CULTURE AND COUNTERFACTUALS
On the Importance of Life Domains

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Past research, with its emphasis on affective regulatory processes, has failed to find cross-cultural differences in counterfactual thoughts. In the current study, the authors examine the tendency to generate additive counterfactuals (those that focus on the addition of new aspects that were not in fact present) and subtractive counterfactuals (those that focus on subtraction of factual aspects) among Mainland Chinese and European American university students in five life domains: schoolwork, romantic relationships, family relationships, friendships, and life in general. As in previous studies, the authors find an overall main effect, in which additive counterfactuals predominate over subtractive counterfactuals within both cultural groups. However, they also find systematic cultural differences in the likelihood of generating additive and subtractive counterfactuals in the domains of schoolwork and family. These findings are discussed in terms of their implications for understanding the nature of cultural differences.

Keywords: counterfactuals; cultural differences; life domains; Chinese culture

Counterfactuals are thoughts of what might have been, of how the past might have turned out differently. Counterfactual thoughts influence emotions, especially regret, which is commonly defined as a negative emotion that springs from the realization that one could have (or should have) done something differently to have achieved a better outcome (Zeelenberg et al., 1998).

"If only I'd studied harder, I'd have passed the exam." "If she hadn't been driving so fast, she wouldn't have been in an accident." As these two examples make clear, counterfactuals often take the form of "if-then" conditional propositions in which the "if" corresponds to an action and the "then" corresponds to a goal. Counterfactual thinking interests psychologists because it influences how individuals reason about and find meaning in the events that befall them. Counterfactuals furnish benchmarks against which actual events are fully comprehended, counterfactuals influence emotions both in magnitude and in kind, and counterfactuals influence a range of judgments, such as blame, likelihood, suspicion, and decision making (see Roese, 1997, for review).

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Counterfactual thoughts may be divided into those that are additive versus subtractive, that is, whether they focus on the addition of new aspects that were not in fact present (e.g., studying harder) or the subtraction of factual aspects (e.g., driving fast; see Roese & Olson, 1993). This distinction has been variously described in previous research using such terms as regrets of inaction versus action or omission versus commission.

CULTURE AND COUNTERFACTUAL THINKING

The study of East-West variation in counterfactual thinking has an intriguing history stretching to the early 1980s, in which cultural differences were first affirmed (Bloom, 1981), then denied (Au, 1983, 1984, 2004), and then denied again (Gilovich, Wang, Regan, & Nishina, 2003).

Available cross-cultural data seem to have rejected the idea that cultures differ in the propensity to engage in counterfactual thinking. Across many studies, American samples tend to generate more regrets of inaction (or additive counterfactuals) than regrets of action (or subtractive counterfactuals; Gilovich & Medvec, 1995; Roese, Hur, & Pennington, 1999; Roese & Olson, 1993). However, the same trend was found in other cultures as well. In a series of studies, Gilovich et al. (2003) examined experiences of the emotion of regret and found that an emphasis on regrets of inaction (additive counterfactuals) over regrets of action (subtractive counterfactuals) occurred similarly in both the East and the West, as revealed in studies conducted in China, Japan, Russia, and the United States. Gilovich et al. argued that psychological mechanisms, such as cognitive dissonance reduction, are more effective with time at reducing the sting of regrets of action relative to regrets of inaction, making the latter more likely to be voiced in questionnaires (Gilovich & Medvec, 1994; see also Gilovich & Medvec, 1995). Moreover, this affective regulation mechanism is likely to be culturally universal, thus accounting for the lack of cultural variation observed in this research.

Although the findings of Gilovich et al. (2003) cast doubt on the idea that cultures differ in counterfactual thinking, it is premature to reject this idea. Given that the tendency to engage in counterfactual reasoning varies across domains of life (Roese & Summerville, 2005), our approach was to examine patterns of additive versus subtractive counterfactual thinking within specific domains of life. Specifically, in the current study, we examined the tendency to engage in additive and subtractive counterfactual thinking among Mainland Chinese and European American university students in five life domains: schoolwork, romantic relationships, family relationships, friendships, and life in general. As per Gilovich et al. (2003), we expected an overall main effect in which additive counterfactuals would predominate over subtractive counterfactuals within both cultural groups. However, we also expected that this pattern would vary across life domains.

