It Was Meant to Happen:
Explaining Cultural Variations in Fate Attributions

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People often perceive important and improbable life outcomes as "meant to happen," that is, predetermined and inevitable. In 4 studies, we constructed diverse measures of such fate attributions and examined the cultural correlates of this attributional tendency, focusing on ethnic culture and religious affiliation differences. Independently of ethnic culture, Christians were found to endorse fate attributions more than did the nonreligious; and independently of religious affiliation, East Asian Canadians attributed events to fate more than did European Canadians. Consistent with theoretical predictions, the religious affiliation difference was mediated by belief in God, whereas the ethnic cultural difference was mediated by a measure of causal complexity, although not by a measure of acculturation. Experimentally inducing thoughts of causal complexity in one domain increased fate attributions in unrelated domains. These results point to 2 independent psychological sources of fate attributions which also explain observed cultural differences in this tendency.

Keywords: attribution, fate, culture, belief, religion

Is the story of our life shaped by the arbitrary choices we make and coincidences we endure, or is life pushed by the mysterious and unstoppable forces of fate? The tendency to explain events by attributing them to fate occurs when perceivers believe that a rare but significant life outcome—for example an unlikely romantic encounter or a tragic accident—was predetermined, fated, surely not a mere coincidence, in short, "meant to happen." Fate attributions may reflect a cross-culturally reoccurring general belief or a *social axiom* (Leung et al., 2002) corresponding to an existential psychological universal (Norenzayan & Heine, 2005). That is, fate attributions are likely to be, under some circumstances, cognitively available to all perceivers, but they are elaborated to different degrees and may take different forms across cultures. Consequently they appear in many cultural traditions, such as in the mythmaking and storytelling of ancient Greece, Eastern Europe, China, India, and the Middle East.

In Western culture, the cultural resonance of the idea of fate goes back to the ancient Greeks. In the myth of Oedipus, for example, the god Apollo tells Oedipus he is doomed to kill his father and marry his mother, and despite his active efforts to avoid

such an awful outcome, Oedipus unwittingly realizes his fate. Similarly in the ancient Chinese tradition, the concept of *tian ming*, roughly translated as fate, or "the mandate of heaven," played an important role in Chinese interpretations of important events, such as dynastic transitions (Raphals, 2003). In fact, the intimate connection between "life" and "mandate" can be seen by the two being represented by the same Chinese character "ming," as if the will of heaven mandates every twist and turn in life.

Belief in fate is often discussed in the psychological literature as *fatalism*, a tendency found to be related to negative consequences. These include risky health behaviors (Henson, Carey, Carey, & Maisto, 2006; Kalichman, Kelly, Morgan, & Rompa, 1997), unwillingness to seek social support (e.g., Goodwin et al., 2002), and failure to prepare for unpredictable, but controllable, negative events such as earthquakes (e.g., Lehman & Taylor, 1988; Lindell & Perry, 1992; McClure, Allen, & Walkey, 2001). Studies in this literature, however, have been limited by their conceptualization of fate beliefs in a manner that is confounded with other constructs which are known to have deleterious consequences, such as a sense of powerlessness, belief in an unjust world, and absence of trust in society. Dake's (1992) Fatalism Scale, for example, contains items such as "I have often been treated unfairly," and "A person is better off if he or she doesn't trust anyone." Similarly, the Fatalism subscale of the Zimbardo Time Inventory (Zimbardo & Boyd, 1999) is a mixture of items reflecting lack of planning for the future and a lack of self-efficacy. Compounding this issue, there has been a disproportionate reliance on samples drawn from Western secular contexts in which belief in fate may have cultural meanings that are not shared in other cultural contexts.

In this article we take a social cognitive approach to examine fate beliefs in an attributional framework. Social psychologists, ever since Heider (1958), have taken great interest in the general cognitive processes underlying causal attributions (e.g., Kelley, 1967; Malle, 1999; Weiner, 1986), yet relatively little is known

about the cognitive underpinnings of fate beliefs. Even less is known about the distribution of such beliefs across cultural groups and the psychological origins of these differences. We draw on attribution theory to present four novel studies that examine the cultural correlates of fate attributions. Unlike previous studies on "fatalism," we conceptualized fate attributions in a manner that does not inherently privilege a particular cultural model or contain religious themes, and we disentangled fate attributions from other related constructs. This methodological step allowed us to investigate and disentangle two independent dimensions of cultural variability—ethnic and religious differences—simultaneously, a strategy that has rarely been employed in past cross-cultural research. We then probed the underlying psychological variables that may account for these cultural differences. In particular, our theoretical predictions focused on two distinct psychological sources of fate attributions, asking (a) whether belief in supernatural agents (e.g., God) explains differences in fate attributions among Christians and the nonreligious and (b) whether perceptions of a complex causal field explain ethnic cultural differences between East Asian Canadians and European Canadians.

Fate Attributions Across Cultures

Despite the prevalence and variability of fate attributions across cultures and historical time, and a rich literature by ethnographers and cultural observers (e.g., Burkert, 1985; Chen, 1997; Johnson, 1989; Raphals, 2003), the cultural antecedents of this phenomenon have been largely overlooked in the psychological literature. Understanding the potential cross-cultural variability of any psychological phenomenon is important in its own right, as human beings are a cultural species with a great deal of population variability in psychological functioning (Heine & Norenzayan, 2006). This is also important as the particular pattern of universality and variability can give clues as to the possible psychological origins of a phenomenon (Heine & Norenzayan, 2006; Norenzayan & Heine, 2005).

In this regard, cross-cultural studies of fate beliefs are uncommon, but there are a few notable exceptions. Sims and Baumann (1972) examined the greater rates of deaths from tornadoes in the U.S. South than the U.S. Midwest, and after ruling out various obvious explanations, they concluded that this difference might be explained by the greater fatalistic beliefs of Southerners. However, in one survey examining beliefs about fate and risky behaviors comparing the U.S. Midwest to the U.S. South, no significant cultural differences were found, despite ethnographic reports of greater fatalism in the U.S. South (D. Cohen & Nisbett, 1998). Another cultural area where differences in fate beliefs have been hypothesized is in comparisons of Western and Eastern Europe. In a values survey, Schwartz and Bardi (1997) found, among other things, lower rates of mastery-related values (e.g., self-assertion, getting ahead, choosing own goals) in Eastern Europe than in Western Europe, and within Eastern Europe, among countries with a stronger penetration of communism (see also Goodwin et al., 2002). However these authors did not measure preferences for fate attributions. Low levels of mastery may lead to fate attributions, although a preference for fate attributions does not necessarily imply less mastery.

In a set of cross-cultural experiments comparing Hindus to Christians, Young, Morris, Burrus, Krishnan, and Regmi (2009; see also Young, & Morris, 2004) focused not so much on different degrees of emphasis on fate attributions, but on different kinds—Christian belief in fate is more focused on immediate retribution and is deity centered, whereas its Hindu counterpart is more focused on the long-term past and is destiny centered. As a result, when confronted with cases of misfortune (e.g., a child who is struck with a deadly illness), Christians were found to hold the victim responsible only when information about the victim's prior misdeeds was available, whereas Hindus were willing to apply the principle of karmic payback even without prior knowledge of misdeeds. Differences were also found in coping with future risk—Christians were more likely than Hindus to seek prayer (to a divinity figure), whereas Hindus were more likely than Christians to seek divination (of a particular destiny). However, Young et al. also found that prayer to divine figures was a high priority for both religious groups. Furthermore, these authors measured the tendency to attribute moral responsibility for a misfortune to the victim, not the tendency to view any outcome—positive or negative—as fated or "meant to happen," which is the focus of our studies.

Fate Attributions: Equifinality and Multifinality

Early attribution theorists (e.g., Heider, 1958) and subsequent elaborations of attribution theory (Kruglanski, 1979; Malle, 1999) and its extension to cultural beliefs (e.g., Pepitone & Saffiotti, 1997; Shaffer, 1984) provide a compelling framework to explain the conditions most likely to trigger fate attributions. In this framework, fate is especially likely to be invoked when a life outcome has important positive or negative consequences (subjective importance) and is relatively rare (subjective improbability; Pepitone & Saffiotti, 1997; see also Deridder, Hendriks, Zani, Pepitone, & Saffiotti, 1999). These explanations were also found to be distinguishable from other forms of nonmechanistic explanations, such as attributions to luck. In addition to subjective importance and improbability, fate attributions have also been found to be influenced by construal level. Events that are framed more abstractly, or are more distant in the past (resulting in more abstract conceptualization), are more likely to generate fate attributions (Burrus & Roese, 2006). More directly relevant to the present research, attributions to fate and to the personal actions of individuals were found to be uncorrelated, suggesting that perceptions of fate and perceptions of individual agency are not necessarily mutually exclusive.

Attributions to fate and attributions involving mechanical causation (which do not involve fate) both reflect deterministic views of the world. However they differ in one crucial way. Mechanistic attributions allow for counterfactual possibilities. They reflect *multifinality*, meaning that an outcome is viewed as part of a linear and reversible causal chain—different antecedent causes produce different outcomes. In contrast, fate attributions are characterized by *equifinality*: The outcome is overdetermined and somehow fixed in advance. Therefore different antecedents are equally likely to lead to the same final outcome, as can be seen in the myth of Oedipus (Shaffer, 1984). Attributions consistent with equifinality and multifinality are theoretically expected to be inversely correlated.

