

Cultural Variation in Unrealistic Optimism: Does the West Feel More Invulnerable Than the East?

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Levels of unrealistic optimism were compared for Canadians (a culture typical of an independent construal of self) and Japanese (a culture typical of an interdependent construal of self). Across 2 studies, Canadians showed significantly more unrealistic optimism than Japanese, and Canadians' optimism bias was more strongly related to perceived threat. Study 2 revealed that Japanese were even less unrealistically optimistic for events that were particularly threatening to interdependent selves. The authors suggest that self-enhancing biases (such as unrealistic optimism) are, for the most part, absent from the motivational repertoire of the Japanese because the consequent attention to the individual that self-enhancement engenders is not valued in interdependent cultures.

The classical notion that mental health is associated with accurate perceptions of reality (e.g., Jahoda, 1958) has been challenged by more recent arguments that the healthy mind is characterized by misperceptions that depart considerably from reality (see Greenwald, 1980; Taylor & Brown, 1988, for reviews; see Colvin & Block, 1994, for a recent opposing view). Much contemporary work on the self has focused on people's tendencies to distort their perceptions of the world in a self-enhancing manner. Accuracy, although necessary to a certain extent, is often compromised in favor of flattering information in a typical self-evaluation. For example, people tend to remember their past performance as better than it actually was (Crary, 1966), judge positive personality attributes as more appropriate in describing themselves than in describing others (Alicke, 1985), and take credit for success, yet attribute failure to the situation (e.g., Greenberg, Pyszczynski, & Solomon, 1982).

Furthermore, there is evidence that links the absence of self-enhancing biases with lower self-esteem and mild depression (e.g., Alloy & Ahrens, 1987; Lewinsohn, Mischel, Chaplin, & Barton, 1980). Taylor and Brown (1988) suggested that "it appears to be not the well-adjusted individual but the individual

who experiences subjective distress who is more likely to process self-relevant information in a relatively unbiased and balanced fashion" (p. 196). Hence, self-enhancing biases, or "positive illusions," as Taylor and Brown coined them, appear to be highly implicated in mental health.

Cross-cultural research has raised questions about the universality of these biases (e.g., Markus & Kitayama, 1991b). Studies have shown that within certain cultures, some effects attributed to self-enhancing motivations are significantly lower, if not absent or even reversed (e.g., Kashima & Triandis, 1986; Takata, 1992). This evidence suggests that self-enhancing tendencies can be culturally variant; they may, in fact, be less prominent in the motivational repertoire of people from cultures outside of North America. Cross-cultural research has further suggested that the benefits of maintaining positive illusions presuppose certain cognitive or motivational tendencies that might be specific to particular cultures. To the extent that such processes (a) are culturally variant (see Markus & Kitayama, 1991b, for a review) and (b) support and sustain self-enhancing biases, cultural variance of these biases would be more understandable.

Independent Versus Interdependent Construals of Self

Markus and Kitayama (1991b; see also Triandis, 1989) provided a model that integrates much of the cross-cultural research conducted thus far. They argued that the various cultures of the world differentially emphasize two tasks relevant to everyday life: independence (i.e., tasks related to agency and autonomy) and interdependence (i.e., tasks related to communion and affiliation; Kitayama, 1993). Cultures in which the former process is primary are said to foster an independent construal of self, whereas cultures in which the latter process is dominant are said to foster an interdependent construal of self.

Markus and Kitayama (1991b) defined the independent construal of self as characterized by a bounded and autonomous sense of self that is relatively distinct from others and the environment. Those with an independent construal of self strive to

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assert their individuality and uniqueness and stress their separateness from the social world. This view is best exemplified by North American and Western European cultures.

In contrast, the interdependent construal of self is characterized by an emphasis on the interrelatedness of the individual to others and to the environment. It is only within the contextual fabric of individuals' social relationships, roles, and duties that the self has meaning. This construal of self is most representative of Asian cultures.

Markus and Kitayama (1991b) argued that because the self is central to many psychological processes, any phenomenon that implicates the self will be shaped accordingly by that culture's dominant construal of self. Hence, cultures characteristic of the independent construal of self will show evidence of motivations, cognitions, and emotions that affirm the independence and autonomy of the self. Psychological processes within cultures representative of the interdependent construal of self, on the other hand, will affirm the interrelatedness and belongingness of the self.

Self-Enhancement and Construal of Self

The psychological processes that sustain self-enhancing biases appear more in line with the independent self. The independent self is motivated to maintain the autonomy of the sacrosanct self, thereby confirming to the individual that he or she is a self-sufficient and worthy person. By engaging in self-enhancing biases (i.e., viewing the self in unrealistically positive terms), the individual promotes the image that he or she is a strong person, fully capable of taking care of him- or herself. Self-enhancing biases might be seen as ways in which individuals bolster their independent selves.

However, self-enhancing biases might not provide the same palliative reassurances for the interdependent self. Lebra (1976) referred to Japanese individuals as "fractions" who do not become whole until they have fit in and occupied their proper place within social units. Hence, we would not expect Japanese to be motivated to separate themselves from their secure position in the group, even in a seemingly positive way. Such separation might actually imply alienation from the interdependent self. Kitayama, Markus, and Kurokawa (1994) found that whereas for Americans feelings of pride and sense of achievement were positively correlated with their sense of well-being, for Japanese these feelings were not associated with their sense of well-being. Rather, a sense of acceptance from others was what correlated the strongest with feelings of well-being for Japanese. Self-enhancement (e.g., distinguishing oneself as better than others) might actually be in opposition to the well-being of Japanese. Self-effacement, in the form of seeing oneself as average, however, would more likely serve their cultural mandate of maintaining interpersonal harmony. Therefore, one would not expect self-enhancing biases to be as common for Japanese as they are for North Americans.

At present, researchers lack a thorough understanding of the cultural specificity of self-enhancing tendencies. Taylor and Brown (1988) outlined three distinct domains of self-enhancing biases: overly positive views of the self, illusions of control, and unrealistic optimism. Thus far, cross-cultural studies of

self-enhancing biases have examined only the first domain. For example, the false uniqueness bias (Markus & Kitayama, 1991a), the tendency to internalize success and externalize failure (Chandler, Shama, Wolf, & Planchard, 1981; Kashima & Triandis, 1986; Yamauchi, 1990), and the tendency to have more confidence in information that is favorable to the self than that which is unfavorable (Takata, 1992) have all been shown to be either absent or reversed for Japanese samples. These studies present consistent evidence that overly positive views of the self are not culturally universal.