IMPLICATIONS FOR CULTURAL DIFFERENCES

The current research pertains to an important issue in the social psychology of culture: Are cultural differences domain general or domain specific. Researchers who adhere to a systemic view of culture believe in the presence of an internal logic (or deep structure) in each culture, from which various surface features evolve (see Brenneis, 2002; Shore, 2002, for discussions of the systemic view). According to this view, because observed cultural differences originate from the same source, cultural differences are domain general.

The systemic view has been the subject in critical discourse in both anthropology (Appadurai, 1996; Brenneis, 2002; Friedman, 1994; Shore, 2002) and psychology

(Bandura, 2002; Chiu & Chen, 2004; Matsumoto, 1999; Oyserman, Coon, & Kemmelmeier, 2002; Takano & Osaka, 1999). A major criticism focuses on the lack of attention the systemic view has given to intracultural variations in behavioral and psychological phenomena. Take the dimension of individualism and collectivism as an example. Within the United States, there are substantial regional and individual differences in the extent of adherence to individualist values (Triandis, Leung, Villarael, & Clack, 1985; Vandello & Cohen, 1999). Contemporary assessments of the research literature in psychology also reveal that the relative distribution of individualism and collectivism in the East and the West varies across different conceptual domains of individualism and collectivism (Ho & Chiu, 1994; Matsumoto, 1999; Oyserman et al., 2002; Takano & Osaka, 1999). For example, collectivism is more widespread in Japan than in the United States in the domain of group work but not necessarily in other domains (Oyserman et al., 2002).

Supporting the idea that cultural variation is domain specific, our research reveals that East-West cultural differences in counterfactual thinking are contingent on life domains, such as those of schoolwork versus friendship. Such differences were invisible to previous research efforts that took a general approach of averaging across these various life domains and become apparent when domain specificity of cultural differences is acknowledged.

In short, the objective of the present research is to document possible cultural variations in the likelihood of generating additive versus counterfactual thoughts and the context-specific nature of such variations. In the current study, we did not include any measures of the possible mediating mechanisms because our goal is not to explain such variations. However, we hope that the observed differences will set the stage for future exploration of the mediating mechanisms of such differences.

METHOD

PARTICIPANTS

The participants were 113 European American college students (69.2% female, ages 18 to 20) from the University of Illinois at Urbana-Champaign and 78 Chinese college students (57.5% female, ages 18 to 20) from Peking University, Beijing, China. The American students participated in the present study to receive course requirement credit in an introductory psychology class, and the Chinese students voluntarily participated in the study during a class meeting. Participant gender was included in our initial analyses, and no gender effects (main effects or interaction effects) were found. Therefore, we did not include participant gender in the statistical model reported below. Age was not included in the analysis because of the restricted range of the measured variable.

MEASURES

Counterfactual thoughts would likely be evoked when individuals recall specific negative events in which an alternative course of action could have led to a better outcome. Accordingly, as in previous research (Roese, 1994), we had the participants first recall a negative event and then record a counterfactual version of that event. Unlike this previous research, however, this task was completed in each of the following five domains: schoolwork, romance, family, friendship, and general. Next, for each negative event they recalled, they completed a sentence with these counterfactual grammatical markers: "If only . . . , then. . . ."

The American participants completed the questionnaire in English. The Chinese participants were given a Chinese version of the questionnaire, which was translated from the English version and validated through a standard back-translation procedure (Brislin, Lonner, & Thorndike, 1973).

Two independent coders read each completed sentence and decided whether the sentence expressed (a) an additive counterfactual thought and/or (b) a subtractive counterfactual thought. An additive counterfactual thought refers to a wish to add something into the past that has not actually happened (e.g., "If only I had called my Mom, then I would not have felt so bad now."). A subtractive counterfactual thought refers to a wish to remove something from the past that has already happened (e.g., "If only I had not broken up with my ex-girlfriend, then we would still be together."). A sentence may contain both an additive counterfactual thought and a subtractive counterfactual thought (e.g., "If only I had not gone to the party and had studied for the exam, then I would have got a better grade."). This indicates that additive and subtractive counterfactual thoughts are not necessarily incompatible. Therefore, we treated additive and subtractive counterfactual thoughts as two independent categories rather than two mutually exclusive options of a single category.

