UNIVERSITY OF CALIFORNIA,
IRVINE

The politics of pathogens and pandemics

DISSERTATION

submitted in partial satisfaction of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

in Psychological Science

by

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Dissertation Committee:
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DEDICATION

To

my parents Jane A. Relihan and Thomas P. Johnson and
my life partner Christian Mans

in recognition of their love, patience, and dedication

In memory of my dad (March 20th, 1961 – April 6th, 2019)

Nature's first green is gold,
Her hardest hue to hold.
Her early leaf's a flower;
But only so an hour.
Then leaf subsides to leaf.
So Eden sank to grief,
So dawn goes down to day.
Nothing gold can stay.

Robert Frost
"Nothing Gold Can Stay"

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Manuscripts Under Review

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ABSTRACT OF THE DISSERTATION

The politics of pathogens and pandemics

By

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Doctor of Philosophy in Psychological Science

University of California, Irvine, 2022

Professor Peter H. Ditto, Chair

Understanding population-level variability in who responds more strongly to pathogen threats is important for devising strategic health-based risk messages targeted at ideologically diverse populations. The aims of this dissertation were to investigate how politically polarized responses to COVID-19 changed over time, the role of political elite cues in shaping responses to COVID-19 and other pathogens, and whether such effects depend on individual differences such as disgust sensitivity and moral feelings about purity. Using a longitudinal probability-based U.S. nationally representative NORC AmeriSpeak sample measured in March-April, 2020 (N = 6,514) then six months later in September-October, 2020 (N = 5,661), Study 1 demonstrated that COVID-19 fear, perceived COVID-19 death risk, and health-protective behaviors became increasingly polarized over time. Initial differences between Democrats and Republicans diverged over the first six months of the pandemic, as did responses among Republicans by support for former president Donald Trump. Trump Republicans initially

reported less COVID-19 fear and health-protective behaviors than non-Trump Republicans, and these differences became more pronounced over time. Importantly, there were minimal differences by political identity, and none by Trump support, in perceived infection risk of a non-politicized pathogen: the seasonal flu. To examine causality, Study 2 tested whether responses to an ostensibly real superbacteria, described as starting to spread internationally in a mock online Associated Press article, can be experimentally polarized via divergent political elite messages. In an online Prolific sample ($N = 400$) there was a negative partisanship effect where Republicans felt less threatened by the superbacteria when Democratic leaders cued worry about it and Republican leaders downplayed it, but not vice versa. In another U.S. nationally representative NORC AmeriSpeak sample ($N = 1{,}947$), Study 3 replicated this effect showing that pathogen disgust sensitivity predicted stronger perceived superbacteria threat regardless of political elite cues, while the effect of moral purity was nuanced. These results have theoretical implications for understanding the evolutionary roles of ingroup authority, disgust sensitivity, and moral purity in pathogen threat responses. These findings also suggest that political elite messages and emotional and moral sensitivities of the target audience be simultaneously considered when devising public health pathogen-related risk communications.

CHAPTER 1: THE PSYCHOLOGY OF PATHOGEN DEFENSE

An increasingly interconnected global population, along with a rapidly warming planet, create an ideal environment for new and deadly pathogens to spread widely and more frequently. This poses a threat to both public health and national security, as widespread disease can overload healthcare systems, halt economic activities, and create geopolitical conflict. Combatting such pathogen threats requires population-wide coordination and compromise. To be better equipped for future pandemics, it is important to understand who responds more strongly to pathogen threats and in what contexts. Research in psychology and political science, suggests that political ingroup leaders' messages play a role in guiding the public on how to respond to large-scale threats. Moreover, research in evolutionary, political, and social psychologies suggests that individual differences in sensitivity to disgust and moral feelings about purity may be related to a broader behavioral immune system that evolved to motivate individual- and group-level pathogen avoidance strategies. It is unclear, however, the extent to which these factors interact in modern pandemic contexts. The current novel Coronavirus (SARS-CoV-2) pandemic and the disease it causes (COVID-19), along with the highly politically polarized milieu in the United States, provides a natural test of how competing elite messages and pathogen-related individual differences shape people's responses to unfamiliar and deadly pathogen threats.

As the COVID-19 pandemic hit the U.S., the pathogen threat quickly became polarized (Hart et al., 2020) with research illustrating that Democrats found the novel virus more threatening, and were more willing to perform health-protective behaviors, than Republicans (Bruine de Bruin et al., 2020; Clinton et al., 2020; Gollwiter et al., 2020; Kerr et al., 2021; Pennycook et al., 2021). However, there is still much to learn about the nuanced ways people

respond to modern pathogen threats. How did such politicized responses in the U.S. change over time, if they changed at all? To what extent did political leader cues and moral purity intuitions play a role in COVID-19 responses? The first study of this dissertation aimed to answer these questions using a large longitudinal U.S. nationally representative sample.

Building on Study 1, Studies 2 and 3 aimed to answer the questions: Can an unfamiliar pathogen threat be politicized by partisan elite cues? Will Democrats and Republicans equally follow their ingroup authorities' cues about the pathgogen? Study 3's research questions further asked: What happens when messages about a pathogen threat from one's political ingroup leaders conflicts with one's intuitions to avoid infection? One prediction is that individuals who are more sensitive to disgust and who hold stronger moral feelings about purity will exhibit stronger responses to pathogens regardless of their ingroup leader's cues about the threat. On the contrary, in a society like the U.S. where political identities have become akin to religious idnetities (Finkel et al., 2020), individuals may trust their political ingroup leaders over their own individual emotional and moral sensitivities. Hence, a second, competing prediction is that partisan elite pathogen-threat cues will affect people's pathogen responses above and beyond their individual disgust sensitivity and moral purity intuition.

The aims of this dissertation are to test: 1) the roles of political identities, partisan elite support in Americans' responses to the COVID-19 pandemic over time, 2) the association between moral purity and affective, cognitive, and reported behavioral responses to COVID-19, 3) whether a new unfamiliar and deadly pathogen can be politically polarized like COVID-19 has, and 4) whether the effects of partisan elite cues on people's pathogen perceptions depends on individuals' sensitivity to disgust and moral feelings about purity. Findings from this research have theoretical implications for how ingroup authority cues, disgust sensitivity, and moral purity intersect in

shaping how people perceive and respond to modern pathogen threats. Results also have practical implications for devising pathogen-related risk communicaitons for an ideologically diverse population, as in the U.S.

The Evolution of People and Pathogens

The spread of infectious disease is natural part of life for the millions of species that call Earth home. Most species, including humans, have evolved some form of defense against such pathogen threats. From biblical plagues to modern pandemics, pathogens (e.g., bacteria, viruses) have been one of the top causes of death throughout human history, and subsequently one of the most impactful forces on human evolution (Fumagalli et al., 2011; Karlsson et al., 2014; Moren et al., 2004). Majority of human history was spent in hunter-gatherer tribes of 50 to 100 people under constant threat of invaders and infection (Dobson & Carper, 1996; Neuberg et al., 2011; Van Vugt & Park, 2009). Individuals and tribes who developed biological, psychological, and social group mechanisms to fight infectious diseases were more likely to survive and pass on their genes (Inhorn & Brown, 1990; Schaller & Duncan, 2007). Indeed, human life expectancy was approximately 20-35 years in ancient Greece and Rome (Finch, 2010; Kyriazis, 2020) and only reached up to around 40 two millennia later in 1800's Western Europe (Rose & Mueller, 1998), with infectious disease, particularly during infancy, being one of the top causes of death. After the discovery of antiseptics and antibiotics, the average human lifespan nearly doubled in the past two centuries (Barreiro & Quintana-Murci, 2009; Kyriazis, 2020; Rose & Mueller, 1998). Although some pathogens were present in early hunter-gatherer environments, such as Hepatitis B, herpes, and Epstein-Bar virus, others only came about after the agricultural revolution engendered closer contact between people and domestic animals, urban living without modern plumbing, and denser populations, around 11,000 years ago (Dobson & Carper, 1996; Wolfe et al., 2007).

Even today, aside from the ongoing COVID-19 pandemic, infection remains the fourth leading cause of death globally according to the World Health Organization (https://www.who.int/news-room/fact-sheets/detail/the-top-10-causes-of-death). Yet, modern hygiene allows people to engage in daily pathogen management practices, such as bathing with soap and brushing one's teeth. Although modern vaccines have aided in nearly eradicating pathogens such as diphtheria, measles, mumps, rubella, tetanus, and polio (Hinman, 1999), new pathogens such as monkeypox (https://www.cdc.gov/poxvirus/monkeypox/outbreak/us-outbreaks.html), West Nile Virus (Kilpatrick, 2011), Zika virus (Petersen et al., 2016) and Ebola virus (Jacobs et al., 2020) continue to emerge as deadly threats to public health (https://www.niaid.nih.gov/research/emerging-infectious-diseases-pathogens). As the world's population continues to grow beyond sustainable capacity for the planet, increased human-to-human and human-to-animal contact may lead to more frequent cross-species pathogen spread (e.g., Kilpatrick, 2011). Moreover, ancient pathogens locked away thousands of years ago in Arctic ice and permafrost may once again be released as global temperatures continue to soar to record highs (Brouchkov et al., 2017; Gross, 2019; Miner et al., 2021). How will people respond to emerging unfamiliar and deadly pathogen threats? Will our evolved biological and psychological defense mechanisms continue to successfully reduce the spread of new pathogens, or might modern media technologies and geopolitical conflict hamper such efforts though misguidance and misinformation?

On a genetic level, humans adapted to the ever-evolving diversity of pathogens through the development of immunological defenses that provide a first response to pathogens invading the body (Barreiro & Quinatana-Murci, 2009). For instance, about 100 genes have been identified across 55 human populations that are specifically sensitive to environmental pathogen load, including genes associated with autoimmune diseases (Fumagalli et al, 2011). However, evolutionary advantages

have trade-offs. Immune responses to infection require metabolic resources to raise body temperature (Dantzer et al., 1991), and sickness from infection debilitates an organism's ability to reproduce and care for offspring (Murray & Schaller, 2016; Schaller, 2016). To compensate for these costs, humans developed psychological and cultural mechanisms to help the immune system in combatting the spread of infectious pathogens.

The Behavioral Immune System

The behavioral immune system (BIS) is comprised of affective, cognitive, and behavioral mechanisms that function to motivate individuals' responses to potential sources of infection, including individuals' participation in group-based cultural norms and practices that function to keep the group protected from pathogens (Schaller, 2016). While the biological immune system developed as a reactive defense against pathogen infection, the BIS developed to provide a proactive form of pathogen threat management that supplements the biological system (Neuberg et al., 2011; Schaller, 2011, 2016; Schaller & Neuberg, 2012; Schaller & Park, 2011). In doing so, it is functionally flexible in that it is contextually sensitive and balances the costs and benefits of health-protective behaviors (Ackerman et al., 2018; Schaller et al., 2007). However, the BIS is not always accurate and sometimes overgeneralizes; it follows the smoke detector principle by erring on the side of caution (Haselton & Nettle, 2006; Nesse, 2005). Just like the cost of a smoke detector sounding a false alarm is minimal compared to the cost of a smoke detector not working when there is a real fire, it is theorized that the evolutionary cost of the BIS over activating likely outweighed the cost of under activation in the presence of a real pathogen threat (Schaller & Neuberg, 2012). For example, obesity (Lund & Miller, 2014) and deformities (Park et al., 2003; Miller & Maner, 2011, 2012) can trigger BIS activation (Ackerman et al., 2018), despite no immediate pathogen threat to the perceiver. That

pathogens can spread from group-to-group and person-to-person, and that BIS activation is contextually dependent, has implications for both intergroup and interpersonal psychology.

One context in which BIS response is important is among social groups. Although groups provide survival benefits like protection and resources, living in close quarters and frequent contact with others increases the likelihood of pathogen spread. Balancing this trade-off, groups that developed stricter cultural practices and norms over time were likely more successful in coordinating responses to pathogen threats than groups without such practices and norms. For example, a study of 33 nations found that those with higher historical pathogen prevalence (r = .36), greater number of life expectancy years lost to diseases (r = .59), and higher prevalence of tuberculosis (r = .61) also tended to have stronger social norms and lower tolerance of deviant behavior (i.e., "tight" cultures), compared to nations with lower pathogens prevalence that have more relaxed norms and acceptance of deviant behaviors (i.e., “loose” cultures; Gelfand, 2011). Similarly, higher pathogen prevalence across countries has been moderately associated with greater conformity (Murray et al., 2011) and strongly correlated with greater collectivism (Clay et al., 2012; Fincher et al., 2008; Thornhill et al., 2009), both of which are cultural values systems that promote ingroup homogeneity and favoritism (Guydkunst et al., 1992; Yamagishi et al., 1998). Though these findings are only correlational (indeed, there may also be a reverse effect where cultures with individuals that work more closely together may be at higher risk of pathogen spread; e.g., Thomas et al., 2022), they support the notion that greater exposure to pathogen threats is associated with population-level variability in psychological attitudes and behaviors that function to maintain the integrity of the ingroup.

Greater coalitional cohesiveness in pathogen prevalent environments makes sense from an evolutionary perspective, given that people from outside one’s immediate community pose a greater risk of introducing unfamiliar pathogens into the local ecology than one’s ingroup community

members. Negative attitudes towards outsiders and dissimilar others may be one evolved way of motivating decreased contact with potentially infectious others. Supporting this notion, research demonstrated that BIS activation is associated with prejudice, ethnocentrism, and xenophobia (Faulkner et al., 2004; Navarette & Fessler, 2006; Schaller & Neuberg, 2012). For instance, one set of studies found that people put in a high disease-salient context reported less positive attitudes toward foreign immigrant groups (Faulkner et al., 2004); and xenophobic dehumanization of outgroups often includes labeling outgroup members as animals notorious for carrying disease, such as rats and cockroaches (Buckels & Trapnell, 2013; Hodson & Costello, 2007). Though such attitudes can lead to horrific outcomes like genocide, there is historical precedence of foreign outgroups invading and bringing new diseases with them. For example, some work suggests that when Europeans invaded the Americas, more Indigenous Americans died from European diseases than battle (Diamond, 1999; Ramenofsky, 2003). Moreover, outsiders tend to be less familiar with local customs, like food preparation and mating practices, that may function to protect locals from pathogen transmission (Schaller et al., 2003); consequently, ingroup and outgroup members who break such norms pose increased pathogen spread risk to the group.

Tighter group norms, collectivism, and conformity – psychological attitudes that promote intragroup social regulation – are descriptive of a social conservative ideology (Janoff-Bulman, 2009). Social conservatives tend to be higher on social dominance orientation (SDO), a psychological trait defined by preference for hierarchical and unequal social structures (Pratto et al., 1994). Social conservatives also tend to be higher on right-wing authoritarianism (RWA), a psychological trait defined by conformity, prejudice toward outgroups, and submissiveness to authority (Altemeyer, 1988). Consequently, a meta-analysis found a small association between BIS activation and social conservatism (r = .25; Terrizzi Jr., et al. 2013), and this appears to be

specifically related to conservative traditionalism rather than SDO (Tybur et al., 2015). Taken together, this literature suggests that activation of the BIS by pathogen threats may increase intragroup cooperative behaviors by changing people's attitudes to motivate such behaviors; and these attitudes are characteristic of collectivism, conformity, and social conservatism. However, although these attitudes may promote group cohesion to fight pathogen threats, the downside to such attitudes is prejudice and discrimination against outgroup members. The mechanism through which the BIS motivates pathogen (and thus people) avoidant attitudes and behaviors is through the emotional experience and expression of disgust.

Disgust

The affective component of the behavioral immune system is disgust – a basic emotion that originally functioned to respond to bitter or toxic foods (Chapman et al., 2009; Darwin, 1872/1965). Disgust is felt and expressed in response to real or perceived potentially contaminating stimuli, such as spoiled food, feces, blood, insects, injuries, sexual acts, bodily fluids, and corpses (Chapman & Anderson, 2012). A physiological disgust response is marked by an urge to expel toxins from the body, physical distancing from the potential source of infection, activation of the autonomic nervous system (Ekman et al., 1983; Levenson et al., 1990) and a distinct facial expression that is cross-culturally recognizable (Ekman & Friesen, 1975; Ekman et al., 1987). The combination of these physiological changes functions to provide reactive defense (Oaten et al., 2009). For example, nausea, gagging, and vomiting attempt to expel toxic microbes (Ekman & Friesen, 1975; Rozin & Fallon, 1987; Shariff & Tracy, 2011). The prototypical facial expression of disgust plays multiple adaptive roles; the wrinkling of the nose and furrowing of the eyebrows tighten the nasal passage to reduce airborne contaminant intake; an opened mouth (sometimes sticking the tongue out) promotes oral expulsion (Ekman & Friesen, 1975; Rozin & Fallon, 1987); and the disgust expression provides

communication to conspecifics about the presence of a potential source of infection (Shariff & Tracy, 2011). Thus, disgust provides an evolved mechanism to fight pathogen infection and communicate the threat to others (Curtis et al., 2004; Schaller & Park, 2011).

Taxonomies of Disgust

The experience and expression of disgust is not limited to physical elicitors. A large body of research suggests that the physical experience of disgust has been extended to the social and moral domains. The complexity of this phenomenon is likely due to the nature of humans needing to navigate and survive both physical and social environments. As physical disgust functions to preserve one's physical purity (i.e., free from contamination by diseases and toxins), sociomoral disgust functions to protect the purity of one's mind, soul, and moral identity– all intangible disgust targets. From this perspective, taxonomies of disgust categorize disgust responses by the eliciting stimuli. Rozin, Haidt, & McCauley (1999) describe four types of disgust: 1) *core disgust* is elicited by foods, animals, and body products to protect the body from contamination, 2) *animal disgust* is elicited by reminders of humanity's animal nature (e.g., poor hygiene, sex, bodily mutilations, death) to protect from the realization of one's eventual death, 3) *interpersonal disgust* is elicited by contact with evil or diseased strangers to protect the self and social order, and 4) socio*moral disgust* is elicited by immoral actions to protect the self and social order. Other taxonomies have been proposed as well (Haidt et al., 1994; Haidt et al., 1997).

Importantly, each of these types of disgust is hypothesized to originate from the same underlying physiological pathogen protective mechanisms. In other words, the mechanisms of the BIS are thought to be adapted for use beyond their original purpose by extending to the moral domain (Chapman & Anderson, 2013; Rozin et al., 2009). One criticism of the four-category taxonomy, however, is a lack of conceptual distinctiveness among the domains (Tybur et al., 2009).

For instance, rotten food eliciting core disgust does so for the same reason as rotting flesh on a corpse eliciting animal reminder disgust – they both pose a risk of pathogen infection. To address this criticism, Tybur and colleagues (2009) devised the Three-Domain Disgust Scale (TDDS) which takes an adaptationist approach to taxonomizing disgust by taking into consideration evolutionary selection pressures that may lead to the experience and expression of disgust. These include avoiding pathogen-carrying agents (pathogen disgust), improving reproductive success by avoiding potentially deleterious sexual partners and practices (sexual disgust), and avoiding individuals who impose social costs on the self or ingroup – for instance, by violating groups norms (moral disgust; Tybur et al., 2009)[1]. Together, this research illustrates that pathogens and BIS activation– namely disgust – play an important role in human moral systems. However, if moral disgust evolved from physical disgust, to what extent are moral disgust experiences physiological?

Over the past two decades, a mountain of social psychological research has investigated the connection between physical and moral disgust experiences. The main idea is that moral disgust experiences are rooted in physiological disgust responses (Chapman et al., 2009; Rozin, Haidt, & Fincher, 2009). Studies investigating this 'embodiment' of moral disgust demonstrated that: experimentally inducing feelings of disgust led to more harsh moral judgments (Schnall, Haidt, et al., 2008; Wheatley & Haidt, 2005), recalling moral transgressions activated cleaning-related concepts and motivated intention to engage in cleaning behavior (Zhong & Liljenquist, 2006), activating cleanliness concepts or physically cleaning one's hands reduced the severity of moral judgments (Schnall, Benton, & Harvey, 2008), and drinking a bitter drink led to more harsh moral judgments (Eskine et al., 2011). At face value, these studies suggest a direct connection between physical to

[1] There are other disgust scales that focus on the clinical implications of sensitivity to experiencing disgust (e.g., Olatunji et al., 2007).

moral disgust experiences. However, a majority (if not all) of these studies relied on small, undergraduate, WEIRD (Western, Educated, Industrialized, Rich, and Democratic – societies such as the United States, United Kingdom, France; Henrich et al., 2010) convenience samples, and replications were rare at the peak of interest in embodied moral disgust research. Since then, several of these studies have either failed to replicate with larger and non-WEIRD samples (e.g., Johnson et al., 2014) or found significant but weaker effects (Landy & Goodwin, 2015). This leaves the current state of embodied moral disgust research in uncertain territory as replications of these earlier studies continue.

One potential solution is to use physiological methods to compare biological disgust processes with psychological experiences of disgust in relation to non-moral and moral stimuli. For instance, some neuroimaging evidence suggests that physical and moral disgust activate some common, but also some idiosyncratic, neural networks in the brain (Borg et al., 2008). Little research, however, has investigated whether moral disgust is linked to immune-related biochemical changes. One study found in a small convenience sample of men in Utah that exposure to images of both universally disgusting images and same-sex kissing induced significantly greater levels of salivary alpha-amylase (a biomarker of sympathetic nervous system activity and stress) than images of everyday objects (O'Handley et al., 2017). This result held regardless of participants' self-reported level of negative attitudes toward same-sex attraction. These findings suggest that moral disgust may be rooted in physical disgust; however, much more research is needed to investigate the link between biomarkers of emotion and morality[2]. As the literature previously discussed, BIS activation may lead to more negative attitudes and behaviors towards outgroup members, particularly minorities who

[2] Indeed, the original idea for this dissertation just prior to the COVID-19 pandemic was to investigate the question of whether moral disgust towards same-sex attraction is a purely metaphorical psychological experience, or whether there is an accompanying immune-related (salivary) biomarker reaction.

practice what may be considered "taboo" sexual practices such as homosexuality. Supporting this notion, numerous studies have found that disgust sensitivity and induced disgust predict more negative attitudes toward gay people (Crawford et al., 2014; Cunningham et al., 2013; Inbar, Pizarro, Knobe, & Bloom, 2009; Olatunji et al., 2017; Smith et al., 2011; Terrizzi Jr. et al., 2010). If moral disgust towards gay people is purely psychological, then efforts to reduce homophobia may be better spent focusing on changing attitudes and cultural narratives around same-sex attraction. If it is also physiological, then a follow up question is whether a pharmacological intervention (e.g., anti-nausea medication) could reduce both physiological and moral disgust reactions when an individual encounters a morally disgusting stimulus. Such a mixed-methods approach may prove fruitful in the future for teasing apart if, and under what contexts, there is a connection between physiological and moral disgust.

Moral disgust has been linked specifically with intuitions about moral purity. Disgust responses psychologically evolved to motivate individual and group-level pathogen preventative behaviors. By forming strong moral norms around cleanliness, cultures can develop pathogen preventative feelings, thoughts, and behaviors among large groups of people while maintaining a shared sense of moral community (Graham & Haidt, 2010). In an initial attempt to taxonomize moral domains of emotion, Shweder and colleagues (1997) proposed three distinct ethics that cultures use when addressing and resolving moral issues: community, autonomy, and divinity (i.e., purity). Each ethic is based on a different conceptualization of the individual as within a broader group, as a sole agent, and as a being connected to God, respectively. Extending this framework, Rozin and colleagues (1999) proposed the CAD (Community, Autonomy, Divinity) Triad Hypothesis, which suggests that violations of each of these ethics is associated with specific moral emotional responses: violations of community induce contempt, violations of autonomy induce anger, and violations of

divinity induce disgust (cf. Hutcherson & Gross, 2011, Kollareth et al., 2019). More specifically, violations of divinity were defined in terms of purity:

> "…cases [where] a person disrespects the sacredness of God, or causes impurity or degradation to himself/herself. To decide if an action is wrong, you think about things like sin, the natural order of things, sanctity, and the protection of the soul or the world from degradation and spiritual defilement." (Rozin et al., 1999, pg. 576).

Additional evidence connecting intuitions of moral purity to BIS functioning was found by Horberg and colleagues (2009), who conducted three studies investigating the role of state and trait disgust (compared to other negative emotions) in predicting moralization in the purity domain. They found that integral feelings of disgust (but not anger) predicted stronger moral condemnation of purity violating behaviors, experimentally induced disgust (but not sadness) increased condemnation of purity violating behaviors as well as approval for virtuous purity behaviors, and trait disgust (but not anger or fear) predicted stronger moral condemnation of purity violations and stronger approval for purity virtues. These results are consistent with the Social Intuitionist Model (SIM), which proposes that moral judgments derive from intuitive emotional reactions (Hadit, 2001), with moral judgments of purity violations deriving form disgust.

The SIM was extended by Moral Foundations Theory (MFT), which posits that throughout evolution problems associated with increasingly complex human social life, such as forging strong coalitions and avoiding infectious diseases, were solved through the development of intuitions about right and wrong. According to the theory, people are born with a template for moral intuitions – that it is wrong to kill, wrong to steal, etc. – and throughout development they learn from their cultures to rely more or less on each given foundation. In other words, moral intuitions come "pre-loaded" and cultures "tune" them up or down depending on the needs and goals of the culture (Graham et al.,

2013; Graham et al., 2011; Haidt & Joseph, 2004, 2007). This can also occur among subcultures, such as political factions within a country (Koleva et al., 2012). Thus far there appear to be five intuitions or 'foundations' that can be found cross-culturally to varying degrees. Tens of thousands of participants around the world have participated in studies testing the five moral foundations (many participated through the data collection website YourMorals.org). MFT allows room to investigate and uncover additional moral intuitions that may exist.

