

CULTURAL DIFFERENCES IN AD INFORMATION PROCESSING: THE INFLUENCE OF ANALYTIC VERSUS HOLISTIC THINKING

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ABSTRACT

A great deal of research posits that East Asians tend to think holistically and Westerners tend to think analytically. This paper explores whether different mental processes are employed by East Asians and Westerners when reading and processing verbal information in printed ads. My findings indicate that East Asians tend to use a holistic approach to process verbal information when reading analytic ads, whereas Westerners tend to use an analytic method to process verbal information when reading both holistic and analytic ads. It also was found that the analytic-holistic dichotomy tends to be deeper when participants are exposed to high-risk products.

INTRODUCTION

Recent research in consumer behavior has shown that culture has a great effect on information processing. However, Monga and John (2007) argue that much of the existing research focuses on the cultural influence on views of self (e.g., Aaker and Maheswaran 1997; Aaker and William 1998; Han and Shavitt 1994; Wang et al. 2000). Few scholars have paid attention to the effect of different ways of thinking regarding consumer behavior (e.g., abstract vs. concrete thinking, Ng and Houston 2006; analytic vs. holistic thinking, Monga and John 2007).

Studies have shown that East Asians (e.g., Chinese, Japanese, and Koreans) and Westerners (e.g., Americans) differ in terms of styles of thinking (Choi, Nisbett, and Norenzayan 1999; Nisbett et al. 2001; Peng and Nisbett 1999). For example, East Asians tend to think holistically and pay more attention to the context and relationships among the elements in the context. But Westerners tend to think analytically and pay more attention to the dispositions. Therefore, different ways of thinking may influence how consumers process the information in ads with different types of information. However, only a few researchers have investigated such effects, even though analytic and holistic variation has a strong foundation in literature as diverse as ethnography, philosophy, psychology, and history. So, the purpose of this paper is to investigate the effects of analytic and holistic thinking on information processing, specifically, how individuals with analytic or holistic thinking process information in ads.

THEORETICAL BACKGROUND

Analytic vs. Holistic Thinking

Scholars in many disciplines have found that people in East Asian cultures have a

relatively holistic cognitive orientation, whereas people in Western cultures have an analytic one (Choi, Nisbett, and Norenzayan 1999; Nisbett et al. 2001; Peng and Nisbett 1999). Holistic thinking is defined as “involving an orientation to the context or field as a whole, including attention to relationship between a focal object and field, and a preference for explaining and predicting events on the basis of such relationships” (Nisbett et al. 2001, p. 293). Analytic thinking is defined as “involving detachment of the [focal] object from its context, a tendency to focus on attributes of the object in order to assign it to categories, and a preference for using rules about the categories to explain and predict the object’s behavior” (Nisbett et al. 2001, p. 293).

The different ways of thinking are due primarily to different views of self (Markus and Kitayama 1991). Westerners have an independent view of self, so they emphasize attention to the self, the appreciation of one’s uniqueness from others, and the importance of asserting the self. In contrast, East Asians have an interdependent view of self, so they stress attention to others, and the importance of interdependent relationships and harmony with others (Markus and Kitayama 1991; Singelis 1994). If the self is seen as independent, individual behavior should be relatively consistent across different situations (Lee, Hallahan, and Herzog 1996). Therefore, gaining insight into others’ dispositional characteristics should help understand and predict their behaviors. As a result, Westerners tend to direct their attention to internal attributes (Nisbett et al. 2001). In comparison, individual behaviors should vary in different situations if the self is seen as interdependent. Thus, context factors should be more important than dispositional factors in understanding and predicting others’ behaviors. Therefore, East Asians tend to direct their attention to context or whole systems (Nisbett et al. 2001).

East Asians live in a high context society (Hall 1977) and think that they are only one part of a large and complicated world with many role relations, so they tend to direct their attention outside themselves and toward the whole social environment (Nisbett et al. 2001). Thus, it is necessary to consider more important or even possible elements in the whole, more relations among objects, and more relations between parts and the whole (Nisbett et al. 2001). In contrast, Westerners live in a low context society (Hall 1977), with fewer and less significant social relations, so attention tends to be directed toward themselves and toward their unique internal attributes. So, it is important to separate the object from its context, to infer category membership of the object from its properties, and to infer how rules apply to categories.

From ancient times, East Asians viewed the world as “a collection of overlapping and interpenetrating stuffs or substances” (Hansen 1983, p. 30) and because they saw the world as “interpenetration and continuous, their attempts to understand it caused them to be oriented toward the complexities of the perceptual or conceptual field taken as a whole” (Moore 1968, p. 3). For East Asians, the individual object was “not a primary conceptual starting point” (Moser, 1996, p. 169), and “the background scheme [of East Asian thinking was] that of mass substances rather than that of objects and properties” (Hansen 1983, p. 31). East Asians believe that within a whole system, everything is related to everything else to some extent. Therefore, it is not the part but the whole that exists. Parts exist only within the whole, in which they are embedded (Munro 1985). Parts are linked together, like “the ropes in a net” (Munro 1985).

In contrast, people from Western cultures tend to see the world as a collection of discrete

objects (Nisbett et al. 2001). Rooted in the thinking of ancient Greeks, Westerners view the world as composed of “objects which are understood as individuals or particulars which instantiate or ‘have’ properties” (Hansen, 1983, p. 30).

A considerable body of research supports the analytic-holistic framework (e.g., Abel and Hsu 1949; Masuda and Nisbett 2001; Morris, Nisbett, and Peng 1995; Morris and Peng 1994). Abel and Hsu (1949) presented the Rorschach cards to European Americans and Chinese Americans. They found that the responses of Chinese participants were based on all aspects of the card or its Gestalt. In comparison, the responses of American participants were based on a single aspect of the card. Masuda and Nisbett (2001) found that when exposed to realistic animated scenes of fish and other underwater objects, Japanese were more likely than Americans to pay attention to relatively peripheral, nonsalient, or background information and relations between fish and other animated objects.

Analytic and holistic thinking also can be demonstrated by a well-established finding called “correspondent bias” (Gilbert and Malone, 1995) or “fundamental attribution error” (FAE; Ross 1977) – the tendency to see behavior as an outcome of the actor’s dispositions and to ignore important situational determinants of the behavior. Numerous studies have found that Westerners are more likely to make dispositional attributions while East Asians tend to make situational/contextual attributions. The cultural difference in FAE is very strong because the result from different studies is consistent across different behaviors (prosocial and deviant behaviors, and successes and failures), different targets (friends, acquaintances, and strangers), and different countries (United States or England compared with India, China, Korea, or Taiwan) (Lee, Hallahan, and Herzog 1996).