One European American and one Chinese-English bilingual coded the American participants' responses, and two Chinese coders coded the Chinese participants' responses. Intercoder reliability was acceptable: Intercoder agreement for the coding was 97.8% for American participants' additive counterfactual thoughts, 97.7% for American participants' subtractive thoughts, 90.2% for Chinese participants' additive counterfactual thoughts, and 92.0% for Chinese participants' subtractive thoughts. Disagreement was resolved through discussion between the first and second authors.

RESULTS

The dependent measure was the presence or absence of a particular type of counterfactual. Note that some participants did not generate any counterfactuals, and some generated more than one kind of counterfactual. Thus, the percentages of additive and subtractive counterfactuals did not add up to 100%.

A 2 (Country: China or United States) × 2 (Participant Gender) × 2 (Thought Type: Additive or Subtractive) × 5 (Domain) mixed design generalized linear model (GLM), with the variance function linked to a binomial distribution (Hastie & Pregibon, 1992), was performed on the coded data. This statistical procedure, which is conceptually similar to analysis of variance, can be applied to analyze binomial data obtained from a factorial experimental design. Specifically, binomial GLM performs analysis of deviance on binomial data and generates deviance chi-square statistics to determine whether the effect of a design variable in the analysis is significant. Because generalized linear models for analyzing categorical repeated measures are not fully developed, we followed Leung's (1987) practice of transforming the data set to treat each response in the Thought Type × Domain data matrix from each participant as a separate case, with thought type and domain encoded by dummy variables. To control for the within-participant variations in the data, we coded each participant as a dummy variable and entered these dummy variables as covariates in the analysis.

The main effect of thought type was significant, $\chi^2(1) = 402.33$, $p < .001$, $\Phi = .46$. Consistent with our prediction, more participants generated additive counterfactuals (73.3%) than subtractive counterfactuals (31.3%). This was the case for both American participants (73.8% for additive counterfactuals and 25.4% for subtractive counterfactuals) and for

TABLE 1
Country Differences in the Average Number of Counterfactual Thoughts Generated

	Chinese	*Americans*
Additive	3.56	3.71
Subtractive	2.00	1.26

Chinese participants (72.8% for additive counterfactuals and 37.1% for subtractive counterfactuals).

Although Chinese and American participants generated a similar percentage of additive counterfactuals, $\chi^2(1) = 0.77$, *ns*, Chinese participants generated a significantly higher percentage of subtractive counterfactuals than did American participants, $\chi^2(1) = 28.06$, $p < .001$, $\Phi = .12$. This pattern is reflected in the significant Country × Thought Type interaction, $\chi^2(1) = 14.44$, $p < .001$, $\Phi = .09$.

To ensure that these findings are not artifacts resulting from the transformation we performed on the data, we counted the number of additive and subtractive counterfactuals each participant generated across the five domains. Through this procedure, an additive counterfactual count and a subtractive counterfactual count were created, with each variable having a range from 0 to 5. Next, we performed a 2 (Country) × 2 (Type of Counterfactual) analysis of variance on the counts, with type of counterfactual as a within-participant variable. This analysis revealed a highly significant main effect of type of counterfactual, $F(1,189) = 165.22$, $p < .001$, $\eta^2 = .47$, and a significant main effect of country, $F(1, 189) = 23.56$, $p < .001$, $\eta^2 = .11$. As shown in Table 1, participants generated an average of 3.64 additive counterfactuals and 1.63 subtractive counterfactuals. Chinese participants generated an average of 2.78 counterfactuals, whereas their American peers generated an average of 2.48 counterfactuals. The Country × Type of Counterfactual interaction was also significant, $F(1, 189) = 8.07$, $p = .005$, $\eta^2 = .04$. Chinese and American participants did not differ in the number of additive counterfactuals they generated ($M_{\text{China}} = 3.56$ and $M_{\text{United States}} = 3.71$), $t(189) = -0.86$, $p = .39$. However, Chinese participants generated significantly more subtractive counterfactuals that did their American peers ($M_{\text{China}} = 2.00$ and $M_{\text{United States}} = 1.26$), $t(189) = 4.43$, $p < .001$.

Table 2 shows that country differences in the likelihood of generating subtractive counterfactuals were most pronounced in the domains of schoolwork and family, as predicted. This pattern is reflected in the significant Country × Domain × Thought Type interaction, $\chi^2(4) = 6.08$, $p < .05$, $\Phi = .06$.