Unrealistic Optimism

Unrealistic optimism is the tendency for people to believe that they are more likely to experience positive events, and less likely to experience negative events, than similar others (Weinstein, 1980). Studies with North Americans have consistently shown a robust unrealistic optimism effect (Alloy & Ahrens, 1987; Weinstein, 1980). Taylor and Brown (1994) reported that at least 121 studies have demonstrated this phenomenon. This effect is particularly strong for negative events (Kirscht, Haefner, Kegeles, & Rosenstock, 1966; Perloff, 1983; Perloff & Fetzer, 1986; Weinstein, 1982, 1984) and is consistent across age and socioeconomic classes (Weinstein, 1987).

Weinstein's (1980) extensive study of unrealistic optimism revealed that two constructs in particular—psychological control and an availability of stereotypes—are highly implicated in unrealistically optimistic judgments for negative future life events. He found that people reported greater relative invulnerability for negative events (a) that they perceived to be more under their control and (b) for which they could more easily visualize the type of person likely to experience them. These two constructs suggest ways in which people are able to rationally justify their unrealistic perceptions of invulnerability.

Unrealistic optimism also appears to be motivated by threat. In general, if a negative future life event is perceived to be particularly serious, it is more likely that the individual will feel relatively invulnerable toward that event (Kirscht et al., 1966; Taylor et al., 1992). People appear, then, to be motivated to counter the perceived threat of potential negative events with unrealistically optimistic assessments of their futures. Traditionally, susceptibility, along with severity, has been viewed as a component of threat (e.g., Kunda, 1987; Lehman & Taylor, 1987). When focusing on estimates of relative susceptibility to threatening events, however, it does not make sense to include susceptibility in the operationalization of threat.

We examined whether cultural differences would be found in unrealistic optimism, particularly with respect to negative future life events. If such cultural differences do exist, we would expect similar cultural differences in the constructs underlying the optimism bias, namely, psychological control and an availability for stereotypes. We anticipated that Japanese would report that future life events are less under their control and are less associated with stereotypes than would North Americans.

Unrealistic optimism has been argued to serve a self-protective function for North Americans (e.g., Taylor et al., 1992). In the face of threatening events, self-enhancing evaluations that place the individual in a favorable position appear to relieve

the independent self of some of the stress associated with these events. Markus and Kitayama (1991a) argued that self-enhancement does not bring the same kind of psychological satisfaction to the interdependent self. Self-enhancing evaluations may serve only to isolate the interdependent self from its collectivist network and, in the face of threat, this isolation could hardly be seen as a coping mechanism. Rather than aiding the interdependent self in coping with threat, self-enhancement might actually exacerbate the negative consequences of the threatening event. Hence, although we anticipated a positive relation between perceived threat and unrealistic optimism for North Americans, we did not expect Japanese to self-enhance more in the case of particularly threatening events.

Study 1

Study 1 examined levels of unrealistic optimism exhibited by a sample typical of an independent construal of self (Canadians) and a sample typical of an interdependent construal of self (Japanese). To provide a more fine-tuned analysis of cultural differences in this bias we also examined constructs found to be associated with unrealistic optimism for negative future life events: perceived control and availability of stereotypes (Weinstein, 1980) and perceptions of threat (Kirscht et al., 1966; Taylor et al., 1992). We anticipated that (a) Canadians would show significantly more unrealistic optimism than Japanese; (b) constructs that have been shown to sustain the optimism bias, namely control and availability of stereotypes, would be more pronounced in Canadians than in Japanese; and (c) Canadians' unrealistic optimism would increase with perceived threat, whereas Japanese's optimism judgments would be less strongly related to threat.

Method

Respondents

A total of 510 respondents participated in Study 1. They came from four different sources: (a) a class of introductory psychology students from Nagasaki University, a public university in southwestern Japan ($n = 112$); (b) a class of introductory research methods students from Ritsumeikan University, a private university in Kyoto, in western Japan ($n = 84$); (c) a class of introductory social psychology students from the University of British Columbia (UBC; $n = 174$); and (d) students enrolled in a UBC introductory psychology course who were contacted through the subject pool ($n = 140$).

As our primary aim was to compare levels of unrealistic optimism for people of eastern and western cultures, we segregated the samples by cultural background. Respondents in the Japanese sample were all between the ages of 18 and 25. Apart from 2 students born in other East Asian countries, the rest of the sample was Japanese-born. A total of 196 students (130 women and 66 men) composed the Japanese sample. The Canadian sample was reduced so that the homogeneous Japanese sample could be contrasted with a homogeneous western sample. To obtain membership in the westernized Canadian sample, respondents had to meet each of the following criteria: (a) the respondent had to be born in either Canada or the United States; (b) both of the respondent's parents had to be born in Canada, the United States, or in a European country; (c) the respondent had to declare his or her ethnic descent to be that of a European culture; and (d) to keep the age range of the Canadian sample comparable to that of the Japanese sample, the re-

spondent had to be between the ages of 18 and 25. Demonstrating the cultural diversity of the UBC student body, only 90 (56 women and 34 men) of the 314 respondents satisfied all four criteria and formed the "Canadians of European descent" sample, or "Canadians," for short.

Materials

All respondents completed a questionnaire packet that included 15 potential future life events. The list of future events included a subset of the events that Weinstein (1980, 1982, 1987) used in his studies, some modified versions of his events (e.g., switching starting salary "greater than \$15,000" to "greater than \$30,000"), plus a few additions that were of particular interest for the present study (see Appendix A). All of the events adopted from Weinstein's studies had produced significant unrealistic optimism effects in his past research. In addition to the 10 negative events that composed our measure of perceived invulnerability to future life events, we included 5 positive future life events for investigation. Unrealistic optimism was measured for both negative and positive events in two ways.

Within-groups measure. First, we used a within-groups design identical to that of Weinstein (1982). Respondents were asked, "compared to other (UBC/Ritsumeikan/Nagasaki) students—same sex as you—what do you think are the chances that the following events will happen to you?" Beneath the description of each event, respondents were presented with a 7-point rating scale with the following choices: much below average, below average, slightly below average, average for other (UBC/Ritsumeikan/Nagasaki) students of your sex, slightly above average, above average, and much above average. For purposes of analysis, these seven responses were assigned the values -3 (*much below average*) through 3 (*much above average*). An optimism or pessimism bias was noted whenever the estimates for a particular event deviated significantly from zero.

Between-groups measure. So that we could measure the between-groups optimism bias, respondents received one of two different versions of the questionnaire. In the first version, beneath each future life event for which respondents made a relative-likelihood estimate, respondents were also asked to estimate the absolute percentage chance that this event would happen to *them*. In the second version of the questionnaire, beneath each future life event, respondents were asked to estimate the absolute percentage chance that this event would happen to the average same-sex student from their university. We calculated an optimism or pessimism bias in this between-groups design whenever the self-estimates were significantly different from the corresponding other-estimates.