Morris and Peng (Morris, Nisbett, and Peng, 1995; Morris and Peng 1994) analyzed the explanations of two similar tragedies that occurred in the USA in an English language newspaper and in a Chinese newspaper. They found that the English newspaper attributed the incident wholly to the presumed mental instability and other negative dispositions of the murders (e.g., “the man was mentally unstable,” and “he has a short fuse”) whereas causal explanation by the Chinese newspaper of the same events focused on situational, contextual, and even societal factors that might have been at work (e.g., “did not get along with his advisor,” and “followed the example of a recent mass slaying in Texas”). Morris and Peng asked American and Chinese university students to explain the events and found the same attribution patterns.

HYPOTHESES

According to the Elaboration Likelihood Model (ELM; Petty and Cacioppo 1979) and the Heuristic Systematic Model (HSM; Chaiken 1980), under high involvement situations (high relevance or risk), people are motivated to engage in diligent deliberation of attribute-relevant information (e.g., arguments) in the ad. In contrast, when viewers lack sufficient motivation (because of low relevance or risk) or ability (because of personal traits or external interference), persuasion follows a peripheral route by which people base their attitude and evaluation on attribute-irrelevant information or peripheral cues (e.g., a picture’s attractiveness, source characteristics, music, message sidedness, etc.). Thus, neither holistic nor analytic thinking toward ad copy would be activated in low involvement situations because the viewers may pay

most of their attention to the peripheral cues and little or no attention to product arguments. In contrast, under a high involvement situation, people engage in diligent deliberation of the attribute-relevant information (e.g., arguments) in the ad (Petty and Cacioppo 1979; Chaiken 1980). Thus, this paper was based on high involvement situation.

For East Asians, it is not the part but the whole that exists. Thus, East Asians look at everything “in its totality, not in parts” (Moore 1968, p. 3). So, when exposed to ads with product attribute information only (henceforth termed “analytic ad”), East Asians tend to think holistically to consider and generate additional factors not provided in such ads. For them, although product attribute information is very important, it alone is far from enough to support evaluation, judgment, and decision-making. Therefore, they consider additional information not provided in analytic ads, such as additional attribute information, brand, reputation, price, availability, etc., and generate thoughts related to peripheral cues in ads because failing to consider even a minor factor, may result in a bad judgment or purchasing decision. Thus, East Asians tend to think broadly.

Since Westerners tend to think analytically (Nisbett et al. 2001), they pay more attention to product attribute information. For Westerners, product attribute information is the predominant factor influencing their evaluation, judgment, and purchasing decision. For them, thinking about an attribute in isolation is quite normal because they tend to focus on the analytic parts, not the holistic totality. Thus, when exposed to analytic ads, Westerners will not think broadly to consider holistic factors but think narrowly and deeply on dispositional factors. Studies also show that Westerners’ analytic thinking is quite stable across different situations (Choi and Nisbett 1998) and that Westerners still tend to think analytically even when the situational factors are made more salient (Abel and Hsu 1949; Ji, Peng, and Nisbett 2000; Masuda and Nisbett 2001; Park, Nisbett, and Hedden 1999). So, even when exposed to ads with holistic information (e.g., ads with product attribute, price, availability, company information, etc., henceforth termed “holistic ad”), analytic thinkers still will pay most attention to attribute information and treat the information not related to the attribute as ignorable noise. Thus, there should be no significant differences in terms of the number of thoughts related to attributes and the presented product between the analytic and holistic ads for Westerners.

Since East Asians tend to think broadly and Westerners tend to think narrowly, I assume that East Asians will generate more holistic thoughts than Westerners but Westerners will generate more analytic thoughts than East Asians. But this argument suggests a direct cross-cultural comparison of the total number of thoughts generated when exposed to analytic ads. However, such comparison may be contaminated because members from these two cultures may have a different number of baseline thoughts across situations (Alden, Stayman, and Hoyer 1994; Douglas 1980; Hui and Triandis 1985). An appropriate approach to address this issue is to use the “comparison of inferences” method, which argues that, in the cases of nonequivalence across cultures, hypotheses should be tested through within-culture comparison (Alden, Stayman, and Hoyer 1994). Therefore, if the main effect of culture is significant, my hypothesis regarding cultural effect on different ads may be tested by comparing holistic ads with analytic ads within a culture. When East Asians are exposed to holistic ads, the holistic way of thinking of East Asians will not be “exacerbated” because such ad presentation matches their tendency of holistic thinking, so that they are less likely to think holistically. Therefore, I hypothesize:

H1: Compared with holistic ads, analytic ads will increase for East Asians (a) the number of thoughts related to the product attributes, (b) the number of thoughts related to advertised product.

When East Asians read holistic ads, the need to generate and consider “missing” information is low; however, for analytic ads, East Asians try to fill in these missing pieces of information. What types of information will they generate to fill this gap? Consider the following distinction: “within-brand” thoughts are those that add to presented information by focusing only on the presented brand; and “between-brand” thoughts are those that add to the presented information by relating the presented brand to other brands. Given East Asian tendency to think holistically, and given a general human tendency to reduce the cost of thinking, it is expected that analytic ads will trigger “within-brand” thinking and holistic ads will trigger “between-brand” thinking. Therefore, I hypothesize:

H2: Compared with holistic ads, analytic ads will increase the number of within-brand thoughts for East Asians.

Finally, because of the tendency of Westerners to think analytically, they will generate many attribute-related thoughts. Since East Asians tend to think holistically, they will generate many thoughts related to the advertised product. Therefore, I expect:

H3: The ratio of “product attribute thoughts” to “product-related thoughts” should be higher for Westerners.

STUDY 1

Design

The purpose of Study 1 is to test whether culture has an effect on consumers’ information processing. To test my hypotheses, a 2 (culture: Chinese vs. American) x 2 (ad: analytic vs. holistic ad) between subject factorial design was used.

Stimulus Material

A digital camera was used as the target product because consumers may be quite familiar with it (88% of Chinese and 85% of Americans in this study owned one; $\chi^2(1, N = 119) = 0.184, p > .1$), so subjects’ ways of thinking would not be limited in a situation where little knowledge about the product exists. A fictitious name (Classa) was used to minimize the effect of prior experience with established brands. Ad stimuli were adapted from a real ad in a magazine to increase the external validity. In the ad, a man sitting in a sailing boat is taking the picture of dolphins jumping out of the water.

