear to moderate the relation between culture and cognitive complexity. Some of these situations pertain primarily to the domain of knowledge on which complexity is observed, and others pertain more to the social context within which the cognitive processes proceed. After summarizing some evidence that illustrates "Culture  $\times$  Situation" interactions on a variety of indicators relevant to cognitive complexity, we offer some speculations about a common set of psychological processes that underlie these various interactions. Ultimately, we suggest that many apparent instances of cultural differences in cognitive complexity may reflect something quite different: Cross-cultural similarities in the processes underlying complexity that manifest differently because of cross-cultural differences in experiences and values. These speculations and suggestions will not resolve all the questions we raise along the way, but we hope that they provide a set of conceptual guideposts that point to some useful means of ultimately drawing accurate inferences from a complicated set of cross-cultural findings.

### CULTURE $\times$ SITUATION INTERACTIONS ON COGNITIVE COMPLEXITY

There is plenty of evidence from the psychological literature on reasoning processes revealing that specific elements of an individual's situational context leads one to think in more or less complex ways. The situational context may be created by the specific domain of information about which individuals are compelled to think (e.g., Cosmides, 1989), or it may be created by the environment within which individuals encounter that information (e.g., Epstein, Lipson, Holstein, & Huh, 1992; Schaller, 1994; Zukier, 1986). Regardless of the specific means through which the situation is created, it's clear that to some extent, cognitive complexity is situation-specific.

Of course, not everyone's cognitive processes respond to the same situation in the same way. In a result that echoes Person  $\times$  Situation effects on helping behavior, Sorrentino and Roney (2000) found that students performed better academically when the specific learning situation matched their preferred mode of learning. Students who preferred certainty performed better in a traditional authoritarian lecture context than in an educational context that emphasized self-learning, whereas uncertainty-oriented students performed better in the latter educational context. More directly relevant to cognitive complexity, Schaller et al. (1995) found that the social context within which information was encountered interacted with individual differences in need of structure/closure in predicting the complexity of inferential reasoning. Other evidence suggests that individual political figures respond differently to different political stressors: While most politicians show a decrease in cognitive complexity during times of crisis, others show an increase during such times (Wallace & Suedfeld, 1988).

The implications for cultural differences are straightforward. Given that individual differences in values and preferences are grouped, to some degree, along cultural lines (Smith & Schwartz, 1997), it seems reasonable to expect that culture may interact with situational context to influence cognitive complexity.

This point is not new. Two decades ago Gamble and Ginsberg (1981) made a similar point in response to Witkin and Berry's (1975) conclusions about culture and psychological differentiation. Upon reviewing the evidence available at that time, Gamble and Ginsberg argued that conclusions about general cross-cultural differences in psychological differentiation were unwarranted, and that researchers needed to attend carefully to the specific domains on which differentiation was measured. This domain-specificity message appears to have gone largely unheeded. (Indeed, according to the Social Sciences Citation Index, Gamble and Ginsberg's paper has been cited only three times in the two decades since it was published.) It appears necessary to re-emphasize

the point that Gamble and Ginsberg made, and to broaden it: When judging the relation between culture and cognitive complexity, it is necessary to attend to the specific situational context in which complexity is measured.

Consistent with that point, there are now lots of empirical results that, in one way or another, imply that cognitive complexity might profitably be examined within an interactionist framework. For instance, results reported by Chiu et al. (2000) reveal domain-specific consequences of the motivation for simple structure across cultures. Among Chinese participants, need for closure/structure increased attributions to group dispositions but not to individual dispositions; among Americans, however, need for closure/structure increased attributions to individual dispositions but not to group dispositions. Although these results do not provide evidence for a Culture  $\times$  Situation interaction on complexity per se, they do suggest that knowledge domain moderates the attributional consequences of cognitive complexity. More telling are the results from studies of several other literatures that reveal Culture  $\times$  Situation interactions on various measures relevant to cognitive complexity.