Again, to ensure that this result is not an artifact of the transformation we performed on the data, we conducted a chi-square test for each type of counterfactual in each domain. Table 2 presents the results of the 10 chi-square tests. In the domain of schoolwork, compared to Chinese participants, American participants were more likely to generate additive counterfactuals (84.0% vs. 72.8%), $\chi^2(1) = 4.35$, $p < .05$, $\Phi = .15$, and less likely to generate subtractive counterfactuals (16.7% vs. 48.9%), $\chi^2(1) = 28.21$, $p < .001$, $\Phi = .38$.

A similar pattern was found in the family domain. Compared to their Chinese counterparts, American participants were more likely to generate additive counterfactuals (80.3% vs. 68.5%), $\chi^2(1) = 3.98$, $p = .06$, $\Phi = .14$, and less likely to generate subtractive

TABLE 2
Domain-Specific Country Differences in Counterfactual Thoughts

Domain	*Counterfactual Type*	*Chinese (%)*	*American (%)*	*Chi-Square*	p	*Effect Size (Φ)*
Schoolwork	Additive	72.8	84.0	4.35	.046	.15
	Subtractive	48.9	16.7	28.21	.001	.38
Family	Additive	68.5	80.3	3.98	.056	.14
	Subtractive	37.1	17.4	10.85	.001	.24
Romance	Additive	65.8	64.4	0.04	.882	.01
	Subtractive	41.8	33.3	1.52	.239	.09
Friendship	Additive	73.0	66.4	1.10	.307	.08
	Subtractive	38.2	31.4	0.29	.316	.04
General	Additive	74.2	71.2	0.23	.649	.03
	Subtractive	37.1	29.5	1.37	.153	.08

counterfactuals (17.4% vs. 37.1%), $\chi^2(1) = 10.85$, $p < .01$, $\Phi = .24$. Country differences in other comparisons were not significant (χ^2s ranged from 0.04 to 1.52, *ns*).

In short, compared to Chinese participants, American participants had a greater tendency to generate additive counterfactuals and a lesser tendency to generate subtractive counterfactuals in the domains of schoolwork and family.

DISCUSSION

Consistent with Gilovich et al.'s (2003) cross-cultural data, we found a preponderance of additive counterfactual thoughts (akin to regrets of inaction) relative to subtractive counterfactual thoughts (akin to regrets of action) among both American and Chinese undergraduates. In both samples, the likelihood of listing an additive counterfactual thought was about 70%, a figure comparable to the one Gilovich et al. obtained in the United States and other cultures (e.g., China, Russia, Japan). Taken together, there is strong evidence for Gilovich et al.'s claim that the affective mechanisms that mediate the preponderance of additive counterfactual thoughts might be universal. According to Gilovich et al., in all cultures, people are generally effective in repairing the negative mood associated with those past failures that resulted from deliberate action (i.e., regrets of action). Thus, regrets of action tend to diminish with time. By contrast, as people's retrospective confidence increases with time, they may feel that they could have seized missed opportunities to maximize past gains. Therefore, people tend to find inactions that lead to missed opportunities more regrettable and memorable than actions that lead to past failures (Gilovich, Medvec, & Chen, 1995).

These affect regulatory mechanisms account for considerable variation in the counterfactual thoughts that participants in the current study reported. Nevertheless, we suggest that there is more to the story. Because counterfactual thoughts are closely tied to people's ongoing goals, dreams, and desires, we may see finer patterns of cross-cultural variation by examining counterfactuals within different domains of important life goals. By taking this approach, we indeed discovered East-West cultural differences in counterfactual thinking in two domains.

How do we account for the domain-specific cultural variations in the current study? We posit that aside from affect regulatory mechanisms, there are other important processes under-

lying counterfactual thinking, perhaps the most important of which is self-improvement and goal regulation (Roese, 1994, 1997, 2001). Counterfactual thoughts most typically specify actions that could have resulted in goal attainment, and these insights facilitate future performance (Morris & Moore, 2000; Nasco & Marsh, 1999). Specifically, reflecting on what one could have done differently to have made things better (engaging in additive counterfactual thinking) focuses the individual's attention on missed opportunities and may increase the individual's sensitivity to future opportunities. Likewise, reflecting on what one should not have done (engaging in subtractive counterfactual thinking) orients the individual to learn from past mistakes (Pennington & Roese, 2003; Roese et al., 1999).

