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Cultural Evolutionary Mismatches in Response to Collective Threat

Michele J. Gelfand
Stanford Graduate School of Business, Stanford University

Abstract

Across the millennia, human groups have evolved specific cultural and psychological adaptations to cope with collective threats, from terrorism to natural disasters to pathogens. In particular, research has identified cultural tightness, characterized by strict social norms and punishments, as one key adaptation that helps groups coordinate to survive collective threats. However, interferences with threat signals that facilitate tightening can lead to cultural mismatches—either too much or not enough tightening. I discuss two examples of cultural mismatches: the COVID-19 pandemic (a case in which collective threat is real, but there is a resistance to tightening) and the rise of populist movements (a case in which exaggerated threat leads to unnecessary tightening).

Keywords

culture, tightness-looseness, threat, social norms, cultural evolutionary mismatch

Collective threat is a universal feature of human groups. Humans across the millennia have evolved specific cultural and psychological adaptations to cope with threat, whether in the form of terrorism, natural disasters, or pathogen outbreaks. In particular, research has shown that groups that experience a lot of chronic threat tend to be *tighter*—to have strict rules and punishments for deviance—than groups that have had less threat, which tend to be *looser*—to have weaker rules and more permissiveness (Gelfand et al., 2011; Pelto, 1968). This cultural adaptation has been observed across historical periods and across different levels of analysis. As I discuss in this review, because strong and consistent signals of threat prompt tightening, it is possible to identify numerous cultural mismatches that can occur in human groups. I discuss two examples: a lack of adaptive tightening when collective threat is real but the signal is blocked (i.e., the COVID-19 pandemic) and unnecessary tightening when collective threat is exaggerated or manufactured (i.e., the rise of populist movements).

Tightness-Looseness Across History

In approximately 425 B.C., Herodotus, generally considered the "father of history," alluded to cultural differences in tightness-looseness in the *Histories*, contrasting the strictness of Egyptian social norms with the latitude he observed among the Persians. Many centuries later, the anthropologist Pertti J. Pelto (1968) also observed variation in the strength of social norms across 21 traditional societies, noting that the "tight" Hutterites, Hanno, and Lubara had strong norms, were very formal, and had severe punishments for norm violations, whereas the "loose" !Kung Bushmen, Cubeo, and Skolt Lapps had weaker norms and greater tolerance for deviance. Pelto speculated that these differences might have arisen from ecological conditions that forced communities to coordinate and cooperate.

Field research across 33 nations first documented the connection between ecological and human-made threat and the degree of norm strength in groups (Gelfand et al., 2011). My colleagues and I theorized that ecological and human-made threats increase the need for people to abide by rules because this helps facilitate the coordination needed to survive—to reduce chaos in nations with high population density, effectively deal with disasters and resource scarcity, defend against territorial threats, or contain the spread of infectious

Corresponding Author:
Michele J. Gelfand, Stanford Graduate School of Business, Stanford University
Email: gelfand1@stanford.edu

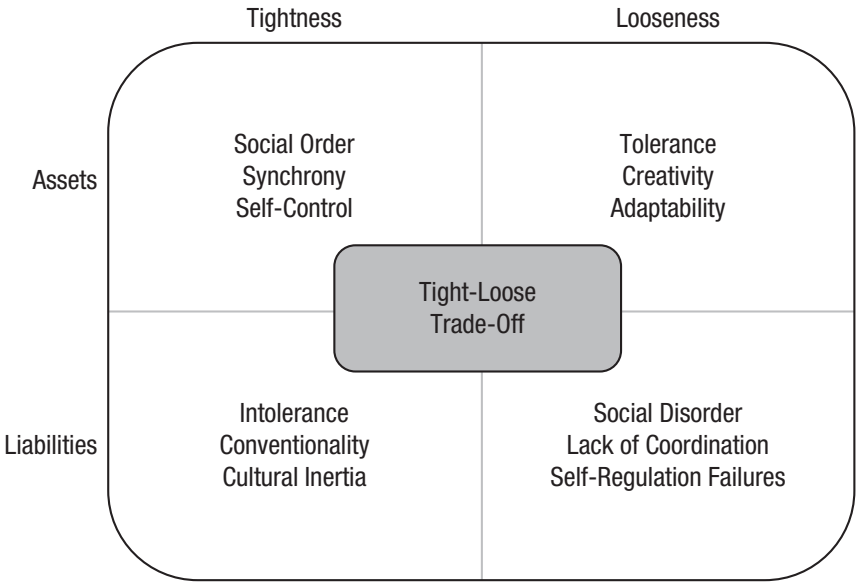

Fig. 1. The tight-loose trade-off between order and openness: assets and liabilities.

