

Culture and the COVID-19 Pandemic: Multiple Mechanisms and Policy Implications

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The coronavirus disease 2019 (COVID-19) pandemic has taken a massive toll on human life worldwide. The case of the United States—the world’s largest economy—is particularly noteworthy, since the country suffered a disproportionately larger number of deaths than all other countries during the first year of the pandemic. A careful analysis may shed new light on the multifaceted processes contributing to this failure and help us prepare ourselves not to repeat the same mistakes in the future. Cultural psychology offers unique insights by highlighting mutually reinforcing interactions across collective, cultural, and psychological factors. Here, we review extant evidence and argue that various factors at these disparate levels converged to foster an independent mode of action, which, in turn, undermined effective coping with the infectious disease. The lack of effective political leadership exacerbated the resulting dire state of the country. Drawing on this analysis, we discuss several policy recommendations at collective, cultural, and psychological levels.

Introduction

The coronavirus disease 2019 (COVID-19) pandemic, caused by SARS-CoV-2, has taken a massive toll across the globe. It hit many countries with little notice, and precisely because of this, it exposed the vulnerabilities of each society to infectious diseases. The United States accounts for only 4.25% of the global population. However, it suffered approximately 20% of the total infections and

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deaths by COVID-19 in the first year of the pandemic. This dire situation did not change until April 2021, when effective vaccines became widely available in the country. Even afterward, a large number of Americans failed to follow health guidelines and get vaccinated. At the time of this writing (October 2021), approximately 33% of American adults remain unvaccinated and there is no clear prospect about when life can get back to normal, if it can at all.

A failure of this magnitude may come as both surprising and alarming. After all, the United States arguably leads the world in both economy and sciences in medicine and related fields, such as virology and public health (Whitman & Raad, 2009). This observation inevitably invites an important question: Why did the United States fail so miserably to slow the spread of COVID-19? In this article, we will suggest that there is no single factor we can blame. Instead, the problem is systemic; it is inherent in a social and cultural system of this country. In particular, the strong emphasis on freedom, choice and individual autonomy in the United States promotes a cultural system of Individualism (Markus & Conner, 2013; Markus & Kitayama, 1991). This cultural system has historical antecedents and psychological consequences, both of which contributed to the country's failure to cope with the pandemic. We offer a systematic review of many of such factors in an effort to shed light on sources of the country's vulnerability. This review will also suggest lessons for the future and the rest of the world.

The U.S.'s failure in the first year of the pandemic could be due, in part, to the lack of political leadership from the White House. On October 8, 2020, the editors of a premier medical journal in the United States observed, "COVID-19 [had] created a crisis throughout the world, which ... produced a test of leadership... [and] our current political leaders [had] demonstrated that they [were] dangerously incompetent" (Editors of the *New England Journal of Medicine*, 2020). However, it is uncertain whether Americans' noncompliance could be attributed exclusively to the lack of political leadership. In the current article, we make a case that the lack of adherence to public health measures was due, in part, to a high value placed on freedom. This ideal of freedom and choice rests on the history of the United States and its ethos of independence (Kitayama et al., 2010; Savani et al., 2008). Much needed, then, is a systematic inquiry into the specific forces endogenous to American culture that might have contributed to the country's catastrophic failure to cope with the pandemic.

Over the previous year, many scholars advocated for behavioral science approaches to the pandemic (Habersaat et al., 2020; Van Bavel et al., 2020). Responding to these calls, many social and behavioral science studies on COVID-19 have been published. The current article draws on this body of published work and derives several empirically informed policy recommendations. We take insights from the cultural psychology approach (Cohen & Kitayama, 2018; Kitayama & Uskul, 2011; Kitayama & Yu, 2020; Markus & Kitayama, 2010) and seek to integrate individual-level psychological processes with their sociostructural contexts.

This perspective would enable us to bridge the multiple levels of analysis and help us sharpen the analysis of the U.S. response to COVID-19.

In what follows, we first present our theoretical framework, which emphasizes the fundamental significance of the ethos of independence that permeates every aspect of contemporary U.S. culture. This ethos has been historically constituted over the last several hundred years while constantly affording and constraining people's behaviors (including overt actions and covert processes such as thinking and feeling). Our analysis describes how the contemporary cultural ethos of independence arose and sustained itself historically over time, focusing on various macrolevel, historical processes contributing to its development. At the same time, we underscore how this cultural ethos motivates people's psychological processes, such as their cognitions, emotions, and actions. Because the cultural ethos forms each person's mentality, it is fundamentally significant in understanding behaviors that affect each person's risk of infection during the pandemic.

In what follows, we will first introduce this conceptual framework. We will then review the relevant empirical literature at each level of analysis. This review will consist of three broad sections. First, we will start with macrolevel processes, including history and social structure, that acted as "preexisting conditions" for the current pandemic. Second, we will discuss various cultural processes that likely hampered attempts to address the pandemic. Third, we will zero in on psychological processes that may have made the United States particularly vulnerable to COVID-19. We will discuss policy implications at each of these three levels, emphasizing both long-term policies and relatively short-term interventions.

Theoretical Framework

The Cycle of Mutual Constitution

Figure 1 illustrates our conceptual framework. The framework rests on the hypothesis that every society or culture is organized by certain conceptions, images, or schematic models of what it means to be a person and the self (Kitayama & Uskul, 2011; Markus & Kitayama, 1991; Shweder & Bourne, 1982). Of note, these cultural models of the self systematically vary across regions and ethnic groups. Some cultures are relatively more independent. They prioritize personal goals and desires over the collective welfare (Triandis, 1995). These societies are mostly of the modern Western traditions, including the United States. Some other cultures are relatively more interdependent. They prioritize the collective over the personal. Typical examples tested in the current cultural psychology literature are East Asian societies, such as China, Korea, and Japan (Cohen & Kitayama, 2018). However, this ethos of interdependence may extend to many non-Western regions. This may be the case even though specific ways to enact interdependence vary substantially (Kitayama et al., 2019; Salvador et al., 2021; San Martin et al.,

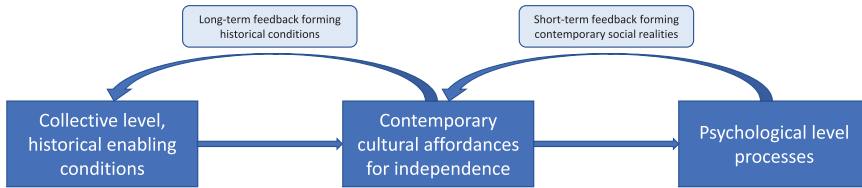


Fig 1. The cycle of mutual constitution across three different levels: The contemporary reality (or cultural ethos, shown in the middle box) is fostered and encouraged by certain historical, collective level processes (shown in the left box). Over time, the cultural ethos influences how these collective-level, historical processes unfold. Further, the culture-level processes are instrumental in forming psychological propensities (shown in the right box). Behaviors motivated by these propensities, in turn, make it possible to reconstitute the cultural ethos.

2018). The cultural ethos defining the daily social reality of a given place at a given time, illustrated in the middle box, constantly affords either the independence of the self in the United States and many other Western societies or its interdependence in the rest of the globe.

The cultural ethos of independence or interdependence is embedded in a broader historical context (Kitayama et al., 1997; Markus & Kitayama, 1991, 2010). Many collective-level processes throughout cultural evolution and history sustain and afford this ethos. For example, a series of texts produced in the era of civic revolutions in the Modern West (e.g., the U.S. Declaration of Independence) have served as indispensable constituents of the ethos of independence in the United States and elsewhere. Simultaneously, once this ethos is established, it encourages subsequent events to unfold and reinforce this ethos. For example, the ethos of individual liberty has motivated many social movements including anti-vaccine movements during the pandemic. In this way, the ethos now serves as a constituent element of subsequent social and historical events. Based on these considerations, we hypothesize that there is a constant cycle of mutual constitution between the broad, collective-level, historically enabling process and contemporary cultural-level processes.

As important, the same sort of cycle of mutual constitution operates between cultural-level processes (the middle box) and psychological-level processes, including the self or identity, cognition, emotion, and motivation (the right box). On the one hand, the cultural ethos plays a pivotal role in forming and sustaining these psychological processes. On the other hand, these psychological processes become part and parcel of the cultural ethos as this ethos is constantly reconstituted in daily social situations. That is, the cultural ethos shapes people’s behaviors, and in turn, these behaviors are instrumental in sustaining the cultural ethos. The last two decades of research in cultural psychology have offered solid evidence that the ethos of independence and interdependence is linked to a divergent

set of psychological processes (Kitayama & Uskul, 2011; Markus & Kitayama, 1991, 2010; Nisbett et al., 2001; Triandis, 1995).

The Ethos of Independence

The United States has proved one of the most independent countries. It inherits the Western European tradition of individualism (Inglehart & Baker, 2000), which is likely augmented through the history of voluntary settlement (Kitayama et al., 2006, 2010) and the associated residential mobility (Oishi & Talhelm, 2012). Social institutions, including business practices, informal social gatherings, and interpersonal relations, are organized by the norm of self-interest (Miller, 1999), which legitimizes the pursuit of personal goals at the expense of the interests of even close others (Kitayama & Park, 2014). Therefore, each person is motivated to pursue their goals and desires by making choices (Savani et al., 2008) while actively influencing others (Morling et al., 2002). The identity formed in this cultural context may be described as ego-centric (Shweder & Bourne, 1982). People are also highly expressive of their attitudes, preferences, and emotions (Kraus & Kitayama, 2019; Tsai et al., 2007). Although the historical transformation that eventually culminated in the contemporary individualism was multifaceted and variable (Kitayama & Uskul, 2011; Schulz et al., 2019), the single most important event arguably was the advent of Protestantism in Western Europe (Sanchez-Burks, 2002; Weber, 1930), which then spread to North America to form a “full-blown” form of individualism in the United States (Kitayama et al., 2009; Li et al., 2012).

The norm of self-interest (which constitutes a social system that legitimizes the active pursuit of personal goals), characteristic of independence, does not entail the negligence of others. If altruistic behavior offers a benefit, either psychological (e.g., feeling good) or tangible (e.g., recognized as kind and generous and thus chosen as, e.g., a partner in business), altruism (e.g., loyalty to ingroup) is both motivated and justified for self-centric reasons (Berg et al., 2021; Rhoads et al., 2021; Weidman et al., 2020). This mode of socially oriented actions is likely an invention of the Modern West, and can be extended to strangers (Rhoads et al., 2021). Social systems based on this norm are most likely nonexistent and largely unheard of until recently in many non-Western regions. In such cultures, the norm of self-interest is not ingrained into lay people’s conceptions of who they are and what they are supposed to do.

Over the preceding 10,000 years, humans had already started sedentary living in groups (Henrich, 2015; Schulz et al., 2019). These groups were likely kin-based clans at first, but they expanded in size by forming social norms to coordinate an increasingly large number of people. Clans then turned to tribes, which formed a basis for even larger groups, such as kingdoms, dynasties, and empires. Although extremely diverse, these traditional groups uniformly demanded loyalty,

which was regulated in various forms, from taboos to traditions to punishing “Big Gods” (Henrich, 2015; Norenzayan & Shariff, 2008). There grew a greater emphasis on social norms that support the interests of ingroup (Miller & Bersoff, 1994). Social relations are considered primary and seen as ascribed and obligatory, and individuals are expected to craft their identities within the relationship. As a result, this identity becomes more sociocentric (Shweder & Bourne, 1982). In most cases, people obliged because they depended on their groups for survival as much as the groups required them. In other words, these traditional forms of sociality were likely highly interdependent (Kitayama et al., 2019). Thus, typically in non-Western cultures and societies, a significantly greater emphasis is given to the welfare of ingroups rather than self-interest (Kitayama et al., 2019; Schulz et al., 2019).