Aaker and Maheswaran (1997) have shown that ELM is robust across cultures, and both Chinese and Americans pay more attention to product arguments carefully under high

involvement situation, so processing strategies (central or peripheral route) between different cultures should not be a major concern. This argument also has been supported by findings in this study.

Participants and Procedures

Sixty-one Caucasian American students and 58 Chinese students in a large Midwest university were selected. All Chinese participants are of Chinese ethnic origin, born and raised in Mainland China. The Chinese participants were required to be in the U.S. for less than six months to ensure that acculturation had not occurred to a significant degree. All American students were born and/or raised in the U.S. The study procedures used by Aaker and Williams (1998) and Petty, Cacioppo, and Schumann (1983) were adapted to increase the involvement. First, in the following cover story, participants read:

A large-scale consumer electronics manufacturer is planning to introduce a new brand of digital camera to the U.S. (and China) market—named Classa. The manufacturer would like to know what U.S. (and Chinese) consumers think about the camera before it is introduced. In the next month, the manufacturer will be asking consumers in large cities in the Midwest area, including Chicago, to test the digital camera, to list the attributes that make this new brand of digital camera unique from other digital cameras they have tried, and to test the advertisement. We will give you an example of the potential print advertisement created for Classa. We want to know your feelings and your thoughts about the brand as well as the advertisement. You are in a small group of students whose opinions will be evaluated. Because your opinions are very important to us, we will be offering you a gift for your valuable view.

After reading the cover story, participants were given the print advertisement in which types of information were manipulated, followed by a series of questions regarding participants' thoughts and comments about the ad and brand. Finally, participants completed a set of manipulation checks and a holistic thinking measurement scale (Choi et al. 2003).

Independent Variables

Cultural Orientation. Past studies suggest that Chinese tend to think holistically, whereas Americans tend to think analytically (Abel and Hsu 1949; Morris, Nisbett, and Peng 1995; Morris and Peng 1994). Therefore, American and Chinese students in a large Midwest university participated in this study.

Types of Information. The analytic and holistic ads were manipulated by using different types of information in the ad. The analytic ad contained four pieces of product attribute information—vibration reduction (VR), 8.1 megapixel, bright 2.5 inch LCD, 3.5X optical zoom—in addition to brand and model information. I chose these four attributes because they were presented in the real ad on which my study was based. Moreover, the ads of digital cameras in magazines and on the Internet also highlight these key attributes. Third, in Pilot Study 1, I asked 14 Caucasian American students and 14 Chinese students to list the attributes of the digital camera. Resolution, screen, and zoom were among the top five most listed features for both Americans and Chinese. Holistic ads contained price information (\$349.99), availability

information (available at Circuit City and Best Buy), company information (address, www.classausa.com, 1-800-4-CLASSA) as well as information on four basic product attributes mentioned above. Price, availability, and company information, etc., were very common in ads in East Asian cultures (Hong, Muderrisoglu, and Zinkhan 1987; Madden, Caballero, and Matsukubo 1986; Rice and Lu 1988).

Dependent Variables

Cognitive Responses. Two bilingual raters who were blind to the purpose of this study coded the cognitive responses as attribute-related thoughts or product-related thoughts. Disagreements were solved by discussion between them. Attribute-related thoughts are thoughts related to attributes such as resolution, zoom, camera size/shape/design, functions/features, memory type, LCD, battery, wireless transmission and printing, etc. I defined these features as attribute-related thoughts because they are inherent parts of the real product. Second, they are features identified by manufacturers and retailers (e.g., Canon, Nikon, Best Buy, Circuit City, Microcenter, resellerratings.com, etc.), and students in pilot Study 1. Product-related thoughts are those related to presented products, such as brand name, price, availability, etc., but not related to attributes or the picture in the ad. I defined these thoughts as product-related thoughts because they are augments of the product. Moreover, in Pilot Study 1, nobody listed them as attributes. Third, after checking the web sites of the above-mentioned manufacturers and retailers, I did not find any sites listing them as attributes. Raters also coded the thoughts as either within-brand thought or between-brand thought, where within-brand thoughts are those related to the advertised brand only and between-brand thoughts are those involving other brands.

Results

The hypotheses were tested initially based on a 2 (culture: American vs. Chinese) x 2 (ad: analytic vs. holistic ad) x 2 (expertise: expert vs. novice) ANCOVA with years of owning a digital camera as covariate. Participants completed a three-item expertise questionnaire on a 7-point Likert scale from 1 (strongly disagree) to 7 (strongly agree), and those with average score on expertise equal to or larger than 4.0 were classified as expert. However, the effects of expertise and covariate generally were not significant. Unless otherwise specified, the three-way ANCOVA collapsed to a two-way ANOVA, and $df = 1, 115$.

Manipulation Check. Participants completed the ten-item holistic measurement scale on a 7-point Likert scale from 1 (strongly disagree) to 7 (strongly agree). As anticipated, the responses to the holistic thinking scale (Cronbach's $\alpha = 0.64$) showed that Caucasian Americans were significantly less holistic than Chinese ($M_{\text{American}} = 4.69$, $M_{\text{Chinese}} = 4.97$; $F(1, 117) = 5.605$, $p < .05$). Reliability was a little low. However, the reliabilities of cultural difference measurement scales generally are low (see Singelis 1994 for detailed review).

Attribute-Related Thought. The inter-judge reliability was 93% for attribute-related thought (conflicts were solved by discussion). A 2 (culture) x 2 (ad) x 2 (expertise) ANCOVA with number of attribute-related thought as the dependent factor revealed only a marginal main effect of expertise ($M_{\text{novice}} = 0.42$, $M_{\text{expert}} = 0.82$; $F(1, 110) = 3.335$, $p < .08$). Although experts generated more attribute-related thoughts than novices, the effect of culture was not mediated by

expertise. So a 2 (culture) x 2 (ad) ANOVA was conducted again. A 2 (culture) x 2 (ad) ANOVA with number of attribute-related thought as dependent factor revealed no significant main effect or interaction effect (see Table 1 for means and standard deviations). H1a was not supported.

Product-Related Thought. A 2 (culture) x 2 (ad) ANOVA with number of product-related thought as the dependent factor was conducted (see Table 1 for means and standard deviations). A significant main effect of culture ($F = 10.292, p < .01$) and ad ($F = 4.530, p < .05$) emerged. A significant interaction effect also emerged ($F = 5.007, p < .05$; see Figure 1). Chinese generated more product-related thoughts than Americans ($M_{\text{Chinese}} = 0.90, M_{\text{American}} = 0.48$). Four contrasts were analyzed since the interaction was significant. Chinese generated more product-related thoughts when exposed to the analytic ad than when exposed to the holistic ad ($M_{\text{analytic ad}} = 1.17, M_{\text{holistic ad}} = 0.61; F = 9.310, p < .01$). H1b was supported. But for American participants, there was no significant difference between the analytic and the holistic ad ($M_{\text{analytic ad}} = 0.47, M_{\text{holistic ad}} = 0.48; F = .006, p > .1$), so H1b was supported.