Respondents were also questioned about (a) the controllability of the event, (b) the availability of stereotypes for the event, and (c) the severity of negative future life events and desirability of positive future life events. We used the same methods used by Weinstein (1980) to assess control and availability of stereotypes. Respondents were asked to rate on a scale ranging from 1 (*not at all controllable*) to 5 (*very controllable*) how controllable they felt each event was, and they were asked to rate on a scale from 1 (*no image at all*) to 3 (*very clear image*) the extent to which they could imagine a typical person likely to experience each event. We measured severity and desirability by asking respondents to rank the 5 positive events in order of their perceived desirability and to rank the 10 negative events in order of their perceived severity. Finally, respondents were asked a series of demographic questions to determine their cultural background.

Translation of materials. Questionnaires were produced in both English and Japanese, and respondents completed them in their native language. The original English version was translated into Japanese and then back-translated into English by a second translator to ensure comparability and equivalence in meaning (Brislin, 1970).

Results and Discussion

Comparability of the Samples

A *t* test revealed that the average age of the Japanese was significantly younger than that of the Canadians ($M_s = 20.97$ and 19.43 for Canadians and Japanese, respectively), $t(284) = 4.74, p < .001$. A correlational analysis, however, indicated that there was no significant relation between age and the within-groups optimism bias for either Canadians or Japanese ($r_s = .13$ and $-.09$, respectively, *ns* for both), and thus the age difference did not confound a comparison of unrealistic optimism between cultures.

The Canadian sample consisted of 62.2% women ($n = 56$) compared with 66.3% ($n = 130$) for the Japanese sample. These proportions were not significantly different, $\chi^2(1, N = 286) < 1, ns$. We conducted all analyses with both sex and culture as factors. Only one sex difference emerged, and because it did not affect our interpretations of the cultural differences, it is not discussed in the text.¹

Unrealistic Optimism

For the within-groups analyses, respondents indicated whether they felt that their likelihood of experiencing the individual future life events was greater than, less than, or about the same as that of their peers. An event that had a mean value that was significantly less than zero demonstrated an optimism bias; that is, respondents felt that they were less likely than their peers to experience the negative event or more likely than their peers in the case of positive events (respondents' estimates for positive events were reversed to make them comparable to their estimates for negative events). An event that had a mean value significantly greater than zero demonstrated a pessimism bias; that is, respondents felt that they were more likely than their peers to experience the negative event (or less likely to experience the positive event).

With respect to the between-groups design, an optimism bias was demonstrated when respondents receiving the self-estimate version estimated that their likelihood of experiencing a negative event was significantly lower (or higher in the case of positive events) than the estimates of the respondents receiving the other-estimate version.

We aggregated the 15 future life events by their valence (10 negative and 5 positive items) and checked the reliability of the within-groups optimism bias for each aggregate ($\alpha_s = .75$ and $.53$ for negative and positive events, respectively). Given the heterogeneous nature of the events in Appendix A and the small number of positive events, these values justified aggregation for subsequent analyses. A Bonferroni reduction was applied to sets of analyses in each table to protect against inflated error rates.

Canadians showed a strong bias for all four of the unrealistic optimism measures. They exhibited the bias across the within-groups and between-groups analyses and across the positive and negative events (see Table 1). Hence, as expected, the unrealistic optimism effect documented by Weinstein (1980, 1982, 1984, 1987) in his series of studies with U.S. respondents was replicated with Canadians. That the bias was present in the between-groups analyses reveals that it did not require direct com-

parisons of self versus other. Canadian respondents did not simply operate with an unrealistically optimistic social comparison heuristic that dictates that one's future is relatively better than that of a given comparison other. Their absolute-likelihood estimates were similarly formatted to fit an unrealistically optimistic template.

Japanese, however, showed a significant bias for only one of the four unrealistic optimism measures. For the within-groups analyses, they demonstrated an optimism bias for the negative aggregate, but they showed no bias for the positive aggregate. In the between-groups analyses, they showed no bias for either the positive or the negative events.

The main hypothesis of Study 1—that Japanese would show less unrealistic optimism than Canadians—was strongly supported. Canadians showed a significantly greater optimism bias compared with Japanese in all instances, regardless of item valence or survey methodology used.

An examination of respondents' actual percentage estimates for themselves and others revealed an interesting pattern. Canadians, relative to Japanese, reported that positive events were more likely to happen both to themselves and to others. Hence, the positive events chosen for this study were seen as subjectively more likely to occur by Canadians than they were by Japanese. In contrast, Canadians reported that the negative events were nonsignificantly less likely to happen to themselves and significantly more likely to happen to others, compared with Japanese. Thus, for negative events, Canadians' self-estimates were slightly kinder, and their other-estimates were significantly less kind, than those of the Japanese.

Control and Availability of Stereotypes

Respondents indicated on a 5-point scale the extent to which they felt that each event was under their control. For both positive and negative events, Canadians reported feeling significantly more control than Japanese. Means for positive events were 3.78 and 3.07 for Canadians and Japanese, respectively, $F(1, 277) = 93.00, p < .001$; means for negative events were 3.71 and 3.19 for Canadians and Japanese, respectively, $F(1, 277) = 52.04, p < .001$. This attenuated internal sense of agency on the part of Japanese corroborates findings from other cross-cultural studies on psychological control (Bond & Tornatzky, 1973; Mahler, 1974).

The availability of stereotypes was measured by asking respondents to indicate on a 3-point scale the extent to which they could imagine a typical person likely to experience the event. Canadians showed a significantly greater tendency to imagine stereotypical people for both positive and negative events. Means for positive events were 2.35 and 1.84 for Canadians and Japanese, respectively, $F(1, 275) = 91.18, p < .001$; means for negative events were 2.05 and 1.69 for Canadians and Japanese, respectively, $F(1, 273) = 55.35, p < .001$. This finding is consistent with other differences between those with independent

¹ In Study 1, there was a main effect for sex with respect to availability of stereotypes for negative events. Men were more likely to imagine vulnerable others than were women ($M_s = 1.75$ and 1.91 for women and men, respectively), $F(1, 276) = 11.67, p < .01$.