Summary

In a nutshell, our analysis addresses the collective, cultural, and psychological processes that contributed to the U.S.’s failure to cope with the COVID-19 pandemic in 2020. A strong emphasis on the independence (vs. interdependence) of the self, promoted by the cardinal value of individualism, precipitated certain risk factors historically at the collective level. It also underlies contemporary social dynamics that compromise society-level efforts toward effective coping in part because it fosters complacency and maladaptive risk-taking behavior at the individual level. In the following sections, we will discuss each of these processes in greater detail.

Collective-Level Processes

The contemporary ethos of independence has evolved on U.S. soil over the last several hundred years since the settlement and colonization by Western European immigrants. Two macrolevel processes motivated by this ethos have been particularly influential during the pandemic. One is the absence of universal vaccination policies against tuberculosis (TB) during the 20th century. Anti-vaccine movements are not a new phenomenon that suddenly sprang during the current pandemic. To the contrary, they were already strong early in the 19th century during the Victorian era in England (Porter & Porter, 1988). The populace back then regarded compulsory vaccination as a major infringement of individual liberty and a “terror of medical tyranny (Porter & Porter, 1988, p. 231).” Transplanted in the United States, these movements have remained persistent ever since (Wolfe & Sharp, 2002). For example, a major anti-vax movement emerged during a Smallpox epidemic that struck Boston in 1901 (Albert et al., 2001). This section reviews the evidence that the failure of the United States to institute a universal vaccination policy against TB proved rather consequential during the current

pandemic. Another macrolevel factor that plagued the U.S. ability to cope with the current pandemic effectively relates to residential segregation. In the United States, people feel less attached to their existing relations and ancestral heritage. They thus move their residence more freely based on their preference within their economic means (Oishi & Talhelm, 2012). There results high degrees of residential segregation by wealth and race, which turned out a major risk during the pandemic (Yu et al., 2021).

History that Haunts: Bacillus Calmette–Guerin

Why BCG? In understanding the contemporary predicament of society, one must trace it back to its history. This truism applies broadly to the entire argument we put forward in the current article. A particular history we discuss relates to TB—an infectious pulmonary disease caused by a bacterium (*Mycobacterium tuberculosis*). Throughout much of the human history, TB was a major public health threat (Daniel, 2006). *Bacillus Calmette–Guérin* (BCG) is a vaccine used against TB. It was invented in an early period in the 20th century. When BCG became widely available, many, but not all, countries adopted a policy of compulsory BCG vaccination.

The evidence shows that BCG is effective, not only for TB (for which it was originally invented; Aronson et al., 2004; Colditz, 1994; Usher et al., 2019), but also for a wide range of pulmonary diseases (Aaby et al., 2011; Biering-Sørensen et al., 2012; Higgins et al., 2016; Roth et al., 2004). This evidence makes the BCG vaccine particularly promising as a candidate in the fight against COVID-19. As for mechanisms, recent experimental work (Arts et al., 2018) finds that BCG vaccination causes genome-wide epigenetic reprogramming of human monocytes, which in turn predicts protection against experimental viral infection. Thus, BCG is thought to “train” immunity against pulmonary diseases, potentially including COVID-19 (Aspatwar et al., 2021; Gonzalez-Perez et al., 2021).

Available evidence shows that a history of BCG vaccination predicts a lower risk of infection in COVID-19 (Rivas et al., 2021) although the evidence is not always consistent (Hamiel et al., 2020), suggesting various moderating variables (Fu et al., 2021). Moreover, BCG is typically administered at very young age. Hence, its effects during adulthood on diseases other than TB, including COVID-19, could be diminished at the individual level. However, such diminished effects at the individual level could still be powerful if people in a community shared them, thereby establishing what has been referred to as herd immunity (Omer et al., 2020).

Herd immunity and the collective-level effect of BCG. To understand the notion of herd immunity, consider one parameter central in analyzing infectious diseases, R_0 (R-naught), which signifies “the average number of secondary cases

attributable to infection by an index case after that case is introduced into a susceptible population” (Sanche et al., 2020). It therefore indicates how contagious a given infectious disease is. According to one estimate based on an analysis of the spread of COVID-19 in a very early period of the outbreak in Wuhan, China, the R_0 for COVID-19 is a median of 5.7, with the 95% confidence interval of 3.8–8.9 (Sanche et al., 2020). Although it is tempting to imagine this parameter is constant for any given diseases, including COVID-19, the fact of the matter is that R_0 for a disease can be highly variable across populations (Dietz, 1993). Moreover, it stands to reason that it can also vary by various circumstantial factors within any single population. For example, it is likely to be higher if the viral load (the amount of virus carried by a single individual) is higher. It may also be higher if the virus is carried by a larger number of people in a setting. It will also depend on how they behave, including whether they speak loudly or whether these individuals are masked or not.

When an individual has developed immunity, there will be a lower likelihood of infection and transmission for this person. This likelihood becomes smaller if a vast majority of people in the community develops immunity and R_0 is rendered correspondingly low. Consequently, even those who have no immunity will be protected in the community. In short, herd immunity could be a potent mechanism by which BCG protects a community of people. It would follow then that it is essential for a large proportion of the community to be vaccinated. Conversely, BCG might lose its effect in communities that have a large proportion of unvaccinated individuals. In such communities, even those vaccinated could be vulnerable, especially if the sheer effect of vaccination is small, relative to the impact of high viral load. For example, Hamiel et al. (2020) took advantage of the fact that Israel had adopted a universal BCG policy between 1955 and 1982, and compared those born from 1979 to 1981 (who received BCG as infants) and those born from 1983 to 1985 (who did not, Hamiel et al., 2020). This study found no significant difference in the infection rate of COVID-19 between the two groups. It is apparent that BCG confers no visible individual benefits in protecting them against COVID-19. However, Israel terminated its universal BCG policy 35 years ago. Hence, the country might not have reached the threshold for herd immunity as more than a half of the population was unvaccinated in 2019 when the pandemic hit. This might explain why there is no difference in the rate of infection between those vaccinated and those not.

Testing the impact of universal BCG policies. During the 20th century, many countries adopted universal BCG policies to fight against TB. Many of these countries have retained these policies until today, or if not, at least until very recently (e.g., China, Ireland, Finland, and France). Some other countries terminated the policies before 2000 (e.g., Australia, Spain, Ecuador). The year 2000 may prove critical since at the population level vaccination may become effective

only when a vast majority (70–80% according to a simulation reported in Betsch et al., 2017) is made resistant against a target virus (known as “herd immunity,” Anderson & May, 1985, see above). BCG is given at birth. Hence, by 2020, more than 30% of the population (share of 20-year olds and younger) will be left unvaccinated if a given country terminated BCG before 2000. These countries, including Israel as noted above, will not benefit from herd immunity. Of note, some countries never mandated BCG vaccination. Along with Italy, Lebanon, and some other countries, the United States is in this category.

A few additional considerations are relevant in testing the impact of various population-level factors, including the effect of universal BCG policy status, during the current pandemic. Most importantly, the countries that vary in the universal BCG policy status may also vary in several different variables. Some demographic variables, such as population size, population density, median age, GDP, and migration rate, would seem obviously important. It is imperative to statistically control for these demographic variables in assessing cross-societal differences in the numbers of COVID infections and/or COVID-related deaths. Less obviously, but equally importantly, there may be country-level variation in reporting biases. Some countries may suppress information, whereas others may be more open. Some may have more stringent criteria in classifying any given case as COVID-related, whereas in others the criteria may be looser. Cross-societal comparisons of COVID infections and COVID-related deaths could be difficult to interpret without controlling such potential confounds.

One way to address these issues is to test the rate of spread within a short period of time. By reducing the testing period as much as possible and examining the slope rather than raw counts of cases and deaths, it is reasonable to assume that all these confounds do not systematically vary within the period. For example, even if governmental suppression existed in some countries, this suppression is unlikely to influence the rate of change of COVID-19 cases and deaths within a few weeks. Likewise, there may exist massive cross-societal differences in the availability of COVID-19 diagnostic tests. But this variation is unlikely to change in any systematic fashion within a similarly short time span. Hence, by focusing on the rate of spread within a fairly short time span, it is possible preclude most of these confounds as potential influence on the outcome. For this reason, Berg et al. (2020) focused on the growth rate of the increase of both confirmed COVID-19 cases and deaths for either 30 days or 15 days at the very beginning of country-wise outbreaks, with the start of the outbreak defined as the date on which each country had reached 100 confirmed cases for the analysis of cases and one death for the analysis of deaths. The COVID-19 data were made available in a public repository by Johns Hopkins University Center for Systems Science and Engineering (<https://github.com/CSSEGISandData/COVID-19>) and their analyses were updated until all countries had the complete 30 days of data (June 10, 2020).

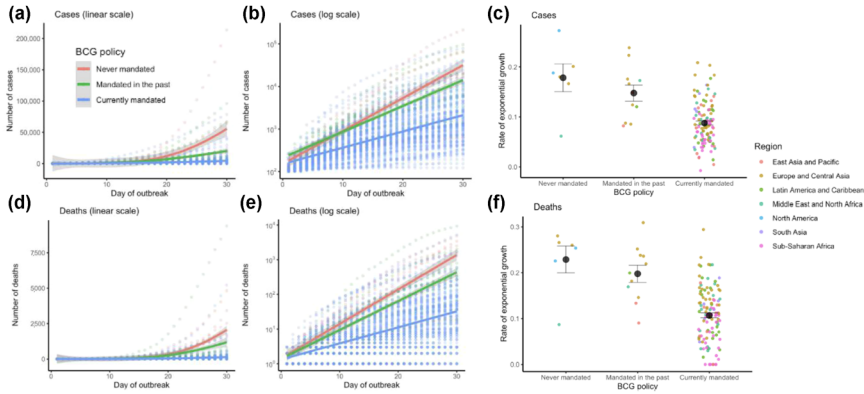


Fig 2. Growth rates for COVID-19 confirmed cases and deaths. (A) and (D) Growth curves in linear scale for cases and deaths. (B) and (E) Growth curves in log scale for cases and deaths. (C) and (F) The rate of exponential growth for cases and deaths for three groups of countries that vary in universal BCG policy. Adapted from *Science Advances* (Berg et al., 2020).