Consider for example a woman who dies in a car crash while driving to work. In multifinality (mechanical causation), she would

not have died if she had not driven to work that day. This is because that particular car crash was a sufficient cause of her death, and removal or alteration of the cause (car crash) would also eliminate the outcome (death). However, in equifinality (fate), she would have died somehow regardless of whether she drove to work that day. In other words, different antecedents are equally likely to lead to the same predetermined outcome.

Religious Affiliation Differences

The attributional analysis we have outlined suggests that invoking fate to explain events should be encouraged by belief in supernatural agents. Powerful supernatural agents resemble humans in many ways, but they are believed to transcend physical, biological, and psychological limitations, and as a result they can defy death, ignorance, and deception (Atran & Norenzayan, 2004). These capacities are believed to allow them to exert a great deal of influence over events and outcomes in the lives of people. For believers, then, significant outcomes in life are not merely the consequences of causal chains in an impersonal universe (multifinality); they are the result of deliberate, goal-directed actions on the part of gods and spirits in a personal, intentional universe (equifinality). Boyer (2001) noted, for example, that across many cultures, repeated or salient misfortune is accompanied with thoughts of supernatural agents, understood within the framework of an intuitive logic of social exchange between humans and gods (e.g., "if only we had made proper sacrifices . . ."). We argue that this is no mere coincidence—misfortune or good fortune may invoke thoughts of supernatural agents, and supernatural agent beliefs may in turn encourage the intuition that life's outcomes are predetermined and "meant to be." The cross-cultural prevalence of belief in supernatural agents could underlie fate beliefs.

As a result, sincere devotion to divine beings should encourage the belief that outcomes in a person's life are not just arbitrary consequences of accidental (reversible) chains of causality (multifinality) but rather the inevitable realization of the intentions of these powerful agents (equifinality). Unlike impersonal mechanical causation, goal-directed personal causation may involve different means and circumstances, but always the same result, leading to the intuition that the result was fated. Just as a powerful and skilled hired assassin intent on eliminating his victim would employ any and all methods of killing to achieve his goal, a supernatural agent intent on arranging someone's demise would seek this outcome by making use of any and all means and methods.

Surprisingly, the association between belief in supernatural agents and fate attributions has not received adequate attention. In these studies, we therefore hypothesized that Christians would be more likely to attribute outcomes to fate than would the nonreligious. Religious and nonreligious individuals vary on a number of characteristics other than devotion to God (such as moral intuitions, political attitudes, subjective well being, and optimism). However in line with our theoretical analysis, we further hypothesized that devotion to God in particular would statistically mediate this difference.

Ethnic Cultural Differences

There is a large body of evidence indicating that people participating in East Asian cultural traditions engage in a more holistic mode of processing information, whereas people participating in Western cultural traditions engage in a more analytic mode of processing (Choi, Koo, & Choi, 2007; Nisbett, Peng, Choi, & Norenzayan, 2001; Norenzayan, Choi, & Peng, 2007). Most relevant to fate attributions is *causal complexity*, a central aspect of holistic thinking which assumes a large number of possible causes underlying any outcome. In causal complexity, it is believed that multiple causes produce the same outcome independently or interactively. There is not one exact right combination of causes, but many right combinations that could produce the same outcome.

Causal complexity assumes that any outcome can be produced by multiple causes, and any initial cause can lead to multiple outcomes (Ji, 2005). In explaining events that have already occurred, which is typically when fate is invoked, people focus on the outcome which is already known. This outcome feels more inevitable to the extent that people believe there are multiple, redundant causal pathways to its occurrence (Choi & Nisbett, 1998).

This reasoning leads to specific predictions about fate attributions regarding known outcomes. In the context of a complex, overdetermined causal field, any single cause is not a necessary condition for the outcome to occur, as it is in multifinality. The absence of one initial cause could be mentally replaced by another potential cause or combination of causes as it would be the case in equifinality, making outcomes seem more inevitable. Consistent with this assertion, the findings of Choi and Nisbett (1998) showed stronger hindsight bias among Koreans, who endorse complex causality, compared to Americans. We therefore hypothesized that, independent of religious affiliation differences, East Asian Canadians would attribute known outcomes to fate more than European Canadians and that measures of acculturation and causal complexity would mediate this difference.

The Present Studies

The studies were designed to address two important methodological considerations that were immediately apparent. First, attributions to fate were operationalized to be conceptually neutral with regard to religious affiliation and ethno-cultural backgrounds. That is, nowhere in the scenarios and dependent measures there was any mention of supernatural beings (associated with theistic religion), or causal complexity (associated with East Asian holistic cultural beliefs). It was then an empirical question as to whether fate attributions in the same scenarios depicting known life outcomes were predicted by belief in supernatural beings and/or perception of causal complexity.

A second challenge was to balance two methodological concerns. First, we wanted to establish convergent validity by using different (but semantically overlapping) wordings of the construct of fate—it was fate, meant to happen, predestined, certainly not a coincidence. These are interchangeable terms in English that mean the same underlying construct of *fate*. It was then important to show that our findings are robust regardless of which terms are provided to participants. However, a competing methodological concern was to establish that our measures adequately tapped into the same underlying construct of fate. We expected that, to the extent that this is the case, these somewhat different wordings would (a) produce high internal reliabilities within each study, and (b) that different measures of fate would be similarly predicted by

the two relevant theoretical variables (devotion to God and causal complexity) across studies.

We simultaneously compared (a) Christians and nonreligious individuals and (b) European Canadians and East Asian Canadians within the same sample. Participants' fate attributions were assessed in several hypothetical stories which depicted various known life outcomes. In Study 1, we established the convergent validity of different but semantically overlapping terms for fate, and probed the discriminant validity of the construct of fate, by distinguishing it from related constructs such as locus of control, just world beliefs, risk aversion, and optimism. In Study 2, we provided further construct validity evidence for fate by establishing that fate and equifinality attributions are positively correlated. In Studies 1–3, we examined devotion to God as a potential mediator for the religious affiliation difference; in Studies 3 and 4, we examined perception of causal complexity as a potential mediator for the ethnic cultural difference. This was accomplished statistically in Study 3. In Study 4, we experimentally manipulated perceived causal complexity in one domain and measured its effect on attributions to fate in other, unrelated domains.

Study 1

Method

Participants. Participants were 213 students from the University of British Columbia (148 women, 64 men; M age = 20.7 years). Ninety-six participants identified themselves as having European heritage (51 Christians, 45 nonreligious) and 117 as having mostly Chinese East Asian heritage (45 Christians, 72 nonreligious). Ethnicity and religious group were correlated, $\chi^2(N = 213) = 4.93$, $p = .03$, such that there was a slightly higher proportion of religious Christians (54%) among Europeans and a somewhat higher proportion of nonreligious participants (61%) among East Asians. However, this pattern goes against our main hypothesis (i.e., fate attributions should be higher among Christians and among East Asians) and therefore is not a confounding factor. The mean number of years living in Canada was 19.2 years for Europeans and 12 years for East Asians. Both groups identified with their cultures to a similar extent (on a 10-point scale, 6.96 for European Canadians and 7.30 for East Asian Canadians, *ns*). All students received course credit for their participation.

Materials. Eight hypothetical stories were created to assess participants' fate attributions. In addition, validated self-report measures of locus of control, intrinsic religiosity, just world belief, optimism, risk aversion, and acculturation were administered. Finally, demographic information was collected. These scales were used to establish the convergent and divergent validity of the fate measure (see below). (All materials in this and subsequent studies are available from the authors upon request.)

Fate attributions. We created eight scenarios to assess participants' attributions to fate. After reading each scenario, participants interpreted the event by answering a forced-choice question alternating between fate and coincidence. These stories were improbable past events in a variety of domains, ranging from discovering a diamond ring on a busy street to reuniting with a long-lost brother after decades of separation. There was an even split between positive events and negative events. Various semantically overlapping terms for the fate option were provided, such as

"fated," "meant to be," and "certainly no coincidence." Proportion of fate responses was used as the dependent measure (see Appendix A).

Locus of control. Rotter's (1966) well-known 13-item Locus of Control Scale (LOC) was used to measure perceived locus of control. A high score on the scale suggests more internal locus of control. Scores on this scale were hypothesized to correlate negatively with fate attributions.

Devotion to God. A slightly updated version of the 10-item Intrinsic Religious Motivation Scale (IRMS), as developed by Hoge (1972), served to measure participants' religious devotion to God on a 7-point rating scale. A sample item is "In my life I experience the presence of the Divine." A high score on the scale suggests more intrinsic religious motivation.

Just world belief. The Just World Belief Scale (JWB) is a 17-item measure that examines the tendency to believe people usually get what they deserve and deserve what they get (Cozzarelli, Wilkinson, & Tagler, 2001; Lerner, 1980; Rubin & Paplau, 1973). Participants indicated their agreement with each item on a 7-point scale, where a high score suggests stronger beliefs in a just world. The purpose of including this scale was to establish that although just world belief and fate attributions are possibly empirically related, they are conceptually distinct. Whereas just world belief is about the moral alignment between actions and outcomes (people get what they deserve), attributions to fate indicate that significant outcomes are somehow "meant to be," and they may or may not involve moral justification. Therefore, we expected a modest positive association between fate attributions and just world beliefs.

Optimism. The revised Life Orientation Test (LOT–R) assesses general optimism in health and behavioral research (Ruthig, Chipperfield, & Newall, 2007; Scheier, Carver, & Bridges, 1994; Scheier et al., 1989). In the present study, participants indicated their agreement with each of the 10 items on a 5-point scale. A sample item is "I rarely count on good things happening to me." A high score indicated high optimism. We did not expect that fate attributions would be associated with optimism, and the latter measure was included to establish discriminant validity.