disease. By contrast, societies with less threat have a lower need for coordination and hence can afford to have weaker norms and much higher tolerance for deviant behavior. Tightness-looseness was assessed through items that reflected the degree to which social norms were pervasive, clearly defined, and reliably imposed within nations. Archival and survey data indeed showed that societies facing more ecological and human-made threats had stronger norms and punishment of deviance (Gelfand et al., 2011), and that their citizens reported having higher felt accountability—that is, higher levels of cautiousness, self-regulation, impulse control, and self-monitoring ability (i.e., to adapt behavior to situational requirements; Snyder, 1974), as well as greater need for a structured environment (Neuberg & Newsom, 1993). Recent research has also shown that groups that engage in rice cultivation, which also necessitates a high degree of coordination, tend to be tighter than those that engage in wheat production (Talhelm & English, 2020). Because traditional rice farming required shared labor that benefited the entire village (e.g., to repair shared irrigation ditches, dredge canals, and pump water by foot), farmers set up strict monitoring and punishment systems that made people accountable for their behavior. By contrast, labor sharing was far less binding in wheat-farming cultures, and that allowed these cultures to be looser (see Talhelm & Oishi, 2018, for a review).

Notably, research has shown that as groups tighten to deal with coordination needs, they also experience a number of trade-offs associated with *order* versus *openness* (see Fig. 1). Tight cultures tend to have more order—that is, more monitoring and less crime (Gelfand et al., 2011), more uniformity (Gelfand, 2018), higher self-regulation (e.g., less debt, alcoholism, and obesity; Gelfand, 2018), and a preference for strong, independent leaders (Aktas et al., 2016)—but lower levels of openness. By contrast, loose cultures tend to have less order but more openness—that is, less prejudice toward stigmatized groups (Jackson, van Egmond, et al., 2019), higher creativity (Chua et al., 2015), higher openness to change (De et al., 2017), and a preference for visionary team leaders (Aktas et al., 2016).[1]

Cultural adaptation to threat and associated order and openness trade-offs can also be found earlier in history. Using ethnographic descriptions from the Standard Cross-Cultural Sample, a database on nonindustrial societies from the 17th to the 20th century, my colleagues and I rated 86 relatively small-scale societies' tightness in six universally important domains: law and ethics, gender, socialization, marriage, sexuality, and funerals and mourning, all of which made up one latent tightness-looseness factor (Jackson et al., 2020). As in contemporary nations, nonindustrial societies that faced higher levels of collective threat—including pathogen prevalence, warfare, food scarcity, and population pressure—tended to be tighter than societies that had less threat. Tightness was also correlated with social complexity: Compared with small-scale hunting-and-gathering societies, larger societies had more complex legal, religious, and economic institutions that required large-scale cooperation and coordination (Turchin et al., 2018). Finally, nonindustrial societies prioritized order by favoring more authoritarian leaders

and moralizing gods, and sacrificed openness by limiting intergroup contact. Overall, these studies indicate that tightness-looseness can be seen as a universal human cultural dynamic, not just a unique feature of modern-day societies.

Tightness-Looseness Across Levels of Analysis

Tightness-looseness appears to have quasisimilar predictors and consequences across levels of analysis. For example, Harrington and I found that tighter U.S. states had more natural disasters and greater environmental vulnerabilities, fewer resources, and a greater incidence of disease and health vulnerabilities than looser U.S. states (Harrington & Gelfand, 2014). Individuals in tighter states had higher levels of conscientiousness, a personality dimension that reflects impulse control, cautiousness, and desire for orderliness. By contrast, individuals in loose states had higher openness, a personality dimension that reflects nontraditional values and beliefs, interest in and curiosity about new ideas, and tolerance for other cultures (for more on this dimension of personality, see John et al., 2008). Tighter states also had significantly higher levels of social organization (e.g., lower divorce rates and mobility), whereas looser states had more creativity and less discrimination. This trade-off can also be seen in longitudinal analyses of tightness-looseness in the United States. Across a 200-year period, the nation has been gradually loosening, and this change has been associated with increases in creativity (e.g., registered patents, trademarks, feature films, and unique baby names) but decreases in order (e.g., higher debt, lower school attendance, and higher rate of pregnancy among adolescents; Jackson, Gelfand, et al., 2019).