The spread of COVID-19 in country-wise outbreaks. In their main analysis, Berg et al. (2020) analyzed 134 and 135 countries in total for the analyses of confirmed cases and deaths, respectively. Among the demographic covariates controlled, only population size predicted an increased growth rate of confirmed cases and deaths. Median age also predicted an increased growth rate of deaths, implying that older adults are more vulnerable to severe disease. Above and beyond these effects, Berg et al. found a strong effect of universal BCG policy status on the growth rates of both confirmed cases and deaths. The growth curves for confirmed cases and deaths in linear scale are shown in Figures 2(A) and (D). The same data in log scale are given in Figures 2(B) and (E). Figures 2(C) and 2(F) show the rate of exponential growth for cases and deaths for three categories of countries that vary in universal BCG policy status (i.e., never mandated, mandated in the past and currently mandated). As can be seen, the growth rate for both cases and deaths was significantly less for countries with a universal BCG policy, compared to those that had such a policy but terminated it before 2000 or those that never had such a policy (p 's < .001). Of note, universal BCG policies conferred no visible benefit if they were terminated before 2000, consistent with the herd immunity hypothesis of how such policies might be protective at the collective level.

It is worth noting that Berg et al. (2020) examined whether the availability of diagnostic tests might be related to the growth rate of confirmed cases and deaths. Berg et al. (2020) used the total number of tests available in each country in April 2020, reported in a public data archive (<https://github.com/owid/covid-19-data/tree/master/public/data/>). This reduces the number of countries from 134

to 77 for the analysis of confirmed cases.¹ The total number of tests available in April 2020 predicted the total number of infections in July of the same year ($p < .001$). Also, interestingly, this variable predicted the growth rate of an early 30-day period of outbreak. This effect was weak, but still statistically significant ($p < .05$). Of importance, after controlling for testing availability, the effect of universal BCG policy remained highly significant.²

Altogether, the Berg et al. (2020) conclusion is robust (see also Escobar et al., 2020). Nevertheless, it is correlational, focusing on associations between universal BCG policy status and the growth of confirmed cases and deaths during the 2020 COVID-19 pandemic. Thus, it should be considered preliminary until direct causal links between BCG and community-level protection are established (Bagheri & Montazeri, 2021). Nevertheless, it avoided potential confounds of reporting biases (which appear to compromise many other similar studies) while controlling for testing availability. Moreover, such data are the only ones available at present to test the hypothesis that a degree of herd immunity realized through universal BCG policies has a protective effect against COVID-19. The evidence is supportive of this possibility.

Systemic Racism: Racial Residential Segregation

What are the root causes for racial disparities in COVID-19 casualties? In the United States, racial minorities, particularly Blacks, Hispanics, and Native Americans, suffered disproportionately during the pandemic (Wright, 2021). For example, after adjusting age and population size, Blacks and Hispanics were nearly three times more likely to be hospitalized as Whites and Asians (CDC, 2020). For Native Americans, the ratio was 3.3. Correspondingly, these three minority group members were far more likely to die of COVID-19 than either Whites or Asians.

To account for the disproportionate suffering of minority groups, it is important to consider many social structural issues (for review, see Yu et al., 2021). To begin with, reflecting the history of racism and racial discrimination (Rucker & Richeson, 2021), there is a massive racial disparity in wealth. In 2019, just prior

¹ The same analysis was not performed for deaths since testing availability is unlikely to bias death counts.

² In another study (Hensel et al., 2020), researchers used the same data while adopting a different analytic strategy. They focused only on a small subset of countries showing high diagnostic test availability and reported no universal BCG policy status effect. However, as the authors observe, testing availability correlates with the total number of confirmed cases. Hence, the reported finding indicates that, with only those countries showing serious outbreaks selected into the analysis, the severity of country-wise outbreaks could be equal in magnitude between these countries and the countries without universal BCG policies. This finding does show that various other factors can overwhelm the benefit of universal BCG policies. However, by no means does it demonstrate the alleged null effect of such policies. As noted, Berg et al. showed this effect after controlling for testing availability.

to the COVID-19 pandemic, the median White household had nearly \$190,000 in wealth, which is almost eight times the wealth of the typical Black household (\$24,000; Broady et al., 2020). This disparity had massive consequences during the pandemic. According to an NPR/Robert Wood Johnson Foundation/Harvard T.H. Chan School of Public Health poll, when asked about their financial predicament during an earlier phase of the pandemic before the summer 2020, more than 50% in each of these minority group members reported serious financial problems. This is in stark contrast with Whites and Asians. Many of those in the latter groups also experienced financial hardship. But the percentage of those who reported serious financial problems was much less (approximately 37% for both groups).

The adverse effect of the racial disparities in wealth is exacerbated by residential racial segregation, a persistent feature of American life (Williams, 1999). Since household wealth is nearly eightfold higher for Whites than for historically underprivileged minorities (Blacks and Hispanics), high segregation of these minority groups will result in a concentration of poverty in sharply demarcated geographic areas (Massey, 1990). Residents in these areas have difficulty in accessing medical and social services (Simons et al., 2018), finding healthy foods (Powell et al., 2007), and, moreover, they have no choice but to expose themselves to the virus at workplaces (Garcia et al., 2021). Thus, the high rate of infection and death of underprivileged minority group members, including Blacks and Hispanics, could be traced back to racial residential segregation and its associated spatial disadvantage. Moreover, this effect of racial residential segregation is likely to be mediated by economic factors. If so, the racial segregation effect may be particularly serious if the area has a larger income disparity. If income disparity is high, then the adverse effect of concentrated poverty, caused by racial residential segregation, should be exacerbated. If income disparity is relatively low, then the adverse effect of racial residential segregation may be buffered to some extent.

The spread of COVID-19 in the 100 largest metropolitan areas in the United States. To explore these possibilities, Yu et al. (2021) tested the growth rate of both COVID-19 confirmed cases and deaths in the largest 100 metropolitan statistical areas (MSAs) of the United States in June 2020. To test the adverse effect of racial residential segregation, Yu et al. (2021) examined whether the growth rate of the cases and deaths would be greater for the MSAs that are relatively more segregated. As a measure of racial residential segregation, they used a dissimilarity index, which quantifies segregation as the degree of deviation from a random residential distribution of two social groups. This measure was available for White versus Black, White versus Hispanic, and White versus Asian segregation.³ Moreover, to test whether the effects of racial residential segregation might

³ Unfortunately, a comparable measure was not available for Native Americans.

be exacerbated by income disparity, Yu et al. (2021) used a measure of income disparity (Gini index) for each county that was part of each of the MSAs.

Yu et al. (2021) examined daily counts of confirmed cases and deaths for 535 counties subsumed in one of the 100 largest MSAs. The county-wise exponential growth rate of cases was estimated from the first day when at least 20 cases were confirmed, while the county-wise rate for deaths was estimated from the first day when at least one death was reported. As in Berg et al. (2020), the researchers tested the first 30 days of the county-wise outbreaks. As controls, the researchers included the proportion of Blacks, Hispanics, and Asians (called Black, Hispanic, and Asian share, respectively), population size, median income, and proportion of elderly. All these control variables were assessed at the county-level.

Consistent with the observation that Blacks and Hispanics suffered disproportionately more than Whites or Asians during the COVID-19 pandemic, both Black share and Hispanic share predicted higher rates of cases, although this effect was less systematic for deaths. Moreover, consistent with the cross-cultural analysis by Berg et al. (2020), population size also predicted greater rates of increase in both cases and deaths. Above and beyond these effects, however, the researchers found systematic effects of Black–White segregation and Hispanic–White segregation. Notably, these effects were moderated by income disparity (measured at the county level). As shown in Figures 3(A) and (B), confirmed cases increased more rapidly for MSAs that were relatively more segregated by the Black–White and Hispanic–White axes. Importantly, however, this effect was driven primarily by those counties with greater income disparity. The pattern was nearly identical for deaths. Lastly, the effect of the Asian–White segregation was informative. This effect was negligible, as may be predicted given the negligible overall difference in wealth between the two ethnic groups (Pew Research Center, 2016).

In short, there is a compelling reason to hypothesize that systemic racism, as manifested in residential segregation, has had a massive impact on casualties during the pandemic. One important caveat is that Yu et al. (2021) analyzed cases and deaths for all ethnic groups, not separated by race, as relevant data (daily cases and deaths by race) were not available for the analysis. Hence, it is unclear exactly how much impact segregation and income inequality had on Whites. At present, approximately 50% of all cases and deaths in the United States have been among the White population. Furthermore, as noted above, Black or Hispanic shares did not always predict increased growth of deaths. Hence, Yu et al. (2021) argue that the deadly effects of both racial residential segregation and income disparity may extend to the entire area. In other words, the adverse effects of structural disparities along income and race may not be strictly limited to the minority groups alone.

The Yu et al. (2021) findings is yet another illustration of systemic racism that pervades U.S. society. However, very few Americans likely appreciate how

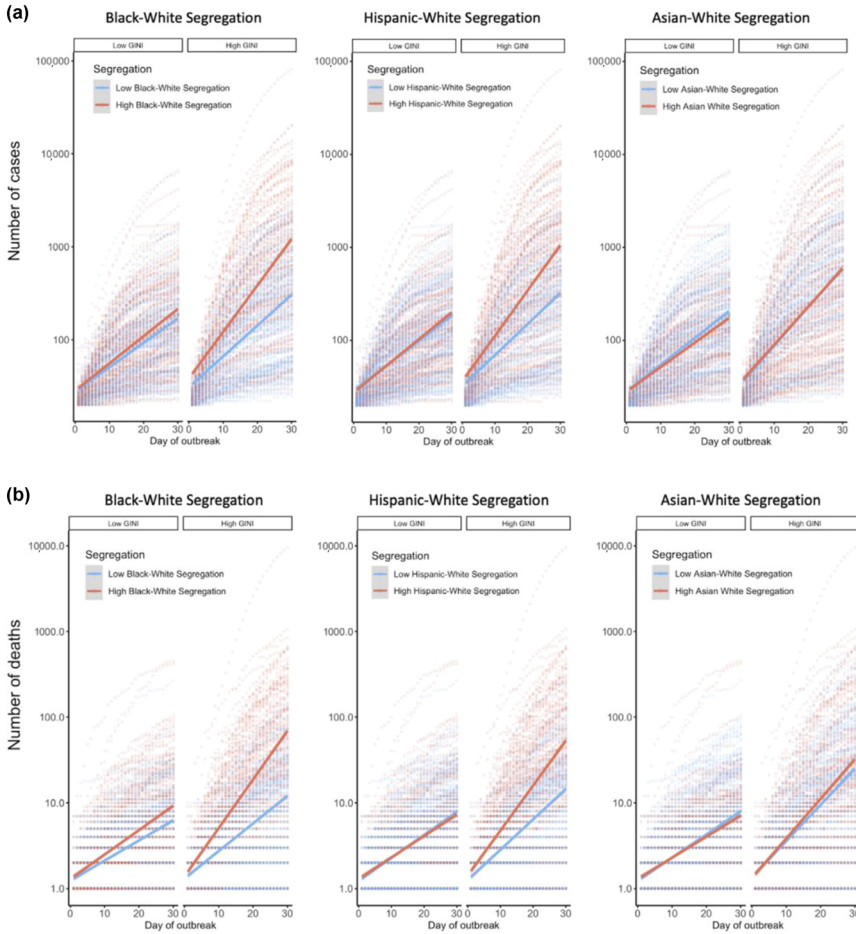


Fig 3. The growth of confirmed COVID-19 cases (A) and deaths (B) during the first 30 days of the county-wise outbreaks in each of 535 counties belonging to one of the 100 largest U.S. metropolitan statistical areas (MSAs) as a function of Black–White, Hispanic–White, and Asian–White segregation at the MSA level and income disparity at the county level. Adapted from *Annals of the New York Academy of Sciences* Yu et al. (2021).

seriously racial disparities in wealth exacerbate the damage of the pandemic (Rucker & Richeson, 2021). A recent study shows that Americans estimated the current average wealth of Blacks to be 90% of the current average wealth of Whites in 2016 (Kraus et al., 2017). This estimate is largely constant across racial groups. The correct percentage, however, is a mere 10–15%. Thus, most Americans fail to register the great wealth disparity between Whites and

minority groups, such as Blacks and Hispanics. This false perception of racial wealth disparities could make it rather difficult for Americans to truly realize the role of segregation in the devastating human toll during the COVID-19 pandemic.

