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— General Article —

Hindsight Bias: A Cross-Cultural Analysis

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ABSTRACT

We examined whether differences found between Japanese and North Americans on a variety of self-serving biases would also be observed for the hindsight bias. In fact, Japanese and Canadians exhibited similar hindsight biases under memory instructions, and Canadians showed only a marginally more pronounced bias than Japanese under hypothetical instructions (where self-serving motivations appear more implicated). We suggest that cultural differences between Japanese and North Americans in distorted cognitions are most pronounced when self-enhancing opportunities become salient.

Key words: hindsight bias; culture; Japan; self-serving biases

The hindsight bias, that is the tendency to feel that one "knew-it-all-along," is a relatively common experience. Events are often viewed as more predictable and inevitable in hindsight than in foresight (Fischhoff, 1975). For example, clues to the identity of a murderer given throughout a suspense movie seem obvious after the murderer is known. Similarly, after the World Series is over one can hear many people claiming that they knew the winning team was a sure thing weeks in advance.

Researchers have been successful in recreating this phenomenon in the laboratory (for a review see Hawkins & Hastie, 1990). The hindsight bias has been demonstrated across a wide array of knowledge domains: for example, medical diagnoses (Arkes, Wortmann, Saville, & Harkness, 1981), elections (Leary, 1982), news events (Fischhoff & Beyth, 1975; Pennington, 1981), outcomes of scientific experiments (Slovic & Fischhoff, 1977), and general knowledge (Fischhoff, 1977). Moreover, people exhibit the bias despite being warned specifically about its effects (Fischhoff, 1977). The hindsight bias thus appears to be a robust distortion typical in everyday life.

As with much psychological research, the vast majority of data on the hindsight bias has been collected from North Americans. In fact, we are unaware of any cross-cultural investigations of its prevalence. At this point, then, the possibility remains that the hindsight bias may be a construct that is affected and shaped by one's cultural environment. The purpose of the present study is to examine whether the hindsight bias exists at a comparable level be-

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tween two distinct cultures: namely, Japanese and Canadian.

Currently the hindsight bias is viewed, by and large, to be an automatic cognitive bias with a small motivational component (Campbell & Tesser, 1983; Hawkins & Hastie, 1990; Hell, Gigerenzer, Gauggel, Mall, & Muller, 1988). Not surprisingly, most research has focused upon the cognitive component. Typically, hindsight biases are regarded as inherent and unavoidable consequences of information processing and storage. Outcome information is immediately and automatically integrated into the individual's knowledge structure such that they are unable to distinguish between what they knew before and after they encountered the outcome information (Fischhoff, 1975).

Two motivational factors have been argued to play a minor role in the hindsight bias. First, people may be motivated to believe that the world is predictable thereby leading them to assume that they knew the outcomes of events before they actually occurred (Campbell & Tesser, 1983; Walster, 1967). A second motivation may be to believe, or to lead others to believe, that one is more knowledgeable than is actually the case (Campbell & Tesser, 1983).

The broad range of evidence for the hindsight bias suggests that it may be an inherent part of human thinking. It seems reasonable to conclude that the automatic integration of outcome information and motivations to view the world as predictable and oneself as knowledgeable are common to all. However, the tendency to assume universality in psychological processes often results in the neglect of important cultural factors. An example of this can be seen in the literature on self-serving biases (i.e., tendencies to view oneself in unrealistically positive terms). These distorted self-perceptions are so common in the North American psychological literature they have been argued to be endemic to the human condition, whether they are understood as errors inherent in the course of information-processing (Miller & Ross, 1975), egocentric knowledge organizations that are products of an "intrapsychic evolution" (Greenwald, 1980), or self-protective tactics that foster attainment of mental health (Taylor & Brown, 1988).

However, cross-cultural studies have demonstrated that self-serving biases are not universal. For example, in contrast to North Americans, Japanese do not show reliable false uniqueness biases (Markus & Kitayama, 1991a), attributional biases (Kashima & Triandis, 1986; Yamauchi, 1990), or unrealistic optimism biases (Heine & Lehman, 1995). Apparently, this is because the two cultures differ with respect to self-concepts, leading to different psychological desires and goals.