Risk aversion. The 6-item Risk Aversion Scale (RAS) used in this study was to provide a general measure of participants' attitude toward risky activities (Jackson, 1976; Pearson, Goldman, & Orav, 1995). A representative item is "Taking risks does not bother me if the gains involved are high." A high score indicated a preference for risk-taking. We did not expect that fate attributions as defined here would be associated with risk aversion.

Acculturation. The Vancouver Acculturation Index (VIA; Ryder, Alden, & Paulhus, 2000) measures bicultural participants' identification with the mainstream (VIA–Mainstream) and heritage (VIA–Heritage) cultures on a 9-point rating scale. The index asks for participants' agreement with 10 different Canadian activities, with parallel items asking their agreement with the same activity in the context of their heritage culture. Two aggregate scores, a mainstream identification score and a heritage identification score, were computed for each participant.

Demographics. Participants reported their gender, age, cultural and religious background, and their identification with their respective backgrounds. Those who indicated Christian or a Christian denomination (e.g., Catholic, Anglican) were classified as Christian. Those who identified themselves as nonreligious, athe-

ist, or agnostic were classified as nonreligious. Finally, participants reported their native language and how long they had been living in North America.

Procedure. This study was advertised in the online subject pool system at the University of British Columbia. Participants obtained a questionnaire which they completed at home, and it was returned to the experimenter for a course credit and debriefing. The first part of the questionnaire consisted of the eight hypothetical scenarios which assessed attributions to fate. The subsequent portion of the questionnaire included, in order of presentation, measures of locus of control, intrinsic religiosity, just world belief, optimism, risk aversion, and acculturation. The demographic section appeared on the last page. All participants received the measures in the same order. The entire survey took approximately 40 min to complete.

Results

A variable was created to measure fate attributions (fate response proportion [FRP]). For each participant, we divided the total number of fate responses in each scenario by the total number of scenarios ($M = 0.28$, $SD = 0.26$). The internal reliability ($\alpha = .73$) was adequate, despite different wordings used to denote fate. For each participant, we also added up the item scores of each personality measure used. The means, standard deviations, and t values comparing the two cultural groups of interest can be seen in Table 1. The new composite variables were adopted for subsequent analyses.

Table 2 shows the intercorrelations between the individual difference measures as well as the internal reliability scores for each measure. FRP was moderately and significantly correlated with devotion to God (IRMS) and inversely with the locus of control (LOC). These two findings were consistent with the predictions that religious devotion is a possible source of fate attributions and that belief in fate should overlap with perceptions of external control. However, these correlations were small to moderate in size, suggesting that fate attributions are largely distinct from these latter constructs. In this analysis, optimism, attitude toward risk, and just world belief were unrelated to fate attributions.

A 2×2 analysis of variance (ANOVA) with ethnic culture (Europeans vs. East Asians) and religious affiliation (Christians vs. nonreligious) as independent variables was conducted to test whether ethnic culture has an effect on fate attributions (FRP), controlling for religious affiliation, and vice versa. Both ethnic culture and religion had a main effect on participants' fate attributions in the predicted direction, as shown in Figure 1, $F(1, 208) = 28.29$, $p < .0005$, $\eta_p^2 = .12$, and $F(1, 208) = 14.34$, $p < .0005$, $\eta_p^2 = .06$, respectively. No significant interaction was found between the two factors ($F < 1$, ns). As seen in Figure 1, East Asian Canadians, on average, attributed events to fate more than did European Canadians, and this tendency was also significantly stronger among Christians than their nonreligious counterparts. A gender comparison also revealed a difference between female ($M = 0.33$) and male participants ($M = 0.19$), $t(210) = 3.59$, $p < .001$, but gender did not interact with culture or religion (ns) and therefore is not discussed further.

It could be argued that the observed ethnic cultural difference in fate attributions was in fact an artifact of other variable traits, especially when our European Canadian and East Asian Canadian participants were different on several individual difference dimensions (see Table 1). We employed simultaneous regression to test this possibility. As shown in Table 3, after controlling for LOC, JWB, RAS, and VIA–Mainstream, ethnic culture was still a significant predictor of FRP ($p = .0005$). JWB and LOC were also found to be independent predictors of FRP. Subsequently we analyzed the potential mediators for the religious affiliation and ethnic cultural differences, following the standard guidelines of Baron and Kenny (1986).

Religious affiliation differences. We investigated the religious affiliation difference using statistical mediation. We conducted three regressions to determine whether the effect of religious affiliation (1 = *Christians*, 2 = *nonreligious*) on fate attributions (FRP) was mediated by religious devotion (IRMS). One regression found a significant effect of religious affiliation on devotion to God ($\beta = -.57$), $t(211) = 9.95$, $p < .001$. A second regression revealed a significant effect of religious affiliation on fate attributions ($\beta = -.20$), $t(211) = 2.89$, $p = .004$. Then we regressed fate attributions on religious affiliation and devotion to God simultaneously and found that devotion significantly predicted fate attributions after controlling for religious affiliation ($\beta = .26$), $t(211) = 3.29$, $p = .001$. Religious affiliation was no

Table 1

Means, Standard Deviations, and t-Test Results of the Individual Difference Scales in Study 1

Scale	Overall (N = 213)		European Canadian (n = 96)		East Asian Canadian (n = 117)		
	M	SD	M	SD	M	SD	p
LOC (13)	6.55	2.47	6.59	2.50	6.51	2.49	ns
IRMS (70)	31.71	14.92	31.44	14.83	31.92	15.04	ns
JWB (119)	73.42	12.15	71.50	13.79	74.97	10.45	.04
LOT–R (30)	20.33	4.20	21.00	4.69	19.79	3.68	.04
RAS (36)	19.56	5.28	20.68	6.08	18.64	4.33	.005
VIA–H (90)	70.33	12.50	69.85	13.46	70.71	11.71	ns
VIA–M (90)	67.64	13.49	71.20	13.11	64.75	13.15	.005

Note. Values in parentheses represent the highest possible sum of each scale. LOC = Locus of Control Scale; IRMS = Intrinsic Religious Motivation Scale; JWB = Just World Belief Scale; LOT–R = revised Life Orientation Test; RAS = Risk Aversion Scale; VIA–H = Vancouver Acculturation Index—Heritage; VIA–M = Vancouver Acculturation Index—Mainstream.

Table 2
Intercorrelations Between the Individual Difference Scales in Study 1

Scale	FRP	LOC	IRMS	JWB	LOT–R	RAS	VIA–H	VIA–M
FRP (0.73)	—	−.29*	.40**	.07	−.08	−.13	.07	−.05
		−.14	.23*	.06	.00	.13	.02	−.06
LOC (0.57)		—	−.14	.27*	.13	.13	−.12	.12
			−.16	.35**	.30**	.11	−.18*	.19*
IRMS (0.90)			—	.10	.07	−.06	.14	−.12
				−.01	.06	.12	−.14	−.07
JWB (0.83)				—	.43**	.13	.25*	.44**
					.25*	−.04	.06	.08
LOT–R (0.76)					—	.21*	−.02	.20*
						.12	−.08	−.02
RAS (0.80)						—	−.02	−.12
							−.08	.15
VIA–H (0.86)							—	.52**
								.21*
VIA–M (0.89)								—

Note. Top values pertain to European Canadians ($n = 96$) and bottom values to East Asian Canadians ($n = 117$). Cronbach's alpha values for each scale are in parentheses. FRP = fate response proportion; LOC = Locus of Control Scale; IRMS = Intrinsic Religious Motivation Scale; JWB = Just World Belief Scale; LOT–R = revised Life Orientation Test; RAS = Risk Aversion Scale; VIA–H = Vancouver Acculturation Index—Heritage; VIA–M = Vancouver Acculturation Index—Mainstream.
* $p < .05$.   ** $p < .005$, two-tailed.

longer a significant predictor after devotion was controlled for ($\beta = -.05$, $t < 1$, *ns*). Finally, a Sobel test indicated a significant mediation ($z = -4.21$, $p < .001$).

Christians and the nonreligious also differed in levels of optimism (greater optimism among the former; $\beta = -.20$), $t(211) = -2.91$, $p = .004$. However unlike religious devotion, optimism was unrelated to fate attributions ($\beta = -.07$), $t(211) = -1.09$, $p = .27$. Therefore optimism failed as a potential mediator between religious affiliation and fate attributions. No other differences were apparent between Christians and the nonreligious.

Ethnic cultural differences. Although European Canadians unsurprisingly scored higher on the VIA–Mainstream measure, there was no cultural difference in the VIA–Heritage measure. Furthermore, there was no significant correlation between FRP and

Figure 1. Mean fate response proportion (FRP) for Christians and the nonreligious in European Canadian ($n = 96$) and East Asian Canadian ($n = 117$) samples in Study 1. Error bars represent the standard error of the mean.

either VIA–Heritage nor VIA–Mainstream for either cultural group. Thus, although we found East Asians to be more inclined to attribute events to fate, the VIA failed to provide a potential mediating mechanism. As a result, a mediation analysis could not be conducted.

Discussion

Study 1 established three main findings. First, there was evidence of convergent and discriminant validity for the fate attributions construct. The tendency to attribute important and unlikely life outcomes to fate showed good internal reliability (despite different wordings of items) and correlated in a meaningful way with an external locus of control and with the tendency to believe in a just world (the latter only when other variables were held constant). However, these correlations were small to moderate in magnitude, supporting the conclusion that fate attributions are conceptually distinct from these latter, well-researched constructs. Fate attributions were unrelated to self-reported optimism and risk aversion.