Similar patterns have been found in China. Chua et al. (2019) adapted the scale of norm strength from Gelfand et al. (2011) and found that provinces that were historically occupied by Japan and that are located on a national border (where invasion would be more likely) tended to be tighter than other provinces. Province-level tightness was positively associated with the prevalence of other threats, such as environmental emergencies, communicable diseases, and pollution, and in another study (Talhelm & English, 2020) was associated with rice cultivation. Chua et al. also found that people in tighter provinces tended to report higher levels of self-monitoring, greater conscientiousness, and less openness to experience. This pattern was reflected in variation in innovation rates; rates of radical innovation were higher in loose provinces, and rates of incremental innovation were higher in tight provinces.

Another recent exploration of tightness-looseness pertains to the strength of norms across social classes. Harrington and I found that the working class had stricter norms than the middle class, which was related to differences in exposure to threat (e.g., debt, unemployment, poverty, and crime; Harrington & Gelfand, 2021). These cultural differences were related to different socialization practices and divergent parental beliefs. For example, working-class parents were more likely to enforce strong rules and punishments and to believe that these practices were important for raising good children. Social-class differences in tightness-looseness were found to develop early: Working-class children ages 3 to 4 were more likely to protest rule violations when interacting with a norm-violating puppet than their middle-class counterparts were. In adulthood, working-class individuals exhibited a greater need for structure and order, a more positive orientation toward rules, and more stringent beliefs about morality, but also lower creativity and more prejudice against controllable forms of deviance. More generally, the results suggest that tightness may be an adaptive mechanism for coping with the threat that comes from the prospect of falling into "hard living" or dregs of poverty (Howell, 1973).

Tightness-looseness theory has also recently been applied to religious cultures. My colleagues and I found that conflict (e.g., war, terrorism) is associated with punitive characterizations of God (i.e., as "punishing" and "strict") but not loving characterizations of God (e.g., "compassionate" "and "caring"; Caluori et al., 2020). This difference was mediated by an increase in desired tightness. Tracking quotations of Bible passages in books published across 200 years, we found that writers quoted Bible verses that depicted God as punitive at a higher rate during times of threat than during more secure times. Experimental studies in which participants read vignettes about what the United States might look like in the future have likewise found that both the threat of war (Caluori et al., 2020) and ecological threat (Jackson et al., 2021) increase participants' punitive religious beliefs. These effects were mediated by an increased desire for strict norms. More generally, when there is threat, punishing gods may be psychologically attractive, given that they provide order in the face of chaos (Jackson et al., 2021).

In summary, tightness-looseness appears to generally have similar predictors and consequences across levels of analysis, with some exceptions.[2] In this respect, it resembles a fractal structure, in which a pattern is quasi-isomorphic regardless of its scale (Mandelbrot, 1982). Regardless of whether tightness-looseness is examined in countries, states, regions, or small-scale societies, it tends to be predicted by ecological and

human-made threat and other coordination challenges, and catalyzes a suite of individual-level adaptations and trade-offs related to order versus openness.

It is important to note that neither tightness nor looseness is inherently good or bad. However, groups that are either extremely loose or extremely tight tend to be dysfunctional. Harrington et al. (2015) showed that both extremes, compared with moderate levels, were related to higher rates of suicide and depression and higher blood pressure, as well as lower well-being. Groups that are extremely loose may experience chaos and a lack of control and not have any ability to coordinate (what Durkheim called *anomie*). By contrast, groups that are extremely tight may experience repression and a loss of any autonomy. This suggests that cultural mismatches with respect to norm strength can happen in human groups, a phenomenon that I discuss next.