#### PREVIOUS EVIDENCE RELEVANT TO COMPLEXITY

The anthropological literature indirectly reveals abundant descriptive evidence of domain-specific cognitive complexity among specific populations. Micronesian peoples, for example, developed a complex cognitive model to understand their geographic location (Hutchins, 1995). Many of the islands in the Micronesian chain are sufficiently small and far apart that navigators who regularly traveled from island to island often traveled beyond the sight of land. These navigators developed a complex geographical knowledge integrating not only geographic direction and location (dimensions salient to most people in the world) but also the relation of directions and location to a complex model of 16 tracks that stars follow across the sky each night. The navigators also developed models integrating reference islands and the relationship of these reference islands to the star tracks, which could then provide indicators of distance traveled. Occasionally the models included imaginary reference islands created to enhance the models when actual reference islands did not exist.

Another example of domain-specific complexity pertains to the domain of social roles in Japan, which is evident in various complex elements of the Japanese language (White, 1988). The word "you" in Japanese, for example, can take six different forms depending on the status and gender of the person being addressed. Verbs also contain status markers, so that even brief interchanges between two Japanese people can affirm any status difference between them. Teachers and work su-

pervisors are seldom addressed by their name, instead they are typically addressed by their status or role. Even twins in Japan are distinguished by status, with one twin referred to as the older twin and the other as the younger twin—even though their births were only minutes apart. In addition, the Japanese language has multiple words for the first person singular pronoun (e.g., “I” in English; Kashima & Kashima, 1998). (Indeed, sampling from a number of cultures, Kashima and Kashima found a negative correlation between the cultural endorsement of individualistic values and the number of first person singular pronouns contained within a culture’s primary language.) Kashima and Kashima suggest that these multiple first person singular pronouns may reflect a heightened Japanese attention to the multiple social roles of the self. These complexities in culturally-shared linguistic structures indirectly imply complexity in the cognitive structures of cultural members; after all, Japanese individuals are very adept at understanding and employing these highly differentiated linguistic constructs.

If there was compelling evidence that Micronesian peoples are generally more sophisticated thinkers than other people, or that the Japanese language is especially subtle and intricate outside the social domain, then these examples would illuminate fairly simple conclusions about cross-cultural differences in complexity. But no such evidence compels this conclusion. Instead, these examples more likely illustrate a culture-specific complexity that is itself specific to particular domains.

Other indirect evidence has emerged from research on the complexity of the self-concept. One possible interpretation of the existence of multiple first person singular pronouns in the Japanese language is that this reflects not a greater emphasis on social roles, but rather a more complex development in general of the self. However, other research suggests that the relationship between culture and the self-concept is dependent, in part, upon the context in which the self is described. In one study, Cousins (1989) presented American and Japanese participants with a self-definition task in which they were asked to write completions to the sentence stem, “I am . . .” When the task was administered in the absence of any specified role context, Americans used more self-descriptive trait attributes to describe themselves than did Japanese participants; however, under conditions in which they were asked to consider themselves within more circumscribed roles, Japanese participants listed more self-descriptive trait attributes than did Americans. To the degree that the number of self-descriptive traits is an indicator of a more complex, highly differentiated self-concept, the results suggest that American culture cultivates a more complex self-concept in one self-reflective context, whereas Japanese culture cultivates a more complex self-concept within a different context.



This interaction is also implied in studies of cognitive development—more specifically, in studies on the mastery of concrete operations. This sort of mastery requires the ability to simultaneously coordinate multiple pieces of information in a systematic and logical way, and so implies complexity of thought. In studies involving children's abilities to solve concrete operational tasks, Australian Aboriginals were found to succeed on spatial tasks before they showed the same competence on logico-mathematical tasks; a European Australian comparison group demonstrated the opposite pattern (Dasen, 1974). Similarly, Dasen (1975) found that Inuit children in North America achieved concrete operational competence at spatial tasks before logico-mathematical ones, whereas African Ebríe children showed the opposite pattern of development. These and other results (Serpell, 1979) suggest a Culture  $\times$  Situation interaction on the developmental attainment of cognitive complexity.

#### CULTURE $\times$ SITUATION INTERACTION ON DOGMATISM

A recent study provides new evidence of a Culture  $\times$  Situation interaction on a construct of enduring interest that is considered to be a prototypic inverse indicator of cognitive complexity: dogmatism (Rokeach, 1960; Suedfeld, 2000).