Second, we examined ethnic and religious differences in fate attributions. We found two independent main effects with no evidence of interaction: Christians showed more fate attributions than did the nonreligious, and East Asian Canadians showed more fate attributions than did European Canadians. Thus, the group showing the strongest tendency to attribute events to fate was East Asian Christians. We discuss this finding in more detail in the General Discussion.

Third, we examined whether acculturation to mainstream (Canadian) or heritage (East Asian) cultures mediated the effect of ethnic culture and whether devotion to divine agents mediated the effect of religion on fate attributions. There was no evidence that acculturation mediated the effect of ethnic cultural differences. The results did indicate that religious group differences were fully mediated by devotion to God. Levels of
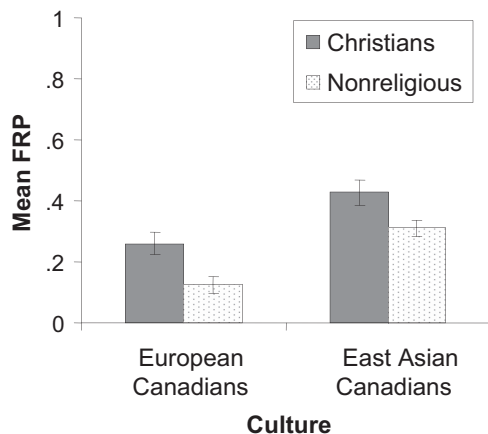
Table 3

Simultaneous Regression Analysis for Selected Variables Predicting Fate Response Proportion in Study 1

Variable	B	SE B	β	t	Significance
Constant	.05	.15		0.37	.72
Culture	.14	.035	.27	3.96	.001**
LOC	−.02	.007	−.23	−3.44	.001**
JWB	.003	.001	.15	2.15	.03*
RAS	.001	.003	.02	0.25	.80
VIA–M	−.001	.001	−.06	−0.86	.39

Note. $N = 213$. LOC = Locus of Control Scale; JWB = Just World Belief Scale; RAS = Risk Aversion Scale; VIA–M = Vancouver Acculturation Index—Mainstream.
* $p < .05$.   ** $p < .005$, two-tailed.

optimism, which were also higher among Christians, did not mediate religious group differences.

We conducted Study 2 to replicate the two main differences (ethnic culture and religious affiliation) from Study 1, with different scenarios and somewhat different dependent measures. We also probed the religious affiliation difference further. We again examined whether Christians attributed events to fate at a higher rate than did the nonreligious. We then asked whether a one-item measure of belief in God explained this cultural difference. In addition to an item measuring attributions to fate, we also included a measure of the related construct of equifinality, that is, the belief that a particular outcome (such as a homeless man winning a large sum of money) somehow would have happened anyway even if the antecedent cause (such as finding a lottery ticket in a garbage dump) would not have occurred. Finally, a third measure assessed attributions of the outcome in each scenario to the personal actions of the main actor. We expected, on the basis of our theoretical analysis, that the fate and equifinality measures would be positively correlated but that fate/equifinality would be orthogonal to attributions to the actor's personal actions (Burrus & Roese, 2006).

Study 2

Method

Participants.   Participants were 44 students (29 women, 15 men; *M* age = 20 years) at the University of British Columbia, 18 European Canadians (10 Christians, 8 nonreligious) and 26 East Asian Canadians (12 Christians, 14 nonreligious). They received half a course credit for their participation. Identification with their respective cultures revealed no statistical difference (on a 10-point scale, where high scores represent stronger identification with participants' own culture; 5.80 for European Canadians and 7.00 for East Asian Canadians, $p = .18$). Religious group and ethnicity were uncorrelated.

Materials.   In the interest of establishing the robustness of our findings from Study 1, we made two methodological changes to assess fate attributions. First, we created four new scenarios (in two alternate versions). For example, one scenario described John, a poor homeless man who wins two million dollars after finding a lottery ticket on the ground (see Appendix B for examples).

Second, we used different dependent measures; whereas in Study 1 participants were given a forced choice between synonyms of fate and coincidence, in this study these two attributions were measured independently with two different rating scales.

Fate attributions.   After reading each of the four scenarios presented to them, participants rated, on a 9-point scale, how likely it is that the target event was due to fate. Higher values represent higher likelihood.

Equifinality.   In addition to a question about fate, participants expressed their agreement with equifinality for each scenario. For example, for the lottery ticket scenario, participants rated, on a 9-point scale, whether they agreed with the statement, "Even if John had not found the lottery ticket on the ground, two million dollars would have come into his hands in some other way sooner or later." Higher scores represent stronger belief in equifinality.

Attributions to personal actions.   Participants rated, on a 9-point scale, the extent to which participants attributed the outcome in each scenario to the personal actions of the main character (e.g., "To what extent was this event determined by John's personal actions?"). Higher values represent more attribution to personal action.

Belief in God.   Unlike the previous study in which religious devotion was measured by the 10-item IRMS, in this study religious devotion was assessed by a one-item, face-valid measure of belief in God. Participants rated their degree of belief in God or a higher power on an 11-point scale, where higher scores indicate stronger belief in God or a higher power. In past research, this one-item measure of belief in God correlates strongly with multiple-item scales of religious devotion (e.g., Hansen, 2007).

Demographics.   Participants indicated their gender, age, native language, and their cultural and religious background. Participants who indicated Christian or a Christian denomination were classified as Christians. Those who identified themselves as nonreligious, atheist, or agnostic were classified as nonreligious.

Procedure.   Participants completed a take-home questionnaire and returned it to the experimenter for course credit and debriefing. The questionnaire took approximately 20–30 min to complete. After informed consent, participants read and responded to the four fate scenarios, followed by the demographic questionnaire. Embedded in the latter was the question on belief in God or a higher power.

Results and Discussion

For each participant, the responses to the four scenarios were summed to form an aggregate value for each dependent measure. These values were used in subsequent analyses. As expected, the average correlation between the fate and equifinality items was significant and positive ($r = .42$, $p = .004$). The more participants attributed events to fate, the more they also agreed with the idea that the outcome event would have occurred even if the antecedent cause was altered. Therefore the four fate and four equifinality items were combined into a single scale ($\alpha = .76$) that served as the main dependent measure. The four items measuring attributions to the actor's personal actions showed poor internal reliability ($\alpha = .29$). Therefore, each of the four items was correlated individually with the fate/equifinality aggregate measure. As expected, and replicating previous research (Burrus & Roese, 2006), attributions to fate/equifinality and attributions to the personal actions of the actors were orthogonal, as none of the correlations were statistically significant ($ps > .25$). Linear regressions showed that neither ethnic culture nor religious affiliation predicted attributions to the actor's personal actions for any of the four scenarios ($ps > .20$).

Next, we conducted a series of linear regressions to examine our main hypotheses: whether religious affiliation had the expected effect on fate/equifinality attributions and whether belief in God/higher power (HP) mediated this effect. In these analyses, we controlled for ethnic culture (1 = *European Canadian*, 2 = *East Asian Canadian*), which, as we have shown previously, independently contributes to variation in the outcome measure.

In the first regression, religious affiliation (1 = *nonreligious*, 2 = *Christians*) was shown to predict belief in God/HP ($\beta = 1.36$), $t(43) = 5.98$, $p < .001$. In the second regression, religious affiliation was also found to predict fate/equifinality ($\beta = .75$), $t(43) = 3.00$, $p = .005$. In the third regression, fate/equifinality was regressed on both religious affiliation and belief in God/HP simultaneously. Belief in God/HP remained a significant predictor after controlling for religious affiliation ($\beta = .37$), $t(43) = 2.21$, $p = .03$. The effect of religious affiliation on fate/equifinality disappeared when belief in God/HP was controlled for ($\beta = .25$, $t < 1$, $p = .45$). Ethnic culture independently contributed to fate/equifinality as expected ($\beta = .97$), $t(43) = 4.01$, $p < .001$, with East Asian Canadians endorsing fate/equifinality at higher rates ($M = 4.79$, $SD = 1.32$) than European Canadians ($M = 3.35$, $SD = 1.44$). There was no evidence of interaction between religious affiliation and ethnic culture.

The Sobel test for mediation was inadequate for this study, as it lacks sufficient statistical power with small sample sizes such as this one (MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002). We used an alternative procedure (Preacher & Hayes, 2004) that relies on the bootstrapping method as the most appropriate option when testing for mediation with small samples. The bootstrapping procedure was used to test the null hypothesis that the indirect path from religious affiliation to fate/equifinality through belief in God/HP was not significantly different than zero. The 95% confidence interval values did not cross zero ([1.03, 0.03]), disconfirming the null hypothesis.

In summary, Study 2 replicated and extended the findings on religious affiliation differences from Study 1. As predicted, we found that attributions to fate and perceptions of equifinality went hand in hand. This provided further evidence that belief in fate is related to the belief that certain outcomes are bound to happen even if the antecedent cause is altered. Variation in religious affiliation again predicted endorsements of fate/equifinality, and this effect was shown to be mediated by belief in God.

In Study 2, participants expressed agreement with "fate" and "equifinality." In contrast, in Studies 3 and 4 we measured agreement with another term synonymous with fate— that is, whether participants thought the target event was *predestined*. We also measured endorsement of mechanical causation by asking participants whether they thought the target event was due to *coincidence*. We expected that the belief that an event is predestined and belief that the same event is due to coincidence would be inversely correlated.