Table 1
Optimism Bias for Study 1

| Events | Canada | Japan | Between-culture analyses |
|---------------------------|---------|-------------------|--------------------------------|
| Within-groups measure | | | |
| Positive ^a | -0.77** | -0.01 | $F(1, 279) = 93.59, p < .001$ |
| Negative | -1.32** | -0.84** | $F(1, 280) = 26.61, p < .001$ |
| Between-groups measure | | | |
| Positive | | | |
| Self-estimates | 67.60 | 47.07 | $F(1, 139) = 110.54, p < .001$ |
| Other-estimates | 52.81 | 43.46 | $F(1, 133) = 17.21, p < .001$ |
| Difference between groups | 14.79** | 3.61 | $F(1, 272) = 14.06, p < .001$ |
| Negative | | | |
| Self-estimates | 18.06 | 20.68 | $F(1, 139) = 1.80, p > .15$ |
| Other-estimates | 25.29 | 20.39 | $F(1, 136) = 6.85, p < .01$ |
| Difference between groups | -7.23* | 0.29 ^b | $F(1, 275) = 7.73, p < .01$ |

^a The values for the within-groups measure for the positive events were reversed to make them comparable with those of the negative events. ^b Items were responded to in a pessimistic manner.

* Within-culture optimism bias significant at Bonferroni-reduced alpha, $p < .01$. ** Within-culture optimism bias significant at Bonferroni-reduced alpha, $p < .001$.

and interdependent construals of self. Markus and Kitayama (1991b) argued that the interdependent self is more other-directed and consequently has a relatively more refined conception of others than does the independent self. Kitayama, Markus, Tummala, Kurokawa, and Kato (1991, Study 1) provided support for this by showing that Hindu Indians have more elaborate knowledge of others than do Americans. Perhaps Japanese similarly possess a surplus of information about others compared with Canadians and, thus, are less likely to impose stereotypes over this elaborate image (see Study 2 of Nisbett, Krantz, Jepson, & Kunda, 1983; Quattrone & Jones, 1980). Further research is necessary to explore this finding in more detail.

Correlations of Severity With Unrealistic Optimism, Control, and Stereotypes

We used a within-respondent design to correlate the rankings of severity with unrealistic optimism, perceived controllability, and stereotype availability for the negative items.² The average within-respondent correlations for each culture were compared (see Table 2). Japanese showed no significant correlations between the ranking of severity and any of the other measures. In contrast, the correlations for Canadians, although modest, were significant for unrealistic optimism, perceived control, and stereotype availability. These indicate that as perceived threat increased, Canadians, but not Japanese, showed a greater optimism bias, felt more control over the events, and were more likely to visualize a vulnerable other. The differences between the correlations for the two cultures were also significant for all three measures.

The obtained cultural difference in the correlations between unrealistic optimism and perceived severity sheds some light on the function of unrealistic optimism for the two cultures. Taylor and Brown (1988) argued that the optimism bias is adaptive

and that it aids the ability to cope effectively with stress (see also Taylor, 1989). Unrealistic optimism has been linked to effective coping, in part because the bias is related to the degree of threat of the event. Taylor et al. (1992) stated that "while illusions of invulnerability may be generally adaptive and protect people from the minor negative experiences of daily life, illusions may become especially important and exaggerated in people facing severe threats as a method of dealing with the threat" (pp. 469-470). The optimism bias has thus been argued to be a defense mechanism—being able to imagine that one's future is better than that of the average other means that one will not be struck by the same calamities as the average other. Although the magnitude of the correlation for Canadians between the ranked severity of a negative event and its corresponding optimism bias was modest, it does provide supportive evidence for the arguments of Taylor and her colleagues that the optimism bias is a means of coping with threat. That the Japanese correlation between severity and the optimism bias was virtually nil suggests that the bias is not activated by threat for Japanese and is less likely to serve as a defense mechanism for them.

The correlations of severity with perceived control and stereotype availability provide additional support for the notion that unrealistic optimism is more likely to be a means of coping with threat for Canadians than it is for Japanese. As perceived severity increased, Canadians were more likely than Japanese to state that the event was under their control. Perhaps by possessing illusions of control over threatening events, westerners are able to dispel the anxiety that they are potentially vulnerable to these events. Also, as perceived severity increased, Canadians were more likely than Japanese to imagine stereotypical people associated with future negative life events. Threat is ap-

² As our primary interest was in the self-protective role of unrealistic optimism in reaction to threatening events, the correlations with desirability (for the positive events) are not discussed here.

Table 2
*Analysis of Variance for Average Within-Respondent
 Correlations With Severity, Optimism Bias,
 Control, and Stereotypes*

| Correlations of ranked severity with: | Canada | Japan | Between-culture analyses |
|---------------------------------------------|--------|-------|------------------------------|
| Optimism bias | -0.16* | -0.02 | $F(1, 269) = 8.22, p < .01$ |
| Control | -0.29* | -0.07 | $F(1, 274) = 24.68, p < .01$ |
| Stereotypes | -0.19* | -0.05 | $F(1, 259) = 10.99, p < .01$ |

Note. Average within-respondent correlations are reported in their original form; however, the between-culture analyses were conducted on correlations that have been converted into Fisher's z scores.

* $r \neq 0$, at Bonferroni-reduced alpha, $p < .001$.

parently a sufficient motivator for priming Canadians to conjure up images of vulnerable others. Japanese do not appear to seek vulnerable others in the face of threat.

Taken together, the significantly greater size of the Canadian correlations relative to those for the Japanese suggests that Japanese do not respond to threat in the same manner as Canadians. Japanese are not as likely to view threatening events as controllable incidents that only happen to stereotypical victims. Apparently, relative to Canadians, threat is less likely to induce Japanese to engage in a defensive, self-protective way of thinking.

Limitation of Study 1

One potential confounding issue in Study 1 deserves comment at this point. The obtained cultural differences in unrealistic optimism might have stemmed from a difference in the perceived importance of the future life events. It could be argued that these events, by and large, were directed at individuals and, hence, are more meaningful to those with independent construals of self. The negative events used in Study 1 might not have been as threatening to the interdependent self. Perhaps this is why Japanese did not demonstrate as much self-enhancement as Canadians. This alternative account suggests that the Japanese would engage in more self-enhancement if their sense of belongingness to the group was threatened. To address this alternative explanation, unrealistic optimism should be studied with events that are more important to the interdependent self. If Japanese are no more likely to exhibit the optimism bias for interdependent events, the plausibility of this alternative account would be reduced.

Study 2

Study 2 sought to confirm the findings of Study 1 and extend them by addressing this confounding issue. Because of our primary interest in the self-protective role of unrealistic optimism, Study 2 examined only negative future life events. We examined whether Japanese would self-enhance more in cases in which their interdependence is threatened. We did this by including two subsets of future life events that we believed would be par-

ticularly threatening to people with independent and interdependent construals of self, respectively. We anticipated that independent events would be more threatening than interdependent events for Canadians and that interdependent events would be more threatening than independent events for Japanese. If true, and if Japanese self-enhance significantly more for the interdependent events, then this would suggest that they possess a self-enhancement generator similar to that of North Americans but activated by different kinds of events. Alternatively, if Japanese show no difference in unrealistic optimism between event types, or if they self-enhance less for interdependent events, this would suggest that the cultural differences in unrealistic optimism found in Study 1 were not simply due to a biased selection of future events but, in fact, indicate self-effacing tendencies (or a lack of self-enhancement) for Japanese. This latter possibility represents our own anticipations.