In this study (Conway, Hallett, Tweed, & Ryder, 2000), participants were 81 students at the University of British Columbia. Thirty-seven participants were classified as "Chinese" (they and both of their parents were born in China, Hong Kong, or Taiwan), and 44 were classified as "Western" (they and both of their parents were born in Canada, the United States, the United Kingdom, western Europe, Australia, or New Zealand). All participants completed a packet of questionnaires that included the Epistemological Development Questionnaire (EDQ; Krettenauer & Hallett, 1999). The EDQ is derived from structured-interviewing methods used to determine young adults' level of epistemological development. It presents participants with 12 items depicting contradictory positions on specific issues. For each item, participants were asked to rate, on a 5-point scale, the extent to which they agreed with a response reflecting dogmatic thinking (simplistic right-and-wrong thinking). Thus, endorsement of dogmatic statements reflects the antithesis of cognitive complexity.

Among these 12 items, two pertained primarily to the domain of religious beliefs: (a) "In thinking about the various religions that exist, both those that have been around for centuries, and more recent ones, it seems to me that, though not everyone will acknowledge it, of all the different religions that exist in the world there is probably only one which is correct;" (b) "The fact that some passages from holy texts such as the Koran or the

Bible are often interpreted in very different ways suggests to me that there are basically two groups of people: those who get the true meaning of the text and those who miss it." Two other items pertained primarily to the domain of socio-political beliefs: (a) "The same activist groups are referred to by some journalists as terrorists, and are called freedom fighters by others. I think that waiting for the future is unnecessary; one can clearly tell who are the freedom fighters and who are the terrorists;" (b) "Over the ages, different countries have had very different forms of government. I would say that it is clear to me which form of government is the best possible one."<sup>1</sup> Dogmatism ratings for the two items reflecting each of these knowledge domains were summed, resulting in one dogmatism score for religion and one dogmatism score for politics.

Results revealed that domain moderated the relation between culture and dogmatism,  $F(1,79) = 14.84, p < .001$ . On matters of religion, Chinese participants ( $M = 2.24$ ) were more dogmatic than Westerners ( $M = 1.49$ ); on issues relevant to politics, Westerners ( $M = 2.64$ ) were more dogmatic than Chinese participants ( $M = 2.37$ ). Additional analyses revealed that, overall, Chinese were more likely than Westerners to agree with all items on the EDQ. Because of this difference in general response tendencies, "ipsatized" dogmatism scores were computed that controlled for participants' mean rating on all responses; these scores show how dogmatic participants were about religion and politics relative to all other items on the EDQ. These ipsatized means also revealed that on matters of religion Chinese participants ( $M = 2.05$ ) were more dogmatic than Westerners ( $M = 1.44$ ), and that in the socio-political realm Westerners ( $M = 2.60$ ) were more dogmatic than Chinese ( $M = 2.19$ ).<sup>2,3</sup>

This study is only preliminary, and so inferential caution is warranted. Further, to the degree that the finding represents a real and replicable effect, the processes underlying this interaction cannot be known with certainty (we offer some speculation below). Nevertheless, the results fit a pattern indicated by many other studies: The exact nature of cross-cultural differences in cognitive complexity is situation-specific.

2. On other EDQ responses, analyses yielded other interactions as well. Results pertaining to religion and politics are presented here simply to illustrate the utility of an interactionist approach to dogmatism on specific domains of knowledge that are typically perceived as interesting and important.

3. The fact that Chinese participants were more dogmatic than Westerners about religious issues may appear, on the surface, to contradict Peng and Nisbett's (1999, Study 4) finding that Chinese found "holistic" arguments for God's existence more persuasive than arguments based upon the principle of noncontradiction. Close inspection of the materials used in the two studies reveals, however, that they may be tapping into two quite different constructs.

CULTURE  $\times$  SITUATION INTERACTION ON PERCEIVED WITHIN-GROUP SIMILARITY

Additional new evidence bearing on Culture  $\times$  Situation interactions in cognitive complexity has emerged from an investigation that examined the development of beliefs about within-group homogeneity. Perceiving that the members of a group are all alike implies an inability or unwillingness to acknowledge the potentially complex nature of a group of people. On the other hand, a willingness to perceive that a group can contain multiple very different sorts of people is conceptually similar to the multi-dimensional thinking that is a hallmark of cognitive complexity. It is for this reason that the perception of within-group similarity serves as an inverse indicator of cognitive complexity.