In addition, in Studies 3 and 4 we probed the potential mediating mechanism for the ethnic cultural differences in fate attributions that were found in the previous two studies. In Study 3, we considered a new and more specific potential mediator, perceptions of causal complexity, which have been found to be more prevalent in East Asian contexts. This tendency is characterized by a broad attention to the many causal factors in explaining events (Choi, Dalal, Kim-Prieto, & Park, 2003; Nisbett et al., 2001). Awareness of a large number of possible causal factors underlying an outcome, a hallmark of the holistic tendency, may then lead to the belief that outcomes are inevitable, because in the context of a complex causal field, the absence of one cause is mentally substituted by another potential cause (Choi & Nisbett, 1998). We hypothesized that differences in this cognitive tendency could explain the difference in fate attributions between East Asian Canadians and European Canadians. In Study 4, we went a step further and experimentally investigated whether priming causal complexity in one domain would increase attributions to fate in an unrelated domain of life.

Study 3

Method

Participants. Participants were 171 students (134 women, 37 men; M age = 20.5 years) recruited from the University of British Columbia. Eighty-one students identified themselves as having European heritage (35 Christians and 46 nonreligious) and 90 as having East Asian heritage (45 Christians, 45 nonreligious). Religious group and ethnicity were uncorrelated. The mean number of years participants had lived in Canada was 19.4 years and 12.6 years for European Canadian and East Asian Canadian participants, respectively. Participants received course credit for their participation.

Materials. The same four new scenarios from Study 2 were used to measure participants' attributions to fate. However in this study (as well as Study 4) we included four different variations for each scenario, rather than just two. (See Appendix C for examples; all materials are available from the authors upon request.) Other measures, in the order they were presented to participants, included the Inclusion/Exclusion Test (IET), the IRMS, and a demographics survey.

Fate attributions. After reading each scenario, participants indicated, on a 9-point scale, (a) how likely the target event was

predetermined, and (b) how likely the target event was due to coincidence. Higher values represent higher likelihood.

Causal complexity.   Following Choi et al. (2003), we used the IET to measure causal complexity as a potential mediator. The test described a hypothetical murder case, and participants played the role of a police officer investigating the murder. They were shown a list of 97 potential clues that depicted different characteristics of the suspect, the victim, and the murder scene. Participants indicated which of these items they thought were irrelevant to the case. Holistic thinkers have a wider field of attention and a broader explanatory frame, and as a result they exclude fewer irrelevant items (Choi et al., 2003). Therefore the number of excluded items served as an inverse measure of causal complexity.

Devotion to God.   The 10-item IRMS from Study 1 was employed again as a measure of religious devotion.

Demographics.   Participants indicated their gender, age, native language, and time spent in North America, as well as their cultural and religious background and how strongly they identified themselves with the reported affiliations. Participants who indicated Christian or a Christian denomination (such as Catholic, Anglican) were classified as Christians. Those who identified themselves as nonreligious, atheist, or agnostic were classified as nonreligious.

Procedure.   Participants completed a take-home questionnaire and returned it to the experimenter for a course credit and debriefing. The questionnaire took approximately 30–35 min to complete.

Results

Dependent measure.   Participants' predetermination and coincidence ratings across the four scenarios were, as expected, strongly and inversely correlated ($r = -.69, p < .001$). Given the large overlap, the two aggregate ratings were combined into a single variable: The coincidence total was subtracted from the predetermination total to produce a new variable, the fate response index (FRI; $\alpha = .64$), which was used in subsequent analyses. (Results were unchanged when we analyzed fate and coincidence ratings separately.) A numerical constant of 32 was added to each score to avoid negative scores, so the range of this variable extended from 0 to 64 ($M = 27.24, SD = 11.39$). Higher scores represent higher fate attributions.

Mediator variables.   For each scale, all items were combined into a total value. Descriptive statistics and cultural comparisons of these scales are shown in Table 4. As noted earlier, the task in the IET was to exclude items that were deemed irrelevant to a murder case. A low score on the test, thus, suggests broad attention and

high causal complexity (Choi et al., 2003). In line with our prediction, it was found that the IET was inversely correlated with fate attributions, $r(171) = -.20, p = .009$. In addition, a positive relationship between fate attributions (FRI) and religious devotion (IRMS) was again found, $r(171) = .32, p < .001$. We also examined whether the two potential mediator variables were related. The IET and the IRMS measures were statistically unrelated in the overall sample ($r = -.09$, *ns*) and within the European Canadian sample ($r = -.11, p = .32$) and the East Asian Canadian sample ($r = .05, p = .64$). Among the nonreligious, the two measures were again unrelated ($r = .08, p = .44$). However among Christians, these two constructs were inversely related ($r = -.23, p = .04$), suggesting that greater belief was associated with more causal complexity, but only in this latter group.

Main analyses: The mediating role of devotion to God and causal complexity.   The design of this study allowed us to conduct a comprehensive set of hierarchical regression analyses to test our hypotheses. Model 1 included both religion and ethnicity as predictors of fate attributions. Replicating previous findings, East Asians Canadians showed more fate attributions than did European Canadians, and Christians showed greater fate attributions than did the nonreligious, as suggested by an ANOVA (see Figure 2). There was no sign of interaction ($F < 1$). Next, three additional regression models were tested (see Table 5). Model 2a included religion, ethnicity, and causal complexity (IET) as predictors, to examine if this reduces the effect of ethnicity relative to Model 1, without reducing the effect of religion. This model was confirmed. Model 2b included religion, ethnicity, and devotion to God (IRMS) as predictors, to examine if this reduces the effect of religion relative to Model 1, without impacting the effect of ethnicity. This model was partly confirmed: IRMS reduced the effect of religion, but unexpectedly it also reduced the effect of ethnicity. Finally, Model 2c included religion, ethnicity, IRMS, and IET. At this point, the effects of both religion and ethnicity were reduced and were nonsignificant relative to Model 1, whereas the effects of IRMS and IET remained significant. Finally, two Sobel tests were conducted to test for mediation. One indicated that the IET significantly mediated the effect of ethnicity on fate attributions ($z = 2.02, p = .04$). Another indicated that the IRMS significantly mediated the effect of religious affiliation on fate attributions, yielding a *z* score of –3.07 ($p = .002$).

Discussion

The results from Study 3 replicated and refined the findings from Studies 1 and 2. Using an expanded set of scenarios and an

Table 4

Means, Standard Deviations, and t-Test Results of the Individual Difference Scales in Study 3

Scale	Overall ($N = 171$)		European Canadian ($n = 81$)		East Asian Canadian ($n = 90$)		
	M	SD	M	SD	M	SD	p
IET (97)	46.40	15.00	51.00	13.34	42.27	15.27	<.0005
IRMS (70)	30.37	14.96	25.90	12.32	34.39	16.02	<.0005

Note.   Values in parentheses represent the highest possible sum of each scale. IET = Inclusion/Exclusion Test; IRMS = Intrinsic Religious Motivation Scale.
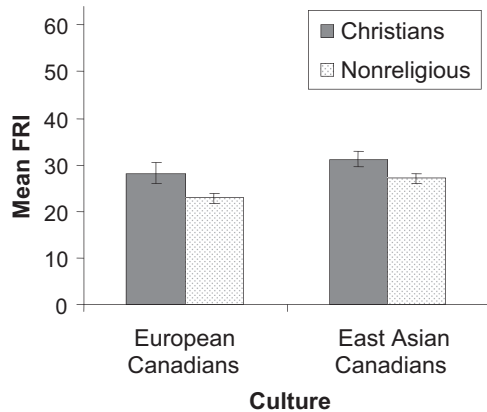
Figure 2. Mean fate response index (FRI) for Christians and the nonreligious in European Canadian (*n* = 81) and East Asian Canadian (*n* = 90) samples in Study 3. Error bars represent the standard error of the mean.

alternative measure of fate attributions, again we found that independent of ethnicity, Christians made more fate attributions than did the nonreligious, and independent of religious affiliation, East Asian Canadians made more fate attributions than did European Canadians. Moreover, we found that devotion to God mediated the religious affiliation difference in fate attributions, and a cognitive measure of causal complexity mediated the ethnic cultural difference. It is important to note that the difference between the religiously affiliated and the nonreligious was fully mediated by devotion to divine agents in three studies using different measures of fate attributions. However, the results in Study 3 revealed one ambiguity regarding ethnic culture: Devotion to God reduced the effect of religious affiliation, but unexpectedly, it also reduced the effect of ethnicity. This implies that the East Asian Canadian sample scored higher on devotion to God than did the European Canadian sample. Indeed, as can be seen in Table 4, this was the case (only in this study).

Study 4 was therefore conducted to shed further light on the causal mechanisms underlying the ethnic cultural difference in fate attributions. We experimentally manipulated causal complexity in one domain and subsequently measured fate attributions in another. We expected higher rates of fate attributions when participants were primed with greater causal complexity.

Study 4

Method

Participants. Fifty-seven European Canadian students at Queen's University were recruited through the online subject pool system (42 women, 15 men; *M* age = 18.8 years). They received half a course credit for their participation.

Materials and procedure. In this study we attempted to verify the role of causal complexity as a reliable causal factor that affects fate attributions. To do that, we primed a complex causal field (vs. control) in one domain and then measured fate attributions immediately after in unrelated domains. Other scales, in the order they were presented to participants, included the IET, the IRMS, and a personal demographics survey. All scores were summed to an aggregate value for that individual difference measure.

Pretest measure of causal complexity. Choi et al.'s (2007) Holistic-Analytic Scale was employed as a pretest measure of causal complexity. The original scale measures four aspects of holistic thinking: field dependence, complex causality, cyclic perception of change, and naïve dialecticism. Since causal complexity represents the most theoretically relevant construct to fate attributions, we included only that particular subscale in our current measure. One sample item is "Any phenomenon has numerous number of causes, although some of the causes are not known."