Within- versus Between-Brand Thought. Thoughts were classified into either within-brand or between-brand thought. Inter-judge reliability was 94%. A 2 (culture) x 2 (ad) ANOVA with number of within-brand thoughts as the dependent variable was conducted (see Table 1 for means and standard deviations). A significant main effect of ad ($F = 7.342, p < .01$) emerged. A significant culture x ad interaction effect also emerged ($F = 17.161, p < .01$; see Figure 2). Four contrasts were analyzed since the interaction effect was significant. Pooled error was used. Chinese generated more within brand thoughts when exposed to the analytic ad than when exposed to the holistic ad ($M_{\text{analytic ad}} = 3.03, M_{\text{holistic ad}} = 1.71, F = 22.907, p < .01$). H2 was supported. For American participants, there was no significant difference between the analytic ad and the holistic ad ($M_{\text{analytic ad}} = 2.00, M_{\text{holistic ad}} = 2.28; F = 1.053, p > .1$). H2 was also supported.

In order to examine H2 closely, I conducted z-tests to compare the ratios of within-brand thought to total thought (WBR; see Figure 3). Chinese were more likely to generate more within-brand thought when exposed to the analytic ad than when exposed to the holistic ad ($p_{\text{analytic ad}} = 93.9\%, p_{\text{holistic ad}} = 73.4\%, z = 3.672, p < .01$). But for American participants, there was no significant difference between these two types of ad. H2 was supported.

Ratio of Attribute-Related to Product-Related Thought. As expected, for the analytic ad, the ratio of attribute-related thought to product-related thought is significantly higher for American participants ($p_{\text{American}} = 1.46; p_{\text{Chinese}} = 0.63; \chi^2(1) = 3.922, p < .05$; see Figure 4). However, for holistic ad, there is no significant difference between American and Chinese participants ($p_{\text{American}} = 1.57; p_{\text{Chinese}} = 0.88; \chi^2(1) = 1.384, p > .2$). So H3 was only partially supported.

Table 1
Study 1 Results: Means and Standard Deviations

| | Americans | | Chinese | |
|------------------|-------------|-------------|-------------|-------------|
| | Analytic Ad | Holistic Ad | Analytic ad | Holistic Ad |
| Thought | | | | |
| Attribute | 0.69(0.93) | 0.76(1.21) | 0.73(0.94) | 0.54(0.88) |
| Product | 0.47(0.57) | 0.48(0.57) | 1.17(0.79) | 0.61(0.83) |
| Peripheral | 1.06(0.88) | 1.28(0.88) | 1.33(0.80) | 1.14(0.80) |
| AP ¹ | 1.46 | 1.57 | 0.63 | 0.88 |
| Within-Brand | 2.00(1.24) | 2.28(1.31) | 3.03(0.81) | 1.71(0.66) |
| WBR ² | 90.1% | 90.4% | 93.8% | 78.1% |
| n | 32 | 29 | 30 | 28 |

NOTE. – Standard deviations are in parentheses.