There is a large literature on perceptions of within-group similarity, but very little of this work has addressed cross-cultural differences, and the cross-cultural results that have been reported are not easily interpreted. Lee and Ottati (1993) found that Chinese students rated an American outgroup to be relatively heterogeneous, whereas American students rated a Chinese outgroup to be more homogeneous; however, these results can be interpreted as revealing no cultural differences in perceptions of specific target groups: Both Chinese and American students perceived Americans to be heterogeneous and Chinese to be homogeneous. Against this backdrop, it's interesting to ponder the implications of results from a recent investigation by Conway and Schaller (2000).

The investigation was conducted on data from two distinct, but procedurally similar, studies that were originally constructed to test other, conceptually unrelated hypotheses. The two studies were conducted concurrently (although by different experimenters). In both studies, participants from either Chinese or Western cultural backgrounds read through an identical set of information describing the members of two novel groups. There was only one substantial difference in the procedures. Participants in one study (the "Write Notes" study), occasionally wrote notes describing their impressions of the groups to another research participant. In the other study (the "Read Notes" study) participants occasionally read notes that they believed were written by a previous participant describing his or her impressions of the groups. Thus, in both studies participants received "objective" information, but only in the "Read Notes" study did they also actually receive additional relevant information interpersonally. At the end of the procedures, participants in both studies completed identical measures assessing the extent to which members of each target group were perceived to be all alike. A comparison of results across the two studies offers a test of a Culture  $\times$  Situation interaction on perceived within-group similarity.

Sixty-four students participated in the study at the University of Brit-

ish Columbia. Participants were classified as “Chinese” or “Western” according to the same criteria used in the study by Conway et al. (2000), described above. Eight Westerners and 14 Chinese participated in the “Write Notes” study; 11 Westerners and 31 Chinese participated in the “Read Notes” study.

After the participants completed a small set of questionnaires assessing several aspects of personality, the experimental procedures commenced. As part of these procedures, participants were presented, over the course of 5 phases, with 18 index cards that contained brief concrete descriptions of male members of one of two novel groups—simply referred to as the Red Group and the Blue Group. These descriptions are slightly modified versions of those used in previous research (Schaller & Conway, 1999). The cards focused on behaviors relevant to the traits of aggressiveness and intelligence. On average, this objective information presented members of the Red Group as more aggressive and more intelligent than members of the Blue Group. All participants received the same stimulus cards in the same order. In the first of the 5 phases, participants received 6 cards; in all subsequent phases, they received 3 cards. In addition, participants were told that phases 2 through 5 were “communication phases.” The exact nature of the communication procedure differed in the two different studies.

In the “Write Notes” study, after participants had read the three new pieces of objective information at each phase, they wrote a short note to another participant in their experimental session about their impressions of either the Red Group or the Blue Group. Participants were told that the four notes they wrote during the course of the procedures would be passed all at once to the designated recipient near the end of the experiment. (In fact, this exchange never took place.) In the “Read Notes” study, after participants had read the three new pieces of objective information at each phase, they then read a note that they believed had been written by a participant in a previous session who was attempting to convey his or her impressions of the groups. In reality, these notes had been crafted in advance by the experimenter. Participants received four notes total (two concerning the Red Group and two concerning the Blue Group). All of the ersatz notes contained the same essential content, either depicting the Red Group as both aggressive and intelligent, or depicting the Blue Group as both passive and unintelligent. (These notes varied along two dimensions of linguistic abstractness as well.)

At the completion of these procedures, participants completed several measures assessing their perceptions of within-group similarity. One of these measures asked participants to make six ratings describing the similarities of individuals within target groups. For example: “How similar to each other do you think the members of the Red Group are on the trait aggressiveness?” On all six similarity ratings, participants indi-

cated their responses on 9-point scales, anchored by poles marked not at all similar and very similar. A second measure presented participants with four different distribution tasks similar to those used in previous research on perceived intragroup variability (e.g., Linville, Fischer, & Salovey, 1989; Park & Judd, 1990). For example, participants were asked to imagine that there were 100 people in the Red Group, and to identify how many of these people would fall into each of five different categories relevant to aggressiveness (e.g., *well below average aggressiveness*, *below average aggressiveness*, and so on). From these distribution tasks, variance scores were computed (see Linville et al., 1989 for computational details). These variances reflect less perceived similarity within groups.