The five foundations consist of harm, fairness, loyalty, authority, and purity (Graham et al., 2013). The harm foundation originally developed to promote protection and care for offspring (e.g., parent-child bonding) and was originally triggered by perceptions of suffering, distress, and neediness. Greater reliance on the harm foundation is associated with compassion for victims and anger at perpetrators. The fairness foundation developed to promote benefitting from partnerships with others and was originally triggered by cheating and deception. Greater reliance on the fairness foundation is associated with anger, gratitude, and guilt. Together, the harm and fairness foundations are considered the "individualizing" foundations because of their focus on individual rights and autonomy. The loyalty foundation developed to promote cohesive tribes and was originally triggered by threat or challenges to the group. Greater reliance on the loyalty foundation is associated with group pride and rage towards traitors. The authority foundation developed to promote beneficial relationships within hierarchies and was originally triggered by sign of high and low rank. Greater reliance on the authority foundation is associated with respect and fear. Lastly, the purity foundation developed to aid in avoiding communicable diseases and was originally triggered by waste products and diseased people. Greater reliance on the purity foundation is associated with disgust (Graham et al., 2013, pg. 38). Collectively, the loyalty, authority, and purity foundations are considered the

"binding" foundations because they focus on binding groups together to achieve a social evolutionary goal.

The research by Graham and colleagues (2013) suggesting moral purity may function, in part, to promote pathogen avoidance coincides with the previously discussed literature linking disgust with violations of cultural values of divinity, and further suggests that affective, cognitive, and behavioral components of the BIS may have been extended to the moral domain throughout evolution as a way to bind groups together and promote intragroup cooperation (i.e., moral norms) in fighting infectious diseases. However, as MFT theorizes, although people are born with the innate "blueprints" for these foundations, their environmental and cultural upbringing adjusts the degree to which they rely on the different foundations in making moral judgments. Thus, intergroup differences in pathogen exposure over time may explain intergroup differences in BIS activation (e.g., disgust sensitivity), and subsequently, cultural differences in moral disgust and moral purity.

Conservatism, Moral Purity, and Religiosity

The MFT framework aids in explaining differences in political orientation. Specifically, numerous studies have shown that liberals tend to show greater endorsement of foundations related to individual rights and autonomy, while conservatives tend to endorse all five foundations equally (i.e., they endorse the binding foundations more than liberals; Graham et al., 2009; Haidt & Graham, 2007). The connection between conservatism and moral purity has especially received an abundance of attention in the social psychology literature. For instance, several studies suggest that conservatives are more easily disgusted than liberals (Inbar, Pizarro, & Bloom, 2009), that disgust sensitivity predicts stronger conservatism (Inbar, Pizarro, et al., 2012), and that the meta-analyzed association between social conservatism and BIS activation is significant (though it is not a large effect size). Given research connecting the BIS to conservatism, and connecting the BIS to moral

purity, it makes sense that conservatives rely more on moral purity intuitions when making moral judgments. Additional evidence of the interplay among the BIS, conservatism and moral purity was demonstrated by Helzer and Pizarro (2011), who found that people reminded of physical cleaning reported being more conservative and made harsh moral judgments towards violations of sexual purity than people in a control condition. Additional support for the political patterns of moral intuitions was demonstrated by Feinberg and Willer (2013), who found that reframing pro-environmental messages in terms of purity eliminated environmental attitude differences between liberals and conservatives.

However, recent work has failed to replicate Helzer and Pizarro's (2011), and a meta-analysis of their studies revealed a very small effect of the cleanliness cues on political attitudes (Burnham, 2020). Moreover, liberals have also shown stronger moral purity concerns than conservatives, particularly relating to polluting the environment – an action that involves releasing harmful toxins (Frimer et al., 2017); and a high-powered study of political moral language found a small but significant correlation between conservatism and use of moral purity words (r = .14; Frimer, 2020). Thus, there appears to be a connection between conservatism and moral purity, though this association may be context dependent. MFT hypothesizes that cultural environments regulate the degree to which individuals rely on different moral foundations. One route through which this may occur is messaging from ingroup political authorities about which moral values matter in a given scenario. If one's ingroup leaders see an outgroup's responses to a pathogen threat as more threatening to the ingroup than the actual pathogen, the ingroup leaders may emphasize moral values of fairness instead of purity. Would such partisan elite cues then moderate the effect of people's moral purity intuitions on pathogen threat perception? This is one of the main questions tested throughout this dissertation.

Another route through which BIS activation is associated with both conservatism and moral purity is religiosity. In the U.S., conservatism tends to be associated with stronger religious beliefs than liberalism (Hirsch et al., 2013). Religious beliefs are inherently intertwined with intuitions of moral purity. Nearly every major religion relies on the concept of cleanliness to guide the thoughts and behaviors of adherents, from baptism in Christianity and mikveh in Judaism to rules about purification before worship in Islam and the freeing of impurities to become a Brahman in Hinduism (Graham & Haidt, 2010). These practices function to keep the faithful both physically and spiritually clean (e.g., Rottman et al., 2014; Preston & Ritter, 2012), and to maintain a sacred order within the religious community (Fincher & Thornhill, 2012; Graham & Haidt, 2010). However, many religious rituals may increase, rather than decrease, susceptibility to infection (e.g., bodily piercings), and religions often promote evangelicalism that requires contact with outgroups (increasing potential pathogen exposure; Swartwout et al., 2012). For example, self-flagellation, brotherhood blood sharing, and tattooing are religious rituals that have been linked to increased spread of hepatitis, HIV, herpes, and bacterial infections (Gaurel & Deresinski, 2021). Consequently, some religious rituals may serve more as signals of an individuals immune system strength – an indicator of good reproductive fitness – as opposed to having a pathogen-avoidant function. Still, religious practices that increase the potential for infection may aid in a long-term fight against pathogens by building up a group's natural immune defenses and promoting mate choices that favor those with stronger immune systems.

Although little research has directly tested the role of religiosity in responding to real and deadly pathogens in modern contexts, some work links religious belief to disgust and pathogen avoidance. Research on the CAD Triad hypothesis suggests that violations of divinity (e.g., disrespecting the sacredness of God) induce sociomoral disgust (Rozin et al., 1999). Moreover,

research by Preston and Ritter (2012) found that participants primed with religious words generated more cleaning-related words from word stems, participants primed with religious words rated cleaning products as more desirable than a control condition, and participants primed with cleanliness reported greater value in religious belief than those primed with dirtiness. Another set of studies by Terrizzi Jr. et al. (2012) demonstrated that religious conservatism (e.g., strict adherence to religious doctrine, fundamentalism, orthodoxy) was associated with disease-avoidant aspects of disgust (sexual and pathogen disgust), but not moral disgust[3]. Moreover, the authors found that religious conservatism mediated the relation between disgust and prejudice towards homosexuals, suggesting an association between religiosity and outgroup avoidance functioning of the BIS. These findings have been replicated outside the U.S. as well: using a large survey of New Zealanders, Bulbulia et al. (2013) used structural equation modeling to examine associations among the five moral foundations and different aspects of religiosity. They found the strongest (i.e., moderate) association was between the purity foundation and intrinsic religiosity (i.e., maintaining religious belief for the sake of inherent goodness, as opposed to religious belief for personal or social benefits). More research is needed, however, to examine how BIS activation may be related to conservatism, moral purity, and religiosity in non-WEIRD populations.

The link between religious belief and moral intuitions of purity appears to extend beyond the physical realm. Religious beliefs are considered sacred values rather than preferences (Heiphetz et al., 2013; Tetlock et al. 2000) and they help maintain membership in the broader moral and religious community (Graham & Haidt, 2010). Thus, holding taboo thoughts and ideological outgroup beliefs in mind may threaten the purity of the spiritual self (and purity of the moral group identity) in a

[3] It is worth noting that the items in the Moral Disgust Subscale of the Three-Domain Disgust Scale (Tybur et al., 2009) used here seem to better capture moral anger than disgust.

similar fashion that pathogens threaten the purity of one's body. For instance, Christianity – particularly Protestantism and Catholicism – considers impure thoughts to be sinful (Cohen & Rozin, 2001). Supporting this notion, Ritter and Preston (2011) found that Christian participants who read and wrote passages from outgroup religious texts, such as the Qur'an (Islam) and Richard Dawkins' *The God Delusion* (atheism), rated a subsequent lemonade drink they tasted as more disgusting than when reading and writing passages from ingroup religious text (the Bible) and the dictionary (control). Moreover, Ritter et al. (2016) found that Christian participants who read and heard atheistic ideas (e.g., "God is a complete myth") reported feeling significantly more disgusted by the ideas than when reading and hearing traditional Christian beliefs (e.g., "The Bible is the word of God"), neutral true statements (e.g., "Water freezes at 32 degrees Fahrenheit") and neutral false statements (e.g., "Canada is located south of the United States"). However, this study failed to find activation of facial micro expressions of disgust (i.e., levator labii activity) when Christian participants reported greater disgust toward atheistic ideas, suggesting that disgust experienced in the presence of ideologically (but not physically) aversive stimuli may be more metaphorical than physical. Taken together, this work suggests that religious beliefs are associated with psychological aversion to the unclean and unholy, even when no physical contaminants are involved.

Although this dissertation does not specifically focus on the role of religious belief in responses to modern pathogen threats (an area of research that could prove a fruitful extension of this dissertation), increasing political polarization in the U.S. has moralized political identities to a level similar to religious identities (Finkel et al., 2020); thus both religiosity and conservatism may play similar context dependent roles in pathogen responses in the U.S. Given research suggesting moral purity is associated with disgust, and that conservatives rely more on moral purity intuitions, one prediction is that conservatives should report stronger pathogen-avoidant responses when confronted

by real and deadly pathogens. A second prediction is that, since conservatism and moral purity already function to prevent pathogen spread, those higher on both should be less worried when confronted with real and deadly pathogen threats because they already belong to political and/or moral groups that adhere to pathogen-avoidant beliefs and behaviors. Moreover, as suggested by the previously discussed literature, pathogen threat prevalence is associated with stronger ingroup-focused attitudes like collectivism, where people are more likely to follow ingroup authorities. This may give greater weight to ingroup political leaders' messages about a pathogen threat, and, given that the BIS is context dependent, a third prediction is that people higher on conservatism and moral purity will only respond more strongly to a pathogen threat when cued to do so by their ingroup leaders. This dissertation aims to contribute to the broader literature by testing these predictions in both real-world and experimentally manipulated pathogen contexts. One psychological process that may lead to the context dependent nature of conservatism and moral purity in pathogen responses is motivated reasoning.

Politically Motivated Pathogen Responses

The literature reviewed thus far suggests that disgust, conservatism, and moral purity are, to some extent, interconnected and associated with BIS activation. One prediction, then, is that people higher in disgust sensitivity, conservatism, and moral purity should react more strongly to an unfamiliar and deadly pathogen threat. However, the BIS is contextually flexible (Ackerman et al., 2018; Schaller, 2016; Schaller et al., 200) and pathogen-related affect, cognitions, and behaviors may be overridden by political motivations that change the way people think and the information they believe is true – especially in societies with extreme political polarization. People are motivated to maintain stable, coherent, and emotionally satisfying views of the world (Bem, 1972; Clark et al., 2015; Festinger, 1957; Festinger & Carlsmith, 1959; Lerner, 1980; Solomon, Greenberg, &

Pyszczynski, 1991; Thagard, 2002) and often have motivations that lead to preferences for certain conclusion (Kunda, 1990). Even if an individual is motivated to be accurate, as one might expect when facing a real and deadly pathogen, they may still exhibit a preferred inaccurate conclusion that is reinforced by positive affect when processing information supporting the conclusion, and negative affect when processing information opposing the desired conclusion (Ditto et al., 2003; Munro & Ditto, 1997).

One major motivating factor that shapes how people perceive, reason about, and interact with the world is their social group identities. Humans evolved over hundreds of thousands of years in small tribes where ingroup and outgroup differences played an important role in survival, and the psychological mechanisms developed for living in such group environments has downstream consequences for modern intergroup dynamics (Clark et al., 2019). According to Social Identity Theory, people come to identify with a group by incorporating the group's identity into their self-concept and attaching emotional significance to that group's membership (Tajfel & Turner, 1979). When made contextually salient, social identities can be used as a lens through which to interpret information, guide behavior, and experience emotion (Bernstein, et al., 2007; Brewer, 1991; Brewer & Gardner, 1996; Mackie et al., 2000; Smith et al., 2007; Turner et al., 1994; Van Bavel & Cunningham, 2012; Van Bavel & Pereira, 2018; Xiao et al., 2016). For instance, merely identifying with a group on the basis of something as trivial as being randomly assigned to the group can trigger negative evaluations of outgroup members (Billig & Tajfel, 1973). In the U.S. political identities are particularly salient given the country's two-party system where Democrats and Republicans continually struggle for power, and political identities have an even stronger effect on people's policy preferences than ideology (Cohen, 2003). The powerful influence of political identities on how Americans feel, think, and act has been a growing issue for the country.

Affective polarization – feeling negatively towards outgroup party members and positively toward ingroup party members – has been increasing in the U.S. over the past two decades (Iyengar et al., 2019; Iyengar et al., 2012; Iyengar & Westwood, 2015), leading to partisan gridlock and instability. It has impacted many aspects of people's lives from what they buy (Gromet et al., 2013), to whom they marry (Alford et al., 2011; Huber & Malhotra, 2012), and where they live (Motyl et al., 2014). With growing affective polarization there has been a drastic increase in political violence in the U.S., especially on the far-right (Kleinfeld, 2021), to the point where partisans avoid social interactions with out-party members (Huber & Malhotra, 2017; Iyengar et al., 2018). One factor that likely contributes to such increasing polarization is that partisans in the U.S. fear different things: while Democrats worry about climate change and gun violence, Republicans worry about immigration and religious freedoms. Misunderstanding how the other side feels about these issues makes it difficult to for bipartisan cooperation to abate major threats to the country. Moreover, the moralization of these political identities creates a moral empathy gap whereby partisans have trouble feeling the deep moral emotions that their opponents feel for current societal issues (Ditto & Koleva, 2011).

Affective (and moral) polarization is dangerous because of the consequences for how people reason about the world and the threats they face. Partisan bias more generally is the tendency for people to think and act in ways that are favorable to their political ingroup – often nonconsciously (Ditto et al., 2019). Three ways in which people typically exhibit partisan bias is by selectively curating their information environments (i.e., selective exposure; Barnidge et al., 2017; Iyengar & Hahn, 2009; Garrett, 2009; Stroud, 2008), remembering information favorable to the ingroup (i.e., selective memory; Frenda et al., 2013; Van Bavel & Cunningham, 2012), and evaluating information in identity and ideologically congruent ways (Lord et al., 1979; Ditto et al., 2019; Van Bavel &

Pereira, 2018). Selective exposure may be particularly prevalent in the context of an unfamiliar pathogen threat. Individuals who feel threatened or anxious show an attentional bias toward threatening stimuli (Bar-Haim et al., 2007; Garret et al., 2018), and threatening visual stimuli activate fear and capture attention (Bishop et al., 2004), especially when relevant to the self (Mogg & Bradley, 1998, 2018). Moreover, neurological fear responses can be flexibly regulated (Reddan et al., 2018; Schiller & Delgado, 2010), suggesting that partisans fears are amenable to the messages they receive from their ingroup.

People today have more options than ever before to choose what information and messages they want to be exposed to with the advent of instantaneous communication and media technology at their fingertips. This exacerbates selective exposure to politically biased information, creating "echo chambers" where partisans choose to only engage with media that portrays the world in a way that is congruent with their political identity (e.g., Brady et al., 2020; Brady et al., 2017; Rathje et al., 2021). In the echo chambers of today's social media platforms, one can imagine how receiving a flood of information supporting a desired but inaccurate conclusion about the severity of a pathogen can be multiply reinforced by one's cultural narrative through consuming mostly ingroup-produced information (because consistency with the ingroup feels good), while more accurate information that opposes the desired conclusion negatively reinforces motivation for accuracy. Consequently, the ease of selective exposure combined with the effects of political identity-based affect on the way partisans evaluate information (e.g., like risk perceptions; Liu & Ditto, 2013; Slovic & Vastfjall, 2010) raises concerns for what the public believes to be factually true. Mounting evidence demonstrates that U.S. partisans hold different factual beliefs about important issues facing the country, and these divergent beliefs are the result of motivated reasoning and selective media exposure (Bartels, 2002; Druckman & Bolsen, 2011; Flynn et al., 2017; Jerit & Zhao, 2020; Peterson & Iyengar, 2020; Schaffner &

Roche 2017). A recent example was the claim by former President Trump that the crowd at his inauguration in January 2017 was the largest in U.S. history, despite a comparison photo of a clearly much larger crowd at former President Obama's inauguration in 2008.[4] While facts such as crowd size may be up for trivial debate, polarized beliefs in much more important facts – such as whether climate change is a threat to the country – have dire implications for the speed and efficacy with which the threat can be addressed. Indeed, stalled solutions due to polarized factual beliefs could lead to thousands of preventable deaths.

An important key to the effects of partisan identity and media exposure on people's perceptions and factual beliefs are cues and messages from political ingroup leaders. When confronted with an unfamiliar threat, especially in a polarized social environment, people are likely to follow the cues of the political elites they trust (Berinsky, 2007). Messaging from political leaders has shown to influence public opinion on a variety of issues, such as energy policy and immigration (Bisgaard & Slothuus, 2018; Druckman et al., 2013), even when the messaging contradicts prior policy positions taken by the group (Slothuus & Bisgaard, 2020). If perceiving a threat, especially one that is amorphous and invisible like a pathogen (Miller & Maner, 2012), is seen as detrimental to a political group's interests and goals, leaders of that group may be motivated to downplay the perceived threat and regulate their followers' fear responses. For example, perceptions of climate change - a major, invisible, and slow spreading threat – fall along political lines where U.S. Republicans perceive less threat and consider it less of a moral issue than liberals (Markowitz & Shariff, 2011), and such polarized perceptions of climate change are exacerbated by partisan media and elite messages (Merkley & Stecula, 2018, Tesler, 2018). However, little research has

[4] https://www.politifact.com/factchecks/2017/jan/21/sean-spicer/trump-had-biggest-inaugural-crowd-ever-metrics-don/

investigated the role of partisan elite cues in shaping people's responses to unfamiliar pathogens. Initial research on polarized U.S. responses to the ongoing international spread of severe acute respiratory syndrome coronavirus 2 (SARS-Cov-2), the virus that causes Coronavirus disease (COVID-19), suggests that Republicans are less worried about COVID-19, perceive lower likelihood of infection, and are less willing to perform health-protective behaviors that prevent the spread of the virus (Clinton et al., 2020; Kerr et al., 2021), and this appears to be driven, in part, by political elite cues (Green et al., 2020; Hart et al., 2020). Yet, it is unclear whether politically motivated reasoning and partisan elite cues can overcome people's individual propensities to avoid pathogen infection. One of the main aims of this dissertation was to test this empirical question.

Chapter 1 Summary

The research synthesized here suggests two competing predictions for how and why people respond to pathogen threats. Pathogens have played an important role in shaping how people feel, think, and behave. Disgust – the primary affective component of the behavioral immune system – appears to motivate attitudes like conservatism and moral purity that bind groups together to coordinate pathogen-avoidant behaviors. This suggests that, on one hand, people higher on disgust sensitivity, conservatism, and moral purity should respond more strongly to real and deadly pathogen threats. However, the world humans inhabit today is not the same environment in which we spent thousands of years coevolving alongside pathogen threats. Today we live in a new world with instantaneous communications, ease of travel to faraway lands, and endless information at our fingertips. Partisan bias, selective exposure to media coverage, and ingroup political elite messages influence the facts partisans believe and the way they think about and respond to different threats. A second competing prediction, then, is that partisan bias and elite cues drive how people respond to an

unfamiliar and deadly pathogen threat regardless of individual differences pathogen-related emotions and moral sensitivities.

How might our evolved mechanisms for combatting pathogens play out in the face of widespread modern pathogen threats? What happens when pathogen threat messages from one's ingroup authorities conflict with intuitions to avoid infection? To begin answering these questions, Study 1 in the following chapter aimed to investigate how political identities, partisan elite support, and moral purity were associated with U.S. responses to an unfamiliar and deadly widespread pathogen threat over time. In Chapter 3, two studies were conducted to experimentally test whether an ostensibly real and new pathogen threat can be politicized by elite partisan cues, and whether such cues moderate the effects of disgust sensitivity and moral purity on perceived pathogen threat.

CHAPTER 2: POLITICIZATION OF COVID-19 IN THE UNITED STATES OVER TIME

Severe acute respiratory syndrome coronavirus 2 (SARS-Cov-2), the virus that causes coronavirus disease (COVID-19), has thus far led to a staggering 520 million infections and over six million deaths worldwide, with more than 82 million confirmed cases and over one million deaths in the U.S. since December 2019 (https://coronavirus.jhu.edu/map.html). Indeed, the COVID-19 pandemic is the worst in a century. Yet cooperation to mitigate threats has become increasingly difficult in Western democracies. Fractured views of reality, alternative facts, and conspiratorial thinking threaten the efficacy of effective solutions for modern global threats to public health (Bertin et al., 2020; Edelson et al., 2017; Jennings et al., 2021; Pummerer et al., 2021; Romer & Jamieson, 2020). For example, politicized responses to the global existential threat of climate change (Markowitz & Shariff, 2012), a divide exacerbated in the U.S. by party media and elite messages (Merkley & Stecula, 2018; Tesler, 2018), demonstrates how political motivations can shape threat responses. Such politicization of major threats is dangerous for society as it erodes public trust in expertise (Kreps & Kriner, 2020) and can stall implementation of swift and effective solutions to existential public health threats.

Recent evidence suggests that the public's responses to the COVID-19 pandemic in the U.S. have followed political elite messaging. Former President Donald Trump, along with Republican leaders and conservative media news outlets such as Fox News, downplayed the seriousness of the threat coronavirus posed to public health (Box-Steffensmeier & Moses, 2021; Green et al., 2020; Hart et al., 2020; Jamieson & Albarracin, 2020; Jiang et al., 2021; Romer & Jamieson, 2021; Simonov et al., 2020). For example, in February 2020 Trump likened COVID-19 to the more

familiar and less deadly seasonal flu in downplaying the seriousness of the situation (Beer, 2021); and in a meeting with Republican senators on March 10, 2020, Trump stated, “We’re prepared, and we’re doing a great job with it. And it will go away. Just stay calm. It will go away” (Stevens & Tan, 2020). Moreover, in the early months of the pandemic, Democratic leaders tweeted messages emphasizing the threat the crisis posed to public health and American workers, while Republican leaders tweeted messages emphasizing China’s role in the crisis and the effects of lockdowns on businesses (Green et al., 2020). Consequently, accumulating anecdotal and scientific evidence illustrates that U.S. Republicans are less willing to perform health-protective behaviors that prevent the spread of the coronavirus (Bruine de Bruin et al., 2020; Gollwitzer et al., 2020; Kreps & Kriner, 2020; Leventhal et al., 2021; Pennycook et al., 2021). This suggests that even a widespread pathogen threat that has killed millions of people worldwide may be perceived and responded to through the lens of one's political identity.

However, this body of work has several important limitations. First, many of the initial studies of COVID-19 perceptions and responses used online convenience samples, limiting generalizability to the broader population. Second, few studies compared responses to COVID-19, a politicized pathogen, with responses to a non-politicized pathogen. Indeed, having a neutral control pathogen against which to compare is critical for establishing the politicization of pathogen responses. Third, most research on politicized COVID-19 responses has been studied cross-sectionally, which precludes the ability to examine the role of politics in COVID-19 responses as the pandemic unfolded throughout 2020 – an important election year.

Estimating change in population-level politicized responses to pathogens over time is important because a rational analysis suggests that if political partisans show initial tendencies to respond differently to pathogen, perceptions should eventually converge across political lines over

time as partisans gain more experience with the threat. As scientists learn more about a novel threat (e.g, a previously unknown pathogen) and convey that accumulating knowledge to governmental officials and the general public, it might be predicted that lay beliefs would eventually converge on a common consensual understanding of the threat. Politically motivated frames and narratives might initially shape how partisans interpret the threat when little relevant data are available, but over time, as greater scientific understanding of the pathogen emerges and is communicated to the public, political differences in reactions to the threat should shrink to reflect a shared sense of the reality of the threat. A historical example of threat perception convergence is U.S. involvement in World War II. At first the U.S. took an isolationist stance and there was considerable internal debate about whether to get involved in another European war. However, after the Japanese attack on Pearl Harbor, the necessity to stop the growing Nazi axis of power became clearer and there was greater bipartisan agreement on the reality of the threat (Kupchan & Trubowitz, 2007).

A second possibility, however, is that political identity and elite cues are powerful enough to reduce or even prevent threat perception convergence over time. Despite the accumulation of overwhelming evidence that the COVID-19 virus has resulted in millions of deaths and untold suffering worldwide, the proliferation of misinformation (and disinformation) about COVID-19 through both social and traditional media may be potent enough to maintain or even strengthen divergent perceptions along partisan lines. Indeed, much recent evidence suggests that social media platforms allowed fractured views of reality and misinformation to spread throughout the COVID-19 pandemic (Darius & Urquhart, 2021; Jamieson & Albarracin, 2020; Jennings et al., 2021; Jiang et al., 2021; Loomba et al., 2021; Stecula & Pickup, 2021), making convergence in threat perception over time less likely and partisan interpretation of the threat more resilient. This may be particularly true for individuals supportive of Donald Trump, who as President of the U.S. for the first year of the

pandemic, admitted downplaying the seriousness of the COVID-19 threat and the necessity of behavioral attempts to combat the pandemic (e.g, mask wearing and physical distancing; Haberman, 2021, September 9). If cues displayed by the former President played an important role in COVID-19 responses, then there should not only be differences between Democrats and Republicans in COVID-19 responses (both initially and over time) but there should be similar differences within Republicans between supporters and non-supporters of Trump.