For example, North American culture emphasizes the integrity of the individual, thus leading to the development of an independent view of self (Markus & Kitayama, 1991b). Such individuals are motivated to view themselves as autonomous, self-contained entities that are distinct from others. Self-serving biases can be seen as products of this motivation as they highlight the competency and autonomy of individuals (Heine & Lehman, 1995).

Japanese culture, on the other hand, emphasizes the importance of interpersonal relations among one's ingroup, thereby fostering the attainment of an interdependent view of self (Markus & Kitayama, 1991b). Such individuals are motivated primarily to view themselves as having a secure sense of belonging with significant others. The interdependent self can thus be seen as being motivated to "fit in" rather than to "stick out" (Takata, 1992). Self-serving biases, however, tend to isolate the interdependent individual from his or her interpersonal network. This apparent opposition to interdependent cultural values can be seen to account for the pronounced lack of self-serving tendencies within Japanese culture (Heine & Lehman, 1995).

As cross-cultural research on distorted cognitions has focused almost exclusively on motivational biases, it seems important to exam-

ine whether cultural differences would extend to include an information-processing bias that is largely cognitive (i.e., the hindsight bias). The present study explored this possibility. Specifically, we investigated whether Japanese would demonstrate as strong a hindsight bias as North Americans (Canadians). If Japanese fail to show the hindsight bias, then this would suggest that cultural differences in distorted cognitions may extend to largely cognitive-driven biases. On the other hand, if Japanese exhibit a comparable hindsight bias to Canadians, this would suggest that such cultural differences may be most pronounced with biases that are motivationally-driven (e.g., Heine & Lehman, 1995; Markus & Kitayama, 1991a).

There are two general approaches typical of hindsight bias studies. In the first, participants estimate the probability that they have correctly identified the outcome of an event. The second approach has participants estimate the probability that their answers to almanac-type information questions are correct. Although the resultant phenomena for these two approaches are essentially the same, the hindsight bias elicited by the almanac-type questions is usually of a larger magnitude (Hawkins & Hastie, 1990). The present study employed this latter approach.

Following the methodology of Fischhoff (1977) and Campbell and Tesser (1983) the present study employed two separate measures of hindsight bias. The two measures differed in terms of the instructions given to participants. The first measure used what Fischhoff (1977) called "hypothetical" (HYP) instructions. Participants were given the correct answers to almanac-type questions and were asked to indicate how they would have responded to the questions had they not been provided with the answers. The second measure employed "memory" (MEM) instructions. Participants first answered almanac-type questions and then later were provided with the correct answers and instructions to recall, as accurately as they could, what their original responses were. In both cases past research has shown that participants overestimate their knowledge (Campbell & Tesser, 1983; Fischhoff, 1977), as compared to either a control group that was not provided with the correct answers (hypothetical instructions) or their own pre-outcome estimates (memory instructions).

Method

Participants

The Japanese sample consisted of exchange students from Ritsumeikan University in Kyoto, Japan studying at the University of British Columbia (UBC). A few days after their arrival in Canada, the 100 students in this group were invited to take part in the study. Eighty-two of the students (36 males and 46 females) agreed and completed the hindsight bias measures.

An equal number of Canadian participants were obtained from introductory psychology classes (50 males and 32 females). To ensure that we were contrasting the Japanese sample with a "Western" sample we restricted the Canadian sample to those who were born in either Canada or the United States, whose parents were born in Canada, the United States, or a European country, and who declared their ethnicity to be that of a European culture.

Procedure

Participants were informed that we were interested in comparing the areas of knowledge of people from different cultures. We created HYP and MEM measures of the hindsight bias using scaled true/false almanac-type questions. An example question was "The liver is the largest organ in the human body," and respondents indicated their response on a Likert scale with answers ranging from 1 (Definitely True) to 12 (Definitely False). Great care was taken in attempting to select questions that were equally accessible to both Canadians and Japanese. Toward this end, the first author worked together with a Japanese research assistant in selecting items that reflected general knowledge that was

not specific to either North America or Japan.