For analyses, data from the participants in the two studies were pooled into the same data set, and the particular study ("Write Notes" vs. "Read Notes") was treated as an independent variable. Consistent with previous research using these stimulus materials (Schaller & Conway, 1999), the results yielded the strongest effects on variables pertaining to the aggressiveness of the Red Group. For this reason, we summarize here only the results pertaining to the degree to which Red Group members were seen as similar to each other on the trait "aggressive." The similarity rating measure revealed a Culture  $\times$  Situation interaction,  $F(1,60) = 3.27, p = .075$ . Westerners ( $M = 6.88$ ) perceived greater within-group similarity than Chinese participants ( $M = 6.29$ ) in the "Write Notes" study; however, in the "Read Notes" study, Westerners ( $M = 5.73$ ) perceived less similarity than Chinese participants ( $M = 7.13$ ). A conceptually identical Culture  $\times$  Situation interaction emerged on the variance scores derived from the distribution task,  $F(1,60) = 4.12, p = .047$ . Westerners ( $M = 301.00$ ) perceived less within-group variability than Chinese participants ( $M = 400.65$ ) in the "Write Notes" study; but in the "Read Notes" study, Westerners ( $M = 449.27$ ) perceived more variability than Chinese participants ( $M = 292.94$ ).<sup>4,5</sup>

Obviously, caution must be exercised in interpreting these results. Although the main substantive difference between the "Write Notes" and the "Read Notes" studies was the communication context, one can-

4. Statistical analyses on a composite of all dependent variables (created by standardizing the variables, and then averaging them) revealed an interaction effect that was virtually identical to that found on the specific dependent variables presented here,  $F(1,59) = 3.32, p = .074$ . In the "Write Notes" study, Westerners perceived greater within-group similarity than Chinese participants; but in the "Read Notes" study, Westerners perceived less similarity than Chinese participants. Separate composites for the two types of dependent measures suggested that these interaction effects were stronger for the distribution task measures ( $p = .028$ ) than the similarity rating measures ( $p = .313$ ).

not dismiss the possibility that the effects were due in part to incidental differences (such as the fact that the two studies were conducted by different experimenters). Moreover, the difference in communication context was multifaceted, so it is difficult to identify the exact locus of its possible effect. Nevertheless, there appears to have been some difference in the contexts of the two studies that fully reversed the effects of cultural background on perceived within-group similarity (we shall discuss one possible interpretation more fully below). Therefore, these results buttress the other evidence summarized above in suggesting that the specific nature of cross-cultural differences in cognitive complexity depends upon the specific situation in which these cognitions proceed.

### CONCEPTUAL GUIDEPOSTS AND UNDERLYING PROCESSES

The selective inventory of evidence presented above cannot, by itself, illuminate the psychology underlying these Culture  $\times$  Situation interactions. It is worth speculating a bit about the deeper, more meaningful psychological universals that may be implicated by these complicated patterns of cross-cultural differences. Two types of variables seem necessary to attend to when attempting to explain the situation-specificity of cross-cultural differences in cognitive complexity: experience and values.

The role of experience is straightforward. Novices in a particular domain of knowledge tend to think simplistically, whereas those with greater experience typically engage in more complex, sophisticated thought (e.g., Ceci & Liker, 1986). The effect shows up not only in the complexity of thought processes, but also in the complexity of emergent beliefs. For instance, the more contact and experience that individuals have with members of specific target groups, the more variability they perceive within those groups (Linville et al., 1989). This has obvious implications for understanding some of the observed Culture  $\times$  Situation interactions on cognitive complexity. For any specific cultural population, there are likely to be certain specific domains of knowledge in which individuals have a great deal of experience, and other

5. Consistent with the assumption that perceived within-group similarity is an indicator of cognitive complexity, individual differences in "personal need for structure" (Neuberg & Newsom, 1993) were positively correlated with measures of perceived within-group similarity. Interestingly, the magnitude of these positive relations was moderated by culture and situation: In the "Write Notes" study, the correlations were strongly positive for Chinese but weak for Westerners; in the "Read Notes" study the correlations were weak for Westerners but strongly positive for Chinese participants.