Study 2 also included two methodological refinements: First, we measured severity by means of an absolute measure, as opposed to the ranking scale used in Study 1. This absolute measure enabled a comparison of the perceived threat of events across cultures. Second, we measured the optimism bias calculated by the difference between self- and other-estimates within, as opposed to between, respondents. That is, rather than dividing our sample into two groups, all respondents provided both self and other likelihood estimates for each event. This allowed both measures of unrealistic optimism to be included in the within-respondent analyses.

Method

Respondents

Study 2 included a Japanese sample of 105 introductory psychology students (96 women and 9 men) from Nagasaki University. All members of this sample were Japanese born and of Japanese parentage. The Canadian sample was obtained from students in introductory psychology classes through the participant pool ($n = 69$),³ or in introductory social psychology classes at UBC ($n = 210$). The Canadian sample was again segregated by cultural background according to the same criteria as in Study 1. Of the original 279 students from the Canadian sample, 110 (73 women and 37 men) met all the criteria to be included in our sample of Canadians of European ancestry, or Canadians, for short.

Materials

All respondents completed a questionnaire packet that contained demographic items and questions about 10 negative independent future life events and 10 negative interdependent future life events (see Appendix B). We selected events to be either independent or interdependent based on the reasoning that independent events should pose a direct threat to the individual, whereas the interdependent events should pose a threat to the individual's relations with close others, generally in one's workplace or family.

³ In an effort to reduce the total number of respondents participating in Study 2, respondents contacted through the participant pool were preselected on the basis of their names. Only respondents with western-sounding names were contacted, and therefore a greater proportion of the Canadian respondents in Study 2 met our criteria for the Canadians of European Ancestry sample.

For each of the future life events, respondents were questioned about the following:

1. Respondents were asked whether the event had ever happened to them. If the respondent answered yes, they were told to skip the rest of the items associated with that particular life event. This was done to preclude the chance that respondents were not responding to the event as a potential future life event.⁴

2. All other respondents next made estimates of their relative likelihood of experiencing the event compared with other same-sex students from their university in a manner identical to that in Study 1.

3. Respondents were then asked to estimate their absolute percentage chance of experiencing the event at some point in their lives.

4. Following this, respondents were asked to rate how serious it would be if the event actually happened to them on a scale ranging from 1 (*not at all a concern to me*) to 100 (*about the most terrible thing that I could imagine*).

5. Respondents then indicated their perceived control of the event in a manner identical to Study 1.

6. Finally, respondents indicated their availability for stereotypes for the event in a manner identical to Study 1.

After completing all of the future life events items, respondents were asked on a separate page for their population estimates for all 20 events. That is, they were asked for their estimates of the percentage of same-sex students from their respective universities who would experience each of the events at some point in their lives.

We again used two measures for assessing the optimism bias. The first, the relative-likelihood measure, was identical to the within-groups measure used in Study 1. The second, the absolute-likelihood measure, was similar to the between-groups measure in Study 1 as unrealistic optimism was calculated by subtracting the respondents' other-estimates from their self-estimates. However, unlike Study 1, this design was within-subjects, as all respondents provided both self- and other-estimates.

Results and Discussion

Comparability of the Samples

The average age of the Japanese sample was again significantly younger than that of the Canadian sample ($M_s = 20.16$ and 18.63 for Canadians and Japanese, respectively), $t(211) = 7.97, p < .001$. Correlating age with the relative-likelihood optimism bias revealed that there was no relation for either Canadians or Japanese ($r_s = -.01$, and $.03$, respectively, n_s for both), and thus the age difference did not confound a comparison of the relative-likelihood optimism bias between cultures. With respect to correlations between age and the absolute-likelihood optimism bias, although Canadians did not demonstrate a significant relation ($r = .08, n_s$), the correlation within the Japanese sample was significant ($r = .24, p < .05$). However, this correlation indicated that the younger the Japanese are the more unrealistically optimistic they are in their absolute-likelihood estimates. Because the Japanese sample was significantly younger than the Canadian sample, this indicated that, if anything, we overestimated the absolute-likelihood optimism bias for Japanese relative to Canadians, and thus differences between Canadians and Japanese on this measure are likely to be conservative.

The Canadian sample had a significantly larger proportion of men than did the Japanese sample ($M_s = 33.6\%$ and 8.6% for Canadians and Japanese, respectively, $\chi^2(1, N = 215) = 20.2$,

$p < .001$. We conducted all analyses with both sex and culture as factors. A number of sex differences emerged; however, as none of them altered the significance of the obtained cultural differences, they are not discussed in the text.⁵

Independent Versus Interdependent Events

Reliability checks for the relative-likelihood optimism bias indicated that events were responded to similarly within the independent and interdependent event aggregates ($\alpha_s = .72$ and $.83$ for independent and interdependent events, respectively). We then compared respondents' responses to the 20 events to determine whether our selection of independent and interdependent events was successful. We expected that independent events would be more threatening than interdependent events for Canadians and that interdependent events would be more threatening than independent events for Japanese. Again, we applied a Bonferroni reduction to each set of analyses to provide protection against Type I errors. Table 3 shows that our selection of items was indeed successful. A significant interaction emerged between event type and culture, $F(1, 218) = 42.18, p < .001$. Simple effects analyses reveal that Canadians found independent events to be more severe than interdependent ones, $F(1, 119) = 41.05, p < .001$, whereas Japanese viewed interdependent events as more severe than independent

⁴ A number of respondents skipped certain events, and thus we do not have data for all the events for every respondent. A priori we determined that respondents had to answer a minimum of 90% of the events for any given measure for their results to be included in the analyses for that particular measure.