Policy Implications

Macrolevel features of American society, such as the lack of BCG vaccination and persistent residential segregation are akin to “pre-existing conditions” of the American response to COVID-19: they are issues that predate COVID-19, but which have also exacerbated the costs of the current pandemic. In times of crisis, it can be tempting to focus on immediate challenges—mitigating the spread of disease and promoting vaccination—but policymakers should not ignore macrolevel issues. The conditions of the past influence the present; they also provide lessons for the future. Furthermore, policies that may not seem related to pathogen threats at first glance can play a role during a pandemic.

Our analysis makes it clear that BCG vaccination could be a potentially powerful antidote against future outbreaks of COVID-19 or other pulmonary diseases. This may be the case because, unlike the most advanced mRNA COVID-19 vaccines by Pfizer and Moderna, which are designed specifically for a particular type of viruses, BCG is demonstrably more general. It works by “training” or reinforcing immunity against lung-related infections (Aspatwar et al., 2021; Gonzalez-Perez et al., 2021) through genome-wide epigenetic re-programming (Arts et al., 2018). Moreover, BCG is both cheap and demonstrably safe. The data show that once a substantial proportion of the population is vaccinated, BCG has a visible protection effect at least during an early period of a pandemic (Berg et al., 2021). Hence, BCG is a good candidate to consider as society prepares itself against future outbreaks of currently unknown infectious diseases. Furthermore, our analysis also indicates that systemic racism—particularly residential segregation by wealth and race—is a major risk inherent in many cities in the United States and elsewhere. Policymakers must consider this in long-term city planning and specific new projects developing housing and neighborhoods.

Given the history of the anti-vax movement and systemic racism in many Western democracies, including the United States, these interventions in universal BCG policy and city planning or any economic reforms (e.g., adoption of basic income) are likely to encounter many, and likely extremely fierce oppositions. However, policymakers must be aware that the policy steps taken (or not taken) today will form the defaults for subsequent pandemic events. In considering the costs and benefits of policy decisions, then, stakeholders should consider the long-term consequences of their decisions. Indeed, measures that appear contentious in the short term may be well worth the political capital they take to enact.

Consider the case of seat belt adoption. Today, most Americans would not think twice about fastening their seat belt when they get in the car: 90.3% of drivers wear a seat belt (National Center for Statistics & Analysis, 2021). As uncontroversial as this measure appears today, when seat belt laws were enacted in the early eighties, only 11% of drivers buckled up (CDC, 1999). Indeed, such measures were derided as antithetical to individual liberty and personal responsibility (Leichter, 1986), but now enjoy the support of over 80% of Americans (Spado et al., 2019). The seat belt mandate has saved over 370,000 lives since the mid-1970s (National Center for Statistics & Analysis, 2021). What was once controversial is now consensus.

How can we understand such a dramatic shift in support? Research across a range of domains demonstrates that once restrictions are enacted, individuals will often rationalize the new status quo by adjusting their attitudes (Laurin, 2018; Tankard & Paluck, 2017). Such effects are bolstered by the certainty of the policies being enacted: once a path has been chosen, individuals engage in justification readily (even days after the policy goes into effect; Laurin, 2018). However, when such policies are uncertain, individuals may be more reactant toward restrictions (Laurin et al., 2012). Moreover, these policies may be even more effective when combined with monetary incentives for those who take an action both voluntarily and quickly before the action is mandated (Campos-Mercade et al., 2021).

These findings carry short-term and long-term implications for the COVID-19 pandemic. In the short term, they suggest that having clear, deterministic policies (e.g., automatically mandating mask wearing once the local case rate surpasses a given criterion) are more likely to receive support than more tentative ones (e.g., leaving such requirements to the discretion of elected officials). Taking a longer view, the findings above suggest that battles fought now to mandate COVID-19 vaccination may not only save lives in the future, but also enjoy broader support, becoming no more controversial than the numerous other vaccinations Americans receive.

Cultural Processes

The ethos of independence pervasive in the contemporary U.S. culture exposed the society to serious risks during the current pandemic. First, in Western contexts, including the contemporary U.S. context, interpersonal relations are important, just as they are in more interdependent cultures. However, they are seen as derived from personal preferences and voluntary association, even when the relations are arguably ascribed rather than chosen. Hence, people tend to be socially open, willing to extend their social network to those they like while cutting out existing relations that do not serve them well: American culture is highly relationally mobile (Thomson et al., 2018; Yuki & Schug, 2020).

Second, people prioritize their freedom over collective welfare, and third, there is a strong emphasis on uniqueness and resistance against the collective (Markus & Kitayama, 1994). This resistance is thought to be a signature feature of personal control and power. Trumpism and other alt-right-wing movements combine this ideology with forceful enforcement of the societal order legitimizing it. As we shall see, all these three components had detrimental impacts during the pandemic by affording and reinforcing the ethos of independence in people's behaviors.

Social Openness: Americans are Relationally Mobile

Social contact and the spread of infectious diseases. Although there was confusion earlier on during the current pandemic, it is now widely accepted that the new strain of the coronavirus that causes COVID-19 is transmitted through social contact. It should follow that viral transmission should increase as social contact becomes more frequent and variable. Although the extent of social contact can depend on numerous factors, one cultural variable that would seem particularly relevant is relational mobility, the extent to which it is easy to form new relationships and terminate current ones (Thomson et al., 2018; Yuki & Schug, 2020). In many non-Western societies, relationships are typically ascribed by social roles and restricted to close others (Adams, 2005). In these societies, relationships are confined to relatively small ingroups. Conversely, in societies high in relational mobility, social relationships tend to be freely chosen and more expansive. People can form new relationships and leave former ones at will. They thus tend to be socially open (Yuki & Schug, 2020). The resulting social ecologies would increase the opportunity for interaction with a greater number of individuals outside each person's primary social groups (e.g., close inner circle of friends). Thus, high relational mobility may put people at particularly high risk for contracting an infectious disease such as COVID-19.

Prior work assessed societal-level relational mobility by asking how socially open people perceive others in their local communities to be (Thomson et al., 2018). The researchers administered a 12-item scale of relational mobility to a large number of adults in 39 countries. Participants responded to questions such as "It is common for people around you to have a conversation with someone they have never met before" and "They (i.e., people around you) are able to choose the groups and organizations they belong to." Using the mean score on this relational mobility scale, the researchers defined the degree of country-level relational mobility (Thomson et al., 2018). Country-level relational mobility scores are related to other variables. For example, relational mobility is positively associated with its level of general trust, self-disclosure, intimacy, and social support across countries (Thomson et al., 2018). Moreover, it is positively associated with individualism. As example, the United States is highly individualistic and

simultaneously highly relationally mobile. Personal choice and freedom, the core features of individualism, could promote relational mobility, for example.

Importantly, relational mobility is distinct from individualism. For example, Latin American societies are highly collectivistic and are located toward the most collectivistic end of the dimension of individualism and collectivism (Hofstede, 1980). Moreover, Latin Americans are highly expressive of emotions—a trait that is commonly equated with individualism in contemporary literature (Krys et al., 2021). However, unlike European Americans (who are arguably independent), Latin Americans express socially engaging (rather than disengaging) emotions, such as feelings of connection and friendly feelings (rather than pride and feelings of competence; Salvador et al., 2021). Of importance in the present context, even though Latin Americans are arguably collectivistic and interdependent, they are also high in relational mobility.⁴

Relational mobility and the spread of COVID-19 across cultures. In a recent study, Salvador et al. (2020a) tested whether country-wise relational-mobility scores (Thomson et al., 2018) would positively predict growth in both confirmed cases and deaths due to COVID-19, with a focus on the first 30 days of country-wise outbreaks in the main analysis as in the Berg et al. (2020) study reviewed above. This study was also conducted in an early period in the pandemic, which enabled us to capture the COVID-19 spread prior to country-wide lockdowns, which would contaminate any effects of country-wise levels of relational mobility.

Figure 4(A) illustrates the daily growth of confirmed cases at the beginning of country-wise outbreaks on a log scale. Figure 4(B) plots the country-wise growth rates of cases by relational mobility. As can be seen, the growth rate is systematically among countries high in relational mobility. The corresponding results for deaths due to COVID-19 are also significant and shown in Figures 4(C) and (D). Of importance, additional analyses showed that the pattern is no different even when certain culture-level variables, including individualism versus collectivism and cultural tightness versus looseness, are controlled. There was no evidence that these cultural dimensions had any effects on the growth rate of either confirmed cases or deaths.⁵ The relational mobility effect was quite substantial. As mentioned, the United States is among the highest in relational mobility. If it had

⁴Historically, Latin America was highly heterogeneous both ethnically and linguistically. This historical condition supposedly led to a cultural system of interdependence based on emotional expression (Niedenthal et al., 2019). This cultural system, in turn, made it possible to relate to strangers relatively easily. While such relations may be necessary for survival and success, they may also make people vulnerable to exploitation by strangers. For this reason, the high level of relational mobility in Latin America may co-exist with strong commitments to close, interdependent social relations.