Study 1

This study tested the role of political identification and political elite cuing in affective, cognitive, and self-reported behavioral responses to COVID-19 over the first six months of the pandemic, with three possibilities: 1) initially polarized COVID-19 perceptions and responses would begin to converge as people gain experience with COVID-19 and the extent of threat it poses becomes clearer over time, 2) initially polarized COVID-19 perceptions and responses would remain stable across party lines and time, or 3) initially polarized COVID-19 perceptions and responses would became increasingly polarized as the pandemic progressed, partisan messaging about the pandemic continued, and the 2020 election neared. A secondary aim of this study was to test whether moral purity scores in a large representative sample predict responses to COVID-19 above and beyond political identities.

Although political differences in Americans' COVID-19 responses have been documented through media reports and, with limitations, peer-reviewed research, the present study extends the prior literature by 1) using a longitudinal probability-based U.S. nationally representative sample across two waves, 2) demonstrating the prospective association between political identity and affective, cognitive, and behavioral COVID-19 responses from the beginning of the pandemic to six months later, 3) illustrating disparate responses to COVID-19 among Republicans by support for

Trump, 4) comparing COVID-19 risk perceptions to perceived infection risk of non-politicized pathogen (the seasonal flu), 5) providing generalizable prospective evidence of polarized intentions to get the COVID-19 vaccine, 6) testing the strength of association between moral purity and COVID-19 responses and perceived seasonal flu infection risk controlling for political identities, and 7) ensuring anonymity in each survey to minimize socially desirable responding.

Method

Sample. Panelists were drawn from the NORC AmeriSpeak Panel, a probability-based survey panel of 35,000 randomly chosen U.S. households recruited through the high effort strategy of door-to-door interviewing; participants then take internet surveys using computer, tablet, or phone. As the first wave of an ongoing nationally representative longitudinal study on American's responses to the COVID-19 pandemic (Holman et al., 2008; Silver et al., 2002), 11,139 panelists were recruited in three consecutive cohorts of 3,713 panelists from March 18, 2020, to April 18, 2020 (cohort data were analyzed in aggregate). By the end of the survey fielding period, 6,598 surveys were completed; 84 cases (1.27%) were removed due to unreliable survey completion times under 6.5 minutes or due to extensive missing data (> 50% of items). This left a final weighted sample of N = 6,514 (58.48% completion). Most participants (86.40%) completed the survey in the first three days of data collection; 54% completed the survey on smartphones, 44% on computers, and 2% on tablets.

The second wave survey was fielded to all available Wave 1 participants (N = 6,501) six months later from September 24 to October 16, 2020. A final weighted sample of N = 5,661 completed the second survey (87.10% completion) with most (80.10%) completing the survey within the first four days of data collection. All data were weighted to adjust for the probability of selection into the AmeriSpeak Panel and to account for differences between the sample and U.S. Census benchmarks. Descriptive statistics are provided in Table S1. Participants received a small

compensation (equivalent to $4) for each wave. All procedures for this study were approved by the Institutional Review Board of the University of California, Irvine.

Materials

COVID-19 Fear (Time 1 & Time 2). Items assessing COVID-19 fear were adapted from prior research on responses to 9/11 (Holman et al., 2008; Silver et al., 2002). For each wave, participants responded to 10 items asking how often in the past week they had fears and worries about COVID-19 infection and death, civil unrest, lack of access to basic necessities, economic consequences of the pandemic, and pandemic-related panic, affecting themselves, their loved ones, and their community. Participants answered each item with 1 (*never*), 2 (*rarely*), 3 (*sometimes*), 4 (*often*), or 5 (*all the time*). Items were averaged at each wave to create a COVID-19 fear composite variable, Time 1 $\alpha = .92$, Time 2 $\alpha = .91$.

Risk Perceptions (Time 1 & Time 2). For each wave, participants indicated the percent chance in the next three months they would 1) get sick with the seasonal flu, 2) get sick with Coronavirus, and 3) die if sick with Coronavirus, by providing a whole number from *0%* to *100%* with higher numbers indicating greater likelihood of the event happening.

Reported Health-Protective Behaviors (Time 1 & Time 2). At Time 1, participants were asked how often they performed each of the following behaviors: washing hands or using hand sanitizer, wearing a face mask and/or gloves in public, purchasing extra household supplies, avoiding people who may be infected with the Coronavirus, avoiding public places, avoiding public transportation, canceling or rescheduling travel plans, and isolating at home for several days or more. At Time 2, participants were asked how often they washed their hands for at least 20 seconds, wore a face mask in public, avoided socializing with people outside their household, avoided public spaces where there may be crowds or where social distancing may be difficult, chose an outdoor activity in

place of an indoor activity, and avoided nonessential personal care services. Participants responded to each item in both waves with 1 (*never*), 2 (*rarely*), 3 (*sometimes*), 4 (*often*), or 5 (*all the time*). Responses for each wave were averaged to create a health-protective behavior composite variable, Time 1 $\alpha = .77$, Time 2 $\alpha = .80$.

COVID-19 Vaccine Intentions (Time 2). At Time 2 participants indicated the percent likelihood they will get the COVID-19 vaccine when one is made publicly available. Participants provided a whole number from *0%* to *100%*, with higher numbers indicating greater likelihood they will get the vaccine.

Political Identity (Pre-Pandemic & Time 2). At least three months prior to the COVID-19 pandemic, as part of entry to the AmeriSpeak Panel, participants reported the strength of their political party as 1 (*strong Republican*), to 3 (*don't lean / Independent / none*) to 5 (*strong Democrat*). Strength of political party identity was reverse scored so that higher scores indicate stronger Republican identity. To conduct analyses on the Republican subsample, political identity at each wave was recoded such that participants who scored lower than the midpoint (i.e., 3) were categorized as Democrat, those who scored at the midpoint were categorized as Independent, and those who scored higher than the midpoint were categorized as Republican.

Trump Support (Pre-Pandemic & Time 2). 2016 U.S. Presidential election vote was measured prior to the COVID-19 pandemic and included the categories *Clinton-Kaine*, *Trump-Pence*, *other*, and *did not vote*. This variable was collapsed into two categories: Trump and non-Trump (Clinton-Kaine, other, did not vote) supporters. At Time 2, participants were asked who they voted for or intend to vote for in the 2020 U.S. Presidential election, which included the categories *Biden-Harris*, *Trump-Pence*, *other*, and *unsure*. This was also collapsed into Trump vs. non-Trump (Biden-Harris, other, unsure) supporters. To conduct analyses on the Republican subsample, a new

variable (Trump Republican support) was created for each wave where if a given participant was categorized as Republican and voted for Trump, they were coded as "1", and if a given participant was categorized as a Republican and voted for anyone other than Trump or did not vote, they were coded as "0".[5]

Moral Purity (Time 2). To keep the survey short, four of the six items from the original purity subscale of the 30-item Moral Foundations Questionnaire (MFQ-30; Graham et al., 2011) were adapted for the study. The MFQ-30 has two sections with three items for each of the five foundations per section. Two items were chosen from each of the two sections of the purity subscale based on face validity and adapted for a sixth-grade level of understanding: "Purity and decency are important for being morally good", "People should not do things that are disgusting, even if no one is harmed", "Some acts are wrong because they are unnatural", and "Controlling sexual desires is an important and valuable virtue". The items were measured with response options 1 (*strongly disagree*), 2 (*somewhat disagree*), 3 (*neither agree nor disagree*), 4 (*somewhat agree*), and 5 (*strongly agree*) and were averaged together to create a moral purity composite, Cronbach's α = .85.

These items were pretested on a Prolific sample (N = 555) on October 30, 2020, as part of a larger survey on perceptions of, and responses to, the 2020 election and the COVID-19 pandemic. The moral purity items in the pretest showed good reliability, Cronbach's α = .88. Interestingly, moral purity was not correlated with COVID-19 fear (two items, Cronbach's α = .88; Pearson r = -.06, 95% CI (confidence intervals)[-.14, .03], p = .173) nor perceived risk of COVID-19 infection (one item; Pearson r = .02, 95% CI[-.07, .10], p= .669). Moral purity was negatively associated with self-reported COVID-19-related health-protective behaviors (six items, Cronbach's α = .76; Pearson r

[5] Note that 41 (37%) pre-pandemic non-Trump Republicans supported Trump at Time 2, and 84 (9%) pre-pandemic Trump Republicans did not support Trump at Time 2. Trump support random slopes were included in the analyses to account for intraindividual Trump support variability.

= -.13, 95% CI[-.22, -.05], p= .002), but this association became non-significant after controlling for self-reported strength of political party identity (β = -.02, *SE* [standard error] = .05, p = .615).

Covariates (Pre-Pandemic & Time 1). Demographic covariates included age, gender, ethnicity, education, household income, employment status, and U.S. Census-bureau designated geographic region, and self-reported prior mental health diagnoses, which were all measured prior to the COVID-19 pandemic. Additionally, prior research suggests that exposure to media coverage can induce availability bias in risk estimates and is associated with overestimated risk perceptions (Combs & Slovic, 1979). To control for this, self-reported average daily hours of COVID-19-related traditional (TV, radio, print, online news) and social (e.g., Facebook, Twitter) media exposure in the prior week was measured at Time 1 and included as a covariate.

Data Analysis

Summary scores were computed for COVID-19 fear, self-reported health-protective behaviors, and self-reported COVID-19 media exposure to account for variability in these constructs (MacCallum et al., 2002). All continuous variables were standardized prior to analysis, and all models controlled for the same covariates. Mixed effects modeling was used to test the interaction between strength of political identity and time on COVID-19 fear, COVID-19 infection risk perceptions, perceived risk of death from COVID-19, perceived risk of seasonal flu infection, and health-protective behaviors across time. First, each model was specified with a maximal random effects structure (Barr et al., 2013) that included by-participant random intercepts, by-participant strength of political identity (or Trump support if relevant) random slopes, by-participant time random slopes, and by-participant strength of political identity (or Trump support) x time interaction random slopes. If the model failed to converge, the random effects structure was simplified one parameter at a time until the model successfully converged without issue (see Supplemental Material

for additional model specification details). Models with strength of political identity x time as the main predictor were estimated with a maximum likelihood approach because they included sampling weights. Models conducted on the Republican subsample with Trump support x time as the main predictor were estimated using a restricted maximum likelihood approach to obtain unbiased estimates; weights were not applied as the subsample was not assumed to be representative of the U.S. population.

Next, ordinary least square (OLS) regression was conducted predicting time 2 likelihood of getting the COVID-19 vaccine from political identity measured prior to January 2020, controlling for the same covariates and with sampling weights applied. The same model was then conducted on the Republican subsample with 2016 Trump support predicting time 2 vaccine intentions, controlling for covariates and without sampling weights.

Lastly, to examine the association between moral purity and COVID-19 responses, OLS regressions were conducted predicting COVID-19 fear, infection risk, death risk, and reported health-protective behaviors, from moral purity, each controlling for strength of political party identity.

Results

Political Identity.

COVID-19 Fear. Across time points and controlling for covariates, the stronger participants identified as Republican the lesser COVID-19 fear they reported, $\beta = -.14$, $SE_{Robust} = .02$, 95% CI[-.17, -.11], $p < .001$. There was also a main effect of time where, overall, COVID-19 fear decreased from the onset of the pandemic to six months later, $\beta = -11$, $SE_{Robust} = .03$, 95% CI[-.16, -.06], $p < .001$. Supporting the notion that polarized COVID-19 fear responses changed over time, there was a significant interaction between strength of political identity and time on COVID-19 fear. The

stronger participants identified as Republican, the less COVID-19 fear they reported over time, β = -.08, SE_{Robust} = .02, 95% CI[-.11, -.05], p < .001 (Figure 1A). Analysis of simple slopes showed that stronger identification as Republican was associated with less COVID-19 fear at both time points, and this association strengthened over time, Time 1 β = -.09, SE_{Robust} = .02, 95% CI[-.13, -.06], p < .001, Time 2 β = -.17, SE_{Robust} = .02, 95% CI[-.21, -.14], p < .001.

COVID-19 Risk Perceptions. Across time and controlling for covariates, the stronger participants identified as Republican the less likely they thought they were to catch COVID in the subsequent three months, β = -.11, SE_{Robust} = .02, 95% CI[-.14, -.08], p < .001. There was also a main effect of time where participants reported less perceived COVID infection risk at Time 2 compared to Time 1, β = 0.22, SE_{Robust} = .04, 95% CI[-.29, -.14], p < .001. There was no strength of political identity x time interaction on perceived risk of COVID-19 infection, β = .02, SE_{Robust} = .02, 95% CI[-.03, .06], p = .475 (Figure 1B), suggesting that polarized COVID risk perceptions did not change over time. Analysis of simple slopes showed that stronger identification as Republican was associated with significantly less perceived COVID-19 infection risk at both time points, Time 1 β = -.12, SE_{Robust} = .02, 95% CI[-.16, -.08], p < .001, Time 2 β = -.10, SE_{Robust} = .02, 95% CI[-.14, -.07], p < .001, but this polarization did not increase or decrease over time.

Similarly for perceived COVID-19 death risk, across time and controlling for covariates, the stronger participants identified as Republican the less likely they thought they were to die from COVID-19, β = -.11, SE_{Roust} = .01, 95% CI[-.13, -.08], p < .001. There was no main effect of time, suggesting that overall perceptions of COVID-19 death risk did not change over the first six months of the pandemic, β = .04, SE_{Robust} = .03, 95% CI[-.02, .10], p = .190. However, there was a significant strength of political identity x time interaction on the extent to which COVID-19 was perceived to pose the risk of death. The more participants identified as Republican, the less they thought they

would die from COVID-19 over time, β = -.07, SE_{Robust} = .02, 95% CI[-.11, -.03], p < .001 (Figure 1C). Simple slopes analysis showed that stronger identification as Republican was associated with perceived COVID-19 death risk increased at both time points, and this association strengthened over time, Time 1 β = -.07, SE_{Robust} = .02, 95% CI[-.10, -.04], p < .001, Time 2 β = -.14, SE_{Robust} = .02, 95% CI[-.17, -.10], p < .001.

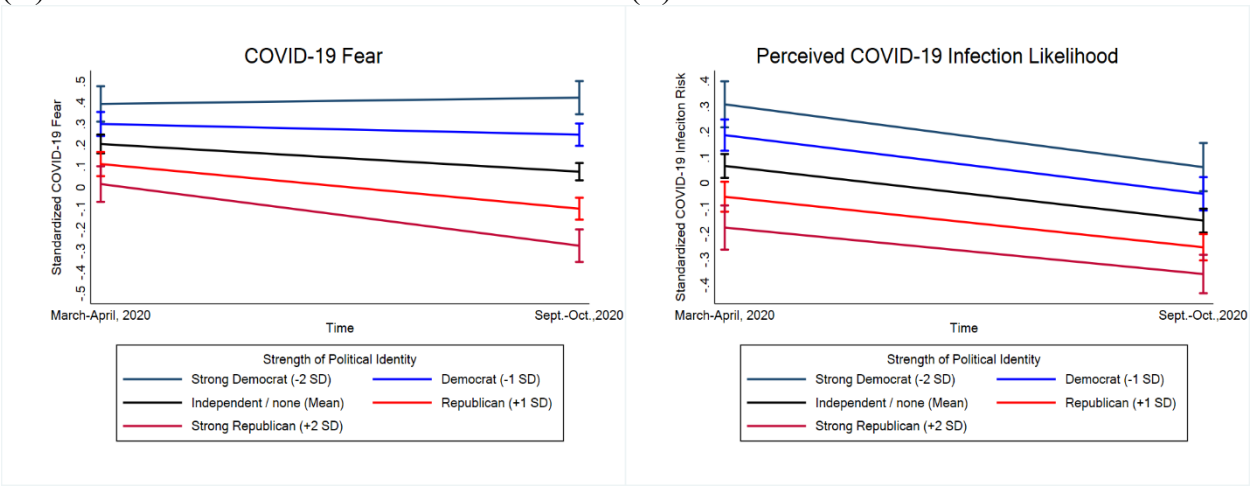
***Seasonal Flu Risk Perceptions*.** Across time and controlling for covariates, the stronger participants identified as Republican the less likely they thought they would catch the seasonal flu in the subsequent three months, β = -.04, SE_{Robust} = .02, 95% CI[-.07, -.005], p = .024. This could suggest that participants perceived seasonal flu risk through the same politically polarized lens' through which they perceived COVID-19 risk, however, this association is much weaker than that found for COVID-19 infection risk. There was also a moderate effect of time such that, overall, participants perceived a greater likelihood of seasonal flu infection at Time 2 compared to Time 1, β = .39, SE_{Robust} = .04, 95% CI[.31, .46], p < .001. This finding makes sense, given that Time 2 occurred at the start of the typical flu season (September – October). There was no political identity x time interaction on perceived risk of seasonal flu infection, β = -.02, SE_{Robust} = .03, 95% CI[-.08, .03], p = .430 (Figure 1D), suggesting that change in flu risk perceptions over time was not dependent on political identity. Analysis of simple slopes showed there was no association between strength of political identity and perceived flu risk at Time 1, and there was a minor change in this association over time, Time 1 β = -.03, SE_{Robust} = .02, 95% CI[-.07, .01], p = .138, Time 2 β = -.05, SE_{Robust} = .02, 95% CI[-.09, -.005], p = .029.

***Reported Frequency of Health-Protective Behaviors*.** Consistent with COVID-19 fear and risk perceptions, across time and controlling for covariates, the stronger participants identified as Republican the less frequently they reported performing COVID-19-related health-protective

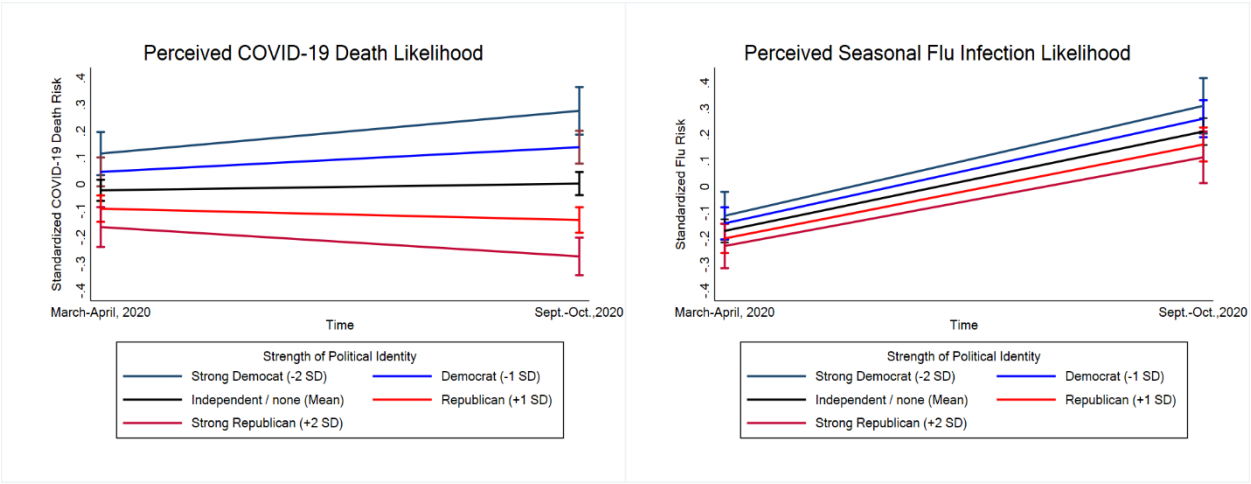
behaviors, β = -.21, SE_{Robust} = .02, 95% CI[-.24, -.17], p < .001. There was also a main effect of time such that, controlling for covariates, participants overall reported performing more frequent health-protective behaviors at Time 2 compared to Time 1, β = .14, SE_{Robust} = .03, 95% CI[.07, .21], p < .001. There was a significant strength of political identity x time interaction on self-reported COVID-19 health-protective behaviors. The stronger participants identified as Republican, the fewer health-protective behaviors they reported over time, β = -.22, SE_{Robust} = .02, 95% CI[-.26, -.17], p < .001 (Figure 1E). Analysis of simple slopes showed that the stronger identification as Republican was associated with fewer reported health-protective behaviors at both time points, and this association strengthened over time, Time 1 β = -.09, SE_{Robust} = .02, 95% CI[-.12, -.05], p < .001, Time 2 β = -.30, SE_{Robust} = .02, 95% CI[-.34, -.27], p < .001.

Figure 1

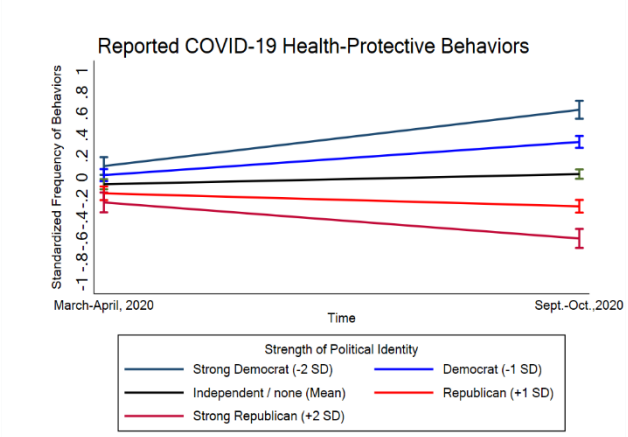
(A) (B)



(C) (D)



(E)



Note. Mixed effects models predicting standardized (A) COVID-19 fear, (B) perceived COVID-19 infection likelihood, (C) perceived COVID-19 death likelihood, (D) perceived seasonal flu infection likelihood, and (E) self-reported frequency of health-protective behaviors, from the interaction between standardized strength of political identity and time, controlling for covariates; *SD* = standard deviation; Bars = 95% confidence intervals; Time 1 (March-April 2020) $N = 6{,}514$, Time 2 (September-October 2020) $N = 5{,}661$.

Trump Support. To examine the role of partisan elite cues in politicizing COVID-19 responses, participants were next stratified based on their strength of political identity score by

subsampling only those who identified as greater than the midpoint on the strength of political identity variable (i.e., 4 = Republican, 5 = Strong Republican). Then the effect of support for Trump (in the 2016 and 2020 elections) on each dependent variable over time was tested.

COVID-19 Fear. Across time and controlling for covariates, Trump Republicans reported significantly less COVID-19 fear than non-Trump Republicans, β = -.20, *SE* = .04, 95% CI[-.27, -.13], $p < .001$. There was also an overall decrease in COVID-19 fear from Time 1 to Time 2, β = -.14, *SE* = .05, 95% CI[-.24, -.03], $p = .008$. There was a significant Trump support x time interaction among Republicans. Trump Republicans reported significantly less fear of COVID-19 over time compared to non-Trump Republicans, β = -.18, *SE* = .06, 95% CI[-.30, -.07], $p = .002$ (Figure 2A). Analysis of simple slopes showed that Trump Republicans were less fearful of COVID-19 than non-Trump Republicans at both time points, and this difference strengthened over time, Time 1 β = -.08, *SE* = .05, 95% CI[-.17, .03], $p = .142$, Time 2 β = -.26, *SE* = .04, 95% CI[-.34, -.18], $p < .001$.

COVID-19 Risk Perceptions. COVID-19 risk perception results were mixed. Across tiem and controlling for covariates, Trump Republicans thought they were less likely to become infected with COVID than non-Trump Republicans, β = -.33, *SE* = .06, 95% CI[-.45, -.22], $p < .001$. There was also an overall decrease in perceived likelihood of COVID-19 infection from Time 1 to Time 2, β = -.33, *SE* = .06, 95% CI[-.45, -.22], $p < .001$. There was no Trump support x time interaction on perceived COVID-19 infection risk, β = -.05, SE = .07, 95% CI[-.18, .08], p = .444 (Figure 2B), suggesting that change in COVID-19 infection risk perceptions was not dependent on strength of political identity. Analysis of simple slopes showed that there was no difference between Trump and non-Trump Republicans in COVID-19 infection risk perceptions at Time 1, β = -.11, *SE* = .06, 95% CI[-.22, .004], $p = .058$, but a significant difference emerged at Time 2, β = -.16, *SE* = .05, 95% CI[-.25, -.07], $p = .001$.

Similarly across time and controlling for covariates, Trump Republicans though they were less likely to die from COVID-19 than non-Trump Republicans, β = -.16, *SE* = .04, 95% CI[-.23, -.09], $p < .001$. There was also an overall decrease in perceived risk of death from COVID-19, β = -.13, *SE*= .06, 95% CI[-.23, -.02], $p = .022$. There was no Trump support x time interaction on perceived risk of death from COVID-19, β = .03, *SE* = .06, 95% CI[-.10, .15], $p = .653$ (Figure 2C), suggesting that change in COVID death risk perceptions over time was not dependent on strength of political identity. Analysis of simple slopes showed that Trump Republicans perceived significantly less COVID-19 death risk at both time points, and this difference remained stable over time, Time 1 β = -.18, *SE* = .05, 95% CI[-.28, -.07], $p = .001$, Time 2 β = -.15, *SE* = .04, 95% CI[-.24, -.06], $p = .001$.