Collective Threat and Cultural Evolutionary Mismatches

From a cultural evolutionary perspective, the tightening of social norms during times of collective threat is an adaptation that helps groups coordinate. Indeed, evolutionary game-theoretic models have shown that differences in tightness evolve as an adaptation to threat (Roos et al., 2015). These computational models are useful for understanding how human behaviors evolve over time, and ultimately for identifying evolutionary stable states. With respect to culture, a stable state consists of behavioral norms that are adaptive and can be expected to remain in the population under certain conditions. My colleagues and I (Roos et al., 2015) found that under conditions of high threat, norms for cooperating and for punishing defectors evolved to be the dominant behavioral strategies. Technically speaking, as threat increased, agents operated in a space of lower payoffs, which increased the selection pressure they faced to engage in cooperative interactions. Under conditions of low threat, evolutionary pressures resulted in a more diverse mix of cooperation and punishment strategies. These models have also shown that temporary increases in objective threat cause norm strength to increase until the threat subsides. In all, this suggests that tightening is an evolutionarily adaptive response to real threat.[3]

On the basis of tightness-looseness theory, one can identify two potential cultural evolutionary mismatches that can occur in human groups, both of which involve interferences with threat signals that facilitate tightening. Such interferences occur when threat signals are either (a) artificially diminished in the face of a real threat, which leads to a lack of required tightening, or (b) artificially amplified in the face of low threat, which leads to unnecessary tightening. The concept of evolutionary mismatches, which originated in evolutionary biology, refers to the idea that traits that evolved in organisms in one environment can be highly disadvantageous in a different environment (Giphart & van Vugt, 2018). Evolutionary-mismatch theory has been applied to diverse human phenomena, including obesity (Power & Schulkin, 2013), drug addiction (Sullivan et al., 2008), and gambling (Spinella, 2003), and to nonhuman phenomena such as the misorientation of sea turtles to light pollution (Witherington & Martin, 2000). This approach can be extended to culture, and in particular, to the strength of social norms in human groups.

As noted, the first type of mismatch occurs when signals of real threat are diminished, which causes a delay of tightening. Societal dynamics during the COVID-19 pandemic illustrate this type of evolutionary mismatch: Loose societies generally had a conflicted reaction to tightening norms, with tragic consequences. My colleagues and I analyzed data from 57 countries and found that nations with high levels of looseness had more than 5 times the cases and 8 times the deaths as compared with nations with high levels of tightness as of the fall of 2020 (Gelfand et al., 2021), even when we controlled for numerous factors (e.g., underreporting, demographics, geopolitical factors, other cultural dimensions, and climate; see Fig. 2). Consistent with these results, evolutionary game-theoretic models also showed that loose groups take much longer to coordinate on cooperative norms and have lower survival rates than tight groups. This suggests that cultural looseness can be a liability for coordination during collective threat.

Because people in loose cultures generally have experienced fewer ecological threats, they may be more likely to underestimate the risk of the novel coronavirus than those in tight cultures. Indeed, we found that even though loose cultures suffered far more cases and deaths than tight cultures, their members had far less fear of the virus, both in the first 100 days since their first case and extending into the fall of 2020 (Gelfand et al, 2021). Although 70% of people in tight cultures reported being very scared of COVID, only 50% in loose cultures did. In evolutionary terms, misperceiving the intensity of the threat reduced the tightening response, thus creating a cultural evolutionary mismatch.

This example suggests that interventions that focus on coordinated, clear, and consistent communication of risk may be needed in loose cultures in times of high threat. Threats like warfare and terrorism are vivid and concrete, but germs are invisible and abstract, so the threat signal may easier to ignore during pandemics. In addition, incorrectly generalizing from previous risks

(e.g., the common cold or flu) can interfere with the adaptive tightening response. In the case of COVID-19, some political leaders intentionally undermined communication of the seriousness of the threat. President Donald Trump consistently denied its severity, telling the American public, "Just stay calm. It will go away" (Wolfe & Dale, 2020), and Prime Minister Boris Johnson urged the British people to "make up their own minds" about the seriousness of COVID-19 (Mason, 2020, para. 5). More generally, relative to people in tight cultures, where there is less aversion to sacrificing freedom for collective safety, people in loose cultures may experience psychological reactance when facing a threat unless it is clear that the threat is real. Thus, there is an urgent need to understand how to communicate threat signals during collective threat. Recognizing that cultural looseness may be a liability for coordination during times of collective threat will help nations develop more effective strategies.