⁵A recent study reports that country-level tightness predicted the number of infections and deaths per million during the summer of 2020 (Gelfand et al., 2021). In a supplementary analysis (Tables S4 and S5), the authors simultaneously entered relational mobility and tightness as predictors of infection and death rates. This analysis is limited because the number of countries with both measures is limited, resulting in a small N. Nevertheless, it showed that relational mobility—but not tightness—significantly predicted the death rate (neither factor significantly predicted the infection rate). Since

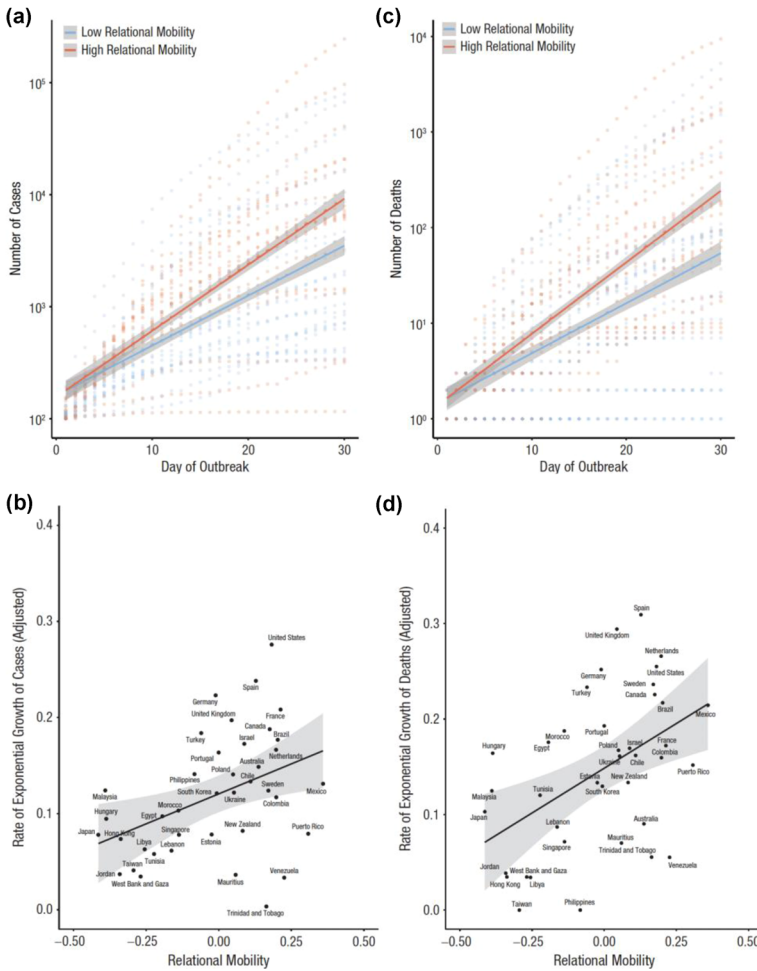


Fig 4. The increase of COVID-19 infections and deaths in the first 30 days of country-wise outbreaks in 39 countries that vary in relational mobility. (A) The exponential increase of confirmed cases. (B) The rate of the increase of confirmed cases by relational mobility. (C) The exponential increase of deaths. (D) The rate of the increase of deaths by relational mobility. Adapted from *Psychological Science* (Salvador et al., 2020).

norms are less tight in relationally mobile societies, one could interpret the finding to suggest that relational mobility drives the tightness effect observed in this study. This analysis is limited because the sample size is reduced when both factors are included. However, since norms are less tight in relationally mobile societies, it could be interpreted to suggest that the tightness effect observed in this study is explained by relational mobility, although more work is warranted for a firmer conclusion.

been low in relational mobility, comparable to Japan (one of the lowest in relational mobility), the deaths at the end of the 30-day study period would have been 8.2% (281) of the actual number reported (3,417).

Americans are Individualistic

Individualism. Individualism refers to the tendency for people in a culture to prioritize their own needs, goals, and interests over group-oriented concerns (Hofstede, 1980; Triandis, 1995). It is linked to a view of the self as independent (Markus & Kitayama, 1991). Individualism is often seen as opposite of collectivism, which involves the tendency to prioritize the group's needs, goals, and interests over self-centric interests (Hofstede, 1980; Triandis, 1995) and is linked to a view of the self as interdependent (Markus & Kitayama, 1991). Several country-level scores of individualism and collectivism are available (Hofstede, 1980; Schwartz, 1992; Triandis, 1995). They are highly correlated. Regardless of the scores used, Americans are quite high in individualism.

As noted, individualism and relational mobility are positively correlated, but distinct (Thomson et al., 2018). In the two cross-national studies reported above (Berg et al., 2020; Salvador et al.,), the index of individualism had no impact on the growth rate of confirmed cases of COVID-19 or COVID-related deaths during an early period of the pandemic. This was the case, even though relational mobility did systematically predict societal-level vulnerability during the early period in the pandemic. Hence, it appears that, unlike relational mobility, individualism does not powerfully modulate societies' vulnerability during an early phase of outbreaks. This, however, does not preclude the possibility that this aspect of culture is significant in influencing subsequent coping behaviors to the threat of the pandemic, which could eventually influence the number of infections and deaths (Kumar, 2021). A striking example of this possibility lies in Americans' reluctance to wear face-coverings during the current pandemic.

Mask-wearing as a model case. According to Yuki et al. (2007), the mouth is a "window to the soul" for Americans. The use of the mouth is instrumental in American society for communication, including emotional expression. A "big smile" signifies a warm soul behind it. In American society, then, a request to cover up the mouth could threaten the core of one's identity. In line with this reasoning, in the United States over the last few months, the simple, practical decision to wear a face mask during the pandemic has been moralized and portrayed as a matter of individual freedom. Moreover, many Americans have resisted covering up their mouths in public, to the detriment of the public welfare, since the use of face masks is demonstrably effective in containing the spread of COVID-19 (Lyu & Wehby, 2020). This behavior may have therefore incurred a grave cost to the collective. If a majority choose not to wear a mask, then an individual may

not be protected even if he/she wears a mask. Unfortunately, many Americans seem to have prioritized their personal convenience or preference while ignoring collective consequences of doing so.

Even though the United States as a whole is highly individualistic, there is a substantial regional variation, with some states more individualistic or less collectivistic than others (Vandello & Cohen, 1999). For example, southern states such as Louisiana and Georgia are high in collectivism. Western states such as Colorado and Wyoming are high in individualism. Further, California and Hawaii are low in individualism or high in collectivism presumably because these states have higher proportions of Asians and Hispanics who are known to be collectivistic. Hence, one way to test the hypothesis that American individualism is responsible for the failure of Americans to wear face-coverings is to see if this failure might be particularly pronounced in states high in individualism.

In a recent study, Lu et al. (2021) show that individualism or collectivism is in fact related to mask wearing. In one of the studies, these researchers analyzed responses to the question, “How often do you wear a mask in public when you expect to be within six feet of another person?” Participants indicated their responses on a 5-point rating scale ranging from 0 = *not at all* to 4 = *always*. This question was included in a large survey ($N = 248,941$) conducted in July 2020. The data were available in all U.S. states. Figure 5 shows the level of mask wearing as a function of state-wise level of individualism and collectivism. Mask wearing is more common in states that are high in collectivism and less common in those high in individualism. This relationship held even when the apparent outlier of Hawaii was excluded. Moreover, it also was independent of various state-level variables, including tightness of social norms, COVID-19 severity, government stringency, political affiliation, average education level, income per capita, and population density. Lu et al. (2021) replicated this pattern in another large U.S. survey conducted in September 2020.

Collectivism and its counterpart, individualism, across the regions of the United States may reflect many factors. One of the most important is the history of frontier settlement (Kitayama et al., 2006, 2010). Prior work shows that the states incorporated into the United States in later years, indicating the history of frontier, are more individualistic and, conversely, less collectivistic (Kitayama et al., 2010; Varnum & Kitayama, 2011). A recent study tested the link between frontier proximity and engagement in COVID-19 preventative behaviors (Bazzi et al., 2021). During the era of Westward expansion of the U.S. territory during the 17th to the early 20th century, counties varied in their proximity to frontier lines, which were constantly moving. The researchers identified the number of years each county spent within the 100 km from the most proximate frontier line. This measure of exposure to the frontier during the early formative period of the United States predicted less mask-wearing, less social distancing, and less stringent local regulations during the current pandemic.

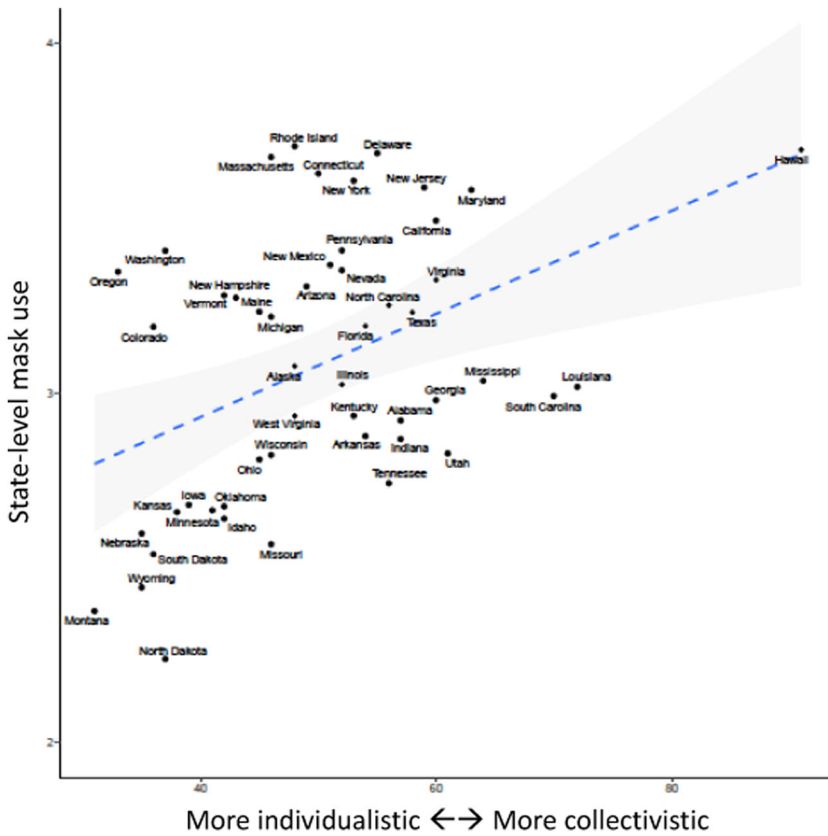


Fig 5. Average mask use level for the U.S. states that vary in individualism and collectivism. Adapted from *Proceedings of the National Academy of Sciences* (Lu et al., 2021).

Does the relationship between collectivism and mask-wearing hold across different societies? In the aforementioned work, Lu et al. tested this using cross-cultural data from 67 countries that varied in individualism or collectivism. They found a similar relationship independent of several country-level control variables, including tightness and COVID severity. Further, even though collectivism had little effect on the spread of COVID-19 during an early period of the pandemic (Berg et al., 2020), it did predict lower rates of infections and deaths over a long span up to May 2021 (Kumar, 2021).

The impact of collectivism may also appear at the individual level. Collectivism entails concerns for others in a community (Triandis, 1995). Hence, it is possible that at least part of the effect of collectivism on mask-wearing and

other actions consistent with public health guidelines are motivated by certain other-oriented concerns. Consistent with this analysis, a survey of a nationally representative sample of Americans (conducted in 2019 before the current pandemic) showed that prosocial concerns (e.g., a worry of infecting others) predict the history of flu vaccination (Jung & Albarracín, 2021). Moreover, this effect was stronger in rural areas of the United States, where people are likely to be more connected—one crucial feature of collectivism.

In our earlier discussion, we treated universal BCG policies as an antecedent for alleviating societal vulnerability to COVID-19. However, in the context of the current discussion on individualism, vaccination is similar to mask-wearing. Both are inconveniences at best at the individual level. However, each of them is also a public good that can contribute to the well-being of society as a whole. Hence, it is not surprising that individualistic countries were far less likely to have adopted universal BCG policies in the 20th century (Berg et al., 2020).

Trumpism: Power, Order, and Control

We witnessed seismic changes in American politics throughout 2020. After 4 years of presidency, Donald Trump was officially chosen again as the Republican presidential candidate in August 2020. His messages had already emphasized power and dominance (e.g., “America First”), order and punitiveness (e.g., blatant hostilities expressed against minorities and immigrants), and authoritarian control (e.g., affinities with Far Right discourses) throughout his presidency (Pettigrew, 2017). However, they became even more explicit in the second half of 2020 as the focal point of his re-election campaign. Through various sources of right-wing social media, they were sinuated into the populace—particularly among working-class Whites who had suffered economically over the last few decades and believed that this suffering was unfair (Hochschild, 2016).