domains in which they are relatively inexperienced. These particular domains differ across populations. For obvious reasons, Micronesian individuals have tended to gain a great deal of experience navigating the seas, compared to individuals from many other parts of the globe. Other constraints lead children from some places to have more early experience with spatial tasks, and children from other places to have more early experience with abstract logical tasks. These sorts of experiences may be due to the immediate constraints posed by the local geography and ecology, or may be due to cultural norms governing the social transmission of knowledge, or both. Whatever the direct mechanisms through which individuals gain experience in specific domains to a greater degree than in others, it appears that underlying some Culture  $\times$  Situation interactions may be a simpler cultural universal: In populations everywhere, individuals are more likely to engage in complex thought on domains in which they are experienced.

The role of values is not nearly so straightforward. At a very general level, it is clear that peoples' values do have influences on the complexity of thought in which they engage when thinking about valued things. But the exact relation between valuation and cognitive complexity is complicated. Some evidence suggests that people think more complexly about valued things; for example, Suedfeld (in press) suggested that politicians generally show greater integrative complexity within those domains that are especially valued planks in their party's platform. Similarly, an empirical study found that emotional involvement with an issue was positively related to complex thinking about that issue (Suedfeld et al., 1994); however, in that same study, Suedfeld et al. also found that when issues were directly self-relevant, they inspired less complexity than when they were not self-relevant—a result suggesting that psychological valuation also can be negatively related to cognitive complexity.

There are several ways to interpret the complicated set of relations between values and cognitive complexity. One interpretation is that the relationship may be curvilinear, reflecting the more general and familiar relation between arousal and performance: As long as the level of personal importance remains at low-to-moderate levels, increasing importance may lead to increased effort and increased complexity; but there may be a certain point at which a domain becomes so highly valued that the high levels of motivation involved may actually inhibit the ability to engage in complex thought (Pelham & Neter, 1995; Suedfeld, in press).

It also may be fruitful to make some finer distinctions between different objects of valuation. First, individuals may place a certain value on a particular domain of knowledge (e.g., a movie buff may place an especially high value on knowledge pertaining to movies). Second, individu-

als may also place a certain value on the sources from which they receive information relevant to that domain of knowledge (the movie buff may value information gleaned from *Variety* magazine more highly than information received from the *National Enquirer*). Third, individuals may place a certain value on specific existing beliefs that lie within that domain of knowledge (the movie buff may hold dear the belief that Jackie Chan's early Hong Kong films are superior to his recent Hollywood offerings). These are clearly different value objects, and they have different implications for cognitive complexity. And, because cultures influence the values that individuals place on things, they have different implications for understanding Culture  $\times$  Situation interactions. We shall briefly consider each in turn.

It is likely that the value or importance that an individual places on a domain of knowledge has a positive impact on the complexity of thought within that domain: Individuals who value a domain are motivated to expend greater effort when thinking within that domain, and this in turn inspires more complexity of thought and more complex beliefs. Because cultures are defined in part by shared worldviews and values, for any specific cultural population, there are likely to be certain specific domains of knowledge that are highly valued and others that are less highly valued. These particular domains differ across cultures. For instance, within Japanese culture, great value typically has been placed on social roles and social status (Nakamura, 1964); for this reason Japanese individuals may be motivated to attend to and learn complex linguistic rules for denoting role and status, or to develop more complex views of themselves within particular social contexts. Similarly, perhaps Chinese Canadians were less dogmatic than European Canadians on political issues because the domain of politics has historically been highly valued by Chinese intellectuals (Nakamura, 1964); this valuation of politics may motivate Chinese Canadians to expend greater complexity of thought on things political.