Yet another cultural evolutionary mismatch can occur when threat is artificially amplified. In particular, research has shown that manufactured or highly exaggerated threats can produce the same tightening as objective threat. In a series of ecological priming studies in the laboratory, Lun and I (Gelfand & Lun, 2013) showed that increased salience of terrorism and population-density threats was related to increased tightening and ethnocentrism. Likewise, my colleagues

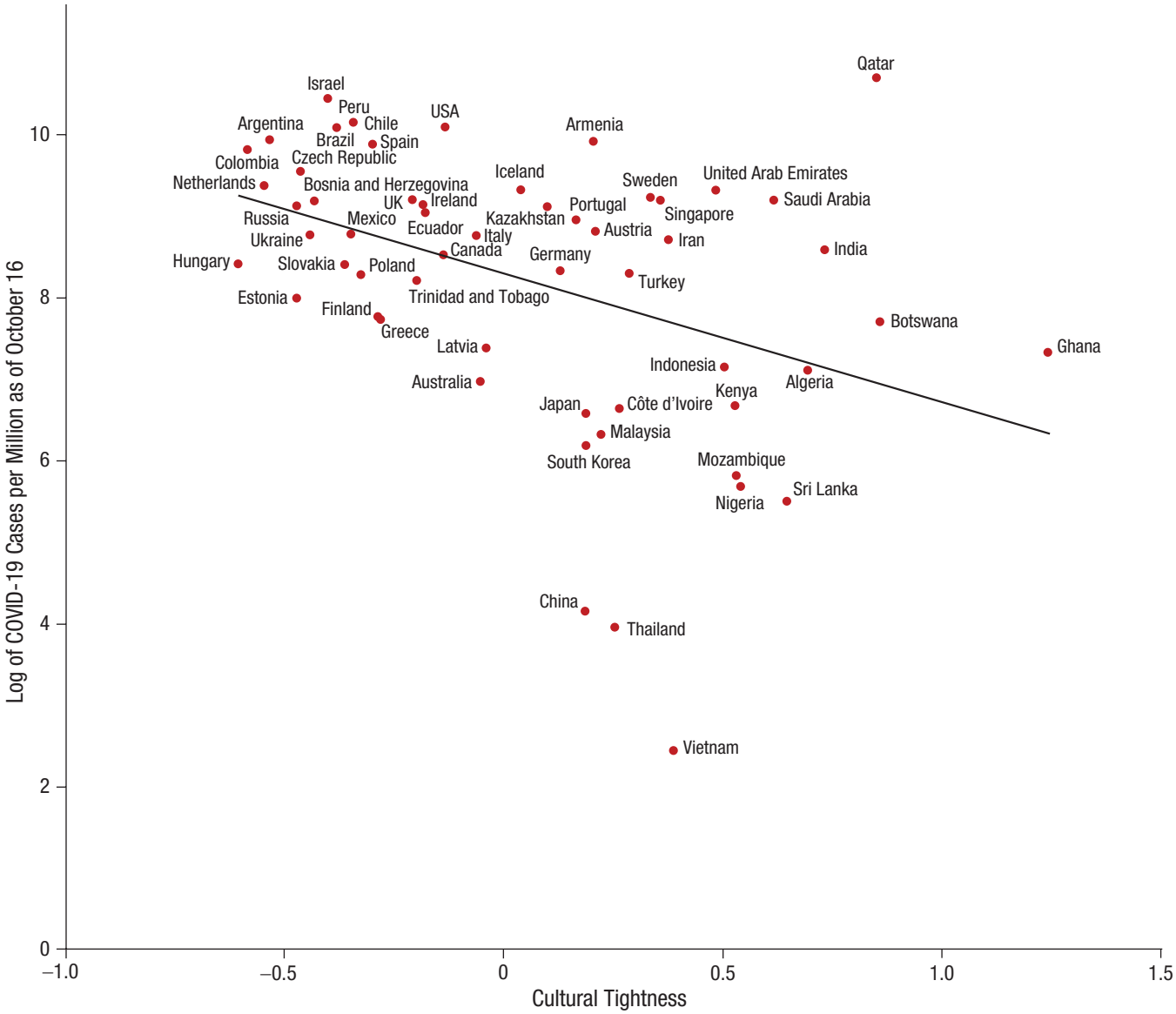

Fig. 2. *(continued on next page)*

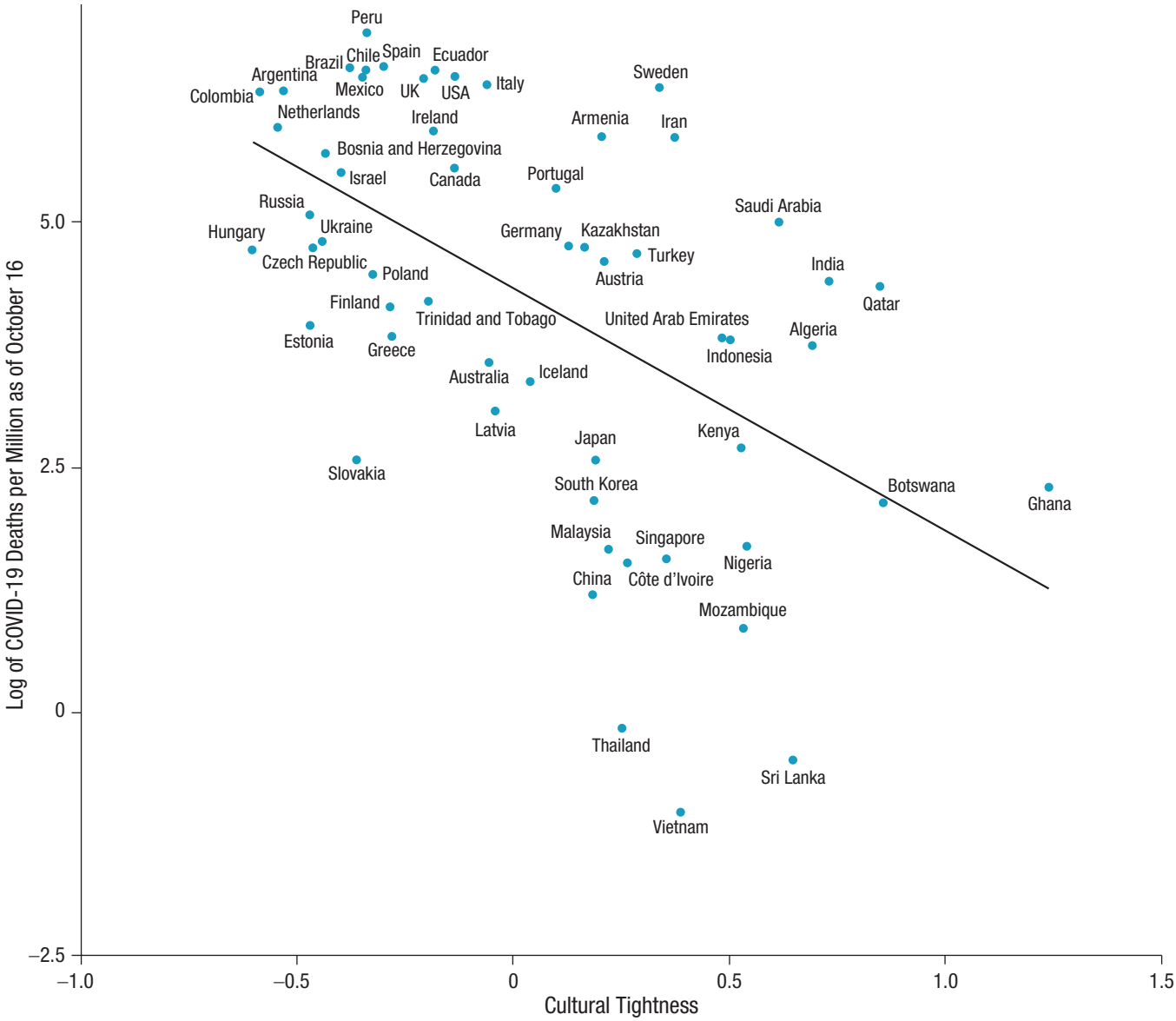

Fig. 2. Scatterplots (with best-fitting regression lines) showing the relation between tightness-looseness in 57 countries and the rate of COVID-19 cases and deaths as of October 16, 2020. From "The Relationship Between Cultural Tightness–Looseness and COVID-19 Cases and Deaths: A Global Analysis," by M. J. Gelfand, J. C. Jackson, X. Pan, D. Nau, D. Pieper, E. Denison, M. Dagher, P. A. M. Van Lange, C.-Y. Chiu, and M. Wang, 2021, *The Lancet Planetary Health*, *5*(3) pp. e137, e140. Copyright 2020 by the authors. The original article is available under the Creative Commons CC-BY-NC-ND license.