Priming apparatus and conditions. Participants were randomly assigned to one of the two conditions. In the causal complexity condition (*n* = 29), a one-page, single-spaced article on the "butterfly effect" was used to temporarily induce a complex causal

Table 5

Summary of Hierarchical Regression Analysis for Variables Predicting Fate Attributions

Variable	*B*	*SE B*	β	*t*	Significance
Model 1					
Culture	3.66	3.33	.16	2.16	.03
Religion	−2.32	0.85	−.20	−2.73	.007
Model 2a					
Culture	2.55	4.83	.11	1.46	.15
Religion	−2.36	0.84	−.21	−2.81	.006
Causal complexity (IET)	−0.13	0.06	−.17	−2.16	.03
Model 2b					
Culture	2.22	1.75	.10	1.27	.21
Religion	−0.61	1.04	−.05	−0.59	.56
God devotion (IRMS)	0.20	0.07	.26	2.71	.007
Model 2c					
Culture	1.19	1.80	.05	0.66	.51
Religion	−0.69	1.03	−.06	−0.67	.51
Causal complexity (IET)	−0.12	0.06	−.16	−2.12	.04
God devotion (IRMS)	0.19	0.07	.25	2.67	.008

Note. *N* = 171. R^2 = .07 for Model 1; ΔR^2 = .02 for Model 2a, .04 for Model 2b, and .06 for Model 2c (*p*s ≤ .001). IET = Inclusion/Exclusion Test; IRMS = Intrinsic Religious Motivation Scale.

field. The article explained, in scientific language, that a seemingly trivial or unrelated event can produce an enormous consequence via a complex matrix of reactions, just as the flapping of a butterfly's wings could disturb the atmosphere that ultimately may cause a tornado to appear in a remote place. In the control condition ($n = 28$), participants were presented with a neutral passage on some facts about tornadoes. The two articles were roughly equivalent in length (see Appendix D for details). To ensure careful reading, participants in both conditions were asked to summarize the article on a sheet of ruled paper and to rate the quality of the arguments presented to them on a 10-point scale.

Fate attributions. The four scenarios in Study 3 (in four alternative versions) were again used as the outcome measure of belief in fate (see Appendix C for details). After reading each of the four scenarios presented to them, participants were asked to rate, on a 9-point scale, (a) how likely the target event was predetermined and (b) how likely the target event was due to coincidence. Higher ratings represented higher likelihood.

Causal complexity. The IET from Study 3 was used again, this time as a manipulation check to the experimental induction of causal complexity. We predicted that the causal complexity prime would temporarily induce a broader and more complex causal field. The number of excluded items served as an inverse measure of causal complexity.

Devotion to God. To rule out any differences in religious devotion due to the prime, the IRMS was employed again as a measure of religious devotion.

Demographics. Participants indicated their gender, age, native language, time spent in North America, and academic major, as well as their cultural and religious background and how strongly they identified themselves with the reported affiliations.

Participants were seated in a quiet room free from distraction. The measures were administered to them one at a time by the experimenters. After reading and evaluating the article, participants proceeded to the fate attributions scenarios, IET, IRMS, and finally the demographic survey. Upon completion (within approximately 30 min), participants were thanked, debriefed, and rewarded half a course credit.

Results and Discussion

Pretest measure and preliminary analyses. A *t* test on the Causal Complexity subscale revealed no initial difference in causal complexity between the casual complexity and the control conditions before the priming manipulation ($t < 1$). Preliminary analyses were then conducted to detect possible artifacts that might contaminate the results of this study. A *t* test was conducted showing that gender was unrelated to fate attributions. Another potential concern was that some versions of the fate scenarios might be more effective than others in eliciting fate attributions. An ANOVA was conducted in each condition to test this possibility. Results showed no significant difference, $F(3, 25) = 2.76$, *ns* (causal complexity condition), and $F < 1$, *ns* (control condition).

Next, the cognitive elaboration of the priming articles was compared. Participants in the control condition wrote significantly *more* than did those in the causal complexity condition (mean difference of 1.12 lines of written text), $t(54) = 2.78$, $p = .007$. The favorability evaluations of the articles between the two con-

ditions did not differ, $t(54) = 1.59$, *ns*. Overall, the correlation between the IET and IRMS was significant, $r(55) = -.31$, $p = .02$. However, the two conditions did not differ on the IRMS ($\alpha = .93$; $t < 1$, *ns*). Thus, if more fate attributions are found in the causal complexity condition, such a finding could not be explained by the possibility that participants in this condition thought about the primed article more (quite the contrary), or that they were more favorably disposed to the content of the story (no difference), or that the butterfly effect article increased religious devotion (no difference).

Dependent measure and priming manipulation. The main dependent variable of this study was the tendency to make fate attributions. As in Study 3, we obtained an aggregate fate measure, the fate response index (FRI; $\alpha = .71$), by subtracting participants' coincidence total from their predetermination total across the four scenarios (the two measures were again inversely correlated at $r = -.80$, $p < .001$). A numerical constant of 32 was added to the distribution again to avoid negative scores ($M = 25.00$, $SD = 12.41$).

The priming manipulation was successful. Participants who received the causal complexity prime excluded significantly fewer items from the IET than did those who received a neutral prime (Ms = 38.93 and 47.52, respectively), $t(54) = 2.12$, $p = .04$, $d = 0.88$. Finally, the central hypothesis of this study was that participants who received the cognitive complexity prime would make more attributions to fate. Indeed, participants in the experimental (causal complexity) group attributed events to fate at higher rates than did their control counterparts (Ms = 28.14 and 21.59, respectively), $t(54) = 2.01$, $p = .05$, $d = 0.54$.

Study 4 provided experimental evidence indicating that priming causal complexity in a domain unrelated to the dependent measure increased fate attributions. Highlighting the possible influences of remote events not only led to more complex causal judgments but also led to more readiness to attribute events to fate. Moreover, given that both conditions were comparable in terms of other relevant characteristics we measured (e.g., evaluation and elaboration of the priming articles, initial causal complexity, and religious devotion), we can rule out the possibility that the priming effect on fate attributions was an artifact of these other variables. This experimental finding supports and supplements the statistical analysis in Study 3, which found that causal complexity mediated the cultural difference in fate attributions between European and East Asian Canadians.

General Discussion

We showed that attributing events to fate is related to, but distinguishable from, other constructs, such as external locus of control and just world beliefs, and unrelated to self-reported optimism and risk aversion. This was an important corrective step that sets this research apart from previous studies on "fatalism," which often have confounded belief in fate with these related constructs. We then examined and found systematic cultural differences in fate attributions and identified the underlying variables that account for them. We went beyond most previous cross-cultural research on attributions in two important ways. We disentangled religious and ethnic cultural affiliation within the same samples, something that has been overlooked in past cross-cultural research (for discussions, see A. B. Cohen, 2009; A. B. Cohen & Hill, 2007;

Norenzayan et al., 2007). Next, following the guidelines of Heine and Norenzayan (2006; see also Kashima, 2009, for a critical discussion), we went beyond the first step of demonstrating systematic cultural variation in a psychological phenomenon and took the further step of identifying the underlying process variables which mediate the cultural differences. Both of these research strategies are important novel contributions of this research to cultural psychology.

First we identified a cultural difference originating in religious affiliation: Christians were more likely than the nonreligious to attribute life outcomes to fate, and this religious difference was shown to be mediated by devotion to God, but not other variables such as optimism. Second, we identified a cultural difference originating in ethnic cultural affiliation: East Asian Canadians were more likely than European Canadians to attribute events to fate. Surprisingly, measures of acculturation to mainstream and heritage cultures failed to show any association with fate attributions. Although the reason for this is presently unclear, we can speculate that the acculturation measure we used (Ryder et al., 2000) may be insensitive to an intricate and largely "invisible" cognitive tendency such as fate attributions. This could be because the instrument we used emphasizes behavioral markers of acculturation (such as willingness to work with people of the heritage culture) rather than acculturation of psychological tendencies, which may be less accessible to introspective self-reports. Consistent with this possibility, our findings showed that a specific cognitive tendency— the awareness of a complex causal field— did mediate the ethnic cultural difference in fate attributions. Also, we experimentally manipulated causal complexity and found, as expected, that it reliably increased fate attributions.

The two main findings in this article are consistent with the attributional analysis of fate beliefs (Heider, 1958). This analysis led us to identify two independent sources of fate. The belief in an all-powerful supernatural agent who intervenes in human affairs and manipulates the world according to his will, as well as the belief in a complex, interconnected world, where a known outcome is overdetermined by a web of underlying causes. Both beliefs facilitated the perception of *equifinality*, or the view that different causes lead to the same outcome because the outcome was fixed in advance, leading to the intuition that such an outcome was fated or "meant to happen."

An interesting implication of these findings was that East Asian Canadian Christians were the group most likely to attribute events to fate. This pattern reveals that fate attributions do not follow a simple cross-cultural pattern along cultural or religious lines: A Western religion (Christianity) and a non-Western ethnic background (East Asian) converged to produce the strongest tendency toward fate attributions. Had we not disentangled ethnic and religious affiliation in our samples, it is unlikely that we would have successfully identified the cultural patterns underlying fate attributions. This is not to deny, of course, that non-Western religions also promote belief in fate. For example, it is likely that devout practitioners of some forms of Buddhism may be as likely as devout Christians to explain events in terms of fate. However, fate attributions may be embedded in different cultural beliefs, such as karmic order. Whether belief in supernatural agency mediates the path from religious affiliation to fate in non-Western religious populations is also an open question. Cultural variation in fate beliefs among different religious groups could also be explained by the fact that religious groups differ on the extent to which religiosity emphasizes devotion to supernatural agents, rather than ritual and practice (e.g., A. B. Cohen, Siegel, & Rozin, 2003). Therefore, fate attributions might be more prevalent among religious groups that emphasize supernatural agency rather than participation. These issues are an important goal for future cross-cultural research.