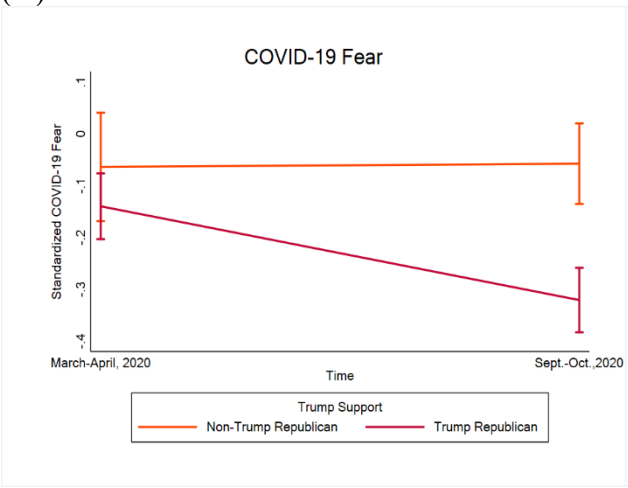
***Seasonal Flu Risk Perceptions*.** Unlike strength of political identity results, there was no significant difference in perceived risk of seasonal flu infection between Trump and non-Trump Republicans across time and controlling for covariates, β = .02, *SE*= .04, 95% CI[-.06, .09], $p = .707$. There was an overall increase in perceived flu infection risk, β = .35, *SE*= .06, 95% CI[.24, .48], $p < .001$. There was no Trump support x time interaction on perceived risk of seasonal flu infection, β = -.04, *SE* = .07, 95% CI[-.18, .10], $p = .593$ (Figure 2D). Analysis of simple slopes showed that there was no difference between Trump and non-Trump Republicans in COVID-19 infection risk perceptions at either time point, and these coherent perceptions remained stable over time, Time 1 β = .03, *SE* = .05, 95% CI[-.07, .14], p = .517, Time 2 β = -.005, *SE* = .06, 95% CI[-.11, .11], p = .933 .

***Reported Frequency of Health-Protective Behaviors*.** Across time and controlling for covariates, Trump Republicans reported performing fewer COVID-19-related health-protective behaviors than non-Trump Republicans, β = -.45, *SE*= .04, 95% CI[-.53, -.37], $p < .001$. There was no main effect of time, β = .01, *SE* = .06, 95% CI[-.11, .14], $p = .855$. There was, however, a

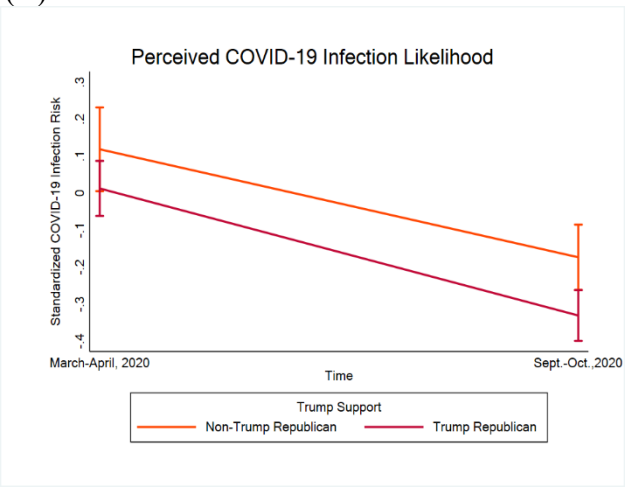
significant Trump support x time interaction on reported health-protective behaviors. Trump Republicans reported significantly fewer health-protective behaviors over time than non-Trump Republicans, β = -.59, SE = .07, 95% CI[-.73, -.46], p < .001 (Figure 2E). Analysis of simple slopes showed that Trump Republicans reported significantly fewer health-protective behaviors at both time points, and there was a large increase in this difference over time, Time 1 β = -.08, *SE* = .06, 95% CI[-.20, .04], *p* = .177, Time 2 β = -.68, *SE* = .05, 95% CI[-.77, -.58], p < .001.

Figure 2

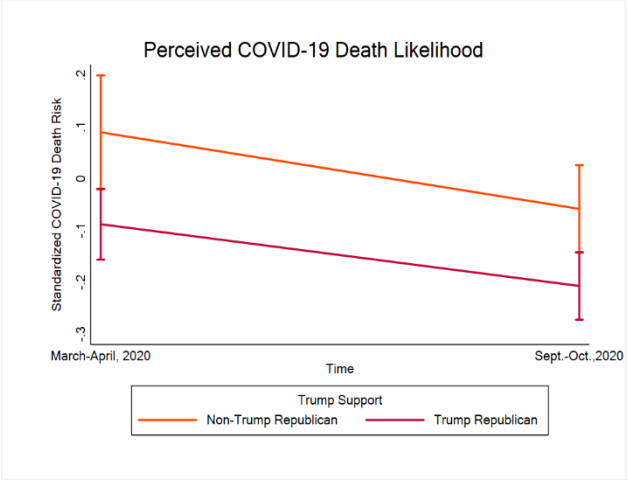
(A)



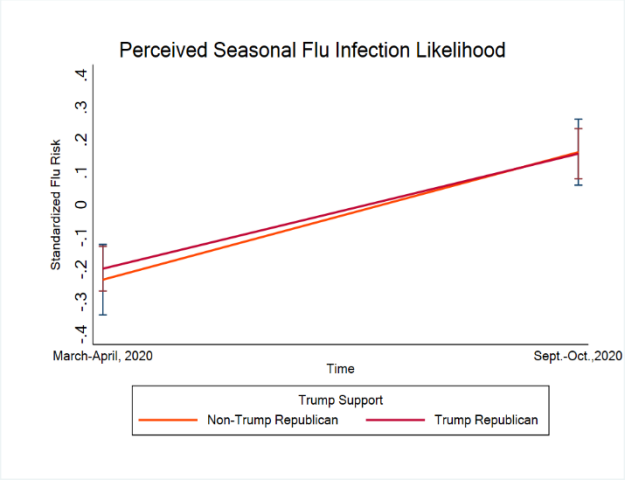
(B)



(C)



(D)



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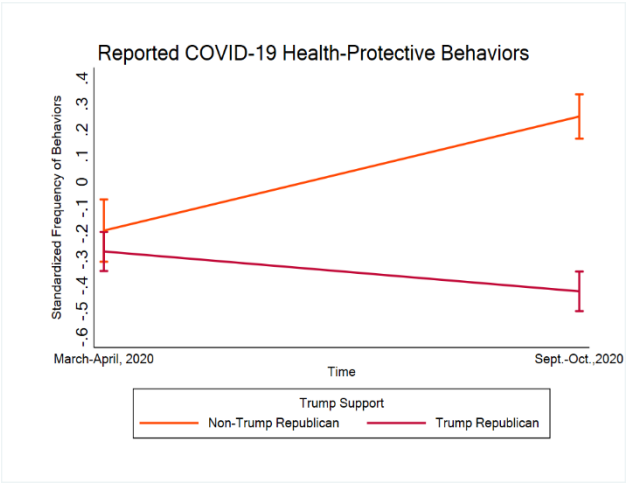


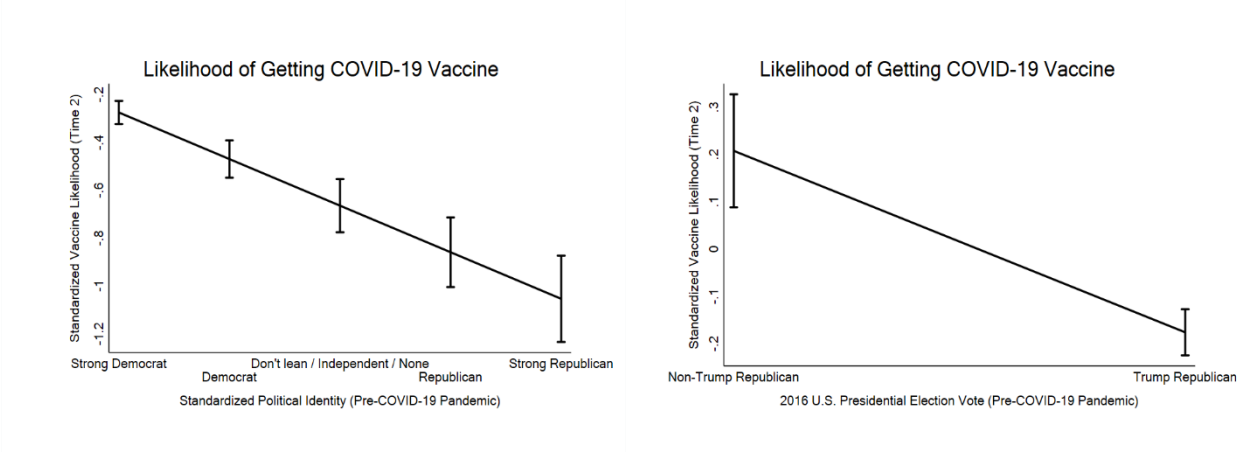
Note. Mixed effects models predicting standardized (A) COVID-19 fear, (B) COVID-19 infection risk perception, (C) COVID-19 death risk perception, (D) seasonal flu infection risk perception, and (E) self-reported health-protective behaviors from the interaction between Trump support and time, controlling for covariates; Bars = 95% confidence intervals; Time 1 (March-April 2020) Republican subsample n = 1,822, Time 2 (September-October 2020) Republican subsample n = 2,050.

Prospective COVID-19 Vaccine Intentions. Polarized attitudes about vaccine hesitancy were examined by conducting linear regressions predicting time 2 likelihood of getting the COVID-19 vaccine from pre-pandemic strength of political identity and 2016 U.S. presidential election vote, controlling for the same covariates as the prior models. Results illustrate that self-identified political identities from prior to the COVID-19 pandemic prospectively predicted participants' likelihood of getting the COVID-19 vaccine six months into the pandemic. Stronger identification as Republican before the pandemic predicted decreased likelihood of getting the vaccine at Time 2, β = -.19, SE = .02, 95% CI[-.23, -.16], $p < .001$ (Figure 3A). There were also differences among Republicans in COVID-19 vaccine hesitancy by 2016 Trump support. Compared to non-Trump Republicans, Trump

Republicans reported they were significantly less likely to get the COVID-19 vaccine, β = -.38, SE = .07, 95% CI[-.51, -.25], p < .001 (Figure 3B).

Figure 3

(A) (B)



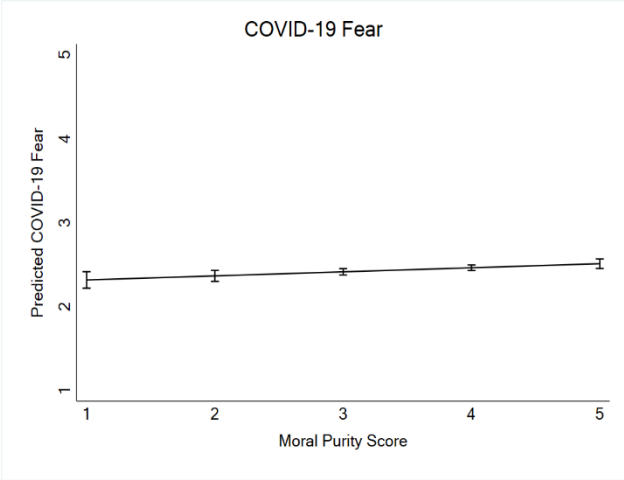
Note. OLS regressions predicting self-reported likelihood of getting the COVID-19 vaccine at Time 2 from pre-COVID-19 pandemic (A) strength of political identity and (B) 2016 U.S. Presidential election Trump vote, controlling for covariates; Bars = 95% confidence intervals; Time 1 (March-April 2020) N = 6,514, Time 2 (September-October 2020) N = 5,661; Time 1 (March-April 2020) Republican subsample n = 1,822, Time 2 (September-October 2020) Republican subsample n = 2,050.

Moral Purity. Replicating prior research (Graham et al., 2009), stronger identification as Republican was weakly significantly associated with stronger moral purity scores, Pearson r = .25, 95% CI[.21, .28], p < .001. Yet, regardless of political identity and the other covariates, participants higher on moral purity reported greater COVID-19 fear, β = .05, SE_{Robust} = .02 95% CI[.01, .09], p = .007 (Figure 4A). There was no association between moral purity and perceived risk of COVID-19

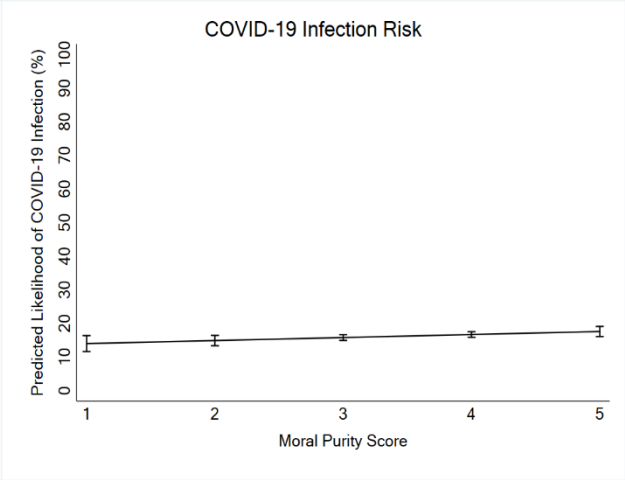
infection, β = .05, SE_{Robust} = .02, 95% CI[-.00002, .09], p = .050 (Figure 4B). There was a significant association between moral purity and perceived risk of death from COVID-19 controlling for strength of political identity, such that participants higher on moral purity reported greater perceived likelihood of dying from COVID-19, β = .07, SE_{Robust} = .02, 95% CI[.03, .11], p = .001, though this association became non-significant after controlling for the other covariates, β = .002, SE_{Robust} = .02, 95% CI[-.04, .04], p = .939. On the contrary, moral purity did not predict seasonal flu infection risk with only political identity in the model, β = .03, SE_{Robust} = .02, 95% CI[-.01, .07], p = .200, but the association became significant after adding the rest of the covariates to the model. Participants who scored higher on moral purity reported slightly greater perceived risk of seasonal flu infection, β = .06, SE_{Robust} = .02, 95% CI[.02, .11], p = .004 (Figure 4C). There was no significant association between moral purity and reported health-protective behaviors, β = .02, SE_{Robust} = .02, 95% CI[-.03, .07], p = .380. Finally, there was a significant negative correlation between moral purity and reported likelihood of getting the COVID-19 vaccine. Participants higher in moral purity reported significantly lower likelihood of getting COVID-19 vaccinated, β = -.07, SE_{Robust} = .02, 95% CI[-.10, -.03], p < .001 (Figure 4D).

Figure 4

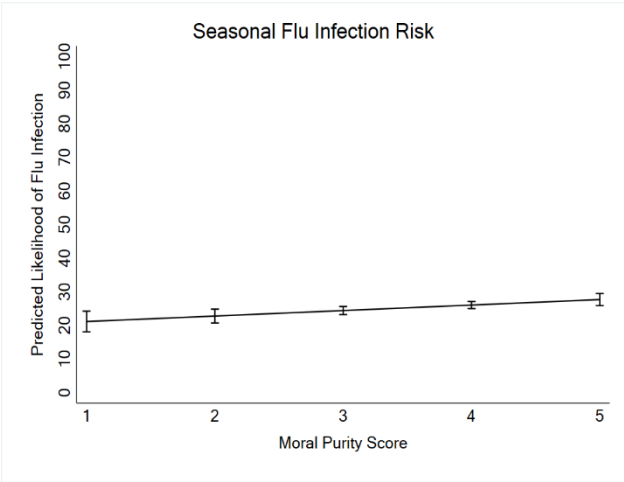
(A)



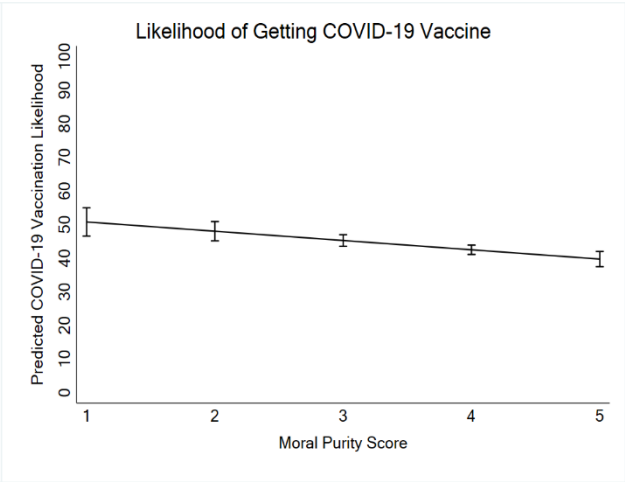
(B)



(C)



(D)



Note. Ordinary least square regressions predicting COVID-19 fear (A), COVID-19 infection risk (B), seasonal flu infection risk (C), and reported likelihood of getting the COVID-19 vaccine when it becomes available (D). Each model controlled for self-reported strength of political identity and all other covariates. Bars represent 95% confidence intervals.

Discussion

The politicization of major threats is a growing issue in modern societies, especially in the West. Politically driven responses to threats such as climate change or global pathogen outbreaks have important implications for public health, policy, and national security in devising effective strategies to combat the threat. To ameliorate the effects of politically motivated responses to pathogens, it is necessary to understand how such politicized perceptions and responses change over time. The present findings demonstrate that, over time, COVID-19 fear (affect), perceived COVID-19 infection likelihood, perceived COVID-19 death likelihood (cognitions), and self-reported frequency of COVID-19-related health-protective behaviors (behaviors) were politically polarized such that the stronger participants identified as Republican the less fearful, less perceived risk, and fewer protective behaviors they performed in relation to COVID. This replicates prior research documenting politically polarized responses to COVID-19 in the U.S. (Bruine de Bruin et al., 2020; Gollwitzer et al., 2020; Kreps & Kriner, 2020; Leventhal et al., 2021; Pennycook et al., 2021). There was also unconvincing evidence for political differences in seasonal flu risk perceptions, driven by small differences at Time 2. It is possible that participants began to see the likelihood of getting the flu – a familiar virus that causes symptoms similar to COVID-19 – through the same political lens that they perceive COVID-19. However, this association was weak and there was no difference by Trump support in perceptions of flu risk, suggesting that flu risk responses were not politicized like they were for COVID-19. That there were clear political identity and Trump support differences in COVID affect, risk perceptions, and protective behaviors, but not perceived flu infection risk, supports the notion that responses unfamiliar and deadly pathogen threats can be polarized by politics and partisan elite cues.

In a nation as politically polarized as the U.S., people may turn to political ingroups and authorities for guidance on how to respond to societal threats. The COVID-19 outbreak took place in the lead up to a contentious U.S. election, where Republicans were motivated to strengthen their power across government branches and Democrats were motivated to unseat Republicans. Throughout this power struggle, the threat of COVID-19 became politicized, with Republican leaders, including then President Trump, downplaying the seriousness of COVID-19 and Democratic leaders emphasizing the severity of the threat (Box-Steffensmeier & Moses, 2021; Green et al., 2020; Hart et al., 2020; Jamieson & Albarracin, 2020; Jiang et al., 2021; Romer & Jamieson, 2021; Simonov et al., 2020). Were such partisan elite cues associated with polarized COVID-19 responses? To examine this, the present study investigated whether responses within Trump's own party were polarized. Results illustrated that, even among Republicans who reported weaker COVID-19 responses, affect and behaviors diverged over time, with Trump-supporting Republicans reporting less COVID-19 fear and fewer health-protective behaviors than non-Trump Republicans as the pandemic progressed. This supports research on the influence of partisan elite messages on public opinion when confronted by novel issues (Berinsky, 2007; Merkley & Stecula, 2018; Tesler, 2018), and speaks to the power of authority in shaping perceptions of real and deadly threats.

There were also significant main effects of time on COVID-19 responses. Overall controlling for politics, media exposure, and demographic differences, there was a decrease in COVID-19 fear and perceived COVID-19 infection risk, no change in perceived likelihood of death from COVID, and an increase in reported frequency of health-protective behaviors, from the onset of the pandemic to six months later. On one hand, it may be that as people came to learn more about the unfamiliar viral threat, they became less worried about it and their infection risk perception followed. It may also be the case that the lockdowns and mask mandates imposed early in the pandemic, along with

public health messages to perform health-protective behaviors like social distancing, provided people with a sense of security, leading them to perceive less infection risk and do more to protect themselves and others from infection over time. Such risk perceptions may be rational, as actively performing behaviors to reduce the risk of infection should lower one's objective risk of infection. However, over these six months the real risk of COVID-19 infection increased. The first survey was conducted over the first two months of the pandemic when not much was known about COVID-19 and the infection rates, though rapidly increasing (7-day moving average ~ 27,500 on April 18th, 2020), were around 688,000 total confirmed cases[6] out of a country of 330 million people[7] (only 0.20% of the U.S. population). The second survey was conducted six months later after the first wave of summer infections and just before the first major winter peak in cases that year, with a 7-day moving average of about 56,500 cases and about 8.25 million total confirmed cases (2.50% of the U.S. population). Moreover, the second survey was conducted at the start of flu season, which may be why there was a moderate increase in perceived flu risk from Time 1 to Time 2. Yet, the 2020-2021 flu season had an abnormally low infection rate, likely due to the COVID-19 preventative measures.[8] Thus, it is interesting that even though the likelihood of COVID-19 infection increased over the first six months, people overall perceived a decreased likelihood of infection, yet they perceived an increased likelihood of flu infection when the actual risk was lower than normal.

These findings have theoretical implications for the literature discussed in Chapter 1 connecting BIS activation to conservatism and moral purity. Although research using correlational and experimental methods suggests that disgust is associated with social conservatism (Aarøe et al., 2020; Chapman et al., 2009; Curtis et al., 2004; Graham et al., 2009; Inbar, Pizarro, Iyer, & Haidt,

[6] https://covid.cdc.gov/covid-data-tracker/#trends_dailycases
[7] https://www.census.gov/quickfacts/fact/table/US/POP010220
[8] https://www.cdc.gov/flu/season/faq-flu-season-2020-2021.htm

2012; Murray & Schaller, 2016; Terrizzi et al., 2013; Thornhill et al., 2009; Tybur et al., 2010) and initial COVID-19 research suggests the pandemic shifted attitudes toward social conservatism (Karwowski et al., 2020), the meta-analytic effect size is small (Terrizzi Jr., et al., 2013) and BIS activation is theorized to be context dependent (Ackerman et al., 2018; Schaller, 2016). The present findings that U.S. Republicans – who tend to adopt a more socially conservative ideology than Democrats – responded less strongly to COVID-19, suggest that one context in which the link between disgust and conservatism can be reversed is when ingroup leaders downplay the pathogen threat (especially for conservatives, whose sense of morality extends to authority and loyalty more so than liberals; Altemeyer, 1988; Graham et al., 2009). A second possibility is that there is no link between disgust and conservatism on an individual level. For instance, some research suggests that the disgust-conservatism link is confounded by the types of elicitors used in research illustrating this association, and that there is no correlation when using an elicitor-unspecific scale (Elad-Strenger et al., 2020). A third possible explanation is that COVID-19 did not cause enough visual symptoms to strongly activate people's behavioral immune systems. Disgust, and BIS activation more broadly, tend to be studied using visceral stimuli, such as images of disgusting objects or acts, and different mechanisms of the BIS may rely upon specific senses (e.g., vision and smell for disgust; Kavaliers et al., 2005; Olsson et al., 2014; Schaller et al., 2010). COVID-19 causes symptoms similar to influenza, common pathogen with which people are familiar. If people have learned to regulate BIS responses to the flu, and COVID-19 appears similar to the flu, then responses to COVID-19 may be easier to regulate than if the virus caused more visually obvious symptoms (e.g., like how the Ebola virus can, in rare cases, cause bleeding from the eyelids and mouth; McElroy, 2015). Nonetheless, several studies throughout the COVID-19 pandemic have found evidence of BIS activation (Bacon & Corr, 2020; Karlsson et al., 2022; Makhanova & Shepherd, 2020; Schaller et al., 2020; Shook et al.,

2020). Study 3 in the following chapter provides evidence supporting this notion. That conservatism negatively predicted responses to COVID-19 points to either flexible regulation of this association by ingroup elite messaging, or no association at all, as likely explanations.

An important weapon in the fight against viral pathogen threats is vaccination. Recent research has documented politicized intentions to receive the COVID-19 vaccine in the U.S. (Callaghan et al., 2021; Fridman et al., 2021; Largent et al., 2020; Latkin et al., 2021; Pennycook et al., 2021; Ruiz & Bell, 2021; Viswanath et al., 2021), however most of this research relies on cross-sectional data or longitudinal data that span less than a month during the pandemic. Moreover, prior studies have evidenced the effects of partisan elite cues on COVID-19 vaccine intentions, where endorsement of the vaccine from a high-ranking Center for Disease Prevention and Control figure, Dr. Anthony Fauci, can lead to increased vaccine uptake (Bokemper et al., 2021) and Trump's anti-vaccination Tweets led Republicans to express increased concern about the vaccine (Hornsey et al., 2020). This study adds to this literature by prospectively demonstrating the effect of self-identified strength of political party identity and support for Trump measured prior to the COVID-19 pandemic on COVID-19 vaccination intentions six months into the pandemic.