Ratio of attribute-related thought to product-related thought

². Ratio of within brand thought to total thought

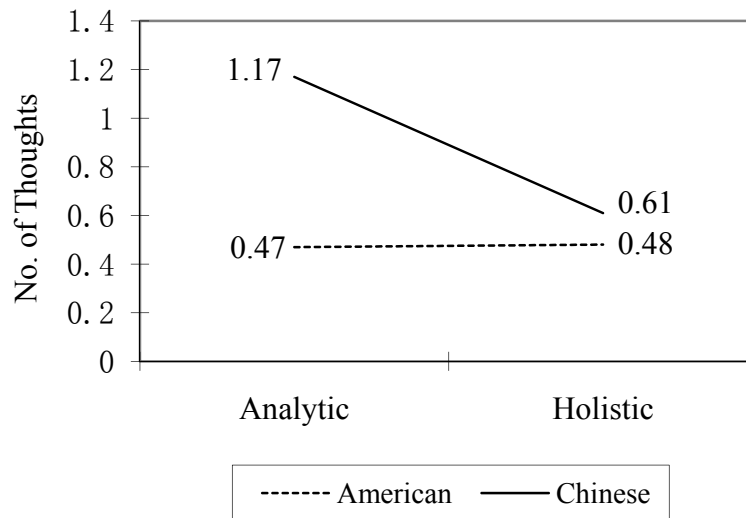


Figure 1 .Study 1 results: Culture x ad interaction for product-related thought

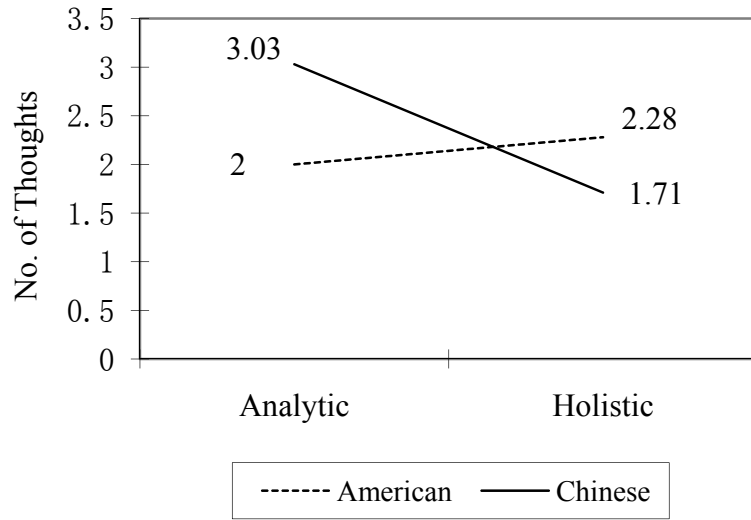


Figure 2. Study 1 results: Culture x ad interaction for within-brand thought

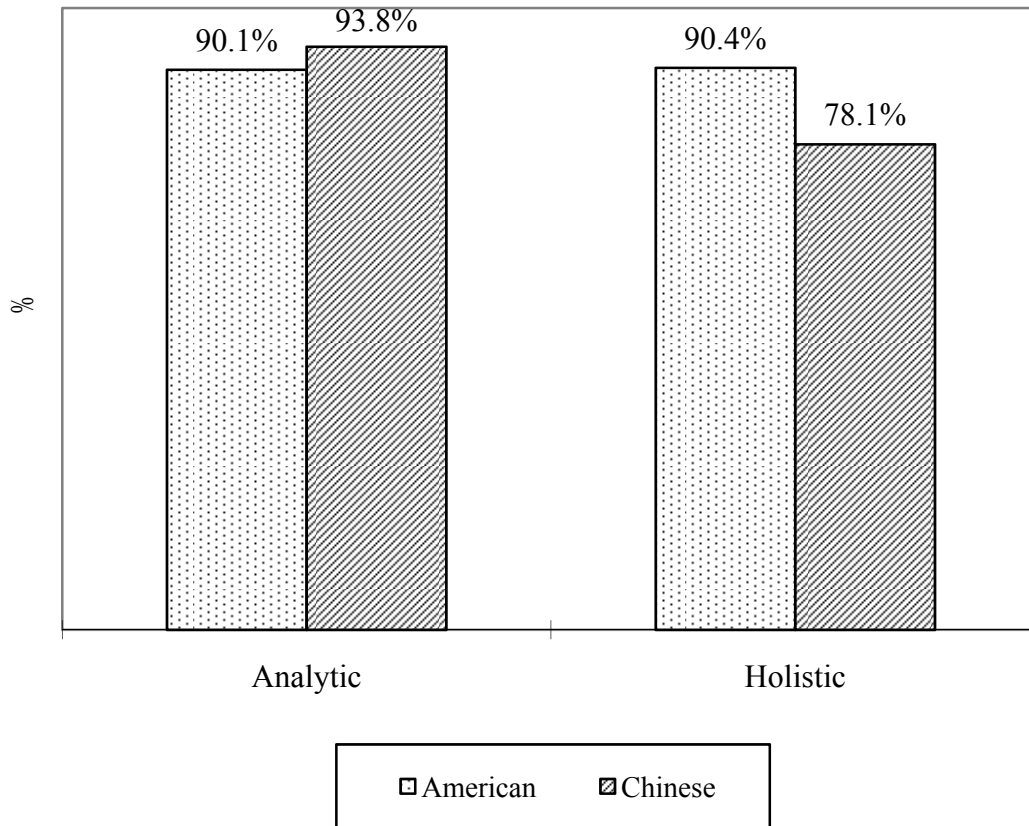


Figure 3. Study 1 results: Ratio of within-brand thought

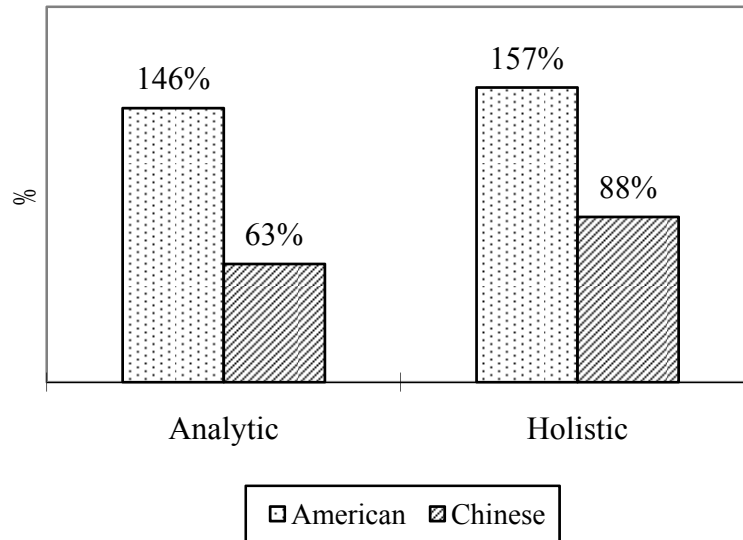


Figure 4. Study 1 results: Ratio of attribute-related to product-related thought

Discussion

My findings add to several confirmations of theoretically expected cultural differences in information processing. Chinese engage in broadly cognitive elaboration and tend to generate more thoughts (product-related) when exposed to analytic ads than when exposed to holistic ads. However, Americans are less likely to do so. Moreover, analytic ads, compared with holistic ads, lead Chinese to generate more within-brand thoughts. But such an effect does not exist for Americans.

Findings also show that holistic thinking is the dominant way of thinking for Chinese, while analytic thinking is the dominant one for Americans. However, both Chinese and Americans engage in two ways of thinking. Americans engage in holistic thinking and Chinese engage in analytic thinking to some extent.

STUDY 2

Krull (1993) and Lee, Hallahan, and Herzog (1996) found that when persons can devote more cognitive effort to the events they want to explain, the extremity of persons' initial way of thinking will be attenuated. Americans may engage in more holistic thinking while East Asians may engage in more analytic thinking. So Study 1 had a limitation because it used only a camera as a target product to check the effect of culture (analytic vs. holistic) on information processing, and ignored the fact that different products may involve different degrees of risk. High-risk products such as automobiles, jewelry, appliances, etc., involve large amounts of money, complicated decision-making process, etc. Thus, consumers may invest much more time and effort to search information, evaluate the alternatives, and consider more factors when making purchasing decisions for high-risk products than for medium-risk products such as a camera, television, watch, etc. As a result, Westerners may engage in greater holistic thinking when they need to make purchasing decisions for high-risk products. Similarly, East Asians may engage in

greater analytic thinking. So the difference between Westerners and East Asians in terms of product-related thought and attribute-related thought should be weaker in high-risk product situations than in medium-risk product situations. Therefore, I expect:

H4: Compared with ads of medium risk products, ads of high risk products will increase (a) for Westerners the number of product-related thought, and (b) for East Asians the number of attribute-related thought.

H5: Compared with ads of medium risk products, ads of high risk product will make the difference between Westerners and East Asians weaker in terms of (a) the number of product-related thought, and (b) the number of attribute-related thought.

Subjects and Design

In order to test my hypotheses, a 2 (culture: American vs. Chinese) x 2 (risk: medium vs. high) between-subject factorial design was used for this study. Thirty-eight American and 41 Chinese students were selected.

Stimuli

An online ad of a car was adapted for this study. In the ad, a car is parked beside a house and there are trees and clouds in the background. A pretest showed that the background was comparable with that used in Study 1. A fictitious name (Classa) was used to minimize the effect of prior experience with established brands. Moreover, only the analytic ad was used in this study because Study 1 had shown that the holistic way of thinking of Chinese is not activated when exposed to holistic ads. The analytic ad for the car contained four pieces of attribute information: 205 horsepower 2.4 liter engine, Bose audio system, Vehicle stability system, keyless access with push-button start. Although only horsepower and audio system were among the top two most listed features in Pilot Study 2, the other two features also are common in real ads. Moreover, no students in Pilot Study 2 mentioned brand, price, etc., as attribute information. The analytic ad for the digital camera that was used in Study 1 was used again in this study.