Participants completed two questionnaires. The first questionnaire consisted of 40 almanac-type questions (hereafter referred to as the "Base set"), followed by a large number of filler items. These filler items took approximately 30 minutes to complete. After collecting the first questionnaire, participants received the second questionnaire. In the first part of this second questionnaire, participants completed another set of 40 true/false items on 12-point Likert scales (the "HYP set"). However, for this set they were told what the correct answers were. Participants were asked to indicate how they would have responded *if they had not been told the correct answer.* In the latter half of the second questionnaire, participants were given the original 40 true/false questions from the Base set in the first questionnaire, this time along with the correct answers (the "MEM set"). Participants were asked to recall and indicate their answers from the Base set. Thus, in total, participants completed three sets of true/false questions, two of which the same. Moreover, the two different sets of questions (the Base set and the HYP set) were counterbalanced across participants, so that the questions in the Base set for one half of the participants were the same questions as those in the HYP set for the other half of the participants. For each set of questions, the correct answers were "True" for exactly half of the questions.

Following the methodology of other hindsight bias studies employing almanac-type questions (e.g., Campbell & Tesser, 1983; Fischhoff, 1977), participants' total scores for the three sets of questions were a function of their accuracy and their confidence in their answers. If participants answered on the correct side (i.e., true or false) of the 12 point distribution, they were given between 1 and 6 points depending on their confidence. For example, if the correct answer was true, participants were given 6 points for answering "1" (Definitely true) and only 1 point for answering "6" (Have no idea but will guess true). If participants answered on the incorrect side of the 12 point distribution, between 1 and 6 points were subtracted from their total score depending on their confidence. For example, if the correct answer was true, 6 points were subtracted for answering "12" (Definitely false) and only 1 point was subtracted for answering "7" (Have no idea but will guess false). These points were summed over all 40 items to give participants a total score for each set.

Japanese participants completed Japanese versions of the questionnaire. The original English versions were translated into Japanese and then back-translated into English by a second translator to ensure comparability and equivalence in meaning (Brislin, 1970).

Calculation of the Dependent Measures

Two different measures of hindsight bias were examined. The first measure, the HYP bias, was calculated by subtracting the participant's total score on the Base set of questions from his or her total score on the HYP set of questions. If participants received a higher score for the HYP set of questions, that is, if they indicated that they would have answered more of the questions correctly when given the correct answers than they answered correctly when no answers were provided, they demonstrated a HYP hindsight bias.[1] Because the Base set and HYP set were counterbalanced across participants, any differences in difficulty between these two sets of questions could not influence the magnitude of the HYP bias. The second measure, the MEM bias, was calculated by subtracting the participant's total score on the Base set of questions from his or her total score on the MEM set of questions where they had recalled their original responses. If participants received a higher score on the MEM set of

1 Unlike Campbell and Tesser's (1983) methodology, our measure of the "hypothetical" hindsight bias was a within-participant measure.

questions, that is, if they remembered answering more questions correctly than they actually had, they demonstrated a MEM hindsight bias.

Results

The ages of the two samples were not significantly different, Means= 19.6 and 19.9 for Canadians and Japanese, respectively, $F(1,162) = 1.02$, ns. However, the proportion of each gender was significantly different between the two cultures, $\chi^2(1, N = 164) = 4.79$, $p < .05$. Preliminary analyses revealed, however, that there were no significant sex differences nor sex by culture interactions for either of the two hindsight bias measures.

The selected questions proved to be equally accessible for the two cultures. Participants' total scores for the Base set were 32.1 and 33.0 for Canadians and Japanese, respectively, $F(1,160) < 1$. However, there was a marginal difference in participants' total scores for the HYP set, 65.0 and 54.9 for Canadians and Japanese, respectively, $F(1,160) = 3.54$, $p < .07$. That is, Canadians were marginally more likely than Japanese to indicate that they would have answered more questions correctly if they hadn't been shown the answers. No significant difference was found between participants' total scores on the MEM set, 41.85 and 40.35 for Canadians and Japanese, respectively, $F(1,158) < 1$.