The political movement organized and energized by the nationalistic, racist values has been called Trumpism, and culminated in a dramatic uprising at the U.S. Capitol on January 6, 2021, in the wake of Trump’s loss in the 2020 election. Several strands of this movement encouraged blatantly hostile attitudes against establishments, including federal and state governments, pharmaceutical companies, and researchers in medical and public health science disciplines. These social institutions were seen as an oppressive force that compromised the right to freedom, control, and self-determination over their lives and behaviors. Pro-minority policies were seen as an unfair effort to infringe on their livelihoods. Moreover, the sense of power, often linked to gun rights, precipitated antigovernment and antiminority demonstrations, which often turned violent. Not surprisingly, Trumpism mobilized a core of strong attitudes against all government mandates and restrictions, including but not limited to mask-wearing and vaccination.

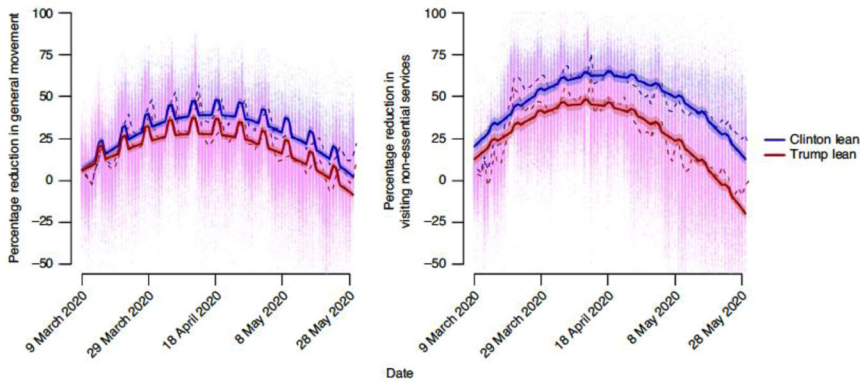


Fig 6. The reduction of people’s movements in general (the left panel) and their movements to nonessential services (e.g., restaurants, barber shops, and clothing shops) from March to May 2020 during the pandemic. Adapted from *Nature Human Behavior* (Gollwitzer et al., 2020).

Gollwitzer et al. (2020) tested whether Trump support might predict the lack of compliance to social distancing guidelines during the pandemic (Gollwitzer et al., 2020). They used county-wise cell phone usage data between March and May 2020, to assess reduction in both people’s movements in general and to nonessential services (e.g., barbers, restaurants, clothing stores) during this period, relative to the period preceding the pandemic. The researchers tested these data by the relative percentage of votes for Trump against Clinton in each of the counties in the 2016 presidential election. Figure 6 illustrates the percentage reductions of both general movements and movements to nonessential locations during the testing period.

As can be seen, movement decreased (indicating social distancing increased) when COVID-19 spread in March 2020 and then began to decrease when many of the reopened around mid-April. There also exists a clear weekly trend such that the reduction of general social movement was particularly pronounced over weekends. Crucially, however, the reduction of movements was significantly less in counties that leaned toward Trump than for those that leaned toward Clinton. This partisan difference was particularly pronounced for the measure of movements to nonessential services. Of importance, the authors showed that the reduction of the movements assessed this way prospectively predicted the growth rates of both infections and deaths due to COVID-19.⁶

⁶ Future work must assess whether the prospective reduction of infections by a decrease in mobility generalizes to other societies, especially those lower in relational mobility. As noted in our discussion on this construct, it stands to reason that physical mobility would have a less adverse effect in societies low in relational mobility, where people are expected not to interact with strangers as much even when they physically move around.

At the time of this writing (October 2021), the United States has failed to live up to the initial vaccination plan set forth by the Biden administration. This has been the case even though effective vaccines by Pfizer, Moderna, and Johnson & Johnson are abundantly available at no cost to the public. The vaccination rate is particularly low in many Southern states, such as Louisiana and Mississippi, where Trump won in the 2020 election. Kitayama, Yu, and Salvador (2021) examined the relationship between the percentage of the vote for Trump (vs. Biden) in this election and the percentage of the population that was fully vaccinated in each state and found a highly systematic relationship. Their preliminary analysis indicates that the percentage of vaccinated people was particularly low in states that leaned toward Trump. The inverse relationship was extremely high ($r = -.76$) and did not change much after controlling various potential confounds such as median age and the percentage that is college-educated.

Theoretically, Trumpism is a manifestation of the values of power, order, and control. Hence, to assess the regional variation in the support for this political and social movement, one may assess the state-level emphasis of power and punishment in social policies and socialization practices, such as national security and defense. Seen from this vantage point, a measure invented by Harrington and Gelfand (Harrington & Gelfand, 2014) may provide a reasonable proxy of the support of Trumpism even though the construct these researchers intended to measure (i.e., state-level tightness of social norms) was very different. Specifically, Harrington and Gelfand (2014) combined eight state-level statistics to yield a single state-level index. Five of the eight measures relate to punitiveness (legality of school corporal punishment, percentage of students hit in schools, rate of executions from 1976 to 2011, severity of marijuana laws, ratio of day to total counties by state). The remaining three relates to anti-gay norms (legality of same-sex civil unions), White dominance (percentage of foreign nationals by state), and religiosity (percentage of religious people by state). These eight measures cohered across the 50 U.S. states. Punitiveness reflects all three values of power, order, and control. Anti-gay or pro-White institutions reflect order when viewed from the most extreme of conservative Christian creeds.

Adopting the Harrington–Gelfand measure as an index of the values of power, order, and control, Kitayama, Yu, and Salvador (2021) found that the Harrington and Gelfand measure predicted the percentage of Trump votes in the 2016 election. Since the Trump vote strongly predicted lower rates of vaccination, the Harrington and Gelfand index inversely predicts the percentage of fully vaccinated people by state, mediated by the percentage of Trump votes in the 2020 election.

Can we extend this line of work to other countries? A cursory observation suggests we might be able to. Several far-right leaders in the world, including Bolsonaro in Brazil and Modi of India, used extreme political rhetoric of power, rule, and control to take over the conservative sectors of their respective coun-

tries. This rhetoric lends itself to the neglect of science and the dismissal of health guidelines since it gives an illusion of invincibility in their supporters. It further undermines any trust of public officials administering policies designed to contain the pandemic (Devine et al., 2021). These countries broke down one way or another in rather dramatic ways. Conversely, leaders who are more faithful to science and rely more on science-based information, including Ardern of New Zealand and Tsai of Taiwan, were far more effective in leading their respective countries to contain the pandemic. Since these officials are elected by the popular vote in the countries under consideration, these leaders could be reflective of the populace that supports them.

The U.S. data on Trumpism presented in this section may illuminate how specific social dynamics responsible for the emergence of the different types of leaders might diminish the effectiveness of coping with pathogen threats. Specifically, the three countries that had disastrous death tolls in the pandemic (the United States, Brazil, and India) share certain features. The leaders of the respective countries (Trump, Bolsonaro, and Modi) fostered a palpable desire for power, control, and rule in their populace. This desire would motivate a blatant neglect of science. It further promoted a mythology of an impeccable nation-state, which could be a source of collective pride.⁷ This mythology reinforcing the perceived invincibility of the nation serves as an effective distractor from the pain and fear of the pandemic (see our discussion on social analgesia below). Moreover, all these countries have notable residential segregation by certain social groups (race, class, and caste), which is arguably compounded by wealth disparity across these groups (Yu et al., 2021). In short, the threat of COVID-19 could motivate people to support their leaders (Yam et al., 2020). But precisely because of this, countries with leaders promoting strong anti-science perspectives combined with the invincibility national myths might have suffered particularly miserably. For the most part, these factors were missing, or if not, much less prominent in the three countries with contrastingly positive outcomes during the pandemic (New Zealand and Taiwan). Given our literature review, it would seem justified to hypothesize that the political, cultural, and social structural factors evident in the United States, Brazil, and India constitute a recipe for disaster during a pandemic. A more systematic, in-depth analysis along this line is well-justified in the future.

⁷ Collective pride, or what may be called national identity, may also predict greater compliance with health guidelines by mobilizing a common national goal. This effect, however, requires the society to remain undivided on the purported effectiveness or the desirability of health guidelines. A recent large-scale 67-country study (van Bavel et al., 2020) suggests positive within-society correlations between national identity and compliance (i.e., people with stronger identities complying to health guidelines more) across many nations. However, the correlations are massively heterogeneous, ranging between 0 and .5 across the countries, suggesting certain important moderating variables, including, but most likely not limited to, the degree of consensus on the effectiveness or desirability of health guidelines.

Policy Implications

Recent work suggests that under threats, including pathogen threats, social norms become both tighter (Gelfand et al., 2011) and more collectivistic (Fincher et al., 2008). During the current pandemic, many Americans might have conformed to the norms based on the ideas of liberty and freedom that are arguably maladaptive in containing the pandemic. Hence, strengthening of norms seems to have backfired to yield adverse consequences. Indeed, the ideas that one's health is their personal responsibility, that government intervention is constrictive rather than constructive, and that choice reigns supreme, have pervaded Americans' views on wellness for decades (Hook & Markus, 2020). However, psychological research provides examples of how these tendencies can be addressed, circumvented, and, in some cases, harnessed, to promote public health.

Tuning health messages: Harnessing and expanding independent selves. Appeals are more likely to succeed when they are consistent with the recipient's personal and social identities (Han & Shavitt, 1994; Uskul & Oyserman, 2010). Given the different ways cultures construct the self, it follows that different messages will resonate—or “fit”—more in some cultures than others. If health messages are framed culturally congruent way, recipients will be more likely to act on the advice and seek out more information (for review, see Sherman et al., 2011). In one study, for example, Uskul and Oyserman (2010) observed that messages that highlighted the individual consequences of fibrocystic disease were more persuasive and led to more health-promoting behaviors among European Americans, where messages focusing on the relational consequences of the disease were more effective among Asian American participants. Likewise, messages that align with Western preferences in motivation (i.e., a gain-seeking versus loss-averting frame; Uskul et al., 2009) and desired emotions (i.e., preferring high-arousal states; Sims et al., 2015) are more likely to shift behavior than culturally incongruent alternatives. From an independent standpoint, then, it may be more motivating to view masks as a means to take responsibility for one's own health than to construe the measure as compliance with a government request.

Identity-consistent frames can help tune health messages to resistant subgroups. White evangelical Christians, for instance, have been among the most reluctant to support mask wearing during the COVID-19 pandemic (Burge, 2021). A recent study by DeMora et al. (2021) found that framing masking as consistent with White evangelicals' religious values (i.e., a way to follow the Biblical injunction to love thy neighbor) or political commitments (i.e., as patriotic support for President Trump) could shift White evangelical respondents' intentions to mask, compared to a control condition (DeMora et al., 2021). Taken together

with cross-cultural work on identity and health, these data identify cultural fit as a strategy in public health appeals.⁸

Although Americans are generally more independent than interdependent, they also have and sometimes endorse interdependent mental sets. Hence, in addition to tuning messages to independent selves, policymakers may try to make interdependent selves more accessible by highlighting how one's personal decisions influence others (Betsch et al., 2017). One's choice to forgo a mask or refuse vaccination can ultimately impede someone else's well-being, not to mention their own liberty. To this end, health interventions that have prompted individuals to reflect on the plight of more vulnerable members of society have been shown to increase health-conscious behaviors generally (Grant & Hofmann, 2011; Sassenrath et al., 2016) as well as individuals' intentions to wear a mask in the present pandemic (Pfattheicher et al., 2020). Perhaps, the strongest relational identities that policymakers can harness is that of being a parent, as evidenced by in recent study (Zeng, 2021). Asking parents to reflect on their experiences with parenthood not only increased support for policies such as mass testing and safety restrictions, but also reduced partisan and gender gaps in policy support. Such findings suggest that interdependent messaging can play a role, even in the most independent cultures.