Procedure

The procedure was identical in most degrees to that used in Study 1. Participants completed a vividness and risk measurement scale in this study.

Independent Variables

Cultural Orientation. Chinese and American students were selected as participants in this experiment.

Degree of Risk. A car was identified as a high-risk product and a digital camera was identified as a medium-risk product by Mueller (1987). So, degree of risk was manipulated by using the car for high-risk products and the camera for medium-risk products. Participants were

asked to rate whether the purchase of a car/digital camera involves a large amount of risk/money/time/effort, and complicated decision-making process on a 7-point Likert scale from 1 (strongly disagree) to 7 (strongly agree).

Dependent Variable

Two bilingual raters, blind to the purpose of this study, were used to code the cognitive responses into attribute-related, product-related, or peripheral thoughts. Conflicts were solved by discussion.

Results

The hypotheses were tested based on a 2 (culture: U.S. vs. China) x 2 (risk: medium vs. high) ANOVA (and unless otherwise specified, $df = 1, 75$)

Manipulation Checks. Participants completed the ten-item holistic measurement scale on a 7-point Likert scale from 1 (strongly disagree) to 7 (strongly agree). As anticipated, the responses to the holistic thinking scale (Cronbach's $\alpha = 0.72$) showed that Caucasian Americans were significantly less holistic than Chinese ($M_{\text{American}} = 4.69$, $M_{\text{Chinese}} = 4.99$; $F(1, 77) = 4.119$, $p < .05$).

Participants completed the four-item vividness scale to compare the backgrounds of these two ads. As expected, responses to the vividness scale (Cronbach's $\alpha = 0.72$) revealed no significant effect. Therefore, background should not be a major concern influencing the information processing strategy in two different ads.

Third, responses to the risk measurement scale were reliable (Cronbach's $\alpha = 0.93$). As expected, 2 (culture) x 2 (ad) ANOVA with mean of risk scale as a dependent variable only showed a significant main effect of ad ($M_{\text{high}} = 5.31$, $M_{\text{medium}} = 3.25$; $F(1, 75) = 90.212$, $p < .01$). So the purchasing of a car is riskier than that of a digital camera.

A 2 (culture) x 2 (risk) ANOVA with number of total thought as the dependent variable was conducted. Only a significant main effect of ad emerged ($M_{\text{camera}} = 2.78$, $M_{\text{car}} = 3.33$; $F = 4.444$, $p < .05$). Therefore, participants devoted more cognitive effort when exposed to ads for high risk products than when exposed to ads for low risk products.

Attribute-Related Thought. Inter-judge reliability was 94% for attribute-related thought. A 2 (culture) x 2 (riskiness) ANOVA with attribute-related thought as the dependent variable was conducted (see Table 2 for means and standard deviations). A significant main effect of culture ($F = 4.769$, $p < .05$) and ad ($F = 11.350$, $p < .01$) emerged. Americans generated more attribute-related thought than Chinese ($M_{\text{American}} = 1.34$, $M_{\text{Chinese}} = 0.85$; $F = 4.769$, $p < .05$). Participants generated more attribute-related thought when exposed to the ad of a car than when exposed to the ad of a camera ($M_{\text{camera}} = 0.73$, $M_{\text{car}} = 1.46$; $F = 11.350$, $p < .01$). In contrast to my expectation, cultural difference in the high-risk product category was stronger rather weaker. An interaction effect also emerged ($F = 4.336$, $p < .05$; see Figure 5). Four contrasts were conducted since the interaction was significant. For Chinese, there was no significant difference between

the car ad and the camera ad ($M_{\text{camera}} = 0.71$, $M_{\text{car}} = 1.00$; $F = 0.860$, $p > .1$) although Chinese generated a little more attribute-related thoughts when exposed to the ad of car. Americans generated more attribute-related thoughts when exposed to the ad of a car than when exposed to the ad of a camera ($M_{\text{camera}} = 0.74$, $M_{\text{car}} = 1.95$; $F = 14.322$, $p < .01$). H4b and H5b were not supported.

Product-Related Thought. The inter-judge reliability for product-related thought was 89%. A 2 (culture) x 2 (riskiness) ANOVA with number of product-related thought as the dependent variable was conducted. Only a significant main effect of culture ($M_{\text{American}} = 0.45$, $M_{\text{Chinese}} = 1.17$; $F = 22.605$, $p < .01$) emerged. Chinese considered more holistic information than Americans. For Americans, there was no significant difference between the ad of camera and the ad of car ($M_{\text{camera}} = 0.42$, $M_{\text{car}} = 0.47$; $p > .1$). The cultural difference was not weakened. H4a and H5a were not supported.

Discussion

Surprisingly, the findings of this study showed that cultural variation was deeper rather than weaker in the high-risk product category. Americans engaged in more analytic thinking when facing high--risk products whereas there was no significant difference for Chinese between medium and high-risk products although Chinese engaged in a little more holistic thinking. Moreover, pilot study 2 also excluded a possible explanation that participants may be more familiar with the car (participants in pilot study 2, Americans and Chinese, listed about the same number of attribute for the digital camera and car; digital camera: $M_{\text{American}} = 5.9$, $M_{\text{Chinese}} = 6.1$; $p > .1$; Car: $M_{\text{American}} = 5.4$, $M_{\text{Chinese}} = 5.5$; $p > .1$). This surprising finding may be due to the nature of the purchase. In order to make a wise purchase decision, consumers pay more attention to the attributes of the product.

According to the multistage theory (Gilbert 1989; Gilbert, Pelham, and Krull 1988; Kahneman 2003) and findings of Krull (1993) and Lee, Hallahan, and Herzog (1996), the extremity of thinking in fast, automatic, and effortless step 1 may be attenuated by a deliberately monitored and controlled cognitive process in step 2. However, this model was not supported in this study even though both Chinese and Americans engaged in another way of thinking to a slight degree. It is quiet likely that individuals are accustomed to think by habit and it is not easy to change a habit, especially a thinking habit, in a natural situation. Another possible explanation is that individuals in this study didn't think hard enough so that their habitual thinking pattern did not register a change. However, the latter argument is less plausible because participants were measured to have invested much time to read the ad and then generated several thoughts related to the ad.