In the present study, identification as Republican had a small but highly significant association with higher moral purity scores (Pearson $r = .25$, $p < .001$). This replicates prior work illustrating that conservatives tend to place greater value on moral purity than liberals (Graham et al., 2009; Haidt & Graham, 2007)[9]. Yet, the moral purity results were more nuanced than the political identity results, and even worked in the opposite direction. Higher scores on moral purity were associated with greater COVID-19 fear at Time 2, while stronger identification as Republican was

[9] This association may have been weakened by the fact that fewer moral purity items were used than is in the original MFQ-30.

associated with lower COVID-19 fear in the same model. This supports the notion that stronger feelings about moral purity are associated pathogen-related affect in the context of a real and deadly pathogen threat. This also provides evidence of divergent validity between moral purity and social conservatism, as some have pointed out the potential for the moral purity subscale to be confounded with measuring conservative attitudes (e.g., Rutjens et al., 2018). The association between moral purity and infection risk perceptions were nuanced: though greater moral purity scores predicted greater perceive COVID-19 infection risk controlling for strength of political identity, this association became non-significant after adding the additional covariates to the model; on the other hand, there was no association between moral purity and perceive risk of seasonal flu infection until the additional covariates were added to the model. Moreover, there was no association between moral purity and reported frequency of COVID-19-related health-protective behaviors. Taken together, these nuanced results leave open the empirical question as to whether moral purity intuition functions, in part, to promote pathogen-avoidant affect, cognitions, and behaviors. One interesting finding, however, was that stronger moral purity scores were associated with lower likelihood of receiving the COVID-19 vaccine. This is in line with prior research illustrating higher disgust sensitivity, religiosity (Clay, 2016; Reuben et al., 2020) and moral purity (Amin et al., 2017) are associated with vaccine hesitancy. Though one may think that since vaccines fight pathogens, people higher in moral purity should have more positive attitudes about vaccines. On the contrary, vaccines are administered via injection, which is an evolutionarily typical mode of pathogen transmission; hence people higher in disgust sensitivity and moral purity are averse to actions that represent or remind of pathogen transmission (Clay, 2016; cf. Karlsson et al., 2022) and the present results suggest this appears to hold true when faced with a widespread unfamiliar pathogen threat.

In addition to political identity, Trump support, and moral purity main effects on affective, cognitive, and reported behavioral responses to COVID-19, another main aim of Study 1 was to examine how these polarized responses changed over time. Some research suggests that competing factions should converge in their responses to superordinate threats with increasing shared threat experience (Kurbin et al., 2020; Sherif, 1958). However, the current study suggests that political identities and elite cues, particularly within a polarized culture, are important factors that may lead to divergent threat perceptions and responses that are resilient over six months. It is unclear, though, why politically polarized COVID-19 fear, perceived death likelihood, and reported health-protective behaviors diverged over time while perceptions of COVID-19 infection risk remained stable. Similarly, only the fear and behavior measures showed polarization over time by Trump support among Republicans, but not risk perceptions. This is somewhat surprising given research demonstrating that affect biases factual beliefs such as perceptions of risk (Liu & Ditto, 2013; Slovic & Västfjäll, 2010). Given that emotional significance is the glue that binds people's sense of self with their group identities (Tajfel & Turner, 1979), and that BIS mechanisms may act upon different sensory modalities (Schaller et al., 2010), it may be that political motivations specifically acted upon COVID-19-related affect which then motivated subsequent behavior, while risk perceptions may have been driven more by direct experience with the virus. Further research with more time points over a longer span of the pandemic may better differentiate changes in polarized affect, risk perceptions, and behaviors.

On a practical level, the present results have implications for public health and epidemiology. Understanding responses to pathogen threats over time is important for strategizing and deploying community, national, and international efforts to combat disease spread. These results suggest that epidemiologists and public health officials should consider better tailoring of their messages to the

multifaceted political and cultural narratives of their target audiences to increase compliance (Gollust et al., 2020), particularly when battling unfamiliar pathogens. For example, given that U.S. Republicans and Democrats rely on different moral intuitions (Graham et al., 2009), public health officials might benefit from framing compliance messages toward Republicans using authority, loyalty, and purity-based terms, and toward Democrats using harm and care-based terms (Feinberg & Willer, 2019). Though, given that political elite support seemed to play a bigger role in people's responses than moral purity, public health pathogen-related risk communications may be more effective when both framed in moral terms and coming from people's political ingroup leaders. For instance, one experiment using a large national sample of White evangelical Christians in the U.S. found that value-consistent messages about mask-wearing from Trump (e.g., mask wearing is patriotic) were more likely to support mask mandates than participants exposed to a control condition message (DeMora et al., 2021).

An increasingly global and interconnected society means a greater likelihood of disease spreading beyond borders (Kilpatrick, 2011). Estimating population-level differences in politicized responses over time could provide insights into best strategies for implementing population-specific public health campaigns. The present study demonstrates that, within politically polarized societies, political subcultures and authorities play a prominent role in how people perceive and respond to unfamiliar and potentially deadly pathogens as such threats unfold. These results add important generalizability to recent research on politicized COVID-19 responses by following a large and anonymous probability-based U.S. nationally representative sample over the first six months of the pandemic, with underrepresented groups (racial/ethnic, geographic, etc.) included proportionally to their representation in the U.S. population. Moreover, much research demonstrating politically polarized U.S. COVID-19 responses fails to consider a non-politicized comparison pathogen threat.

The present results add to the literature by demonstrating politically convergent perceptions of infection risk from a non-politicized pathogen, the seasonal flu.

One limitation of Study 1 is that, although it is prospective and longitudinal, and several potential confounds were statistically controlled for, the present findings cannot determine causality. A second limitation is that the items measuring reported frequency of health-protective behaviors were somewhat different between the two timepoints. This was done to adapt to the quickly changing nature of the pandemic. For instance, the item at Time 1 "isolate yourself at home for several days or more" was much more relevant to the first two months of the pandemic during global lockdowns than it was six months later when people had already begun to reconnect with close family and friends. Moreover, several of the items were repeated across time points, such as hand washing and mask wearing. A third limitation is that Trump support was used as an indirect measure of political elite cue. For instance, it is unclear the extent to which participants were exposed to Trump's messages downplaying COVID-19 over time. To extend this research, Studies 2 and 3 in the following chapter aimed to test the causal effect of partisan elite cues on responses to an unfamiliar pathogen threat by experimentally politicizing a fake (but ostensibly real) pathogen. Moreover, these studies extended Study 1 by testing whether the effects of disgust sensitivity and moral purity on responses to the unfamiliar pathogen shift depending on ingroup partisan elite cues.

CHAPTER 3: THE EFFECT OF ELITE PARTISAN CUES ON PATHOGEN PERCEPTIONS

Overview

Both anecdote and research suggest that Republican elite partisan cues drove decreased perceptions of COVID-19 threat. This poses interesting questions regarding the roles of political affiliation, disgust sensitivity, and moral purity in pathogen threat responses. If disgust sensitivity and moral purity are related to the broader BIS and function, in part, to motivate pathogen avoidance, then one prediction is that individuals who score higher on these constructs will exhibit stronger pathogen responses, regardless of the cues they receive from their political authorities. A second, competing prediction is that disgust sensitivity and moral purity intuitions can be regulated in the presence of a pathogen threat, depending on the goals and motivations of one's ingroup. For instance, despite the objective risk of a new and dangerous pathogen, if emphasizing a pathogen threat leads to a major loss of power for the ingroup, cultural authorities may de-emphasize the need to respond. If one's ingroup and cultural authorities do not find a given pathogen threatening, then the intuition to listen to ingroup members and leaders competes with the intuition to avoid potentially infectious people and actions. The main aim of the next two studies was to experimentally politicize an ostensibly new pathogen to test the effects of political affiliation on pathogen threat perception while also examining the roles of disgust sensitivity and moral purity on pathogen threat perception.

Study 1 showed that Trump-supporting Republicans were less worried about, and did less to protect themselves from, COVID-19, apparently following Trump's cues in downplaying the

threat. However, partisan elite support is an indirect measure of elite cuing, and this finding was correlational. For instance, it is not clear how strong of cues participants perceived from Trump to not take COVID-19 seriously. Participants in Study 1 could have indicated that they voted for Trump in both elections without having engaged much with Trumps media messages. Moreover, the correlational nature of Study 1 precludes the ability to determine whether partisan elite cues caused the polarized pathogen responses that were found. Can partisan elite cues politicize any pathogen threat? Moreover, the supposed elite cue effects on responses to COVID-19 thus far largely show that Trump Republicans were responding to their ingroup authority cues, leaving the question of whether such an effect would be found on the other side of the political aisle. A recent meta-analysis on partisan bias illustrated that Republicans and Democrats exhibit statistically equal bias across 51 partisan bias experiments (Ditto et al., 2018). Yet, a second analysis argues that political bias is found more among conservatives than liberals (Baron & Jost, 2019; cf. Ditto et al., 2019). Moreover, if conservatives place greater value on loyalty and authority than liberals (Graham et al., 2009), then they may be more likely to follow ingroup authorities' messages and cues about potential threats. Thus, Study 2 examined whether an ostensibly real, unfamiliar, deadly pathogen threat can be politicized by political elite cues, and whether both Democratic and Republican participants will follow their ingroup leaders' cues about the threat.

Do individual differences in disgust sensitivity and moral purity predict responses to pathogen threats? The extensive literature discussed in Chapter 1, plus the moral purity results from Chapter 2, suggest that this should be the case. Furthermore, given the results illustrating the importance of political elite support in how Republicans responded to COVID-19 over time, another question is what happens when one’s sensitivity to disgust and intuitions of moral purity conflict with loyalty to one’s political ingroup (and, subsequently, the ingroup’s response to a new

pathogen threat)? Are the effects of party affiliation, disgust sensitivity, and moral purity intuitions on pathogen threat responses dependent on political elite partisan cues? Study 3 sought to add to this literature by 1) replicating the effect of partisan elite cues on responses to a fake pathogen threat examined in Study 2, and 2) testing the effects disgust sensitivity and moral purity (and their interactions with manipulated partisan elite cues) on responses to an ostensibly real pathogen threat using a large U.S. nationally representative sample.

These research questions were tested using careful manipulation of partisan elite cues and a control condition to strengthen internal validity of the findings. Moreover, these experiments involve exposing participants to information about a pathogen for which they have no prior knowledge or attitudes, which allows for better isolation of the effect of partisan elite cues on their responses[10]. Specifically, partisan elite pathogen threat cues were manipulated through the presentation of a mock Associate Press (AP) online news article that described the international spread of a new superbacteria and either only information about the pathogen, or additionally that Democratic leaders are worried about the superbacteria and Republican leaders are not, or that Republican leaders are worried about the superbacteria and Democratic leaders are not. Lastly, Study 3 uses a large nationally representative U.S. sample and statistical population weights, which improves the generalizability of the results compared to most other psychological and political science studies that are correlational and/or rely on convenience sampling.

Study 2

Study 2 preregistration can be found at https://osf.io/2x75n/?view_only=a83aebafdfbe4b59b9ee72371f7e22ad.

[10] However, the studies were conducted during the COVID-19 pandemic, so one drawback is that prior knowledge and attitudes about COVID-19 may be imbued on perceptions of, and responses to, any other pathogen in the same sociopolitical environment

Method

Sample. An online sample was recruited from Prolific from June 14th to 16th, 2021, which occurred as COVID-19 cases in the U.S. were improving and some travel restrictions were being lifted, and right before the SARS-Cov-2-delta surge (the U.S. passed 600,000 COVID-19-related deaths on June 15th, 2021; https://www.cdc.gov/museum/timeline/covid19.html#Mid-2021). Based on the availability of resources for participant recruitment, we aimed to recruit a total of 450 participants. Prolific panelists were eligible to participate if they currently lived in the U.S., identified as U.S. nationality, identified English as a first language, and identified as Democrat or Republican, and received $0.70 for their participation. Republicans were oversampled to reach a near even distribution between Democrats and Republicans. Ninety-five participants were excluded for failing preregistered prescreen and attention check items, leaving a final pretest sample of $N = 400$ (mean age = 35.30, $SD = 13.10$, range = 18 to 92; 52% women, 82% White / European; 47% Democrat, 50% Republican; Table S2). This sample had 95% power[11] to detect an effect size of $f = .20$. The survey took on average four minutes ($SD = 2.5$ minutes, median = 3.5 minutes)

Materials and Procedure. After providing consent, participants were presented with an ostensibly real online AP news article that described the spread of a new superbacteria, Perinia Accetis (including a picture of an actual superbacteria) that originated in the Brazilian Amazon Rainforest and has begun spreading internationally. The mock news article describes the superbacteria as causing a disease with large black boils, as having no known cure, and with medical officials estimating that 1 in 10 people with the disease will end up dying. Participants in the control condition ($n = 137$ [34.25%]; Figure 5A) read only this description of the superbacteria, but

[11] Power analysis was conducted using G*Power version 3.1.9.7 (Faul et al., 2007).

participants in the elite threat cue conditions additionally read comments from partisan leaders emphasizing and downplaying the seriousness of the new superbacteria. In the Republican threat cue condition (n = 122 [30.50%]; Figure 5B), Republican leaders emphasized the seriousness of the threat while Democratic leaders downplayed it. In their messages about the threat, the leaders from both parties offered political reasons for their positions. In the Democratic threat cue condition (n = 141 [35.25%]; Figure 5C), Democratic leaders warned of the seriousness the new pathogen threat while Republican leaders downplayed it. For example, in the Democratic elite threat cue condition, Democratic majority leader Senator Chuck Schumer expresses concern about the new superbacteria and claims that Republicans are not concerned because they are too focused on revenge politics, and Republican minority leader Senator Mitch McConnell claims Democrats are exaggerating the threat as a distraction from their failed immigration policies. Each condition also includes an ostensible statement from Trump, stating that the pathogen is of concern because Democrats cannot handle it (Republican elite threat cue condition) or that Democrats are exaggerating the pathogen's seriousness to be able to take away more of people's rights (Democratic elite threat cue condition). After reading the AP article, participants answered questions about perceived pathogen seriousness and worry, a manipulation check, items about the AP news article stimulus, and demographics.

Figure 5

(A)

AP

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By MICHAEL BALSAMO an hour ago

WASHINGTON (AP) – A new superbacteria, Perinia Accetis (pictured above), known for the intense fever and large black boils it causes, has been found throughout villages of Brazil's Amazon rainforest. Officials report that the superbacteria is spreading, with over 25 new cases in nearby Bolivia, 8 new cases in Peru, and one unconfirmed case in Guatemala. Visitors to the region who recently returned to Europe may have been infected. Superbacteria receive their name from their unusually strong resistance to antibiotics. Scientists know very little about how Perinia Accetis spreads and there is no known cure for the disease it causes. Medical experts report that so far 1 out of 10 patients who become infected end up dying from this new disease, though the accuracy of these reports remains questionable.

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Statements were released today by U.S. Republicans expressing concern about the new pathogen. Senator Mitch McConnell (R-KY) stated, "I'm deeply concerned about this new threat. We've already seen what a virus can do. The Biden administration is too focused on identity politics and passing their left-wing economic policies. This new superbacteria must be taken seriously." Democrats responded with less concern. Senator Chuck Schumer (D-NY) released a statement saying, "We're already in a viral pandemic. Perinia Accetis is not COVID-19. Republicans are just exaggerating this disease because they want to ban Hispanics and Latinos from coming to the U.S. They are just trying to scare people." Former President Donald Trump also commented, saying that "the Democrats will do anything to ruin this country... they just don't want to admit they can't handle the situation. Bad leadership!"

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Note. Study 2 control condition (A), experimental Republican elite superbacteria threat condition stimulus (B), and Democratic elite pathogen superbacteria cue condition stimulus.

Measures.

Pathogen Threat. Perceived pathogen threat was measured using two items. Pathogen seriousness was measured by asking, "How serious of a threat do you think the Perinia Accetis superbacteria is?" with response options 1 (*Not at all*), 2 (*A little*), 3 (*Somewhat*), 4 (*Very*), or 5 (*A great deal*). Pathogen worry was measured by asking "How worried are you about the spread of the Perinia Accetis superbacteria?" followed by the same five response options. Perinia Accetis seriousness and worry were averaged together to create a composite score, Cronbach $\alpha = .85$, Pearson $r = .75$, 95% CI[.70, .79], $p < .001$.

Strength of Political Elite Pathogen Threat Cue. As a manipulation check (and secondary independent variable to test the hypotheses), participants were asked, "In the Associated Press article you just read, which U.S. political party leaders seemed more worried about the spread of the Perinia Accetis superbacteria?", with response options 1 (*Democrats very much more worried*), 2 (*Democrats moderately more worried*), 3 (*Democrats slightly more worried*), 4 (*Democrats and Republicans equally worried / unsure*), 5 (*Republicans slightly more worried*), 6 (*Republicans moderately more worried*), and 7 (*Republicans very much more worried*).

AP Article Stimulus Check. To assess believability of the article, participants were asked, "To what extent do you find the Associated Press article you just read believable?" with response options 1 (*Not at all*), 2 (*A little*), 3 (*Somewhat*), 4 (*Very*), or 5 (*A great deal*).

Strength of Political Party Identity. Participants were asked, "To what extent do you identify as Democrat or Republican?" with responses from 1 (*Strong Democrat*) to 4 (*Don't lean / Independent / None*) to 7 (*Strong Republican*).

Demographics. At the end of the study, participants were asked to report their age, gender, race / ethnicity, education level, and household income.

Data Analysis

R version 4.0.3 was used for Study 2 analyses (R Core Team, 2020). To test whether the manipulation worked, a one-way analysis of variance (ANOVA) was conducted on perceived strength of partisan elite pathogen threat cue with the experimental condition (control, Democratic threat cue, Republican elite threat cue) as the main independent variable. Tukey Honestly Significant Difference (HSD) comparisons were then conducted between elite partisan cue conditions.

Next, a one-way analysis of covariance (ANCOVA) was conducted on perceived superbacteria threat with partisan elite cue condition and participant self-reported strength of political party identity as the main independent variables, controlling for demographic covariates. The model was then repeated with the inclusion a partisan elite cue condition x strength of political party identity interaction term. As a secondary test of the manipulation on pathogen threat perception, and ordinary least square (OLS) regression was constructed predicting Perinia Accetis threat perception from the interaction of perceived strength of partisan elite threat cue and political party identity[12]. For this analysis, strength of political party identity was collapsed into two categories with participants scoring lower than the midpoint categorized as *Democrat* and those scoring higher than the midpoint categorized as *Republican*.

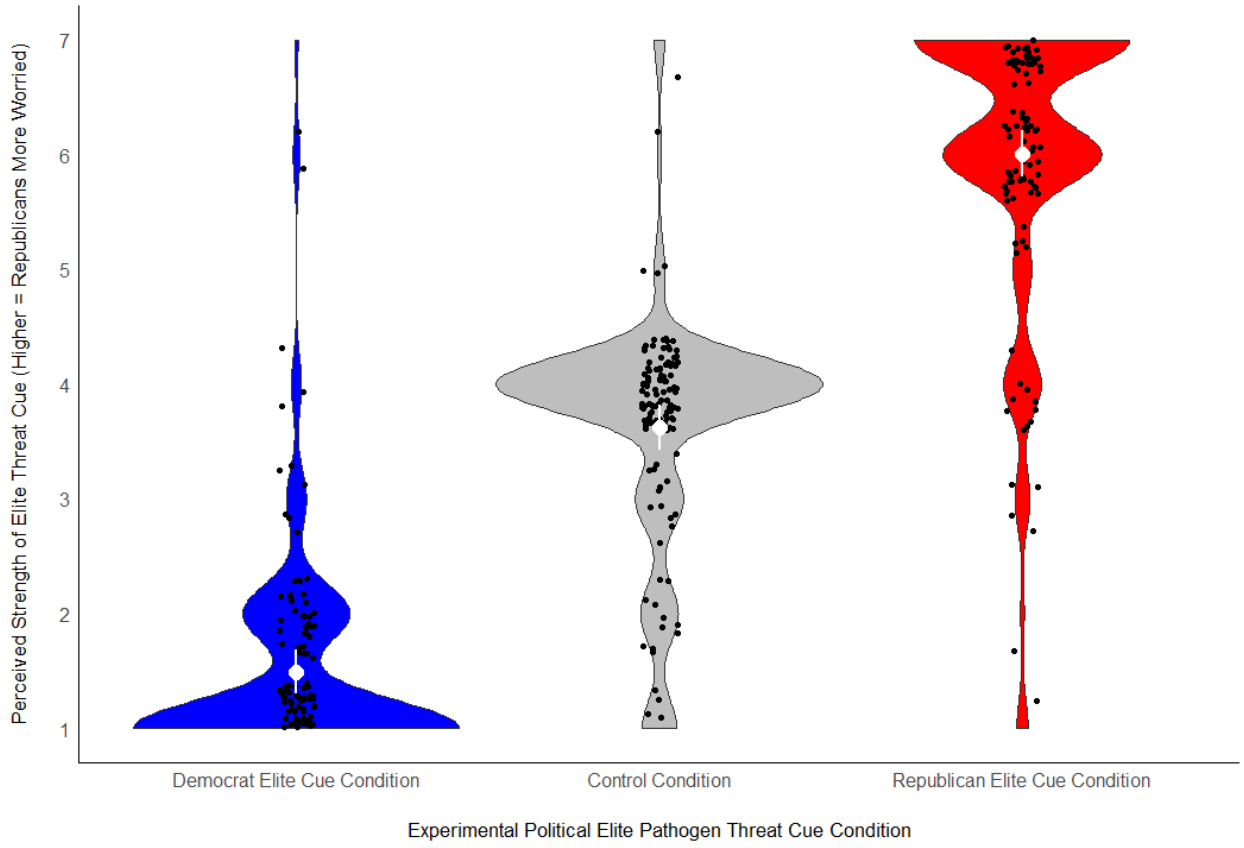
[12] This analysis was not preregistered.

Finally, a one-sample *t*-test was conducted comparing mean story believability against a null hypothesized mean of zero (i.e., not believable at all). An ANOVA was conducted with experimental condition as the independent variable and stimulus believability as the dependent variable, followed by Tukey HSD comparisons between conditions.

Results

Manipulation Check. Results showed that the experimental manipulation worked: there was a significant main effect of elite threat cue condition on perceived strength of elite threat cue, $F(2, 397) = 504.00$, $p < .001$, and this effect held after controlling for covariates. When Democratic leaders cued concern about the superbacteria, participants perceived Democratic leaders as being more worried about the pathogen (mean = 1.49, *SE* = .10, 95% CI[1.30, 1.68]) than in the control condition (mean = 3.62, *SE*= .10, 95% CI[3.43, 3.81], difference = -2.13, 95% CI[-2.46, -1.81], $p < .001$). In contrast when Republican leaders cued concern about the superbacteria, participants perceived Republican leaders as being more worried about the pathogen (mean = 6.01, *SE* = .10, 95% CI[5.80, 6.21]) than in the control (difference = 2.39, 95% CI[2.05, 2.73], $p < .001$) and Democratic elite cue (difference = 4.52, 95% CI[4.18, 4.85], $p < .001$) conditions (Figure 6).

Figure 6



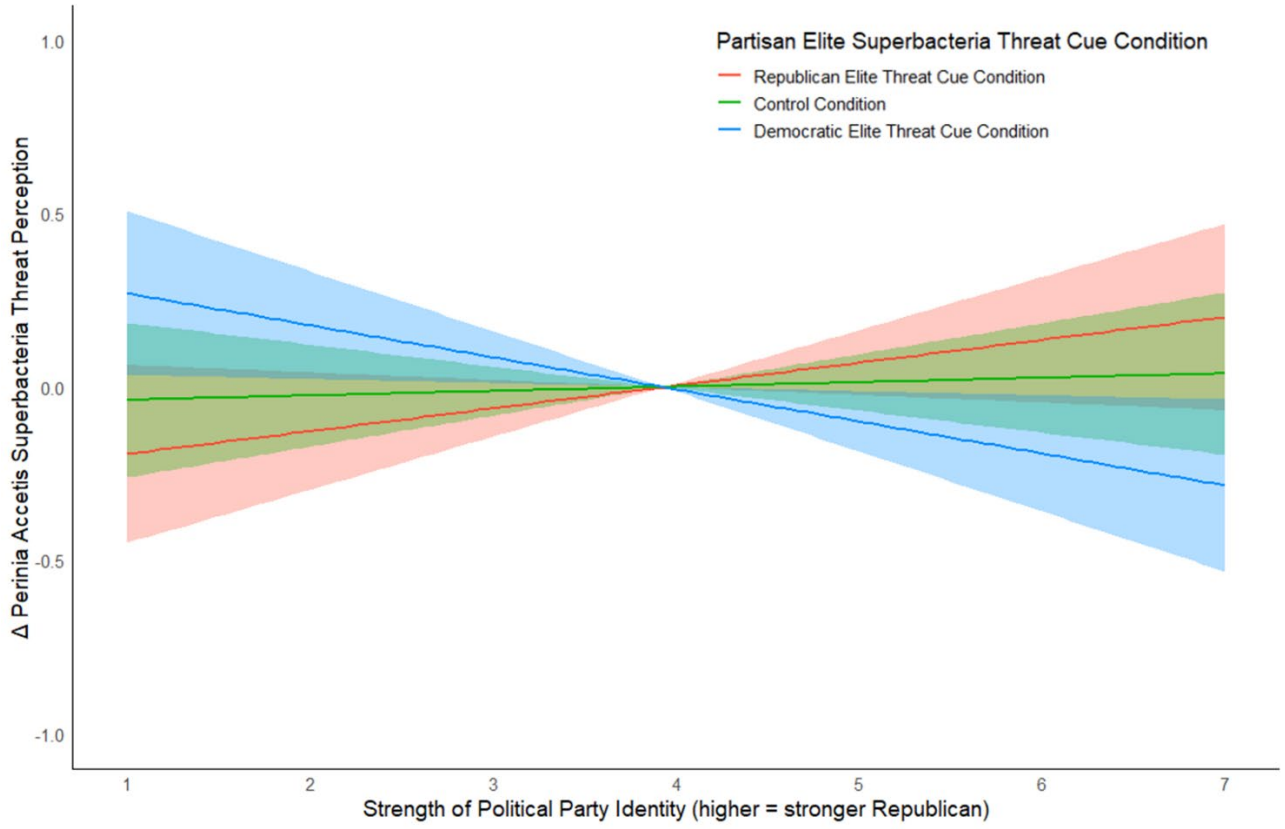
Note. Study 2 manipulation check; Perceived strength of political elite cue ranged from 1 (*Democrats very much more worried)* to 4 (*Democrats and Republicans equally worried / unsure) to 7* (*Republicans very much more worried*); Black dots = data points with a small amount of random variation to the location of each point; White circle = mean with 95% confidence intervals (white lines).