Now consider the value placed on sources of information bearing on a domain of knowledge. Information obtained by a valued source may inspire greater motivation to mold that information into a simple coherent belief, whereas information obtained from a less valued source may remain in more differentiated form. To understand why this might be so, we begin with the assumption that most people have some desire to arrive at simple, straightforward inferences about their social environments. (It is for this reason that people often "seize" upon any seemingly relevant information for the purposes of forming simple inferences that relieve uncertainty and offer some sort of cognitive closure; see, for example, Kruglanski, Webster, & Klem, 1993.) The extent to which individuals form these sorts of simple inferences may depend upon the perceived legitimacy of the



source. People may be more likely to form simple inferences on the basis of information that arrives from a preferred source of knowledge, but to keep a more open mind if the information arrives from a less preferred source of knowledge—because untrustworthy sources of knowledge may be less apt to produce true closure. (Thus, for example, the movie buff may be more motivated to use information found in *Variety*—compared to the *National Enquirer*—as the basis for an enduring impression of a film production.)

Of course, norms guiding preferred sources of knowledge may differ across different cultural populations. In more “collectivistic” cultures, persons more readily draw their knowledge from the communications of other people, but in more “individualist” cultures, persons may be more prone to think that knowledge is discovered on one’s own (Keller & Greenfield, 2000). Consistent with this notion, research on compliance strategies reveals that individuals from a relatively collectivistic Eastern European nation (Poland) are more influenced by social validation concerns, whereas individuals from the relatively individualistic United States are more influenced by cognitive consistency concerns (Cialdini, Wosinska, Barrett, Butner, & Gornik-Durose, 1999). Similarly, the attitudes of Japanese students, who tend to be more collectivistic, are less likely than the attitudes of Canadian students to change in response to threats to cognitive consistency (Heine & Lehman, 1997). Other evidence also implies that East Asians and Westerners are differentially sensitive to interpersonal versus individual sources of knowledge. Peng and Nisbett’s (1999) research suggests that the Chinese view knowledge as something that is informed by (and even co-existent with) interpersonal context, while people from Western cultures view knowledge as something that is independent of that social context. Similarly, consistent with a Confucian philosophical perspective, Chinese are more likely than Westerners to view knowledge as something that is passed down from person to person; on the other hand, Westerners are more likely than Chinese to view knowledge within a Socratic perspective, as something that is created within individuals (Tweed & Lehman, in press).

These differences in sensitivity to different epistemological sources may offer some explanation for the results of the “Read Notes / Write Notes” study described above. In contexts in which inferentially relevant information arrives from another person, East Asians may be more likely than Westerners to seize upon the information as true, and so will develop relatively simpler cognitive structures—such as highly homogeneous impressions of group members. On the other hand, in contexts in which inferentially relevant information arrives from less social and more directly perceptual sources (e.g., persons reading about what they presume to be the actual behaviors of group members), Westerners may

be more likely than East Asians to seize upon the information as true, and so will develop relatively simpler cognitive structures. This explanation for the finding is simply speculation at this point, and other explanations for that particular empirical result cannot be dismissed. (Indeed, one could argue that the fact that participants in "Read Notes" studies simply got additional information-irrespective of the psychology of communication-is responsible for the effect.) In addition, the implications of this line of thinking may be complicated; psychological valuation of a source can have multiple effects on cognitive complexity and thus there is a basis to argue that differences in preferred epistemological sources may have effects different from the specific speculation we've offered here.<sup>6</sup> Nevertheless, further consideration of cultural norms concerning epistemological sources may be helpful in understanding some Culture × Situation effects on cognitive complexity.

Finally, consider briefly the effects of the value or personal importance of a specific existing belief. The importance of an existing belief may often lead individuals to "freeze" upon it, to be unwilling to entertain the veracity of alternative beliefs. This is likely to manifest as less complex thinking about that particular belief. (The movie buff who holds dear his opinions on Jackie Chan films may be very dogmatic in the face of opposing views.) However, as research on motivated reasoning has revealed (Ditto & Lopez, 1992; Schaller, 1992), in attempting to maintain valued beliefs, people may engage in either simplistic or complex reasoning about new information that bears on those beliefs—depending on the style of reasoning necessary to compel a conclusion justifying that belief. (The movie buff may, for instance, offer elaborate and sophisticated arguments in defense of his closely held opinions on Jackie Chan.) Peoples' values, of course, are influenced by their socialization in a culture. Individual from one culture may be motivated to defend certain specific highly prized beliefs, whereas individuals from another culture may be motivated to defend a different set of highly prized beliefs. These cultural differences in values may manifest in the form of Culture × Situation interactions—and the specific nature of those interactions may depend crucially upon the specific way in which cognitive complexity is operationalized.