⁵ In Study 2, there was a main effect for sex with respect to perceived severity for the independent events: Women found these events to be more threatening than men ($M_s = 76.31$ and 71.38), $F(1, 216) = 7.67, p < .01$. Three other sex differences emerged for the Japanese sample within Sex \times Culture interactions. However, because there were only 9 men in the Japanese sample, these sex differences should be treated with caution. A Sex \times Culture interaction emerged for the relative-likelihood estimates for independent events, $F(1, 219) = 7.88, p < .01$. Simple effects analyses reveal that Japanese women were more unrealistically optimistic than Japanese men ($M_s = -0.65$ and -0.10 for women and men, respectively), $F(1, 101) = 6.81, p < .05$, whereas there was no significant difference for Canadians ($M_s = -0.94$ and -1.12 for women and men, respectively), $F(1, 128) = 1.91, p > .15$. This suggests that the underrepresentation of men in the Japanese sample resulted in a conservative estimate of the difference between Canadians and Japanese with respect to the relative-likelihood optimism bias. There was also a Sex \times Culture interaction for perceptions of control for independent events, $F(1, 219) = 5.03, p < .05$. Simple effects analyses revealed that Japanese men perceived more control than did Japanese women ($M_s = 3.52$ and 3.16 for men and women, respectively), $F(1, 101) = 5.05, p < .05$, whereas there was no difference for Canadians ($M_s = 3.66$ and 3.72 for men and women, respectively, $F < 1$). Last, there was a Sex \times Culture interaction for availability of stereotypes for the independent events, $F(1, 220) = 5.38, p < .05$. Simple effects analyses reveal that Japanese women were more likely to visualize stereotypes associated with independent events than were Japanese men ($M_s = 1.67$ and 1.33 for women and men, respectively), $F(1, 101) = 8.83, p < .01$, whereas there was no difference for Canadians ($M_s = 2.07$ and 2.06 for women and men, respectively, $F < 1$).

Table 3
Comparisons of Independent and Interdependent Events

| Measure | Canada | Japan | Between-culture analyses |
|-----------------------|---------|--------|-------------------------------|
| Severity | | | |
| Independent events | 75.40** | 75.14* | $F(1, 218) < 1$ |
| Interdependent events | 69.04** | 77.87* | $F(1, 218) = 25.07, p < .001$ |
| Control | | | |
| Independent events | 3.70 | 3.21** | $F(1, 221) = 18.70, p < .001$ |
| Interdependent events | 3.73 | 3.52** | $F(1, 221) = 8.28, p < .01$ |
| Stereotypes | | | |
| Independent events | 2.06** | 1.64 | $F(1, 222) = 69.29, p < .001$ |
| Interdependent events | 1.85** | 1.62 | $F(1, 222) = 19.15, p < .001$ |

* Within-culture differences significant at Bonferroni-reduced alpha, $p < .05$. ** Within-culture differences significant at Bonferroni-reduced alpha, $p < .01$.

ones, $F(1, 99) = 8.00, p < .01$. Comparing across cultures we found that although there was no difference in the perceived severity for independent events, Japanese found the interdependent events to be more severe than did Canadians.

We were also interested to see how these independent and interdependent events would be rated in terms of control and stereotypes. With regard to control, there was a significant interaction between event type and culture, $F(1, 221) = 18.70, p < .001$ (see Table 3). Although there was no difference in the perceived controllability of the two event types for Canadians, $F(1, 121) < 1$, Japanese found interdependent events to be more controllable than independent events, $F(1, 100) = 42.72, p < .001$. Comparing across cultures, we found that Canadians reported that both interdependent and, especially, independent events were more controllable than did Japanese. This cultural difference in perceived controllability parallels the findings from Study 1.

A significant interaction emerged for availability of stereotypes as well, $F(1, 222) = 18.61, p < .001$. Simple effects analyses revealed that Canadians were more likely to imagine stereotypical people associated with independent events than they were with interdependent events, $F(1, 122) = 42.70, p < .001$, whereas Japanese showed no significant difference, $F(1, 100) < 1$. Between-culture comparisons demonstrated that Canadians were more likely to imagine stereotypical people likely to experience both interdependent and, especially, independent events than were Japanese. This tendency for Canadians to report that they had clearer images of vulnerable others than did Japanese replicates the findings from Study 1.

Taken together, this pattern of severity, controllability, and availability of stereotypes ratings suggests that the events were perceived differently by the two cultures. Canadians viewed independent events as more severe and more associated with stereotypes than interdependent events. In contrast, Japanese found interdependent events to be more severe and more controllable than independent events.

Unrealistic Optimism

We aggregated the items by event type (independent vs. interdependent) and conducted t tests to determine the

presence of unrealistic optimism (see Table 4). Although Canadians and Japanese showed unrealistic optimism for the relative-likelihood estimates for both independent and interdependent events, Canadians were more unrealistically optimistic than Japanese for both independent and, especially, interdependent events. For the absolute-likelihood estimates, whereas Canadians demonstrated significant unrealistic optimism for both independent and interdependent events, Japanese actually showed significant unrealistic pessimism for both types of events.

The two measures of unrealistic optimism were significantly correlated within each culture ($r_s = .42$ and $.50$ for Canadians and Japanese, respectively, $p_s < .001$). Those who were most unrealistically optimistic in the relative-likelihood measure tended to be most unrealistically optimistic in the absolute-likelihood measure as well. These correlations suggest that the two measures assessed the same general phenomenon, even though the relative-likelihood measure resulted in a larger optimism bias than the absolute-likelihood measure for both Canadians and Japanese.

Respondents' actual percentage estimates for themselves and others reveal that for both independent and interdependent events Canadians, relative to Japanese, reported that the events were significantly less likely to happen to themselves and more likely to happen to others. Relative to Japanese, then, Canadians' estimates were both self-enhancing and other-derogating.

Optimism Bias for Independent Versus Interdependent Events

The pattern of optimism bias differed between the two types of events. For the relative-likelihood estimates, a significant interaction emerged between event type and culture, $F(1, 197) = 33.06, p < .001$. Simple effects analyses showed that, interestingly, Canadians demonstrated significantly more unrealistic optimism for interdependent events than for independent events, $F(1, 97) = 21.72, p < .001$ (see Table 4). In contrast, Japanese showed significantly less unrealistic optimism for interdependent compared with independent events, $F(1, 100) = 11.17, p < .01$. A significant interaction also emerged for the absolute-likelihood estimates, $F(1, 194) = 4.74, p < .05$. Here,

Table 4
Optimism Bias for Study 2

| Measure | Canada | Japan | Between-culture analyses |
|------------------------------|--------|---------|--------------------------------|
| Relative-likelihood measures | | | |
| Independent events | -1.05* | -0.60* | $F(1, 208) = 22.04, p < .001$ |
| Interdependent events | -1.36* | -0.45* | $F(1, 197) = 106.66, p < .001$ |
| Absolute-likelihood measures | | | |
| Independent events | | | |
| Self-estimates | 22.66 | 31.92 | $F(1, 206) = 37.63, p < .001$ |
| Other-estimates | 30.05 | 19.26 | $F(1, 206) = 43.39, p < .001$ |
| Difference | -7.39* | 12.66** | $F(1, 206) = 122.10, p < .001$ |
| Interdependent events | | | |
| Self-estimates | 16.16 | 31.97 | $F(1, 195) = 97.75, p < .001$ |
| Other-estimates | 20.58 | 13.16 | $F(1, 195) = 25.33, p < .001$ |
| Difference | -4.42* | 18.81** | $F(1, 195) = 177.01, p < .001$ |

* Items were responded to in a pessimistic manner.