Believability of the articles was near the midpoint (i.e., "somewhat"; *Mean* = 2.76 out of 5, *SD* = 1.09), and this was significantly greater than zero (i.e., "not at all"; $t(399) = 51.00$, $p < .001$). Believability also differed by experimental condition, $F(2, 397) = 5.47$, $p = .005$ (Figure S1). The control condition (mean = 2.98, *SE* = .09, 95% CI[2.80, 3.16]) was significantly more believable than

the Democratic elite cue condition (mean = 2.55, *SE* = .09, 95% CI[2.38, 3.73]; difference = .43, 95% CI[.12, .73], *p* = .003). There was no difference between the Republican elite cue condition (mean = 2.74, *SE* = .10, 95% CI[2.55, 2.93]) and the control condition (difference = -.24, 95% CI-.56, .07], *p* = .171), nor between the Republican and Democratic elite cue conditions (difference = .19, 95% CI-.13, .50], *p* = .347).

Perceived Pathogen Threat. There was no main effect of political identity on perceived superbacteria threat, controlling for condition and demographics, $F(1, 382) < .01$, $p = .983$. There was, however, the predicted elite cue condition x political identity interaction, $F(2, 380) = 3.52$, $p = .031$. In the control condition, there was no association between political identity and superbacteria threat, simple slope = .01, *SE* = .04, 95% CI[-.06, .09]. When Democratic leaders warned of the seriousness of the superbacteria and Republican leaders downplayed it, stronger identification as Republican was associated with less perceived superbacteria threat, simple slope = -.09, *SE* = .04, 95% CI[-.17, -.01]. Yet, when Republican leaders warned about the superbacteria threat and Democratic leaders downplayed it, the result was in the expected direction with stronger Republicans reporting slightly greater superbacteria threat in the Republican elite threat cue condition, but this difference was not significant, simple slope = .06, *SE* = .04, 95% CI[-.02, .15] (Figure 7).

Figure 7



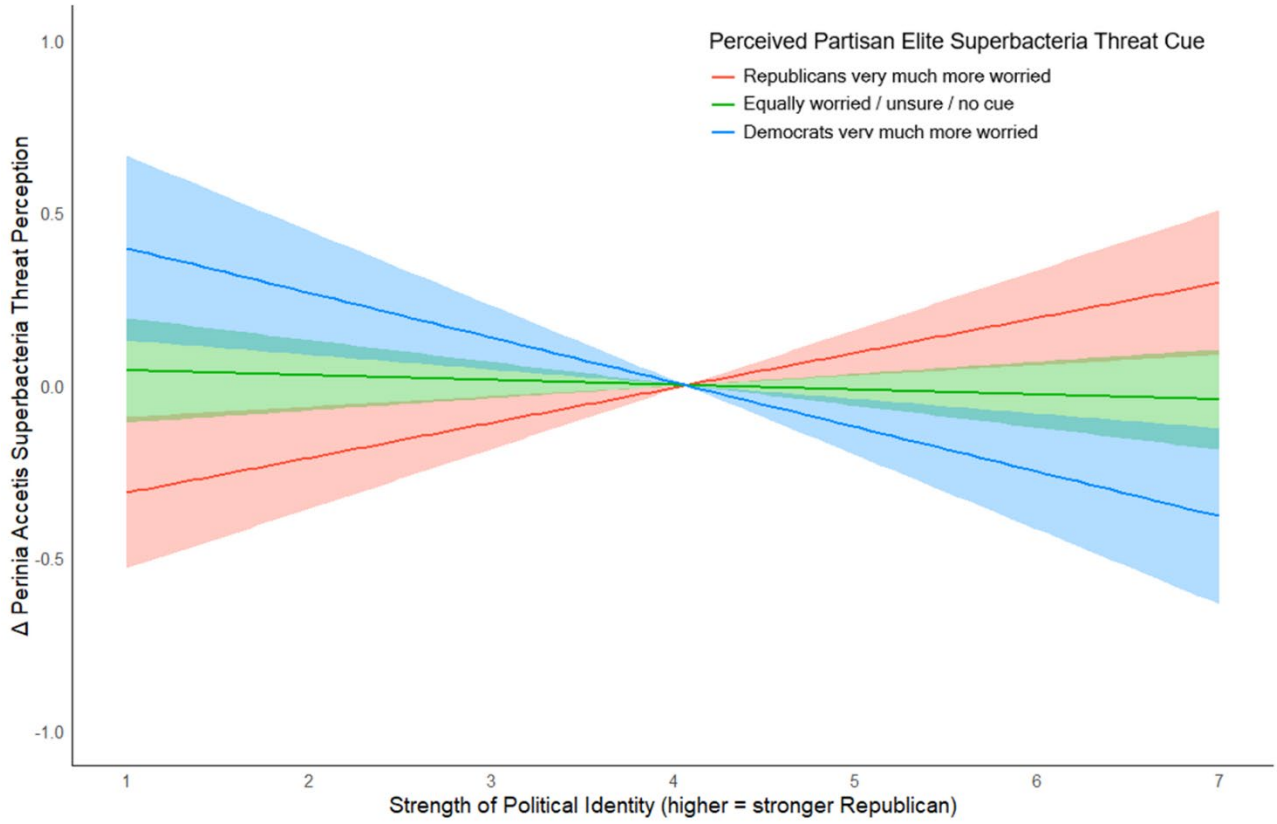
Note. Interaction between experimental elite cue condition x political identity on the expected value of superbacteria threat by moving threat perception away from its mean on the x-axis for each condition; Political identity ranged from 1 (*Strong Democrat*) to 4 (*Independent / Other*) to 7 (*Strong Republican*); Gray dots illustrate partial residuals; Shaded gray area represents 95% confidence intervals.

Results from the secondary analysis revealed a similar pattern. controlling for demographics, there was no main effect of perceived strength of elite cues, β = .08, *b* = .04, *SE* = .02, *p* = .130, and no main effect of political identity, β = -.01, *b* = -.004, *SE* = .03, *p* = .863, on perceived superbacteria

threat. There was, however, a significant interaction between perceived strength of elite cue and political identity on superbacteria threat, β =.47, b = .04, SE = .01, p < .001. When participants perceived stronger cues from Democratic leaders warning of the seriousness of the superbacteria and Republican leaders downplaying it, participants identifying as stronger Republican reported less superbacteria threat, simple slope b = -.09, SE = .03, 95% CI[-.15, -.02], p = .011. Unlike the interaction with elite cue condition, there was a significant simple slope in the opposite direction for perceived strength of elite cue condition: when participants perceived stronger Republican leaders threat cues about the superbacteria and Democratic leaders downplayed it, participants identifying as stronger Republican reported greater superbacteria threat perception, simple slope b = .08, SE = .03, 95% CI[.01, .15], p = .018 (Figure 8)[13].

[13] Simple slopes were estimated at -1 and +1 standard deviation for perceived strength of political elite superbacteria threat cue.

Figure 8



Note. This figure illustrates Study 2 ordinary least square regressions interaction between perceived strength of partisan elite pathogen threat cues and self-identified strength of political party identity on the expected value of Perinia Accetis superbacteria threat perception by moving threat perception away from its mean on the x-axis for each condition; Gray dots illustrate partial residuals; Shaded gray area represents 95% confidence intervals.

Discussion

Study 2 results suggest that the partisan elite cue manipulation worked in the expected directions, while the effect of cue condition on perceived superbacteria threat was mixed. In the Democratic elite superbacteria threat cue condition, stronger identifying Democrats followed the cue and were more worried about the superbacteria while stronger identifying Republicans went against cue and reported lower perceived superbacteria threat. There was no partisan differences in superbacteria threat perception in the control condition. In the Republican elite threat cue condition, the association was in the expected direction with Republicans perceiving the superbacteria as a more serious threat and Democrats perceiving it as slightly less of a serious threat, but this was not significant.

Results from the secondary analysis, however, suggested that both cue conditions worked in changing perceptions of the superbacteria threat: when participants perceived stronger Democratic leader superbacteria threat cues (and opposing Republican leader cues), participants identifying as stronger Democrat reported greater superbacteria threat and stronger Republican-identifying participants reported less superbacteria threat. Moreover, when participants perceived stronger Republican leader superbacteria threat cues (and opposing Democratic leader cues), participants identifying as stronger Democrat reported less superbacteria threat and stronger Republican-identifying participants reported greater superbacteria threat. Interestingly, the size of the simple slope coefficients for each effect were nearly identical (association between strength of political party identity and superbacteria threat for the Democratic elite threat cue b = -.09 and for the Republican elite threat cue b = .08). This may suggest that Democrats and Republicans can be equally biased by their ingroup leaders' (and outgroup leaders') messages about a pathogen (e.g., Ditto et al., 2018).

Study 2 provided initial evidence that exposing people to information about a new pathogen threat, one they had no prior knowledge or attitudes about, along with brief messages from political ingroup and outgroup leaders, can lead to polarized pathogen threat perceptions. However, changing the source of the information is only part of the process in communicating risk about a new pathogen threat. The people receiving the message also bring to the situation differences in the extent to which they feel and expression BIS-related emotions and attitudes. Study 3 aimed to extend Study 2 by examining how people's differences in disgust sensitivity and moral purity interact with the partisan elite cues they receive about an unfamiliar pathogen threat to influence how they respond. Study 3 also adds to Study 2 by comparing the roles of partisanship, disgust sensitivity, moral purity in responses to the fake superbacteria with perceived threat of a real politicized pathogen (COVID-19) and a real non-politicized pathogen (the seasonal flu). Lastly, Study 3 improves generalizability by conducting the experiment on a large U.S. nationally representative sample.

Study 3

The aims of Study 3 were to replicate the effect of partisan elite cues on the fake superbacteria that was found in Study 2, and to explore the interactive roles of disgust sensitivity and moral purity in perceptions of the fake superbacteria, COVID-19, and the seasonal flu.

Method

Study 3 preregistration is available at https://osf.io/ba2uw/?view_only=2a7184435bc0444faf59288fed7827d7 and deviations are noted. See Supplemental Material for additional methodological details.

Sample. An a priori power analysis was conducted using G*Power version 3.1 (Faul et al., 2007) for an ANCOVA with the smallest effect size of interest $f = .10$, three groups, and eight

covariates. The power analysis indicated a total sample size of 1,548 was necessary to achieve 95% power. Based on the availability of resources, we aimed to recruit 1,800 people (n = 600 per each of the three experimental manipulation conditions), with half (n = 900) self-identifying as Democrat and the other half (n = 900) self-identifying as Republican.

A total of 1,947 participants (weighted mean age = 48. 54, SE = .58, range = 18 – 93; see Table S3 for unweighted and weighted descriptive statistics) were invited to complete a survey in English from March 14th to April 4th, 2022 (survey duration weighted mean = 7.91 minutes, SE = .16, median = 7 minutes; survey completion rate = 75.60%). Panelists were drawn from the AmeriSpeak Panel by National Opinion Research Center (NORC) at the University of Chicago, a probability-based survey panel of over 35,000 randomly chosen U.S. households recruited through the high effort strategy of door-to-door interviewing; participants then take internet surveys using a computer, tablet, or phone. AmeriSpeak panelists cannot volunteer to join the panel, unlike typical online panels for which people choose to opt in. NORC drew the sample using stratification based on age, race / ethnicity, education, and gender to ensure representativeness. For panel households with more than one active adult panel member, only one adult in the household was eligible for selection and was selected at random. Panelists who completed an AmeriSpeak study earlier in the business week were not eligible for sample selection until the following business week. All data were weighted to adjust for the probability of selection into the AmeriSpeak Panel and to account for differences between the sample and U.S. Census benchmarks. Participants were offered the cash equivalent of $2 for completing the study.

Participant demographics consisted of the following weighted percentages (Table S3): 52% women, 48% men, 67% White, non-Hispanic, 13% Hispanic, 12% Black, non-Hispanic, and 9% Other, non-Hispanic (Asian, Other, 2+). Participants' self-reported strength of political party identity

included Strong Democrat (22%), not so strong Democrat (i.e., moderate Democrat; 17%), lean Democrat (14%), lean Republican (13%), not so strong Republican (i.e., moderate Republican; 15%), and strong Republican (20%), weighted mean strength of political identity = 3.41, SE = .05, range = 1 – 6 where higher indicates stronger Republican. In the 2020 presidential election, 47% voted for Biden, 39% voted for Trump, 3% voted for someone else, and 11% did not vote.

Materials and Procedure. The same mock online AP news articles as Study 2 were used, with minor revisions to the text. Namely, the sentence stating the base rate of 1 in 10 people who are infected with the superbacteria end up dying, and the sentence that subtly referred to the COVID-19 pandemic ("we've already seen what a virus can do") were taken out. Participants were randomly assigned to either only read about information regarding the international spread of the new superbacteria (control condition weighted n = 619 [31.77%]), or read the same story as the control condition plus comments from Democratic leaders emphasizing the pathogen threat and Republican leaders de-emphasizing the threat (Democratic threat cue condition n = 628 [32.35%]), or the same narrative as the control condition plus comments from Republican leaders emphasizing the pathogen threat and Democratic leaders de-emphasizing the threat (Republican threat cue condition n = 701 [35.98%]). The control condition read:

> "WASHINGTON (AP) – A new superbacteria, Perinia Accetis (pictured left), known for the intense fever and large black boils it causes, has been found throughout villages of Brazil's Amazon rainforest. Officials report that the superbacteria is spreading, with over 25 new cases in nearby Bolivia, 8 new cases in Peru, and one unconfirmed case in Guatemala. Visitors to the region who recently returned to Europe may have been infected. Superbacteria receive their name from their unusually strong resistance to antibiotics. Scientists know very little about how Perinia Accetis spreads and there is no known cure for the disease it causes."

In the neutral control condition, this is all participants read. In the Democratic elite pathogen threat cue condition, participants additionally read,

> "Statements were released today by U.S. Democrats expressing concern about the new pathogen. Senator Chuck Schumer (D-NY) stated, "I'm deeply concerned about this new threat. Republicans are too focused on revenge politics and blocking our proposed economic policies. This new superbacteria must be taken seriously." Republicans responded with less concern. Senator Mitch McConnell (R-KY) released a statement saying, "Democrats are just exaggerating this new disease because they want to distract people from their failed immigration policies. They are just trying to scare people." Former President Donald Trump also released a statement, saying that "the Democrats will do anything to ruin this country... they just made up this germ because they want to spend more money, impose more lockdowns, take away your freedom!’""

In the Republican elite pathogen threat cue condition, participants read the same base paragraph as the control condition, along with,

> "Statements were released today by U.S. Republicans expressing concern about the new pathogen. Senator Mitch McConnell (R-KY) stated, "I'm deeply concerned about this new threat. The Biden administration is too focused on identity politics and passing their left-wing economic policies. This new superbacteria must be taken seriously." Democrats responded with less concern. Senator Chuck Schumer (D-NY) released a statement saying, “Republicans are just exaggerating this disease because they want to ban Hispanics and Latinos from coming to the U.S. They are just trying to scare people." Former President Donald Trump also released a statement, saying that "the Democrats will do anything to ruin this country... they just don't want to admit they can't handle the situation. Bad leadership!""

Measures.

Pathogen Threat. Perceived pathogen threat was measured using three items for the superbacteria and two items for influenza and COVID-19, respectively. Pathogen seriousness was measured with the item, "How serious of a threat do you find each of the following?" followed by "Perinia Accetis superbacteria", "Influenza (seasonal flu)", and "SARS-CoV-2 (COVID-19)". For each of the three pathogens, participants responded with either 1 (Not at all), 2 (A little), 3 (Somewhat), 4 (Very), or 5 (A great deal). Pathogen worry was measured with the item, "How worried are you about the spread of each of the following?" followed by the same three pathogens and the same five response options as pathogen seriousness. Pathogen mitigation support was measured by asking participants, "To what extent do you support the U.S. spending resources to prepare for the spread of the new Perinia Accetis superbacteria?", with the response options will 1 (Not at all), 2 (A little), 3 (Somewhat), 4 (Very much), or 5 (A great deal). Pathogen seriousness, worry, and mitigation support for Perinia Accetis superbacteria were averaged together to create a composite score, Cronbach $\alpha = .88$. Pathogen seriousness and worry about influenza (Cronbach $\alpha = .88$, Pearson $r = .78$, 95% CI[.77, .80], $p < .001$) and COVID-19 (Cronbach $\alpha = .90$, Pearson $r = .82$, 95% CI[.80, .83], $p < .001$) were averaged together, respectively.

Strength of Political Elite Pathogen Threat Cue*.* The same manipulation check item as Study 2 was used, except that response options were randomized such that half of participants saw "Democrats" in the first three response options with "Republicans" in the latter three response options, and the other half saw "Republicans" in the first three response options and "Democrats" in the latter three. There was an additional, non-randomized response option 8 (*No information was given about political party leaders' responses*), which was recoded to the midpoint of the scale (4).

AP Article Stimulus Check. The same stimulus believability item as Study 2 was used.

Strength of Political Party Identity. Strength of political party identity was measured prior to the current study as part of a panel demographics survey and included the response options 1 (*Strong Democrat*), 2 (*Not so strong Democrat*), 3 (*Lean Democrat*), 4 (*Don't lean / Independent / None*), 5 (*Lean Republican*), 6 (*Not so strong Republican*), and 7 (*Strong Republican*). Panelists who responded 4 (*Don't lean / Independent / None*) were not eligible to participate in this study.

Pathogen Disgust Scale. The Three-Domain Disgust Scale (TDDS; Tybur et al., 2009) measures disgust responding to three domains of evolutionary elicitors: pathogens, sex, and moral violations. Because the length of the survey was limited, the top four items loading onto pathogen disgust in Tybur et al. (2009) were chosen. These consisted of "Standing close to a person who has body odor", "Shaking hands with a stranger who has sweaty palms", "Stepping on dog poop", and "Accidentally touching a person's bloody cut", each measured from 0 (*Not disgusting at all*) to 6 (*Extremely disgusting*). These four items were combined to create a pathogen disgust sensitivity composite, and showed acceptable reliability, Cronbach $\alpha = .78$.

Moral Purity. The same moral purity items as Study 1 were used, Cronbach $\alpha = .79$.

Partisan Elite Feeling Thermometers. In the present survey, participants were be instructed, "Please rate how you feel towards each person below. Rating above 50 means that you feel favorable and warm toward the person. Rating below 50 means that you feel unfavorable and cold toward the person. Click on the line for the indicator to appear, then slide the indicator on the scale where it best reflects your answer." followed by two slider bars, one for *President Joe Biden* and one for *former President Donald Trump*.

Covariates.

Reported Media Exposure. Prior research suggests that media exposure is associated with perceptions of risk and health-protective behaviors when faced with a pathogen threat (Chan et al.,

2018). To statistically control for media exposure, participants were asked, "Over the past week, on average, about how my hours per day did you spend watching, reading, and/or listening to media coverage from each of the following media sources?", followed by the items "TV, radio, print news", "online new sources (e.g., CNN, Yahoo, NYTimes.com)", and "social media (e.g., Facebook, Twitter, Reddit, etc.)". For each item, participants responded from 0 (None) to 11+ hours. These three items were summed to create a composite media exposure variable (Thompson et al., 2017), Cronbach $\alpha = .67$.

Additional Variables. The following covariates were measured as part of an AmeriSpeak Panel demographics survey prior to the current study: age, gender, education, income, employment status, marital status, U.S. Census Bureau-designed geographic region, belief in a God or gods, and frequency of religious service attendance. See Supplemental Material for additional item descriptions.

Data Analysis

Analyses were conducted using Stata version 16.1 (StataCorp, 2019). Zero-order correlations were conducted among dependent and independent variables, moderators, and covariates, with Bonferroni-adjusted p-values to adjust for multiple comparisons ($\alpha = .05 / 153 = .00033$). As a manipulation check, an ANOVA[14] was conducted on strength of perceived political elite threat cue by political elite threat cue condition. Follow-up pairwise comparisons were then conducted between conditions with Bonferroni-adjusted *p*-values ($\alpha = .05 / 3 = .017$). As a check on the believability of the stimuli, an ANOVA was conducted on believability of the AP news article by political elite threat cue condition, followed by Bonferroni-adjusted pairwise comparisons between conditions.[15]

[14] Because Stata 16 does not allow ANOVA with weighted data, the *svy: regress* command was used followed by *contrast* or *testparm* to compute *F*-values for all ANOVAs and ANCOVAs.
[15] These manipulation check analyses were not preregistered.

To test the main hypothesis, an ANOVA was conducted for each of the three pathogens with experimental condition (control vs. Democratic elite threat cue vs. Republican elite threat cue) as the independent variable and pathogen threat composite score as the dependent variable. Pairwise comparisons with Bonferroni corrections were then conducted to compare conditions on pathogen threat.[16] The same models were repeated using ANCOVA to test the effects of strength of political party identity, feelings towards Trump, pathogen disgust sensitivity, and moral purity, controlling for self-reported average daily hours of media exposure, age, gender, ethnicity, education, income, employment status, marital status, and geographic region (strength of political identity, pathogen disgust sensitivity, and moral purity were included as covariates in models in which they were not the main predictors).[17] Next, two-way interactions among elite cue condition, self-reported political identity, disgust sensitivity, moral purity, and feelings toward Trump were tested on pathogen threat for each pathogen, controlling for the same covariates. Simple slopes contrasts were conducted for significant interactions.

As a secondary test of the hypothesis, an ordinary least square (OLS) regression was constructed predicting perceived threat of the superbacteria from perceived strength of political elite cue (the manipulation check). This model was then repeated controlling for the same covariates and testing for the same moderators. Standardized variables were standardized prior to analysis.

Results

Descriptive statistics are presented in Table S4.

[16] The preregistration stated that Tukey HSD comparisons would be conducted. However, Stata 16 does not allow Tukey HSD with weighted data, so the more conservative Bonferroni correction was applied instead. The *pwcompare* command was use for the comparisons.

[17] The covariates education, employment status, marital status, and frequency of religious service attendance were not preregistered and were included as exploratory covariates.

Zero-Order Correlations. Zero-order correlations are presented in Table 1. Perceived threat of the fake experimental stimulus pathogen, the Perinia Accetis superbacteria, was significantly moderately associated with greater perceived threat of the flu (r = .56, 95% CI[.53, .59], p < .001) and COVID (r = .63, 95% CI[.60, .66], p < .001), as well as more self-reported average daily hours of media exposure (r = .20, 95% CI[.16, .24, p < .001), and lower household income (r = -.15, 95% CI[-.19, -.11], p < .001). Moreover, perceived threat of the fake superbacteria tracked politicized responses to COVID in that identifying as stronger Democrat (r = -.28, 95% CI[-.32, -.24], p < .001), more negative feelings towards Trump (r = -.26, 95% CI[-.30, -.22], p < .001), and more positive feelings toward Biden (r = .31, 95% CI[.27, .35], p < .001) were associated with greater perceived superbacteria threat. As expected, disgust sensitivity was significantly positively associated with perceived threat of all three pathogens (Perinia Accetis superbacteria: r = .17, 95% CI[.13, .22], p < .001; influenza: r = .24, 95% CI[.20, .28], p < .001; COVID: r = .18, , 95% CI[.14, .23], p < .001) and with moral purity (r = .22, 95% CI[.18, .26], p < .001; replicating Olatunji et al., 2012). However, although moral purity scores were significantly positively associated with identifying as stronger Republican (r = .36, 95% CI[.32, .40], p < .001), more positively feelings towards Trump (r = .36, , 95% CI[.32, .40], p < .001), and more negative feelings towards Biden (r = -.28, 95% CI[-.32, -.24], p < .001), replicating prior work connecting moral purity with conservatism (Graham et al., 2009), moral purity was not significantly associated with perceived threat of any of the three pathogens (Perinia Accetis superbacteria: r = .03, 95% CI[-.01, .08], p = 1.00; influenza: r = .07, 95% CI[.02, .11], p = .588; COVID: r = -.08, 95% CI[-.12, -.03], p = .081).