Table 2
Study 2 Results: Means and Standard Deviations

| | American | | Chinese | |
|------------|------------|------------|------------|------------|
| | Camera | Car | Camera | Car |
| Thought | | | | |
| Attribute | 0.74(0.65) | 1.95(1.22) | 0.71(0.72) | 1.00(1.21) |
| Product | 0.42(0.51) | 0.47(0.61) | 1.05(0.67) | 1.30(0.86) |
| Peripheral | 1.37(0.76) | 1.11(0.88) | 1.24(0.62) | 0.85(0.67) |
| n | 19 | 19 | 21 | 20 |

NOTE. – Standard deviations are in parentheses.

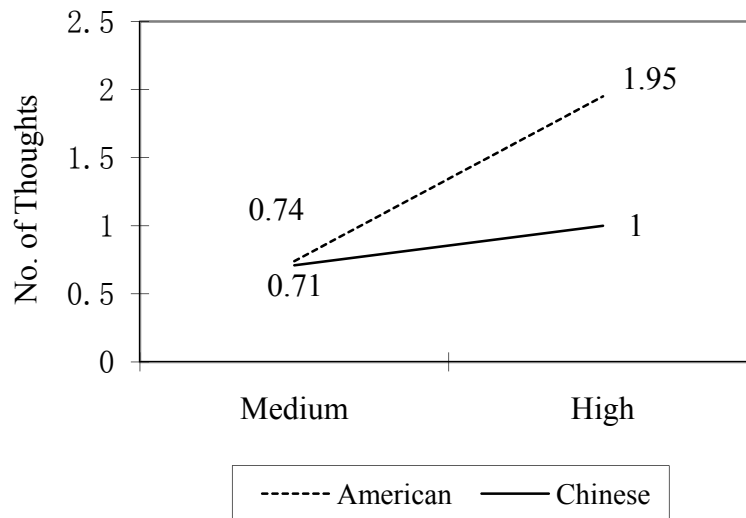


Figure 5. Study 2 results: Culture x ad interaction for attribute-related thought

STUDY 3

Although Study 1 found cultural differences in ad information processing by using the analytic ad and the holistic ad, findings of Study 1 may be subject to the criticism that the analytic way of thinking of Westerners is not activated because four important pieces of attribute information were presented in the ad. So the purpose of this study is to check the difference between analytic ads with only one piece of attribute information (henceforth “AA1”) and analytic ads with four pieces of attribute information (henceforth “AA4”). Namely, this study was to check whether analytic thinking of Westerners would be inactivated when they were exposed to AA4.

Since Westerners tend to think about attributes in isolation, given their tendency to focus on the analytic parts, not the holistic, they may engage in analytic processing, or piecemeal processing, no matter whether exposed to AA4 or AA1 (ads without any attribute information

are rare in the U.S.). Therefore, I expect that for Westerners, there is no significant difference in terms of attribute-related thought between AA1 and AA4. In contrast, when exposed to AA1, holistic thinking of East Asians may be exacerbated because they will consider additional attribute information not contained in the ad. Therefore, I hypothesize:

H6: There will be no significant difference in terms of the number of attribute-related thought between AA1 and AA4 for Westerners.

H7: Compared with AA4, AA1 will lead East Asians to generate a greater number of attribute-related thought.

Design

To test my hypotheses, a 2 (culture: American vs. Chinese) x 2 (ad: AA1 vs. AA4) between-subject factorial design was used.

Stimuli

The analytic ad used in Study 1 was adapted for this study (86% of Chinese and 93% of Americans in this study owned a digital camera; $\chi^2(1, N = 82) = 0.402, p > .1$). The AA4 was the same as the analytic ad used in Study 1, but the AA1 contained only one piece of attribute information, vibration reduction (VR).

Subjects and Procedure

Forty Caucasian American students and 42 Chinese students in a large Midwest university who had not been in previous studies were selected. The procedure was identical in most respects to that used in Study 1.

Results

The hypotheses were tested based on a 2 (culture: American vs. Chinese) x 2 (ad: AA1 vs. AA4) ANOVA (and unless otherwise specified, $df = 1, 78$).

Manipulation Check. As expected, responses to the holistic thinking scale (Cronbach's $\alpha = 0.70$) showed that Caucasian Americans were significantly less holistic than Chinese ($M_{\text{American}} = 4.61, M_{\text{Chinese}} = 4.91; F(1, 80) = 4.775, p < .05$).

Attribute-Related Thought. Inter-judge reliability was 93% for attribute-related thought. A 2 (culture) x 2 (ad) ANOVA with attribute-related thought as the dependent variable revealed no significant effect, although both Americans and Chinese generated a little more attribute-related thought when exposed to the AA1. Neither Americans nor Chinese engaged in significantly greater cognition when exposed to the AA1. H6 was supported but H7 was not supported.

Product-Related Thought. Inter-judge reliability was 91% for product-related thought. A 2 (culture) x 2 (ad) ANOVA with amount of attribute-related thought as the dependent variable showed only a significant main effect of culture ($M_{\text{Chinese}} = 1.28$, $M_{\text{American}} = 0.55$; $F = 21.564$, $p < .01$). The finding in Study 1 was repeated. Americans are more analytic and Chinese are more holistic.

Table 3
Study 3 Results: Means and Standard Deviations

| | American | | Chinese | |
|------------|------------|------------|------------|------------|
| | AA1 | AA4 | AA1 | AA4 |
| Thought | | | | |
| Attribute | 0.85(0.81) | 0.68(0.78) | 0.85(0.75) | 0.50(0.76) |
| Product | 0.55(0.69) | 0.55(0.60) | 1.45(0.83) | 1.10(0.72) |
| Peripheral | 1.25(1.29) | 1.05(1.00) | 1.25(0.64) | 1.40(0.75) |
| n | 20 | 20 | 20 | 22 |

NOTE. – Standard deviations are in parentheses.

Discussion

The findings in this study excluded a possible explanation that the analytic way of thinking of Americans may be inactivated in AA4. Americans tend to think about attribute information in isolation. Therefore, the findings in Study 1 should be supported. However, this study did not support my expectation that Chinese would generate a greater amount of attribute-related thought when exposed to AA1. This shows that Chinese still tend to think holistically, not analytically.