* Within-culture optimism/pessimism bias significant at Bonferroni-reduced alpha, $p < .001$.

Canadians showed more unrealistic optimism for independent events, $F(1, 95) = 16.28, p < .001$, and Japanese showed more unrealistic pessimism for interdependent events, $F(1, 99) = 75.25, p < .001$. The Canadian unrealistic optimism pattern was thus inconsistent for the two types of events. In the relative-likelihood measure they were more unrealistically optimistic for interdependent events, and in the absolute-likelihood measure this pattern was reversed. The Japanese, in contrast, showed less unrealistic optimism for interdependent events across both measures.

Correlations With Severity

As the correlations of severity with the relative-likelihood optimism bias, control, and stereotypes demonstrate, in general the findings from Study 1 were replicated (see Table 5; note however that the correlations between severity and the absolute-likelihood optimism bias did not reach significance for either culture). In the face of greater perceived threat, Canadians were more likely than Japanese to demonstrate more unrealistic optimism for relative-likelihood estimates, as well as to feel more control, and to visualize more stereotypes. However, in contrast

to Study 1 in which Japanese demonstrated no correlation between severity and the relative-likelihood optimism bias, in Study 2 Japanese also demonstrated a significant, albeit modest, correlation between these measures. Perhaps the different events used in this study, or the use of an absolute measure of severity (as opposed to the ranking measure used in Study 1), account for this difference.

General Discussion

Cultural Differences in Unrealistic Optimism

Study 2 successfully replicated the basic findings of Study 1 with respect to cultural differences in unrealistic optimism, control, availability of stereotypes, and, to a lesser extent, the correlations of these constructs with perceived severity. The cultural differences in unrealistic optimism for the relative-likelihood estimates in Study 2 were similar in magnitude to the findings in the within-groups design in Study 1. For the absolute-likelihood estimates, although the Japanese demonstrated no bias for the negative events in Study 1, they demonstrated a highly significant pessimism bias in Study 2. In sum, in contrast

Table 5
Analysis of Variance for Average Within-Respondent Correlations With Severity, Both Relative- and Absolute-Likelihood Optimism Biases, Control, and Stereotypes

| Correlations with perceived severity | Canada | Japan | Between-culture analyses |
|--------------------------------------|---------|---------|------------------------------|
| Relative optimism bias | -0.22** | -0.12** | $F(1, 197) = 5.36, p = .02$ |
| Absolute optimism bias | -0.04 | 0.04 | $F(1, 200) = 3.83, p = .05$ |
| Control | -0.27** | -0.13** | $F(1, 201) = 13.07, p < .01$ |
| Stereotypes | -0.16** | -0.07* | $F(1, 195) = 6.27, p = .01$ |

Note. Average within-respondent correlations are reported in their original form; however, the between-culture analyses are conducted on correlations that have been converted into Fisher's Z scores.

* $r \neq 0$, at Bonferroni-reduced alpha, $p < .05$. ** $r \neq 0$, at Bonferroni-reduced alpha, $p < .001$.

to the consistent optimism bias for all measures and all types of events exhibited by Canadians across the two studies, Japanese showed unrealistic optimism in only one specific domain: relative-likelihood estimates for negative events.

In interpreting the meaning of this specific pocket of optimism for Japanese, it is first instructive to revisit the correlations in Study 2 between the optimism bias for the relative- and absolute-likelihood measures. These reasonably strong correlations suggest that the different pattern of responses for Japanese (i.e., unrealistic optimism for relative-likelihood measures and unrealistic pessimism for absolute-likelihood measures), rather than being due to the measurement of two distinct phenomena, might be the result of a methodological artifact. Although speculative, the manner in which the relative-likelihood questions were processed may lead people from both cultures to appear to self-enhance more.⁶ That is, because most people assumed that the negative events used in these studies were unlikely to happen to them (see Tables 1 and 4), when answering the relative-likelihood items they were anchored at this point. In addition to self-serving motivations, it may be cognitively difficult to entertain the notion that although an event is subjectively unlikely to happen to oneself, one may still be as likely, or even more likely, to experience the event compared with the average other. Unrealistically optimistic judgments in response to the relative-likelihood question might be inflated as a result of the difficulty involved in shifting one's perspective from personal-likelihood to relative-likelihood estimates (because the absolute-likelihood estimates do not involve any such conflict between personal- and relative-likelihood estimates, they do not share this potential confound). We reasoned that if this is true there should be pronounced correlations between respondents' self-estimates and their relative-likelihood estimates. Events that respondents think are extremely unlikely to happen to them should be the very events that show the largest relative-likelihood optimism bias. Indeed, the correlations for both cultural groups across both studies ranged from .66 to .91.

That the only indication of a Japanese optimism bias occurred for these potentially inflated relative-likelihood estimates (and that the Japanese were unrealistically pessimistic for the absolute-likelihood estimates in Study 2) suggests that the optimism bias may, for the most part, be absent from their motivational repertoire. The self-effacing manner of viewing their futures as about average, or sometimes even worse than average, appears more characteristic of Japanese.

Consideration of Alternative Interpretations

Two alternative accounts for the pattern of results across Studies 1 and 2 must be addressed. First is the possibility of divergent response styles between the two cultures. An argument could be made that the obtained cultural differences in unrealistic optimism were due to a self-effacing response style among Japanese. That is, perhaps privately Japanese were as unrealistically optimistic as Canadians but cultural norms of modesty prevented them from presenting themselves as such. There are three reasons to doubt this interpretation. First, we

are not aware of any evidence showing easterners to be less honest than westerners on anonymous self-report questionnaires. For example, using Paulhus's (1991) Balanced Inventory of Desirable Responding, Lai and Linden (1993) found no differences in self-deception and impression management scores between Asian and Caucasian respondents. Similarly, although we did not include the inventory in the present studies, we did include it in a separate study of Japanese and westernized Canadians (Heine & Lehman, in press). We too found no differences on either of Paulhus's subscales as a function of culture.

Second, Takata's (1992) recent experimental research has demonstrated a similar self-effacing tendency in the behaviors of Japanese. Japanese searched for more information before concluding that their performance on a task was better than average than they did before concluding that their performance was worse than average. This indicates that self-effacement (or modesty) by the Japanese is not limited to self-reports and as such weakens the response-style interpretation.

Finally, if the cultural differences in unrealistic optimism reported here are simply the result of a self-effacing response style on the part of Japanese, then we would expect Japanese to show less unrealistic optimism for the relative-likelihood measures, in which they are directly asked to compare their futures with another than in the case of the absolute measures (in which the comparison is more unobtrusive in the within-subjects design and nonexistent in the between-subjects design). In fact, the opposite pattern emerged. Taken together, all of the aforementioned data converge on the suggestion that our findings represent real differences between Canadians and Japanese, and not merely a response-style difference.