Guiding choices through decision architecture. When it comes to effective health messaging, audience matters: Policymakers can better inform and motivate the public by attending to their cultural context. Another approach targets decision structures rather than decision makers. These interventions, popularly called "nudges" (Thaler & Sunstein, 2008) steer individuals toward behaviors by capitalizing on biases in decision-making, such as the tendency to select default options. Nudges have been used to promote a range of actions, from investing more in retirement accounts (Thaler & Benartzi, 2004), to selecting healthier meal options (Thorndike et al., 2012), to reducing electricity consumption (Brandon et al., 2019). For example, texting community members that a vaccine has been reserved for them increases their intentions getting vaccinated, as they feel as though they have already been endowed with the vaccine (Dai et al., 2021; Milkman et al., 2021).

⁸ We must bear in mind that, to translate a theoretical analysis like ours into persuasion and behavioral change, there needs to be a mechanism to create new frames and test them through focus groups and small-scale pilot studies for their plausibility, appeal, and eventual persuasive power. For example, mask-wearing might be framed as an effective means for self-protection. Alternatively, it could be framed as a tool to resist big pharma's exploitive tactics. We might anticipate that, if effective at all, these specific frames would be effective in certain population segments, but not in others. Yet, it is hardly possible to be certain about the effectiveness of any frames for any given demographic region or group without extensive research translating theoretical constructs, including cultural fit, into practically applicable and demonstrably effective persuasive messages.

A guiding philosophy of nudges is that individuals hold the ultimate choice in their behavior, even as the decision process facilitates some options and impedes others: they embody “libertarian paternalism” (Sunstein, 2016). Although there is vigorous debate over whether nudges are sufficiently libertarian to respect citizens’ autonomy (see Sunstein, 2016) or paternalistic enough to achieve their desired ends (Bhargava & Loewenstein, 2015), we note that they may be a way to guide behavior without running afoul of individualist values of liberty. Indeed, resistance to government restrictions—the proverbial “nanny state”—runs deep: One poll of Americans found that respondents viewed freedom from government interference as more important than government support for those in need (Pew Research Center, 2016).

More broadly, nudges illustrate the importance of making the prosocial choice the easiest option to choose. The choice to make an online appointment, take off work, and drive to a vaccination site requires time, effort, and resources; by making vaccines readily available in the community and providing paid time off to receive them, policymakers can make getting a vaccine less an act of willpower and more a matter of course. Moreover, different decision framing can cause changes in how the public views health behaviors themselves. Under an opt-in policy for organ donations, for example, the act of donating one’s organs after an accident is seen as an act of heroism; the same action under an opt-out regime is viewed as the fulfilment of one’s social obligation, while choosing not to donate is an exceptional act of selfishness (Davidai et al., 2012).

In short, the cultural milieu of the United States poses challenges in combatting pandemics such as COVID, since health tends to be conceptualized in terms of individual choice rather than collective responsibility. However, policymakers can work to tune messages for cultural fit, make interdependence more salient, and structure decisions in a way where healthy choices are easy choices.

Psychological Processes

The discussion so far has presented a compelling case that the U.S. suffering during the current pandemic has been exacerbated for multiple reasons, from historical to social structural to cultural. However, this work is limited largely to the analysis of public health information. Although the focus on this public health statistic is fundamental, clarifying societal-level health consequences of social and cultural factors, it falls short of informing the psychological dynamics underlying the spread of the virus. To address this gap, we present a preliminary model of how the experience of a virus threat may be translated into noncompliance behaviors under certain conditions. The model posits a few intervening steps.

The Reputation–Compensation Model

Figure 7 illustrates our key idea. When a pathogen threat is perceived as imminent, people experience fear and anxiety. Importantly, they *know* that they are afraid and worried (first box). However, the available evidence (Coan et al., 2006; Eisenberger et al., 2007; Salvador et al., 2020b) suggests that the experience of such a threat may be temporarily blocked if people feel connected with close, supportive others (second box). Such social relations are likely to have an analgesic effect. While interacting with these others, individuals may not show any fear or anxiety since they feel less concerned. Accordingly, most people will act as if they are not afraid or worried while interacting with others, even though they *are* afraid and worried in private when not interacting with others. This leads to a state of affairs social psychologists have long called pluralistic ignorance (third box; Allport, 1924). Everyone feels that everyone else is less worried than themselves, even though everyone is just as worried as everyone else in private. At least in the U.S. culture, which emphasizes power, confidence, self-efficacy, and strength (Heine et al., 1999; Schwartz, 1992), it is problematic for many to think that they are more prone to anxiety and worry, and thus weaker or less efficacious, than others (fourth box). Thus, these individuals will try to ensure that such weakness will not leak out and taint their public reputations. We therefore hypothesize that the unfavorable social comparison induced by the pluralistic ignorance is a potent motivator to compensate for their threatened reputation by exaggerating their personal strength and worth (fifth box; Henry, 2009). This will lead to competitiveness (as revealed in risk-taking behaviors) and increased selfishness in social interactions. This analysis may shed light on the question of why America did so poorly during the pandemic since its culture may lend itself to a larger effect at each of the three steps. Here, we review the evidence for each step.

Analgesic effects of close social relations. The extant evidence indicates that close social relations entail an analgesic effect. For example, recent neuroimaging studies find that the presence of close others can mitigate neural responses to physical pain (Coan et al., 2006; Eisenberger et al., 2007). This effect could be greater for those who are closely attached to the relations. Consistent with this reasoning, Eisenberger et al. (2007) showed that physiological responses to physical pain are not as strong among those who feel social support. A similar reduction of pain response is observed when people are induced to feel interdependent (Wang et al., 2014). Furthermore, the evidence is growing that people high (vs. low) in interdependent self-construal (SC) are more resilient when they are socially excluded (Gardner et al., 2005; Over & Uskul, 2016; Ren et al., 2013; Uskul & Over, 2014, 2017). Thus, it stands to reason that social relations—particularly warm, supportive relations—may have a strong analgesic effect on perceived threats, including a threat of germ contamination.

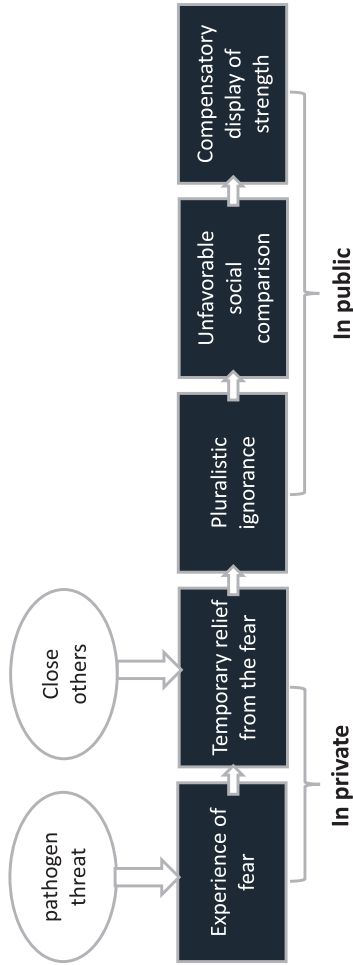


Fig. 7. The reputation–compensation model of reckless behaviors under pathogen threat: It hypothesizes that when interacting with close others in public under pathogen threat, everyone perceives everyone else is less fearful than themselves, due to social analgesia, even though everyone shares a degree of fear in private (pluralistic ignorance). The resulting unfavorable social comparison motivates reckless behavior as a compensatory display of the self’s strength.

In a study conducted in 2018, well before the current pandemic, Salvador et al. (2020b) examined whether the psychological impact of a pathogen threat may be less for those who are high in interdependent SC. Such reduction of the threat's impact might occur since relational embeddedness of these individuals will reduce the fear linked to the threat. To prime a pathogen threat or not, the researchers showed young American adults a slideshow depicting either risks of epidemics in the United States in the threat priming condition or office supplies in the control condition. They then tested one well-examined effect of pathogen threat. When such a threat is made salient, people are known to value social norms and conformity to them (Gelfand et al., 2011; Murray & Schaller, 2016). Thus, the researchers tested how the norm sensitivity would be modulated by both threat and interdependent SC, while assessing the norm sensitivity by neural indices of how strongly people responded to someone who violated social norms. As may be expected, the reactions to norm violations were stronger in the threat priming (vs. control) condition. Moreover, this effect was observed primarily among those low in interdependent SC. For those high in this SC, there was virtually no effect of threat priming. It thus appears that people become sensitive to norms in the presence of a pathogen threat only if they are not interdependent. A similar effect of interdependence has been reported for Americans in the context of the Ebola scare in 2014 (Kim et al., 2016). Under a pathogen threat, prejudice toward outgroup members tends to increase, as reflected in heightened xenophobic reactions (Navarrete et al., 2007). This indeed happened in the United States during the 2014 Ebola scare. However, this effect was significantly less for those high in interdependent orientations.

Pluralistic ignorance. In social settings, especially when interacting with close social others who are pleasant, friendly, and ingratiating, people will temporarily experience little or no worry of the pandemic. They therefore will act as if they have no worries even though they do worry in private outside of such social settings. Since people infer others' psychological states by observing their behaviors, everyone believes that everyone else is less worried than themselves. This effect, called pluralistic ignorance, is pervasive. In one study, college undergraduates estimated their friends' attitudes toward campus drinking while reporting their own. The participants inferred that their friends on campus would have more lenient attitudes toward drinking than themselves (Miller & Prentice, 1994). It appears that they felt less worried about drinking in the presence of their friends even though they do worry in private outside of such positive social interactions. Thus, everyone ends up feeling that everyone else is less worried about drinking than themselves (see also Kjeldahl & Hendricks, 2018; Miller & McFarland, 1987, for other hypotheses discussed in the literature).

So far, pluralistic ignorance has not been explored with the attitudes toward the pandemic. However, the hypothesis that people perceive others to be less

worried about the pandemic than themselves even though everyone feels equally worried offers important implications. Through this social process, people perceive the self as less resourceful or strong, which, in turn, could lead at least some to compensate for the perceived inadequacy. For example, they may assert the self's prowess by acting recklessly.

Social comparison and risk-taking. We hypothesize that when individuals perceive others to be less worried about the pandemic than they are, there arises a motivational drive to show off their prowess and compensate for the threat to the self's perceived efficacy and strength. Consistent with the status challenge hypothesis (Archer, 2006; Wingfield et al., 1990), recent research shows that the level of testosterone (T, the hormone linked to aggression and risk-taking) increases when people are challenged, and moreover, the increased T predicts future risk-taking (Welker et al., 2017, 2019).