GENERAL DISCUSSION

My findings add several confirmations of theoretically expected cultural differences in information processing, attitude, and memory. Moreover, my studies also found some surprising results. In Study 1, I found that Chinese engage in broader cognitive elaboration and tend to generate more holistic thoughts (product-related thought) when exposed to analytic ads than when exposed to holistic ads. However, Americans are less likely to do so. Americans tend to think analytically. So the ratio of attribute-related to product-related thought is higher for me. Moreover, analytic ads, compared with holistic ads, lead Chinese to generate more within-brand thought. But such an effect does not exist for Americans. Study 2 found that cultural variation tends to be deeper rather than weaker in the high-risk product category. Study 3 enhanced the finding in Study 1 by comparing American and Chinese responses to AA1 and AA4.

My findings extend the findings in cross-cultural psychology by showing that the holistic-analytic framework also holds in verbal information processing. Moreover, my findings show the situation in which the holistic thinking of Chinese is inactivated or at least not salient. Third, my study shows that both Americans and Chinese may engage in two ways of thinking. Fourth, my findings also suggested that the two-step model might not work as many scholars expected, at least in this study. So the two-step model should be changed to a three-step model (see Figure 6). Step 1 should be a fast and automatic cognitive process that is governed by habit

of thinking. Individuals may engage in greater cognitive elaboration given different situations (e.g., Choi and Nisbett 1998; Lee, Hallahan, and Herzog 1996), different goals (e.g., Krull 1993; Quattrone 1982), different motivations, the use of different priming techniques (e.g., Monga and John 2007), and availability of mental resources; however, they will extend their habitual thinking mode in step 2. In step 3, individuals may engage in deliberate elaboration so that they may use another way of thinking to some extent. However, many individuals may not reach this step because they are not accustomed or motivated to think harder. Some individuals may reach step 3 after controlling their cognitive process deliberately or after specific training to do so.

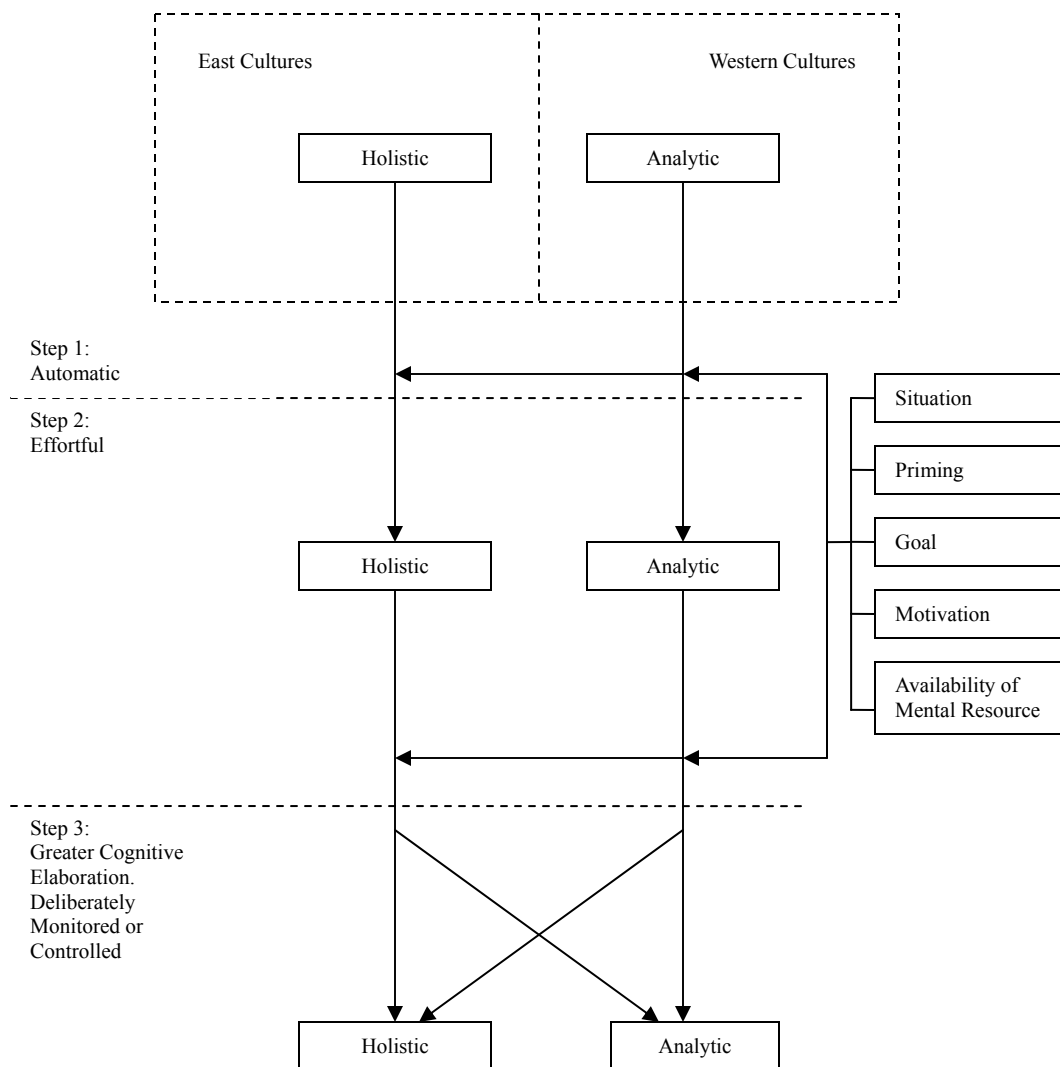


Figure 6. The model of analytic-holistic framework

My results contribute to the set of growing findings in cross-cultural consumer behavior by applying the analytic-holistic framework in a marketing context, especially in information processing. Although there is a strong foundation of the analytic-holistic framework in cross-cultural psychology, its application in a marketing context, especially in information processing,

is very limited. Monga and John' study (2007) is the only recent example of using the analytic-holistic framework in a marketing context to examine the evaluation of brand extension.

My findings also add to the consumer research literature by showing that consumers from different cultures respond differently toward ads with different types of information. Prior studies paid more attention to effects of vividness, color, layout, information consistency, etc., on information processing. However, my findings show that ads with different types of information may have different effects on readers. Analytic ads tend to encourage Chinese to think elaborately while holistic ads have no such effect.

My study used only students to check the effect of culture on information processing. So generalization to other age groups should be cautious. Second, my study relied only on two products—digital camera and car—so the generalization of findings to other categories may not be reliable. Future studies should examine cultural variations in other product categories. Third, my study used only Chinese participants in the East Asian category, so future research should examine the effect of culture on information processing by using participants from other East Asian cultures, such as Koreans or Japanese. Fourth, my study did not examine situations in which habitual modes of thinking would be attenuated. Fifth, future study should study when individuals may change their ways of thinking.

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