These various speculations are still sketchy, and we do not pretend to be able to offer a complete value-based interpretation of the various findings we've reviewed. And, indeed, it is almost certainly the case that

6. The interaction between culture, situational context, and personal need for structure reported in footnote 5 might be interpreted as inconsistent with the epistemological sources explanation sketched out above.

processes outside the psychological value that persons place on a particular domain, source, or belief account for at least some of these previous results. For example, it may be that, because the expression of free thought on political issues has traditionally been discouraged in Chinese society (see Nakamura, 1964), Chinese persons are less likely than Westerners to express dogmatic attitudes about politics—regardless of how dogmatic their attitudes actually are, and regardless of the actual psychological importance of politics as a domain. These qualifications noted, at a broader level, given the apparent connection between values, motivation, and cognitive complexity, value-based models (informed by both anthropological and psychological data) seem to offer promising means of detecting the deeper psychological truths underlying complicated Culture  $\times$  Situation interactions.

### CONCLUDING THOUGHTS

Our selective review and discussion of empirical results concerning culture and cognitive complexity has taken us on a circuitous path. We've suggested that results revealing apparently simple cultural differences in cognitive complexity may be misleading, and reflect just some part of more complicated interactions between culture, domain, and context. We've suggested also that these more complex interactions may reflect some simpler cross-cultural differences after all—differences not in cognitive complexity, but in experiences and values. Ultimately, these complicated Culture  $\times$  Situation interactions may reflect deeper psychological universals in the way that experiences and values shape individual's cognitive processes.

### INFERENCE ADVANTAGES OF INTERACTIONS

As our conceptual speculations imply, a focus on interactions need not be in opposition to the search for psychological universals; indeed, a focus on interactions can actually aid this search. Simple psychological processes can sometimes manifest in complicated ways. Although it seems a bit counterintuitive, there are some inferential advantages in choosing to look for complex rather than simple manifestations of underlying cultural differences.

Because cultures differ in so many thousands of ways, it is often possible that a difference obtained between cultures is not due to a difference on a specified theoretical variable, but rather to a difference on a theoretically uninteresting variable. For example, it has been argued that Chinese display a stronger tendency than Westerners to agree with questions they are asked (Hofstede, 1980). This general difference in response tendency (referred to as the Chinese "acquiescence" bias or the

Western “nay-saying” bias, depending on one’s perspective) can thus lead to cultural differences regardless of the particular psychological construct under investigation. However, cultural differences in general response tendencies cannot easily account for Culture  $\times$  Situation interaction effects. As a result, any alternative explanation from a general response tendency approach must become increasingly complicated, and thus more difficult to apply, if an interaction-rather than a main effect-is focused on. To the degree that a theory about cross-cultural differences logically implies some interactive consequences, the observation of those interactions can offer especially compelling support for that theoretical model.

#### THE STANDARD FOR SIMPLICITY AND THE COMPLEXITY OF COMPLEXITY

Although not precluding the possibility of main-effect cultural differences altogether, the present analysis does illustrate why we must be cautious in drawing overly quick and simplistic conclusions about cultural differences in social cognition. One way to avoid the sorts of over-generalizations that occur all too often in cross-cultural psychology (see Cole, 1996, for a review) is to raise the standard for stating simple generalizations about cultures. If cultural differences persist across multiple domains and multiple contexts, we can become more confident that they represent some real main effect. However, a main effect difference between cultures on only one or two domains, or that has occurred in only one or two contexts, should not be given the weight of supporting a simple cultural difference. Such strong theoretical inferences are best made only after explicitly testing the hypothesized difference across multiple domains and contexts.

When we turn our investigative lens to complexity, the evidence reviewed here suggests that this standard for inferring simple cross-cultural differences has not been met: It would appear to be unjustified to suggest that members of specific cultures are generally more complex in their thinking than those of another. Both knowledge domain and situational context can moderate what might otherwise appear to be monolithic cross-cultural differences in cognitive complexity. Although these results raise conceptual questions that we cannot yet answer, one conclusion that they do compel is this: If we are to draw accurate conclusions about the relations between culture and cognitive complexity, we must be prepared to accept the scientific challenge to be more complex thinkers ourselves.

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