Table 1

Zero-Order Correlations (Weighted and Bonferroni-Adjusted) Among Study 3 Variables

Variable	Perinia Accetis threat	Influenza threat	COVID threat	Strength of political elite cue	Strength of political identity	Moral Harm	Moral Fairness	Moral Loyalty	Moral Purity	Disgust sensitive	God belief	Religious attendance	Trump thermometer	Biden thermometer	Media exposure	Age	Education	Income
Perinia Accetis threat	1.00																	
Influenza threat	**.56*****	1.00																
COVID threat	**.63*****	**.71*****	1.00															
Strength of political elite cue	.03	.04	.02	1.00														
Strength of political identity	**-.28*****	**-.26*****	**-.42*****	.05	1.00													
Moral harm	**.25*****	**.16*****	**.24*****	-.01	**-.13*****	1.00												
Moral fairness	**.19*****	**.14*****	**.21*****	.06	**-.16*****	**.35*****	1.00											
Moral loyalty	**-.15*****	-.06	**-.17*****	.05	**.44*****	.003	-.01	1.00										
Moral purity	.03	.07	-.08†	.03	**.36*****	**.14*****	**.15*****	**.39*****	1.00									
Disgust sensitivity	**.17*****	**.24*****	**.18*****	.05	-.02	**.11*****	**.14*****	.003	**.22*****	1.00								
God belief	.01	.08	-.08	.04	**.32*****	.08†	-.01	**.28*****	**.51*****	**.18*****	1.00							
Religious attendance	-.07	.01	**-.10*****	.06	**.31*****	**-.02**	**-.12*****	**.25*****	**.35*****	.001	**.52*****	1.00						
Trump thermometer	**-.26*****	**-.22*****	**-.43*****	.05	**.74*****	**-.15*****	**-.12*****	**.45*****	**.36*****	.04	**.33*****	**.26*****	1.00					
Biden thermometer	**.31*****	**.31*****	**.49*****	-.06	**-.76*****	**.15*****	**.16*****	**-.35*****	**-.28*****	.05	**-.27*****	**-.22*****	**-.75*****	1.00				
Media exposure	**.20*****	**.27*****	**.19*****	.06	-.07	.05	.06	-.01	**.08***	**.14*****	.07	.07	.05	**.11*****	1.00			
Age	.05	**.13*****	**.12*****	.04	.08†	**.17**	**.16*****	**.31*****	**.20*****	-.01	**.17*****	**.15*****	.02	.05	-.03	1.00		

Education	-.07	-.07	.03	-.04	**-.09****	.03	**-.09***	.01	**-.12*****	**-.17*****	**-.11*****	.08	**-.22*****	**.13*****	**-.15*****	**.18*****	1.00	
Income	**-.15*****	**-.15*****	-.06	-.01	.02	-.04	**-.11*****	**.10****	**-.10****	**-.14*****	-.11***	.04	**-.10****	.01	**-.16*****	**.15*****	**.43*****	1.00

Note. First number in each cell is the Pearson *r* correlation coefficient and the second number is the Bonferroni-corrected *p*-value with an adjusted alpha level of .00033 (α = .05 / 153); Bolded = significant; Strength of political elite cue midpoint = *Democrats and Republicans equally threatened / unsure / no political information given*, higher = Republicans more worried; Strength of political identity higher = s*tronger Republican;* Belief in a God or gods higher = stronger belief; Self-reported religious service attendance higher = more frequent; For feeling thermometers, lower under 50 = colder feelings and higher above 50 = warmer feelings; Self-reported household income was measured from 1 (*Less than $5,000*) to 9 (*$40,000 to $49,999*) to 18 (*$200,000 or more*);

Manipulation Check. As expected, there was a significant difference in strength of perceived elite cue threat by elite cue threat condition, $F(2, 1921) = 319.66$, $p < .001$. Compared to the control condition with no political elite cues, participants in the Republican elite pathogen threat cue condition judged Republicans as significantly more worried about the superbacteria (β =.40, b = 1.61, SE_{Robust} = .10, 95% CI[1.37, 1.86], $p < .001$), and participants in the Democratic elite pathogen threat cue condition judged Democrats as significantly more worried about the superbacteria (β = -.36, b = -1.49, SE_{Robust} = .09, 95% CI[-1.71, -1.28], $p < .001$; Figure S2). Participants in the Republican elite threat cue condition also perceived Republican leaders are more worried about the superbacteria threat than participants in the Democratic elite threat cue condition, and vice versa (β = .78, b = 3.11, SE_{Robust} = .12, 95% CI[2.81, 3.40], $p < .001$).

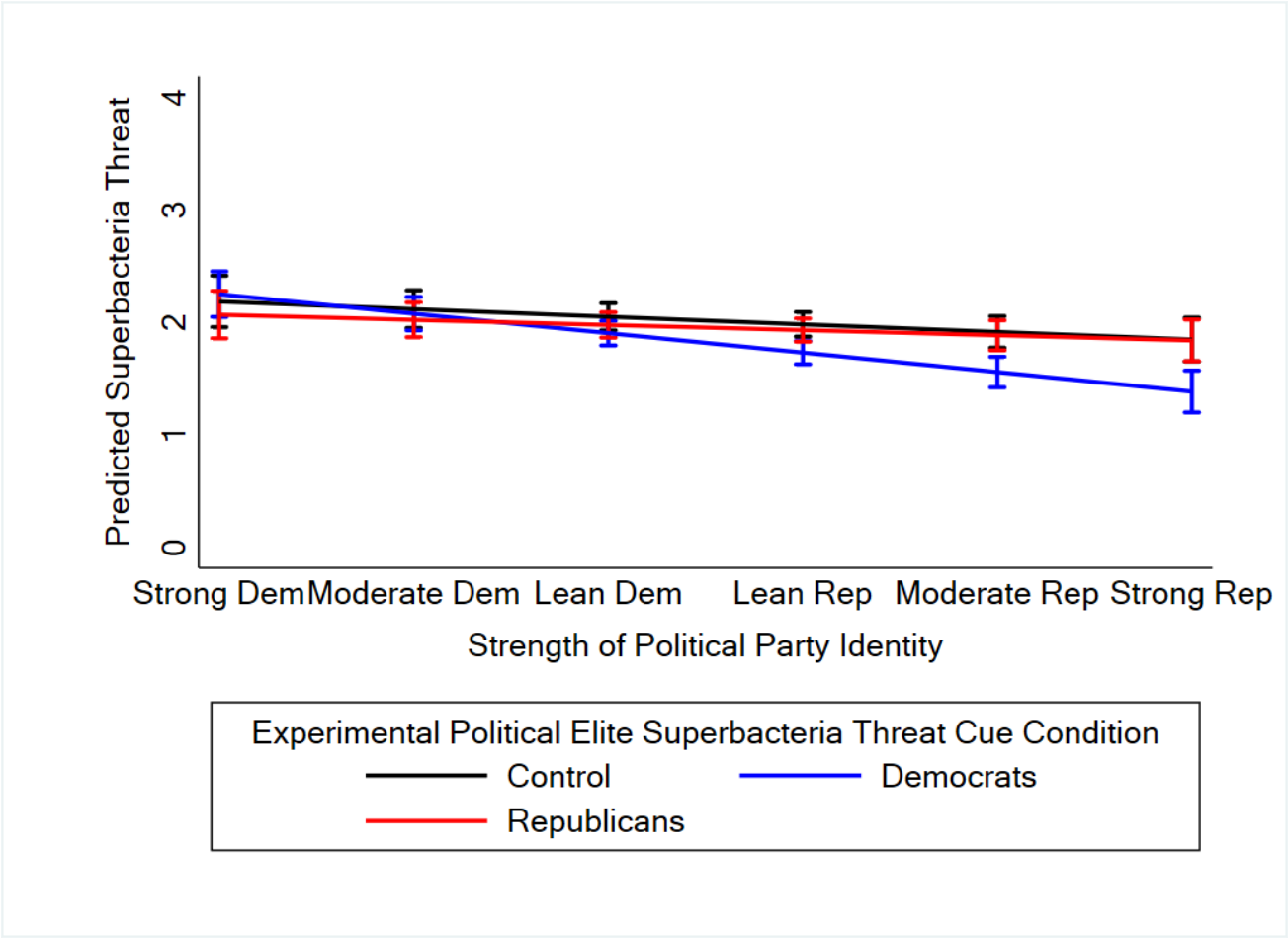
Assessing believability of the stimuli, there was a significant difference in believability of the AP news article by experimental condition, $F(2, 1939) = 9.47$, $p < .001$. Compared to the control condition with no political cues, participants in the Republican elite pathogen threat cue condition judged the article as significantly less believable (β =-.13, b = -.27, SE_{Robust} = .07, 95% CI[-.45, -.10], $p < .001$), as did participants in the Democratic elite pathogen threat cue condition (β = -.12, b = -.25, SE_{Robust} = .07, 95% CI[-.41, -.08], $p < .001$; Figure S3). There was no difference in believability between Republican and Democratic elite threat cue conditions (β = -.01, b = -.03, SE_{Robust} = .07, 95% CI[-.20, .15], p = 1.00).

Perceived Superbacteria Threat.

Condition x Strength of Political Identity. There was no significant main effect of experimental condition on perceived threat of the fake superbacteria, $F(2, 1946) = 2.12$, p = .121. Controlling for covariates, there was a significant main effect of strength of political identity on superbacteria threat perceptions $F(1, 1847) = 12.84$, β = -.16, SE_{Robust} = .05, 95% CI-.25, -.07], p <

.001, such that the stronger participants identified as Republican the less superbacteria threat they perceived. There was also a significant political elite threat cue condition x strength of political identity interaction on perceived threat of the superbacteria, $F(5, 1845) = 6.36$, $p = .002$ (Figure 9). Consistent with Study 2 results, compared to the control condition, the stronger participants identified as Republican in the Democratic elite threat cue condition the less superbacteria threat they reported, $F(1, 1845) = 6.64$, $\beta = -.19$, $b = -.11$, $SE_{Robust} = .04$, 95% CI[-.19, -.03], $p = .010$. There was also a significant difference in the effect of strength of political identity on superbacteria threat perception between Republican and Democratic elite threat cue conditions. Compared to the Republican elite threat cue condition, participants who more strongly identified as Republican in the Democratic elite threat cue condition reported significantly less perceived superbacteria threat, $F(1, 1845) = 11.16$, $\beta = -.23$, $b = -.13$, $SE_{Robust} = 04$, 95% CI[-.20, -.05], $p = .001$. There was no difference in the effect of political identity on superbacteria threat between control and Republican elite threat cue conditions, $F(1, 1845) = .27$, $\beta = .04$, $b = .02$, $SE_{Robust} = 04$, 95% CI[-.06, .10], $p = .601$. Thus, replicating Study 2, it appears that the interaction is driven by Republicans feeling less threatened about the superbacteria when given Democratic political elite threat cues and ingroup Republican elite cues downplaying the pathogen threat.

Figure 9

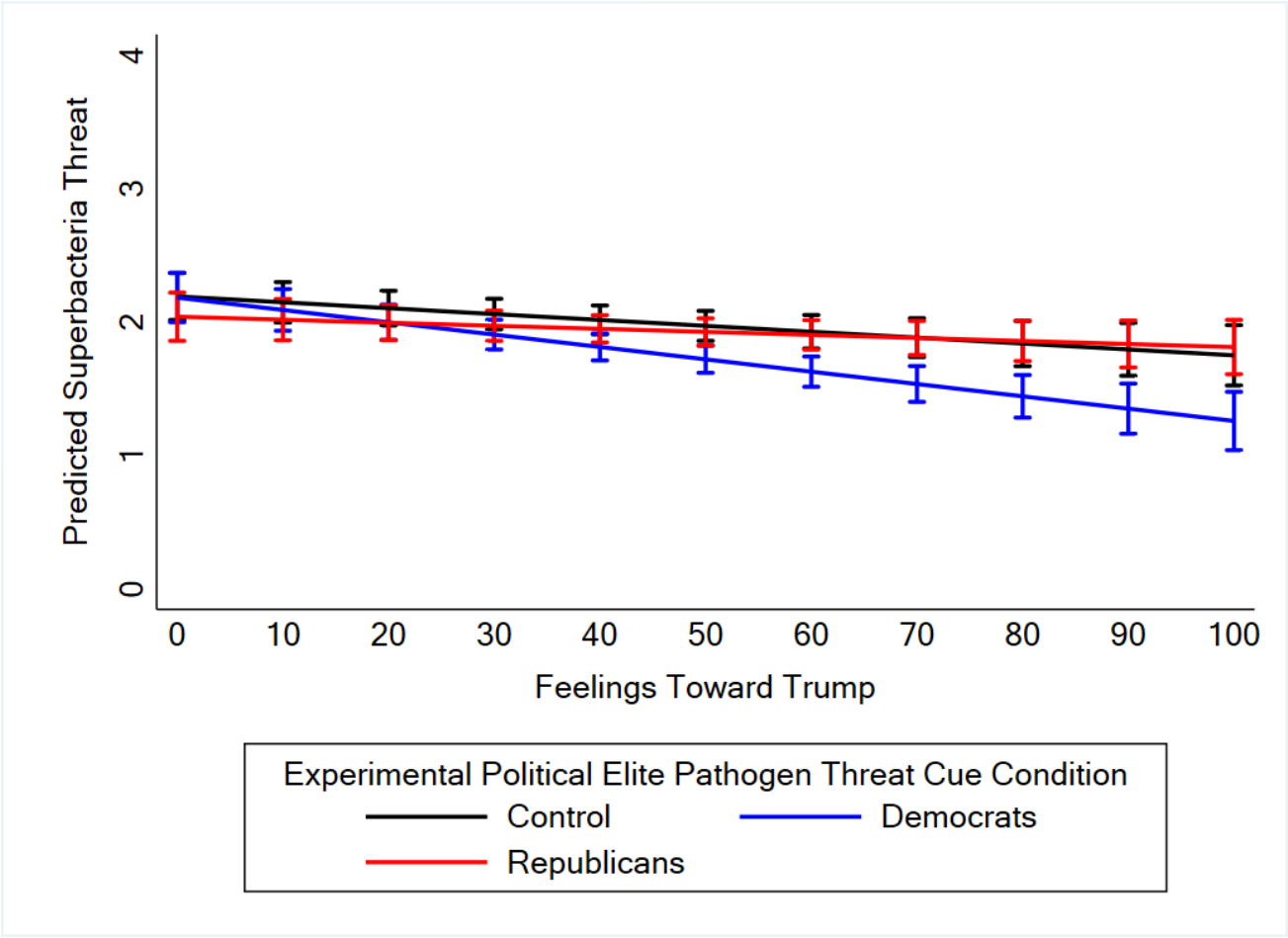


Note. Interaction between experimental political elite pathogen threat cue condition and strength of political party identity on perceived threat of the Perinia Accetis superbacteria that participants read about in the mock Associated Press article, controlling for covariates; Bars = 95% confidence intervals.

Condition x Feelings Toward Trump. Given that the elite cues in each of the two political elite cue conditions convey a message from Trump about the superbacteria threat, feelings toward Trump were examined as a moderator of the effect of elite cues on superbacteria threat perception.

Controlling for covariates, there was a significant main effect of feelings towards Trump such that the more favorable participants felt towards Trump the less superbacteria threat they perceived, $F(1, 1859) = 15.50$, $\beta = -.18$, $b = -.01$, $SE_{Robust} = .05$, 95% CI[-.01, -.003], $p < .001$. Controlling for covariates, there was also a significant interaction between political elite threat cue condition and feelings toward Trump on superbacteria threat perception, $F(5, 184) = 8.20$, $p < .001$ (Figure 10). Compared to the control condition, the more favorable participants felt towards Trump in the Democratic elite threat cue condition the less superbacteria threat they reported, $F(1, 1845) = 5.86$, $\beta = -.12$, $b = -.005$, $SE_{Robust} = .002$, 95% CI[-.01, -.001], $p = .016$. There was also a significant difference in the effect of Trump feelings on superbacteria threat between the Democratic and Republican elite threat cue conditions. Compared to the Republican threat cue condition, the more favorable participants felt towards Trump in the Democratic elite threat cue condition the less superbacteria threat they reported, $F(1,1845) = 12.88$, $\beta = -.18$, $b = -.01$, $SE_{Robust} = .002$, 95% CI[-.01, -.003], $p < .001$. There was no difference in the effect of feelings toward Trump on superbacteria threat between the control and Republican threat cue condition, $F(1, 1845) = 1.18$, $\beta = .06$, $b = .002$, $SE_{Robust} = .002$, 95% CI[-.002, .01], $p = .278$. This result mirrors the interaction for between condition and strength of political identity on superbacteria threat, even though that analysis controlled for feelings toward Trump and the present analysis controlled for strength of political identity.

Figure 10

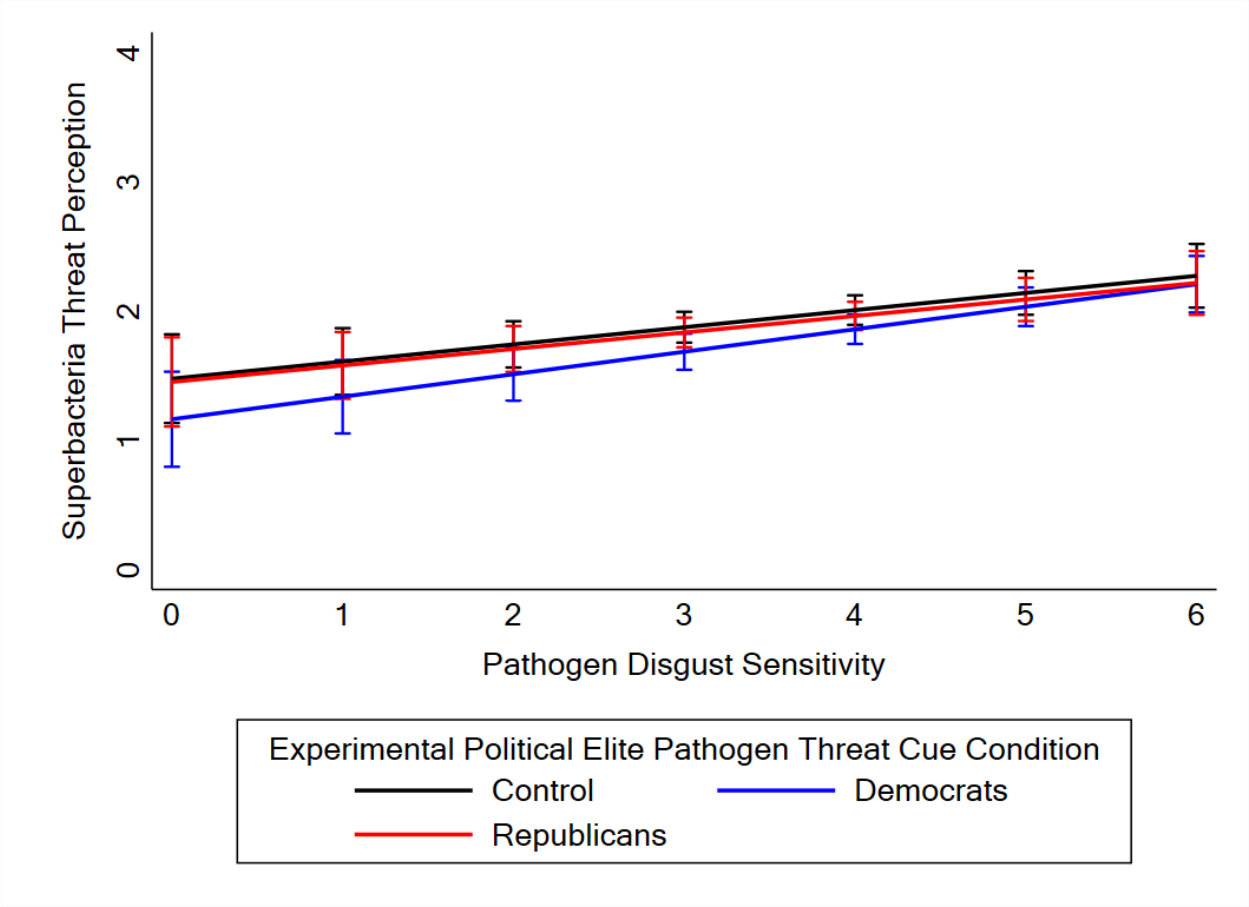


Note. Interaction between political elite superbacteria threat cue condition and feelings toward Trump (higher = warmer / more favorable) on superbacteria threat perception. Bars = 95% confidence intervals.

Condition x Pathogen Disgust Sensitivity. There was a significant main effect of pathogen disgust sensitivity. The more participants were sensitivity to pathogen disgust the greater superbacteria threat they perceived, $F(1, 1859) = 14.72$, $\beta = .16$, $b = .14$, $SE = .02$, 95% CI[.09, .19],

$p < .001$. There was no political elite pathogen threat cue condition x pathogen disgust sensitivity interaction on superbacteria threat perception, $F(2, 1943) = .31$, $p = .736$, suggesting that participants higher on sensitivity to pathogen disgust perceived the superbacteria as more threatening regardless of political elite cues about the threat (Figure 11). This remained the same after including covariates in the model, $F(2, 1919) = .11$, $p = .894$.

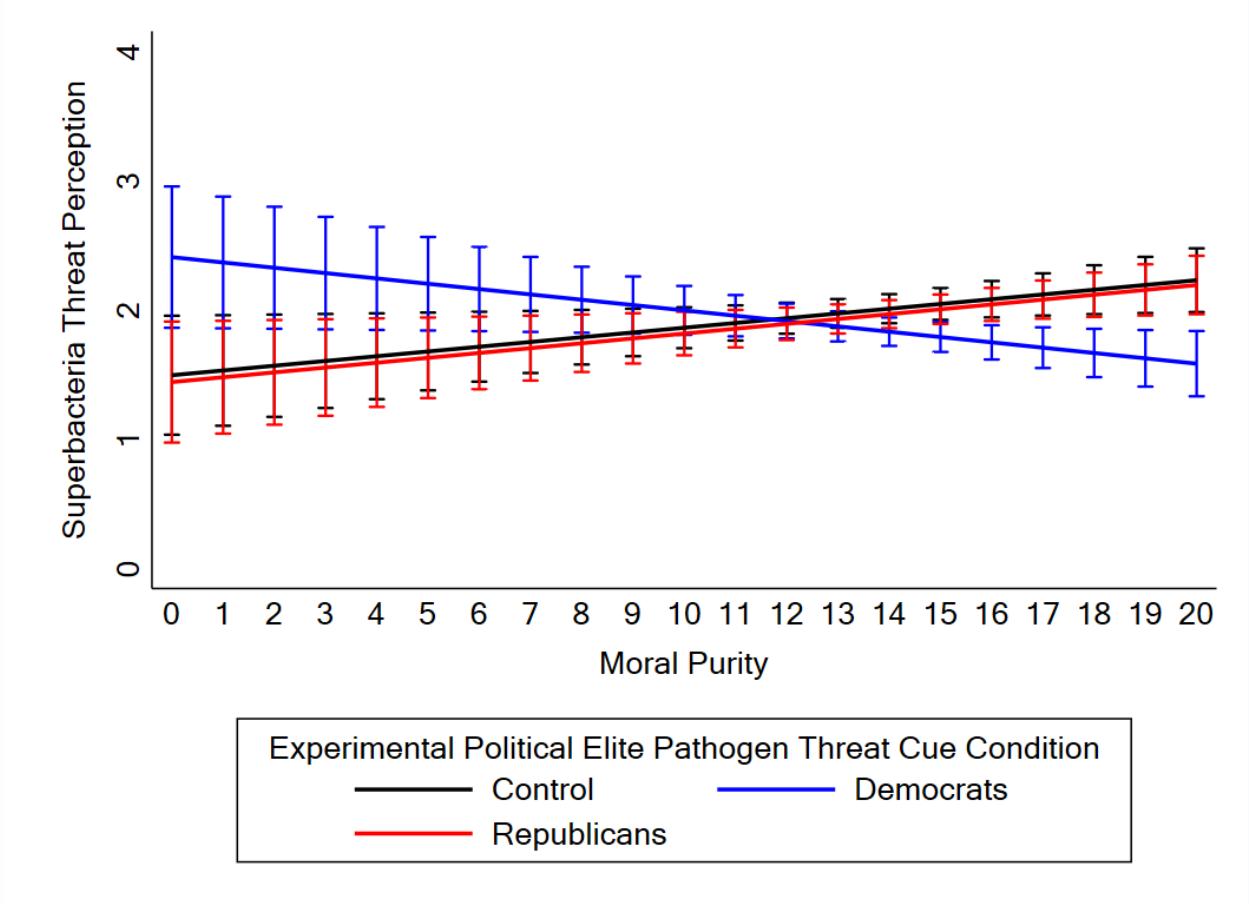
Figure 11



Note. Interaction between experimental political elite pathogen threat cue condition and pathogen disgust sensitivity on perceived threat of the Perinia Accetis superbacteria that participants read about in the mock Associated Press article; Bars = 95% confidence intervals.

Condition x Moral Purity. There was no significant main effect of moral purity on superbacteria threat perception, $F(1, 1934) = .97$, $\beta = .03$, $SE = .01$, 95% CI[-.10, .03], $p = .325$. There was a significant political elite pathogen threat cue condition x moral purity interaction on perceived threat of the superbacteria, $F(2, 1934) = 5.90$, $p = .003$. Compared to the control (contrast = -.08, $SE = .03$, $p = .003$) and Republican elite threat cue (contrast = -.08, $SE = .03$, $p = .002$), those higher in moral purity in the Democratic elite threat cue condition reported significantly lower perceived superbacteria threat (Figure 12). In other words, the effect of partisan elite cues on superbacteria threat depended on moral purity. This interaction was not significant, however, after controlling for strength of pollical party identity and the other covariates.