The present study was successful in replicating a "knew-it-all-along" effect for both hindsight bias measures. A significant hindsight bias is revealed when the overall mean of any of the corresponding analyses is significantly greater than zero. First, analyses of the HYP maeasure revealed that the mean for the Canadian sample was 33.40, $t(80) = 7.57$, $p < .001$, and the mean for the Japanese sample was 22.18, $t(79) = 4.62$, $p < .001$. Hence, both cultures demonstrated a highly significant HYP hindsight bias.[2] The Canadian bias was marginally larger in magnitude than it was for the Japanese, $F(1,158) = 2.97$, $p < .09$, indicating a slight tendency for Canadians to be more biased than Japanese in estimating their knowledge on the HYP items. The MEM measure also resulted in significant effects for both cultures: The mean for the Canadian sample was 8.96, $t(80) = 4.87$, $p < .001$, and the Japanese mean was 8.37, $t(78) = 2.92$, $p < .01$. There were no differences in the magnitude of the MEM hindsight bias between the two cultures, $F(1,157) < 1$. Replicating past studies (Campbell & Tesser, 1983; Fischhoff, 1977), the HYP hindsight bias was more pronounced than the MEM hindsight bias for both cultures.

Discussion

Unlike research with self-serving biases (where North Americans exhibit significantly stronger biases than Japanese), there was no consistent evidence for a difference in hindsight biases between Japanese and Canadians (however, it should be noted that because the Japanese sample consisted of exchange students, their responses may not be representative of Japanese as a whole). Participants from both cultures demonstrated a pronounced "knew-it-all-along" effect when answering the almanac-type questions indicating that the hindsight bias is not only pervasive in Western cultures, but also exists in Eastern cultures. A plausible account for the two different patterns of results is that self-serving biases are predominantly motivationally-driven whereas the hindsight bias is predominantly cognitively-driven. Cultural differences in distorted cognitions appear to be especially pronounced in the motivational realm.

There were two marginally significant cultural differences with respect to participants' answers to the HYP set of questions. First, Canadians' total scores for the HYP set were marginally higher than those of the Japanese.

2 Each of the variables was summed over 40 items so the average size of the effect per question was 0.84 for Canadians and 0.55 for Japanese, out of a possible 12 points.

Second, the Canadian HYP hindsight bias was marginally larger in magnitude compared to the Japanese. Although speculative, this finding might be the result of a greater motivational factor implicated in the HYP compared with the MEM bias (cf., Campbell & Tesser, 1983). Two indicators of a larger motivational component of the HYP bias deserve comment. First, the HYP bias was large in absolute magnitude than the MEM bias. Second, it seems reasonable to assume that the HYP instructions may provide a greater opportunity for participants to present themselves favorably: They are free to respond in a manner suggesting that they knew more of the questions in the HYP set than was actually the case. Participants motivated to present themselves favorably in the MEM set, in contrast, can be seen to be presented with two conflicting tasks. The MEM instructions explicitly ask participants to recall their original answers as accurately as they can. thus, the desire to present oneself as knowledgeable will at times be in conflict with the experimental task of accurately remembering their original responses.

This speculation aids the reconciliation of the present results with cross-cultural studies of self-serving biases. To reiterate, self-serving biases can be seen to occur largely because of motivations to enhance the individual self (Greenwald, 1980; Taylor & Brown, 1988). Those with an interdependent view of self, however, do not seem motivated to stick out as individuals, and this cultural difference manifests in a striking absence of self-serving tendencies among the Japanese (Heine & Lehman, 1995; Kashima & Triandis, 1986; Markus & Kitayama, 1991b; Takata, 1992; Yamauchi, 1990). It appears that when the opportunity to enhance the individual self is more pronounced, as we speculate is the case in the HYP instructions, Japanese demonstrate slightly less of a hindsight bias compared with Canadians. When the opportunity for self-enhancement is reduced, as we argue is the case for the MEM instructions, Japanese exhibit hindsight biases to the same extent as Canadians. Taken together, these results suggest that cultural in distorted cognitions between Japanese and North Americans are more pronounced when opportunities for self-enhancement are greater.

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