Conceivably, the relative importance of learning from one's mistakes over seizing opportunities differs across cultures as a function of life domain. For example, in the domain of academic achievement, past research shows that East Asian undergraduates are more concerned about correcting their learning mistakes than are European Americans (Crystal & Stevenson, 1991; Crystal et al., 1994; Heine et al., 2001). Similarly, in the domain of family relations, there are stricter rules and sharper parental expectations in the Far East than in North America (Ho, 1994; Ho & Kang, 1984). In the Far East, relative to the West, children are more often reprimanded for their misconduct than praised for their achievement (Hamilton, Blumenfeld, Akoh, & Miura, 1990). In both examples, we might expect to see relatively greater emphasis on subtractive counterfactuals among individuals from the Far East than from the West, particularly within these specific domains of academic achievement and family. Consistent with these expectations, in the current study, despite the preponderance of additive over subtractive counterfactual thoughts in both cultural groups, cultural processes did influence the relative likelihood of retrieving subtractive counterfactual thoughts in the domains of family and schoolwork, where learning from past mistakes is more important in China than in the United States.

It is possible that in Chinese societies, a troublesome romance or friendship might also reflect badly on the family and hence evoke subtractive counterfactuals. Consistent with this idea, Table 2 shows a higher percentage of subtractive counterfactuals for Chinese participants than for American participants, although the differences were not significant. The cross-domain variation in effect size might be due to the different social expectations in family relationships and those in friendships and romantic relationships in contemporary China. Familial and kinship relationships are based on blood and marriage ties; they are difficult to dissolve. Accordingly, fulfilling familial obligations is a lifelong moral imperative. Conversely, friendship, romantic relationships, and coworker relationships in contemporary Chinese societies are often viewed as voluntary relationships, characterized by reciprocal involvements (Chiu, 1990; Ho & Chiu, 1994). The rise of voluntarism in friendship and romantic relationships in Chinese societies might have lowered the likelihood of generating subtractive counterfactuals in these relationships.

Although the proposed explanations of our findings seem to follow from previous findings pertinent to the psychological functions of counterfactual reasoning and cross-cultural differences in motivation orientation, it is important to point out that they are post hoc speculations rather than confirmed explanations. Future research is needed to critically examine the validity of these speculative claims.

One limitation of the current study needs to be addressed. In the current study, participants reported counterfactual thoughts on the personal events they recalled. This research method is unexceptional in counterfactual thinking research. As such, it allows us to compare our findings to previous findings in the research literature. Nonetheless, it could be argued that we obtained cross-cultural differences in two domains because American and

Chinese participants thought of different events in these two domains. Perhaps it would be useful to design studies in which both groups respond to the same hypothetical events. A challenge in designing such studies is to identify events that are equally meaningful to both groups. Furthermore, regrets over hypothetical events may not have the same psychological significance as regrets over personal events. If cultural differences emerge simply because participants in the two groups recalled different events, one would expect cross-cultural differences to emerge in the general domain because in this domain, the participants were least constrained in the types of events they were asked to recall. In spite of this, cultural difference was not found in this domain.

In summary, past research, with its emphasis on affective regulatory processes, has failed to find cross-cultural differences in counterfactual thoughts. However, a closer examination of the self-regulatory functions of counterfactual thinking in different life domains has led us to discover systematic differences between Chinese and American undergraduates in the likelihood of generating additive and subtractive counterfactuals. These findings underscore the complexity of many cultural phenomena. Most cultural phenomena have multiple determinants, some of which may be culturally invariant, whereas others are culture dependent. In the case of counterfactual thinking, the affective regulatory function of counterfactual thinking may be invariant across cultures, whereas the self-regulatory function appears to be culture dependent. The findings from the current study are best interpreted in terms of the joint effects of both culture-invariant and culture-dependent processes.

Finally, as our findings indicate, cultural differences in counterfactual thinking are domain specific; they are most pronounced in some life domains than in others. In the domains where cultural differences in counterfactual reasoning are most pronounced, there is a heavier emphasis on learning from past mistakes in Chinese culture than in North American culture. These findings illustrate the value of a contextual approach to studying culture (Chiu & Hong, 2005; Matsumoto, 1999; Oyserman et al., 2002).

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