When perceiving the self to be more worried than others in a group during the pandemic, people may feel challenged. Moreover, this type of reaction may be especially common in masculine cultural contexts. This consideration might explain why Trump supporters who have strong commitments to "Make America Great Again" as well as rebel against the "conspiracy of dark-state elites"—two possible manifestations of their masculine, independent values—might have often been noncompliant with governmental health recommendations (Gollwitzer et al., 2020). It is therefore possible that the perception of the self as more worried and afraid of the pandemic leads people to take more risks to compensate for the threatened reputation of the self as strong and resourceful.

Policy Implications

Our model provides one account of how pathogen threats may evoke counterproductive responses, particularly in independent cultures. Some elements in the sequence of processes are more difficult to intervene upon than others. For example, pathogen threats are inevitable amid a pandemic, and individuals will necessarily seek out support from others during a crisis. To break the chain between pathogen threat and risky behavior, we identify ways in which policymakers can target pluralistic ignorance and compensatory risk-taking.

Combating pluralistic ignorance. Pluralistic ignorance can prevent individuals from adopting precautions, especially when those behaviors are highly visible (such as wearing a mask) and local norms are not clearly established. One especially pernicious aspect of pluralistic ignorance is that groups can conform to a norm that no individual privately supports. How can individuals and institutions prevent false norms from taking hold?

One strategy is for public health campaigns to address pluralistic ignorance directly by highlighting the gap between the private concern individuals experience and what they think others are doing. In one field experiment, Schroeder and Prentice (1998) sought to reduce underage drinking by dispelling false consensus. First-year undergraduates were randomly assigned to participate in a dorm discussion about how students can be less comfortable with drinking than they seem, or a control discussion focused on making responsible decisions. Students who received the pluralistic ignorance intervention reported drinking less than those in the control group, even 4–6 months later.

These findings are compelling, but these and similar interventions (e.g., Turetsky & Sanderson, 2018) have capitalized on pre-existing social connections by having peers—fellow university students—deliver the intervention. This would suggest that policymakers stand to gain more by encouraging these discussions within communities and social networks than by transmitting this information themselves. There is also a fine line between identifying pluralistic ignorance (pointing out how some individuals are more wary of COVID than they may seem) and highlighting an undesired descriptive norm (emphasizing the number of individuals disregarding health recommendations), a message that could backfire by creating the impression that risky behaviors are normative (Cialdini et al., 2006).

What can policymakers do in cases where precautions are not the norm? Recent research suggests that communicating information about *dynamic norms*, or the rate at which behaviors are changing rather than their current levels, can be a powerful force for behavior change (Sparkman & Walton, 2017). Learning that others have recently changed their behavior, like wearing masks or deciding to get vaccinated, invites individuals to consider the reasons for this change; moreover, it licenses them to change their own behavior in light of others who are doing the same (Sparkman & Walton, 2019). Messages that harness dynamic norms may be particularly effective in pandemic circumstances, which are dynamic.

Addressing compensatory risk-taking. It is hard to conceive of a more uncertain threat than that of a global pandemic. In the face of such challenges, some individuals will seek out external sources of control such as government intervention (Kay et al., 2008), others can be motivated by those same threats to embrace libertarian ideologies that assert individual control in opposition to centralized efforts (de Leon & Kay, 2020). What can be done to avoid a race to the bottom in risk-taking?

One potential venue for intervention is capitalizing on compensatory responses, redirecting them instead of trying to suppress them. To the extent that individuals are motivated to assert control and self-efficacy, messages can emphasize the agency that community members have in protecting themselves and their communities. One can construe mask-wearing as a potent way to avoid potential infection; however, one can also view it as a means to take control of one's

Table 1. Collective, Cultural, and Psychological Risk Factors that Hampered the U.S. Response to the COVID-19 Pandemic and Empirically Based Policy Insights to Address Such Risks

Level of analysis	Collective level, historical enabling conditions	Contemporary cultural affordances for independence	Psychological-level processes
Risk factors	Absence of universal BCG policies in the 20 th century Racial residential segregation and wealth disparity	Relational mobility (social openness) Individualism (value placed on individual freedom over collective welfare) Trumpism (political propaganda for power, order, and control)	Social analgesia (threat reduction by close social relations) Pluralistic ignorance (everybody perceiving others to be “stronger” than themselves) Social comparison and compensatory risk-taking
Policy implications	Implementing/renewing universal BCG policies Less segregated city planning Reduction of wealth disparity Know that today’s policies set tomorrow’s defaults	Social selves as asset or obstacle in messaging Consider tuning to independent selves or making interdependence accessible Decision architecture can steer behavior while respecting choice	Address the gap between private concern and public behavior Frame precautions as a way to assert control and influence others rather than a sign of weakness

health and to influence others to do the same (see footnote 7). Indeed, successful interventions in domains as wide-ranging as scholastic achievement (e.g., Walton & Cohen, 2011), healthy eating (Bryan et al., 2016), and conflict resolution (e.g., Paluck et al., 2016) have gained purchase by turning audiences into advocates. To be sure, there are challenges in adapting some of these interventions to the COVID context. Bryan et al. (2016) capitalized on teenagers' distrust of authority to dissuade unhealthy eating, for example, by linking processed foods to the corporations that sell them; one could imagine that a similar message could backfire in garnering support for CDC recommendations. However, the broader point is that health-promoting behaviors can be framed in a way that highlights the agency and influence of the community.

Conclusions

The lackluster U.S. response to COVID-19 was not the result of a single fatal flaw, but a constellation of weaknesses at multiple levels of analysis. In considering each level, we can better understand these shortcomings, along with insights for policymakers and practitioners. Table 1 summarizes these risk factors and their practical implications. Our discussion focuses on three distinct levels of processes (i.e., collective, cultural, and psychological) in assessing the U.S. response to COVID-19. Further, we offered some empirically based policy implications at each level.

First, collective- or societal-level, structural aspects of U.S. society created "pre-existing conditions" that were exacerbated by the pandemic. For example, many countries benefitted from universal BCG policies they adopted in the 20th century. The United States is one of a relatively small number of countries that never adopted such policies, and the evidence suggests that this fact seriously handicapped the United States in its effort to fight against the pandemic, especially in its early phase (Berg et al., 2020). The country's individualistic ethos might account in part for the adverse psychological reactions against such policies. Further, most U.S. cities are racially segregated, often to notorious degrees (Williams, 1999). Moreover, wealth disparity across racial lines was and still is massive (Kraus et al., 2017). These social structural factors inherent to American cities made it very challenging to contain the initial spread of COVID-19 (Yu et al., 2021). In preparing for the future, it is fundamental for the U.S. society to bring about policy changes that institutionalize behaviors, such as vaccination, mask-wearing, and racial desegregation of cities, that would render the country more virus-resilient. Such policy changes require political will and courage. However, the evidence we reviewed shows that people do rationalize such changes if they recognize them as both inevitable and uncontestable (Laurin, 2018; Tankard & Paluck, 2017). It is of utmost significance to engage in the long-term planning of institutions at every level, and to offer clear guidance amid the crisis.

Second, there are culture-level processes powerfully damaging the society's ability to cope with the pandemic. Most importantly, the culture of individualism that pervades U.S. society (Markus & Kitayama, 1991; Triandis, 1995) likely had huge adverse effects during the pandemic. This cultural value is associated with social openness, since it promotes free choice of social relations (Thomson et al., 2018; Yuki & Schug, 2020). Thus, people are prepared to interact with others they like while terminating existing relations that do not do any good to them anymore. Although social openness has a number of admirable, attractive features, it is a major liability during pandemics (Salvador et al., 2020a). Moreover, individualism positively sanctions and thus promotes both strong confidence (or even "over"-confidence) in the self (Salvador et al., 2021) and the pursuit of self-interest (Kitayama & Park, 2014). The emerging evidence of cultural neuroscience shows that this motivational propensity is quite deep: It is ingrained into the automatic and spontaneous functioning of the brain that supports this pursuit (for reviews, see Kitayama & Salvador, 2017; Kitayama & Yu, 2020). Thus, for many Americans, the pursuit of self-interest is no more than a habitual mode of being, experienced as natural or as a "default" in behavioral decisions. Thus, it is unlikely to be seen as selfish or self-centered.

Evidence is mounting that individualism renders it very challenging to promote risk-mitigating behaviors, such as mask-wearing and vaccination, that come with inconveniences or other detriments at the personal level (Lu et al., 2021). With its unhinged propaganda toward order, power, and control, Trumpism exacerbated the hesitancy toward these behaviors. We suggest that health-promoting media campaigns and other persuasive efforts must harness the value of individualism. When that is not possible, they can promote alternative values of community, interdependence, and mutual support. In both cases, messages will be more persuasive to the extent they comport with their intended recipients' identities and relationships. Recent efforts to devise effective interventions in other domains, such as academic performance and economic development (Paluck et al., 2016; Walton & Cohen, 2011) provide a useful framework that can be adapted to promote mask-wearing, vaccination, and other community-oriented behaviors during pandemics.

Our third level involves some distinct psychological processes, illustrating how the culturally conditioned "habits of the heart" could powerfully interfere with any effort to contain infectious diseases. To begin with, when people experience fear (as is likely when a pathogen threat becomes highly salient), they often try to diminish their worry (Kim et al., 2016; Salvador et al., 2020b). There are many ways to do so, but the one most readily available is close others in relationships. The mere presence of these people can calm down the fear (Eisenberger et al., 2007). Moreover, close others may offer support and care to one another. One subsidiary consequence of this otherwise positive social relationship is to promote behaviors that would assure their safety. This situation lends itself to the

state of pluralistic ignorance, in which people feel that everybody else is feeling safe even though everybody is feeling anxious in private (Miller & Prentice, 1994). In combination, these processes are likely to lead to collective complacency. This negative spiral of collective delusion is likely exacerbated, especially in cultures like the United States, where a show of power and control is highly valued (Heine et al., 1999; Schwartz, 1992). In these cultures, people are motivated to show that they are stronger and more resourceful than others by acting recklessly. As noted above, this same motivation for power, including masculine power, was greatly fueled by Trumpism, which underscores the values of power, order, and control. We suggested a few promising interventions to reduce both the risks of pluralistic ignorance and the delusion of self-control, power, and efficacy.

In short, we have covered a broad terrain encompassing history, racism, the culture of individualism and social openness, and various social psychological factors, all of which contribute to the U.S.' failure in coping with COVID-19. This failure was particularly dramatic in the first year of the pandemic although it still seems as though there is no end in sight. We hope that policymakers will learn from their mistakes and follow the recommendations offered. Although our focus was on the United States, our theoretical analysis and the policy implications go beyond this single country. The in-depth analysis of the U.S. failure offers invaluable lessons to learn from it.

The 21st century will most likely be the century of infectious diseases due to population expansion (which reduces the distance between humans and viruses of wild animal origin) and globalization (which makes the global spread of infectious viruses far more likely) Christakis (2020). As social and cultural psychological processes powerfully mediate the spread of a virus, building a deeper understanding of them is of utmost significance. This theoretical understanding is indispensable to make society better prepared for epidemics and pandemics in the future. Moreover, it is already clear that the effort to understand various social, behavioral, and psychological aspects of the current pandemic has significantly expanded the scientific knowledge of the social, behavioral, and psychological sciences. This cross talk between theory-building and practical problem-solving will enrich our science—and our policies—in the future to come.

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