The second alternative account is that, owing to our efforts at securing a homogeneous western sample, the strong optimism exhibited by Canadians may reflect accuracy rather than bias. That is, in both studies the small subset of (European Canadian) UBC students who met the strict selection criteria may have, in general, been advantaged relative to the excluded UBC students. Yet our optimism questions targeted the overall UBC student population and not this more restricted subset. Additional evidence renders this interpretation less plausible. The implication of this alternative account is that the UBC students not included in our final Canadian samples would exhibit significantly reduced levels of optimism than those included in the final samples. Presumably, this would be because a group of "relatively disadvantaged" persons would be comparing their futures to a larger group, including "relatively advantaged" persons. When we examined the optimism scores for the excluded UBC students in both Studies 1 and 2, we found that they did not differ from the included UBC students.⁷

⁶ Canadians also showed more unrealistic optimism for the relative-likelihood estimates than for the absolute estimates. Although this is not evident in Tables 1 and 4 (because the optimism bias for Canadians was consistently so pronounced), an examination of the magnitude of the *t* statistics (and square-rooted *F* values for the between-groups measure) reveals that they were always at least twice as large for the relative as compared with the absolute measure.

⁷ A comparison of the two groups of Canadians (those included and those excluded from the final samples) revealed no differences for any of the unrealistic optimism measures across the two studies. In Study 1,

Finally, we also considered the possibility that the Japanese showed less unrealistic optimism than Canadians in Study 1 because the events used in Study 1 were directed at the independent self. This possibility was not supported in Study 2 in which the Japanese did not self-enhance more for interdependent events, even though they found them more threatening. In fact, for both measures in Study 2 the Japanese showed less unrealistic optimism (or more unrealistic pessimism) for interdependent events.

Concluding Remarks

Taken together, these studies indicate that, similar to the cultural differences found for overly positive construals of self, there are pronounced cultural differences with respect to unrealistic optimism. People from cultures representative of an interdependent construal of self do not self-enhance to the same extent as people from cultures characteristic of an independent self. In contrast to what Western social psychological literature has shown for North Americans, self-enhancing biases are not typical for Japanese.

This cultural difference suggests that the "normality" of self-enhancing biases might be specific to Western cultures. Perhaps the relation between positive illusions and well-being forwarded by Taylor and Brown (1988) can be interpreted differently across cultures. It might be the case that, to a certain extent, well-being is achieved when the individual satisfies the cultural criteria of selfhood. For people with an independent construal of self, realization of the cultural ideal requires that one believe that one is competent as an individual. Without any objective standards of competence, social comparison theory suggests that people determine their worth by sizing themselves up to others (Festinger, 1954). Hence, believing that one is better than average (or in the present article's case, believing that one's future is rosier than average) is tantamount to believing that one has self-worth in an independent culture. Self-enhancing biases may serve to buttress sagging egos by raising the individual's self-assessments to a level that approaches the standards valued by an independent culture. In this way, self-enhancing biases can be seen as the necessary tools to construct the sense of self favored by Western culture.

In contrast, the cultural criteria of selfhood for the interdependent self appear to require the individual to be immersed in his or her group. As Takata (1992) stated, the Japanese individual is motivated to perceive him- or herself "not as a 'figure' but as a 'ground'" (p. 5). In cultures characteristic of an interdependent construal of self, well-being is not associated with feelings of individual competence, but with feelings of belong-

ingness (Kitayama et al., 1994). Self-enhancing assessments of individuals' competence or futures, then, would not receive the same kind of cultural validation that they appear to in independent cultures. Perhaps individuals in interdependent cultures come closer to realizing their cultural ideals by self-effacing, thereby removing their distinguishing and potentially alienating features and allowing them to maximize their sense of belongingness. We might find that positive illusions in interdependent cultures are illusions of averageness rather than illusions of grandeur, and that these illusions are associated with increased psychological well-being.

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for the within-groups design, $F_s(1, 308) < 1$ and 2.70 , $p_s > .10$, for positive and negative events, respectively, and for the between-groups design, $F(1, 294) = 1.79$, $p > .15$, and $F(1, 294) = 1.48$, $p > .20$, for positive and negative events, respectively. In Study 2, for the relative-likelihood measure, $F(1, 227) = 2.54$, $p > .10$, and $F(1, 227) < 1$ for independent and interdependent events, respectively; for the absolute-likelihood measure, $F(1, 227) < 1$ for both independent and interdependent events.

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Appendix A

Future Life Events in Study 1

Negative Events

1. Sometime in the future you will become an alcoholic.
2. Sometime in the future you will attempt suicide.
3. Sometime in the future you will develop skin cancer.
4. You will get divorced a few years after marriage.
5. Sometime in the future you will have a nervous breakdown.
6. Sometime in the future you will get AIDS.
7. Before graduating you will drop out of university.
8. Sometime in the future you will do something to make your family ashamed of you.

9. You will have a heart attack before the age of 50.
10. You will become senile with old age.

Positive Events

1. You will enjoy your career.
2. You will live past the age of 80.
3. Sometime in the future you will own your own home.
4. Sometime in the future you will leave your job for a better offer.
5. Your starting salary of your first postgraduation job will be greater than \$30,000/2,500,000 yen a year.

Appendix B

Future Life Events in Study 2

Independent Events

1. Sometime in the future you will become an alcoholic.
2. Sometime in the future you will attempt suicide.
3. You will come to hate your chosen career.
4. Sometime in the future you will get lung cancer.
5. After growing old, you will find out that you never realized your most important dreams.
6. Sometime in the future you will get AIDS.
7. In the future you will *not* be able to own your own home.
8. You will have a heart attack before the age of 50.
9. After graduating, it will take you at least 6 months of job-hunting until you are able to find a job.
10. Sometime in the future you will have a nervous breakdown.

Interdependent Events

1. Sometime in the future you will do something that will make your family ashamed of you.

2. In the future you will not be able to help to provide a decent standard of living for your family.
3. In your future career, most of your fellow workers will not like you.
4. In the future, in some way, you will become a heavy burden on your family or friends.
5. In your future career, you will not be promoted as quickly, nor to as high a level, as your fellow workers.
6. Sometime in the future a *member of your family* will be convicted of an embarrassing crime.
7. In your future career, your fellow workers will think of you as someone who is not responsible.
8. In the future, your family will be disappointed in you because of the career you chose.
9. You will be forced to resign from your career because of your involvement in some kind of improper conduct.
10. Sometime in the future a member of your family or a friend will be seriously harmed because of your negligence.

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