Methodological Considerations

One methodological challenge was to operationalize fate attributions to be conceptually neutral with regard to religious affiliation and ethno-cultural backgrounds. It would make little sense to conduct cross-cultural comparisons of fate attributions if the definition of the latter privileges a particular cultural model. We ensured the neutrality of the concept of fate by constructing scenarios and dependent measures that were devoid of any mention of supernatural beings (associated with theistic religions) and causal complexity (associated with East Asian holistic cultural beliefs). We consistently found two main effects of religious affiliation and ethnic background (no interactions were evident). The fact that religious devotion and causal complexity independently explained variability in fate attributions in the very same scenarios is further evidence that the dependent measures were conceptually neutral (i.e., the same scenarios could not simultaneously privilege two orthogonal variables—theistic religion and ethnic culture).

Another objection regarding our findings might be that fate attributions were measured in verbal reports and therefore are highly sensitive to the way questions are framed and scenarios are phrased. We took a three-pronged approach to address this important concern. First, we measured fate attributions in different scenarios and life events that varied on domain, valence, subjective importance, and improbability. Second, we varied the question format. Whereas in Study 1 participants responded in a forced-choice format contrasting a fate option with mechanical causation, in subsequent studies two independent rating scales were available for each option (which, as expected, were negatively correlated). Third, different synonyms for the fate option were used. In Study 1, the fate option included "it was meant to happen that . . . ," "it was certainly no coincidence that . . . ," and "it was fated that . . . ." In Studies 2–4, we used another synonym of fate, "it was predestined that . . . ."

In Study 2, we measured fate attributions and equifinality independently and showed that, as predicted, these two constructs were positively correlated. We found the same, theoretically predicted, pattern of results across the four studies (despite variation in wording and format), encouraging the conclusion that our measures assessed a meaningful and coherent construct reflecting attributions to fate. Although variation in wording, response format, domain, and valence may have had independent effects on the dependent measure, they are not counterexplanations and cannot account for the overall pattern of findings.

Another criticism might involve the way the response format was designed for the scenarios. That is, one might argue that our participants, when interpreting the scenarios, did not freely choose their explanations but instead were forced to alternate between a "fate" option and a "pure coincidence" option; other ways of interpreting the events were not available. Note, however, that this was the case only for Study 1. Although future research can

fruitfully investigate fate attributions in an open-ended format, we believe that this concern, although an important one, does not compromise our findings. First, our main point was to show that cultural differences in fate attributions, when they do occur, are facilitated by devotion to God and a complex causal field. This finding is independent of the possibility that other attributions for the same scenarios are possible. Second, in Studies 2–4 we made a methodological change by presenting the dependent measures separately in the form of two rating scales, which allowed participants to respond independently to these two measures. This modification allowed the possibility of explaining a scenario by neither fate nor coincidence (e.g., by giving a low rating on both scales). Nevertheless, even when their response options were flexible, our participants exhibited a strong preference for inversely related fate and coincidence attributions.

Limitations and Future Directions

In this research, we relied on diverse but interrelated terms to establish the robustness of the construct of fate attributions. We acknowledge that this approach involves a cost—it lumps together several related concepts (meant to be, fated, predestined) and may overlook some important nuances, such as the role of intentions and teleology and the distinction between *reason explanations* versus *cause explanations* (e.g., Malle, 1999). For example, devotion to God clearly implicates intentionality attributions to agents (Atran & Norenzayan, 2004; Boyer, 2001). However, it is an open question as to whether perceptions of intentionality underlie the effect of causal complexity; within East Asian traditions that invoke causal complexity in the world (Taoism, Mahayana Buddhism), the role of intentional agency is contested. Another related issue is whether attributing intentionality to the universe plays a role in the reported unwillingness of people to "tempt fate" (Risen & Gilovich, 2008). In light of the dearth of research on fate attributions, and particularly cross-cultural comparisons, we think that the present studies can serve as a stepping stone to disentangle these important nuances in future research.

It is important to note that in this research we refrained from examining the costs and benefits (and more broadly, the consequences) of fate attributions to the perceiver. The psychological literature on "fatalism" emphasizes detrimental consequences for health and well-being (e.g., Goodwin et al., 2002). In these previous studies, belief in fate is often operationalized as lack of personal control or passivity, which is different from our operationalization of this construct which focused on the cognitive properties of this belief. We think that attributions to fate under some conditions might reflect, but not inevitably so, a lack of an agentic self.

For example, in Study 2, we found that fate/equifinality attributions were unrelated to attributions to the personal actions of the actors, implying that belief in fate is not necessarily endorsed at the expense of belief in the efficacy of personal actions. We argue that fate attributions may have a complex cost–benefit calculus, and this calculus may partly depend on the cultural circumstances and the value placed on fate beliefs. In circumstances where events are uncontrollable or personal agency is socially constrained, acceptance and surrender (as it is encouraged by many religions) may free individuals from the constant anxiety of persistent but futile goal pursuit and may enhance coping (Miller & Wrosch, 2007; see

also Kay, Gaucher, Napier, Callan, & Laurin, 2008). Kay et al. (2008) showed that belief in a controlling God who micromanages life's outcomes is enhanced when perceptions of control are undermined either chronically or situationally. On the other hand, in circumstances where events are controllable or agency is socially facilitated, fate attributions may lead to inaction and negative outcomes. In this respect, fate attributions may be related to *secondary control*, which is more widespread in interdependent societies such as East Asian cultural contexts as well as highly religious societies, where social alignment is more valued than direct social control over one's circumstances (Morling & Evered, 2006). The costs and benefits of fate attributions is a complex and fascinating question, which we leave for future research.

We found that devotion to God explained differences in fate attributions between Christians and the nonreligious. However, we did not specify the particular type of supernatural belief which may be most likely to be implicated in fate attributions. It is likely that anthropomorphized God concepts (Barrett & Keil, 1996; Epley, Waytz, & Cacioppo, 2007; Morewedge & Clear, 2008) are particularly potent in motivating attributions to fate, since a human-like, agentic God is more likely to get involved in peoples' lives and influence outcomes than an impersonal abstract God. These are also open questions for the future.

The present research focused on convenience samples of European and East Asian Canadian university students. Although these samples had the advantage of comparability and some diversity, fate attributions did not figure prominently in the outlook of either of these groups (as can be seen from the mean levels). This fact perhaps explains why fate attributions have been a neglected topic—the typical samples in social and personality psychology tend to be modern secular Western university students who are unusual in the context of the world for their disinclination toward fate explanations. Future research can extend this paradigm to other regions of the world and religious groups (e.g., Hindu Indians, Buddhists, Southern U.S. Christians, Middle Eastern Muslims) where fate attributions may play a greater role in the cognitive outlook of participants.

One important variable we did not directly measure is counterfactual thinking, or the tendency to imagine alternate versions of the past, leading to the familiar "what might have been" (Roese, 1997). We expect that the tendency to attribute events to fate, by facilitating the intuition that life outcomes are inevitable, discourages counterfactual reflection. If there are powerful external reasons for why things happen (because of God's will, or because events are overdetermined by too many forces behind each event), then it would be futile to revisit the past and worry about what might have been. On the other hand, counterfactual reflection, rather than highlighting life's arbitrary nature, paradoxically may heighten the perception that the actual path taken or event lived through was fated and thus infuse life with meaning and purpose (Kray et al., 2010). The relationship between counterfactual thinking and fate attributions has not received adequate attention and is ripe for investigation (Kray et al., 2010).

This research examined how people make sense of significant and improbable outcomes in life—the love affair with the person who happens to be a next-door neighbor, the chance encounter with an old friend that leads to a new career path, the car accident closely averted. Upon reflection, few would deny that the daily coincidences and mundane choices we make can shape the direc-

tion of our lives. Yet all of us can recognize, at least once in a while, the intuition that the significant events of our lives were somehow predetermined, fated, meant to happen, and not simply the fluke result of the circumstances which led to them.

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Appendix A

Sample Scenarios and Dependent Measures in Study 1

1. It was 8:00am in the morning and the street was busy as usual. Kelly, on her way to school, stopped and reached down for her shoelace. While bent over she found a little diamond ring lying right in front of her which couldn't have been spotted otherwise.

    a) It was a fluke that Kelly found the ring.

    b) Kelly was meant to find the ring on that day.

2. Each day Jill activates the security alarm before leaving the house for work. Yesterday Jill was on the phone with a very important client, and she was so focused on the conversation that she totally forgot about putting the alarm on. Jill found out her house had been broken into when she came home. Her friends were surprised by the mishap because Jill is well-known for being a mindful person.

    a) It was pure chance that Jill's house was robbed on that day.

    b) It was her day her house was meant to be robbed.

3. Bob ran across his friend Jim and Jim's sister on the street one day. Later Bob and Jim's sister fell in love with each other and got married. Do you think:

    a) It was pure chance that Bob ran across his friend Jim and his sister that day.

    b) Bob and Jim's sister were meant to meet each other on that day.