and I (Jackson, van Egmond, et al., 2019) found that people prompted to think about a possible ecological threat (such as a foreign attack or major recession) had a greater desire for tightness and greater prejudice toward out-groups than did those in a control condition. Outside of the lab, people who perceive high threat are much more attracted to autocratic candidates in national elections than are people who feel more secure. For example, people who intended to vote for Donald Trump in the 2016 U.S. primaries perceived much higher threat than those who intended to vote for another candidate and also felt that the United States was too loose, a finding we replicated in another study conducted in France prior to its 2017 presidential election (Jackson, van Egmond, et al., 2019).

Notably, autocrats can capitalize on this association between threat and tightness by deliberately creating a culture of threat and fear, targeting individuals who are vulnerable, and promising to deliver safety and security (Gelfand & Lorente, 2021). Examples of the use of this

threat psychology abound, from Italian politician Matteo Salvani's declaration that "we are under attack. Our culture, society, traditions and way of life are at risk" (Balmer, 2018, para. 6); to Hungarian Prime Minister Viktor Orbán's claim that his nation needs to get rid of "Muslim invaders" (Schultheis, 2018, para. 3); to France's Marine Le Pen's warning that globalization and Islam will "bring France to its knees" (Melander, 2017, para. 7). This strategy likely succeeds by tapping into a deep cultural evolutionary principle that helped groups deal with objective threat: People who feel that their nations are "on the brink of disaster" will want tighter rules and strong-arm rulers, which they believe will help them survive. Yet when threat signals are exaggerated, they can produce unnecessary tightening, maximizing order at the expense of openness. To avoid this cultural mismatch, interventions are needed to counteract fake and exaggerated threat and to meet the needs of those individuals attracted to populist leaders. Toward this end, my colleagues and I have developed a new computational linguistic tool that can diagnose when populations—both on- and offline—are being exposed to threat and trace its impact on cultural, political, and economic shifts (Choi et al., 2021). This tool enables us to detect threat levels with high temporal resolution, across multimedia platforms and across time, and to identify where interventions are needed to counteract fake threat in human groups.

Concluding Remarks

A key challenge for human groups is to be appropriately calibrated to the degree of collective threat that they face. Ample evidence suggests that tightening social norms in response to collective threat and loosening social norms when conditions are safe is adaptive. Yet interferences with threat signals that facilitate tightening can lead to cultural evolutionary mismatches—either too much or not enough tightening. Calibrating to the degree of actual threat while also maximizing both openness and order—that is, becoming "culturally ambidextrous"—is a key challenge for human societies now and will continue to be so in the future.

Recommended Reading

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Roos, P., Gelfand, M., Nau, D., & Lun, J. (2015). (See References). Uses evolutionary game theory to show that tightness is an evolutionary adaptation to threat.

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ORCID iD

Michele J. Gelfand https://orcid.org/0000-0002-9780-9230

Notes

1. A similar set of trade-offs has been observed in the study of ritualistic synchrony, which may also develop in response to threat (Gelfand et al., 2020). Rituals that involve synchronous behavior in groups have been found to promote prosocial behaviors such as cooperation, coordination, and cohesion, but are also associated with harmful obedience, conventionality (i.e., lack of creativity and divergent thinking), and groupthink.

2. There are, of course, notable exceptions to the antecedents and consequences of tightness and looseness. For example, there are other predictors of tightness-looseness, such as relational mobility (Thomson et al, 2018). Similarly, not all tight cultures have had chronic threat and other coordination challenges, and not all loose cultures have experienced safety. Likewise, tight cultures have contexts in which deviance is tolerated, and loose cultures have tight domains in which rules are strict (Gelfand, 2018). The extent to which groups generally veer tight or loose, however, varies across cultures (Gelfand et al., 2011; Jackson et al., 2020; Pelto, 1968; Triandis, 1989).

3. Although previous evolutionary models have shown how between-groups warfare can promote within-group cooperative behavior (e.g., Bowles, 2009; Nowak, 2006), our evolutionary game-theoretic models (e.g., Roos et al., 2015) are designed to capture a broad array of different types of threat and show that evolution toward strong cooperation or coordination norms does not require group selection. That is, our models

show that differences in norm strength can emerge independently of evolutionary pressures that derive from competition with other groups.

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