4. John was walking in downtown when he spotted a Toonie lying on the ground. Just when John stopped and picked up the coin a window from an apartment above falls from its frame, hurting John severely.

    a) John's injury could have been avoided if he happened to pass the coin instead of picking it up.

    b) Even if John had not picked up the coin, he would have been injured by something else.

Appendix B

Sample Scenarios and Dependent Measures in Study 2

1. It was a freezing night and John, a penniless starving homeless person, was desperately searching for food in every garbage can. John had not eaten for three days. While searching he found a lottery ticket on the ground, which indeed was a winning ticket and John received two million dollars from it. The money changed John's life entirely.

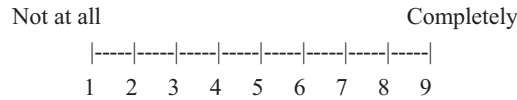   **Target event:** John found a lottery ticket that rewarded two million dollars.

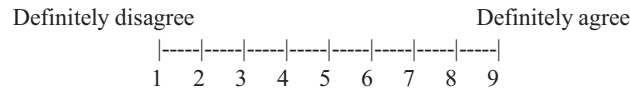   a) To what extent was this event determined by fate?

    Not at all determined by fate   Entirely determined by fate
    |-----|-----|-----|-----|-----|-----|-----|-----|
     1 2 3 4 5 6 7 8 9

(Appendices continue)

b) To what extent was this event determined by John's personal actions?

         Not at all   Completely

        |-----|-----|-----|-----|-----|-----|-----|-----|
        1   2   3   4   5   6   7   8   9

c) Even if John had not found the lottery ticket on the ground, two million dollars would have come into his hands in some other way sooner or later.

     Definitely disagree   Definitely agree

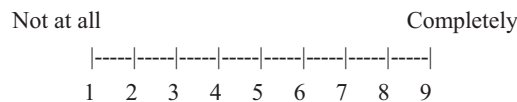 |-----|-----|-----|-----|-----|-----|-----|-----|
        1   2   3   4   5   6   7   8   9

2. Michael's office is in a tall building in downtown Vancouver. Although Michael uses the elevator everyday for the past five years, this is his first time being trapped in a malfunctioning elevator. With him there is a girl whom he has never met. Michael uses the time to edit a report on his notebook, while the girl makes several phone calls to her clients. After an hour of waiting they are rescued and hustle to their respective offices.

   Target event: Michael is trapped in an elevator with this girl for an hour, and they rush to their respective offices after being rescued.

   a) To what extent was this event determined by fate?

   Not at all determined by fate   Entirely determined by fate

        |-----|-----|-----|-----|-----|-----|-----|-----|
        1   2   3   4   5   6   7   8   9

   b) To what extent was this event determined by Michael's personal actions?

         Not at all   Completely

        |-----|-----|-----|-----|-----|-----|-----|-----|
        1   2   3   4   5   6   7   8   9

   c) Even if Michael had not been trapped in the elevator, he would have met the girl in some other way sooner or later.

     Definitely disagree   Definitely agree

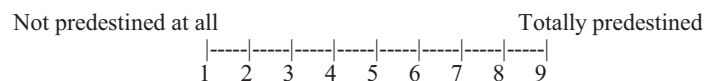 |-----|-----|-----|-----|-----|-----|-----|-----|
        1   2   3   4   5   6   7   8   9

Appendix C

Sample Scenarios and Dependent Measures in Studies 3 and 4

1. Ken was walking in a busy city when he spotted a Loonie lying in the middle of a street. Just when Ken approached the coin and bent over for it, a window from an apartment above falls from its frame, violently smashing Ken in the head and putting him into a permanent vegetative state.

   Target event: Ken was injured by fallen window when he was picking up a coin.
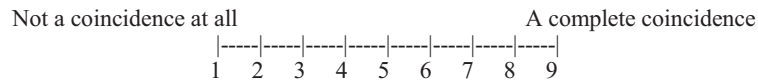
   a) This event was predestined in Ken's life.

     Not predestined at all   Totally predestined

        |-----|-----|-----|-----|-----|-----|-----|-----|
        1   2   3   4   5   6   7   8   9

b) This event was a coincidence in Ken's life.

Not a coincidence at all   A complete coincidence

```
|----|-----|-----|-----|-----|-----|-----|-----|
 1    2    3    4    5    6    7    8    9
```
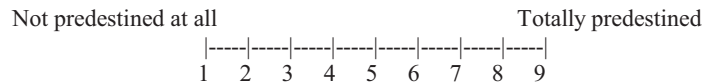
2. Kevin is a low-rank junior soldier who has served in the army for two months. He has participated in one minor war, and he has learned a few tips to minimize injury on a battlefield. One day, Kevin is chasing after an enemy soldier with his teammates. The retreating enemy soldier, knowing he will not be able to return to his base no matter how hard he struggles, turns around and aimlessly takes a few shots. One of the bullets hits Kevin's leg and Kevin falls on the ground almost immediately, with slight injury.

Target event: Kevin gets shot in the leg and when he is pursuing the enemy.

a) This event was a coincidence in Kevin's life.

Not a coincidence at all   A complete coincidence

```
|----|-----|-----|-----|-----|-----|-----|-----|
 1    2    3    4    5    6    7    8    9
```

b) This event was predestined in Kevin's life.

Not predestined at all   Totally predestined

```
|----|-----|-----|-----|-----|-----|-----|-----|
 1    2    3    4    5    6    7    8    9
```

Appendix D

Causal Complexity and Control Primes in Study 4

The Butterfly Effect [Experimental Condition]

Is it truly possible that a simple flap of a butterfly's wing in one part of the world could eventually result in a disastrous hurricane halfway across the globe? Although it sounds extraordinary that the root cause of a devastating storm could be traced back to an event as seemingly insignificant as the wing-flapping of an insect, this is precisely what a growing number of scientists are inclined to believe (Gelman & Maccoby, 1986). Generally speaking, the butterfly effect is the phenomenon that small variations of the initial condition of a system may produce large variations in the long term behavior of the system, just as a single movement of a butterfly's wing could evolve to a storm at a remote location that would otherwise fail to present.

The butterfly effect first came to attention in 1961. Edward Lorenz, a meteorologist and mathematician, was testing a mathematical model for weather prediction with a computer when he stumbled upon some startling results. Based on the very same mathematical model he used, he noticed the second run of his simulation data to be completely different from that in the first run. Much to his surprise, he found out the cause of the data discrepancy was due to a seemingly neglectable change in the initial numbers he entered into the model: In the first run, the initial values were six decimal places in length. In the second run, Lorenz decided to reduce the decimal places to three because as a mathematician, he knew better than anyone that the actual difference between the two values was less than 1/10000. But as the model showed, the small variation he made to the initial condition (the initial numbers) actually swayed the subsequent events from its predicted trend, thus producing an entirely different outcome (Haslam, Rothschild, & Ernst, 2000; Gelman & Maccoby, 1986).

(Appendices continue)

Scholars in different academic areas are well aware of the implication of the butterfly effect. While empirical evidence is still emphasized, scientists are now more open to the position that an event, however trivial it is, has the potential to lead to a consequential outcome after a long chain of causality (Haslam et al., 2000). For example, a recent report from the U.S. Geological Survey (USGS) department provided supporting evidence from a moderate tsunami that occurred near the Southwest area of Alaska on 31st October, 2007. It was reported that the tsunami observed was actually associated with the increased coastal activity at Kamchatka Peninsula, Russia—a group of islands located at the opposite end across the ocean (USGS, 2007). Another implication of the butterfly effect is that when explaining an event, one should not easily dismiss a potential cause that has not yet been observed or identified. Just as a simple movement of a butterfly is capable of inducing a giant tornado, it is not at all surprising to have causes which exist outside of our rational expectation.

Facts About Tornadoes [Control Condition]

The word "tornado" is an altered form of the Spanish word *tronada*, which means "thunderstorm." This in turn was taken from the Latin *tonare*, meaning "to thunder." It most likely reached its present form through a combination of the Spanish *tronada* and *tornar* ("to turn"); however, this may be a folk etymology. Tornadoes are also commonly referred to as *twisters*. Although tornadoes have been observed on every continent except Antarctica, most occur in the United States. They also commonly occur in southern Canada, south-central and eastern Asia, east-central South America, Southern Africa, northwestern and central Europe, Italy, western and southeastern Australia, and New Zealand.

Most tornadoes take on the appearance of a narrow funnel, a few hundred yards (a few hundred meters) across, with a small cloud of debris near the ground. However, tornadoes can appear in many shapes and sizes. In addition, tornadoes may be obscured completely by rain or dust. These tornadoes are especially dangerous, as even experienced meteorologists might not spot them.

One of the most persistent myths associated with tornadoes is that opening windows will lessen the damage caused by the tornado. While there is a large drop in atmospheric pressure inside a strong tornado, it is unlikely that the pressure drop would be enough to cause the house to explode. Some research indicates that opening windows may actually increase the severity of the tornado's damage. Regardless of the validity of the explosion claim, time would be better spent seeking shelter before a tornado than opening windows. A violent tornado can destroy a house whether its windows are open or closed.

Another commonly held belief is that highway overpasses provide adequate shelter from tornadoes. On the contrary, a highway overpass is a dangerous place during a tornado. In the Oklahoma Tornado Outbreak of May 3, 1999, three highway overpasses were directly struck by tornadoes, and at all three locations there was a fatality, along with many life-threatening injuries. The small area under the overpasses created a kind of wind tunnel, increasing the wind's speed, making the situation worse. By comparison, during the same tornado outbreak, more than 2000 homes were completely destroyed, with another 7000 damaged, and yet only a few dozen people died in their homes.