Figure 12

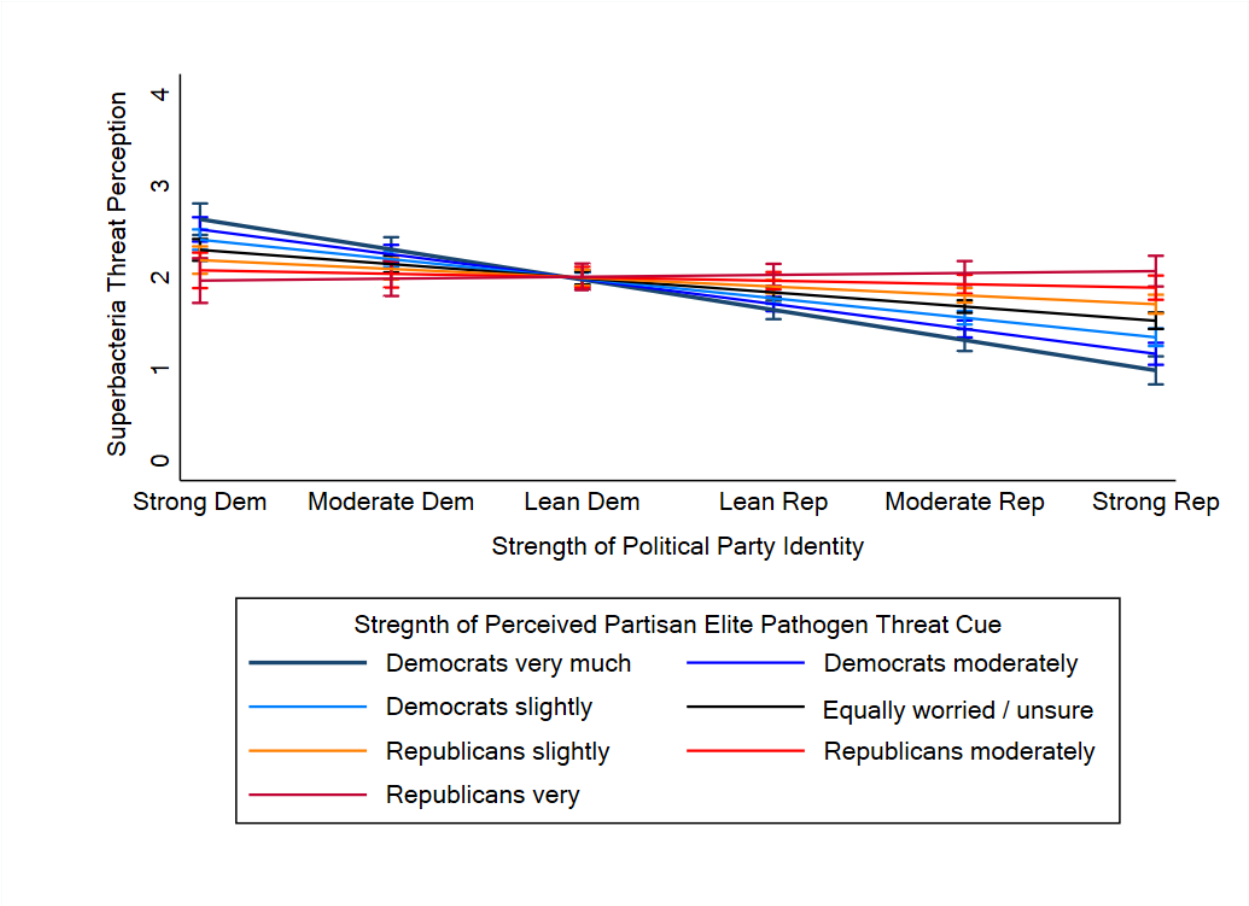


Note. Interaction between experimental political elite pathogen threat cue condition and moral purity scores on perceived threat of the Perinia Accetis superbacteria that participants read about in the mock Associated Press article; Bars = 95% confidence intervals.

Perceived Strength of Political Elite Threat Cues. As a secondary test of the hypotheses, the same models as above with experimental political elite threat cue condition were analyzed again but as OLS regression replacing experimental condition with participant-reported strength of political elite threat cue. Consistent with experimental condition results, there was no significant main effect

of perceived strength of political elite threat cue on superbacteria threat perception, β = .03, *b* = .02, *SE* = .02, *p* = .351. There was, again, the predicted significant strength of political elite pathogen threat cue x strength of political party identity interaction on superbacteria threat perception, β = .57, *b* = .06, *SE* = .01, *p* < .001. The stronger participants perceived Republican elite pathogen threat cues (and Democratic elites downplaying the threat), the less difference there was across the political spectrum in superbacteria threat perception. However, the stronger participants perceived Democratic elite pathogen threat cues (and Republican elites downplaying the threat), the more divergence there was by participant party identity such that Democrats found the superbacteria more threatening and Republicans found the superbacteria less threatening. (Figure 13). This interaction remained significant after including covariates in the model, β = .49, *b* = .05, *SE* = .01, *p* < .001.

Figure 13

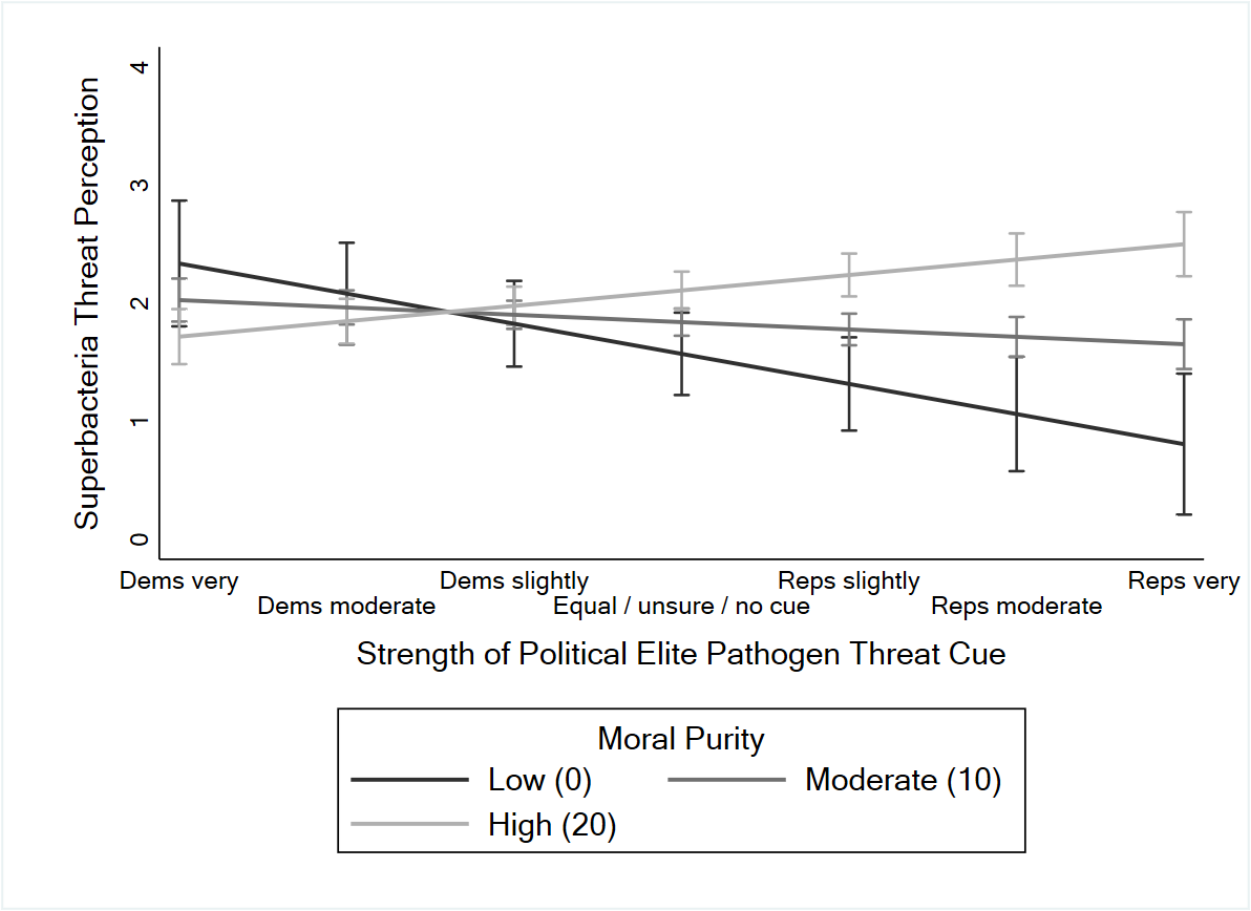


Note. Interaction between perceived strength of political elite pathogen threat cue (from 1 [*Democrats very much more worried*] to 4 [*Democrats and Republicans equally worried / unsure / no political information was given*] to 7 [*Republicans very much more worried*]) and strength of political party identity (measured prior to the current study) on perceived threat of the fabricated Perinia Accetis superbacteria; Bars = 95% confidence intervals.

Perceived Strength of Political Elite Threat Cues x Disgust Sensitivity. As with experimental condition results, controlling for strength of political identity, there was no significant

strength of political elite pathogen threat cue x pathogen disgust sensitivity interaction, β = -.12, *b* = -.01, *SE* = .01, *p* = .303, suggesting that the effect of pathogen disgust sensitivity on superbacteria threat perception did not depend on political elite cueing about the threat. Also consistent with experimental condition results, there was a significant strength of political elite threat cue x moral purity interaction, β = .55, *b* = .02, *SE* = .01, *p* < .001, on perceived threat of the fabricated superbacteria (Figure 14). For participants who scored low on moral purity, the more strongly they perceived Democratic elite pathogen threat cues (and Republican downplaying the threat) the more threatening they found the superbacteria, and the stronger they perceived Republican threat cues (and Democrats downplaying the threat) the less threatening they perceived the bacteria. Yet the pattern was opposite for participants who scored high on moral purity: when they perceived stronger Democratic threat cues (and Republicans downplaying the threat) they found the superbacteria less threatening and when they perceived stronger Republican elite threat cues (and Democrats downplaying the threat) the found the superbacteria more threatening. This interaction remained significantly after controlling for covariates, β = .54, *b* = .02, *SE* = .01, *p* < .001.

Figure 14



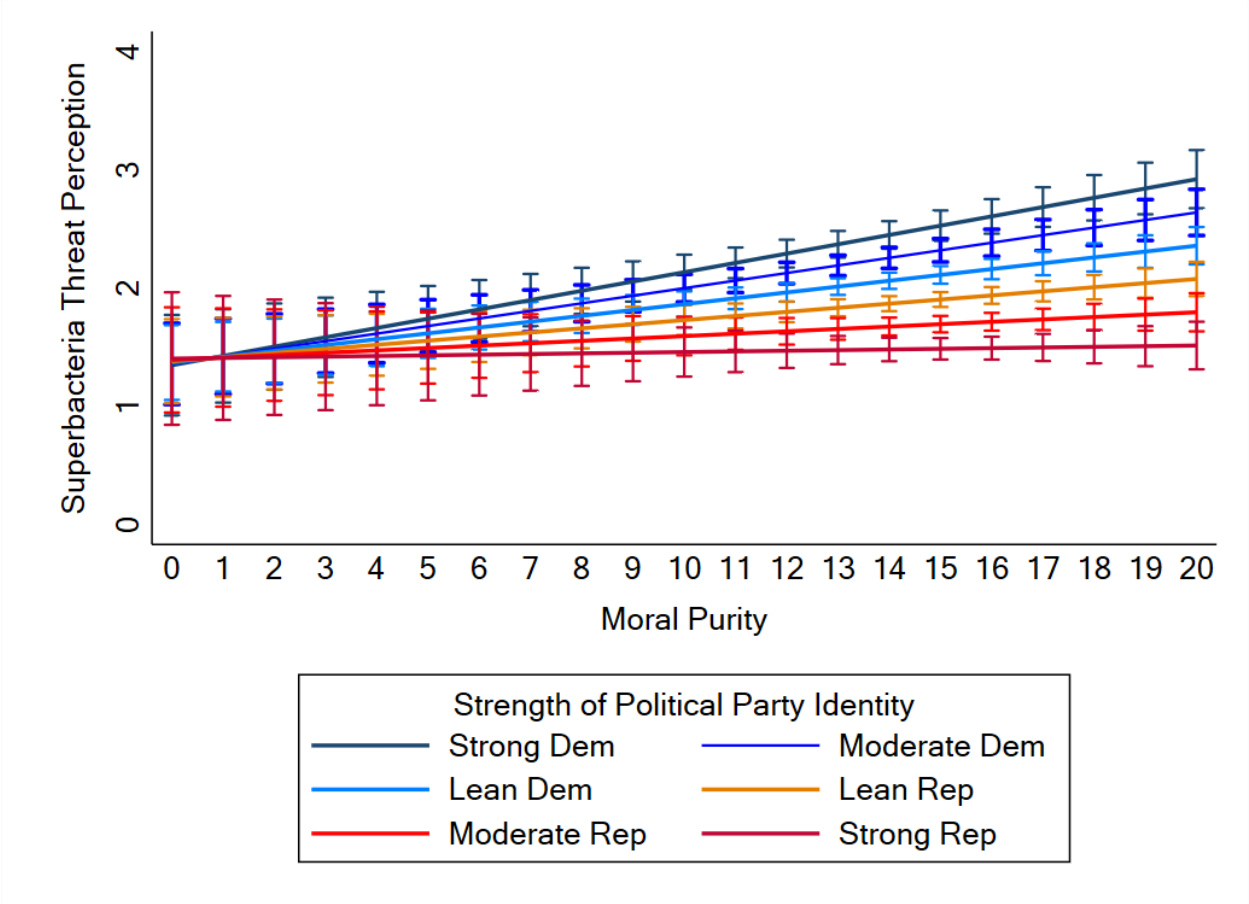
Note. Interaction between perceived strength of political elite pathogen threat cue (from 1 [*Democrats very much more worried*] to 4 [*Democrats and Republicans equally worried / unsure / no political information was given*] to 7 [*Republicans very much more worried*]) and moral purity scores on perceived threat of the fabricated Perinia Accetis superbacteria; Bars = 95% confidence intervals.

Strength of Political Party Identity x Pathogen Disgust Sensitivity. There was no significant interaction between strength of political party identity and pathogen disgust sensitivity on perceived

superbacteria threat, $F(1, 1944) = .09$, $\beta = .04$, $b = .004$, $SE = .03$, $p = .761$. This suggests that, counter to the hypothesis that conservatism is associated with BIS activation, the effect of party identity on superbacteria threat perception did not depend on disgust sensitivity.

Strength of Political Party Identity x Moral Purity. Controlling for experimental condition, there was a significant interaction between strength of political party identity and moral purity scores on perceived superbacteria threat, $F(1, 1935) = 7.97$, $p = .005$. The higher participants scored on moral purity and the stronger they identified as Democrat, the more threatening they perceived the superbacteria, $\beta = -.43$, $b = -.01$, $SE = .005$, $p = .005$ (Figure 15). This interaction remained significant after including all covariates in the model, $F(1, 1920) = 4.54$, $\beta = -.34$, $b = -.01$, $SE = .005$, $p = .034$.

Figure 15

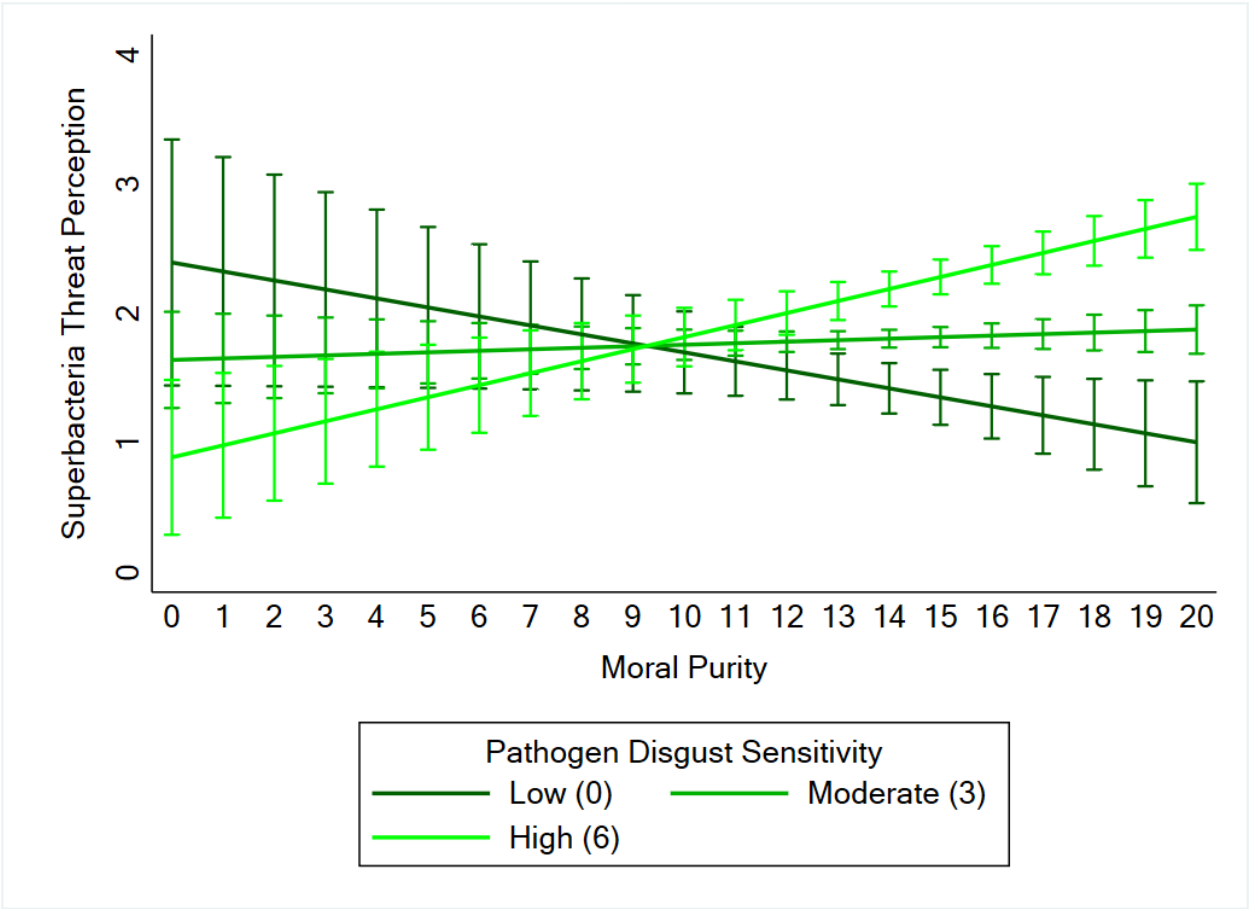


Note. Interaction between self-reported strength of political party identity (measured prior to the current study) and moral purity scores on perceived threat of the Perinia Accetis superbacteria that participants read about in the mock Associated Press article; Bars = 95% confidence intervals.

Pathogen Disgust Sensitivity x Moral Purity. Controlling for experimental condition and self-reported strength of political identity, there was a significant interaction between pathogen disgust sensitivity and moral purity scores on perceived superbacteria threat, $F(1, 1933) = 10.64$, $p = .001$. The higher participants scored on both pathogen disgust sensitivity and moral purity, the more

threatening they perceived the superbacteria, β = .62, *b* = .03, *SE* = .01 (Figure 16). In other words, the effect of moral purity on superbacteria pathogen threat depends on pathogen disgust sensitivity. The interaction remained significant after including all covariates model, $F(1, 1920) = 8.75$, β = .56, *b* = .02, *SE* = .01, $p = .003$.

Figure 16



Note. Interaction between pathogen disgust sensitivity (Tybur et al., 2009) and moral purity scores on perceived threat of the Perinia Accetis superbacteria that participants read about in the mock Associated Press article; Bars = 95% confidence intervals.

Influenza (Seasonal Flu). There was no significant main effect of experimental condition on perceived threat of the seasonal flu, $F(2, 1946) = .69$, $p = .500$, and this remained the same after including covariates in the model, $F(2, 1920) = .07$, $p = .934$. Covariate main effects on perceived flu threat matched the superbacteria results. There was a significant main effect of stronger identification as Democrat, $F(1, 1899) = 82.29$, $\beta = -.28$, $b = -.16$, $SE = .02$, $p < .001$, stronger pathogen disgust sensitivity, $F(1, 1899) = 32.32$, $\beta = .16$, $b = .13$, $SE = .02$, $p < .001$, more self-reported average daily hours of media exposure, $F(1, 1899) = 41.45$, $\beta = .20$, $b = .04$, $SE = .01$, $p < .001$, older age, $F(1, 1899) = 24.59$, $\beta = .17$, $b = .01$, $SE = .002$, $p < .001$, and lower household income, $F(1, 1899) = 8.63$, $\beta = -.09$, $b = -.02$, $SE = .01$, $p = .003$, on influenza threat perception. Controlling for covariates, perceived threat of the flu was not significantly associated with moral purity scores, $F(1, 1899) = .80$, $\beta = .03$, $b = .01$, $SE = .01$, $p = .372$.

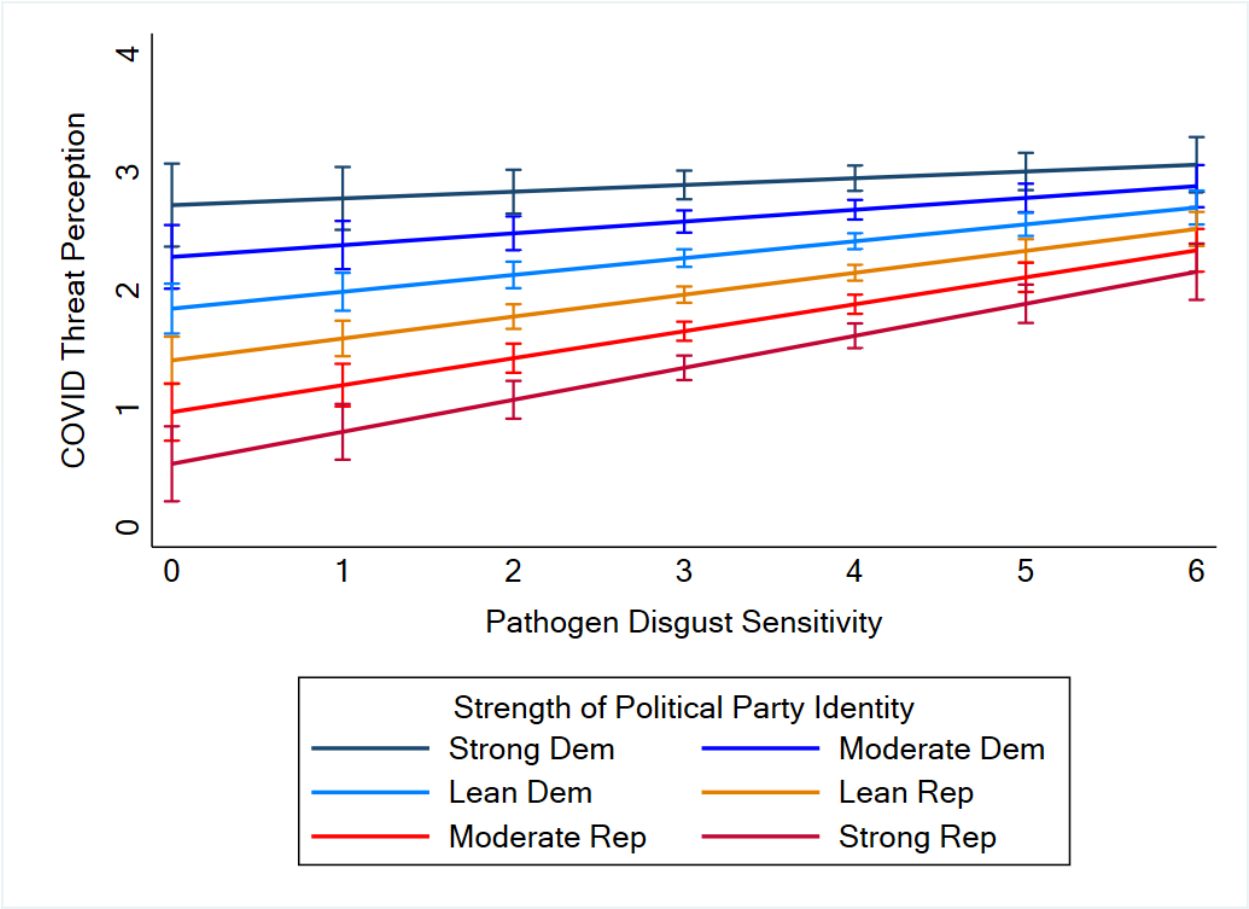
Moderators. There was no interaction between political elite threat cue condition and strength of political identity, $F(2, 1945) = .17$, $p = .858$, pathogen disgust sensitivity, $F(2, 1943) = .06$, $p = .942$, nor moral purity, $F(2, 1934) = .27$, $p = .763$, on influenza threat perception. There was also no interaction between strength of political identity and disgust sensitivity, $F(1, 1944) = .07$, $\beta = -.03$, $b = -.004$, $SE = .01$, $p = .792$, strength of political identity and moral purity, $F(1, 1935) = 3.27$, $\beta = -.31$, $b = -.01$, $SE = .01$, $p = .071$, and disgust sensitivity and moral purity, $F(1, 1933) = 2.09$, $\beta = .37$, $b = .01$, $SE = .01$, $p = .149$, on flu threat perception.

SARS-CoV-2 (COVID-19). There was no significant main effect of experimental condition on perceived threat of COVID, $F(2, 1946) = .14$, $p = .870$, and this remained the same after including covariates in the model, $F(2, 1920) = .40$, $p = .672$. Covariate main effects on perceived COVID-19 threat were similar to, but not exactly the same as, the superbacteria and influenza results. There were significant main effects of identification as Democrat, $F(1, 1899) = 177.73$, $\beta = -.41$, $b = -.25$,

SE = .02, $p < .001$, greater pathogen disgust sensitivity, $F(1, 1899) = 28.60$, β = .15, *b* = .14, *SE* = .03, $p < .001$, more self-reported average daily hours of media exposure, $F(1, 1899) = 21.97$, β = .14, *b* = .03, *SE* = .01, $p < .001$, older age, $F(1, 1899) = 27.04$, β = .20, *b* = .01, *SE* = .002, $p < .001$, identifying as Hispanic (compared to White non-Hispanic), $F(3, 1899) = 4.58$, β = .08, *b* = .29, *SE* = .10, $p = .004$, and identifying as other non-Hispanic (compared to White non-Hispanic), β = .06, *b* = .24, *SE* = .12, $p = .043$, on COVID threat perception. Controlling for condition and covariates, perceived threat of COVID- was not significantly associated with moral purity scores, $F(1, 1899) = .02$, β = -.01, *b* = -.002, *SE* = .01, $p = .880$.

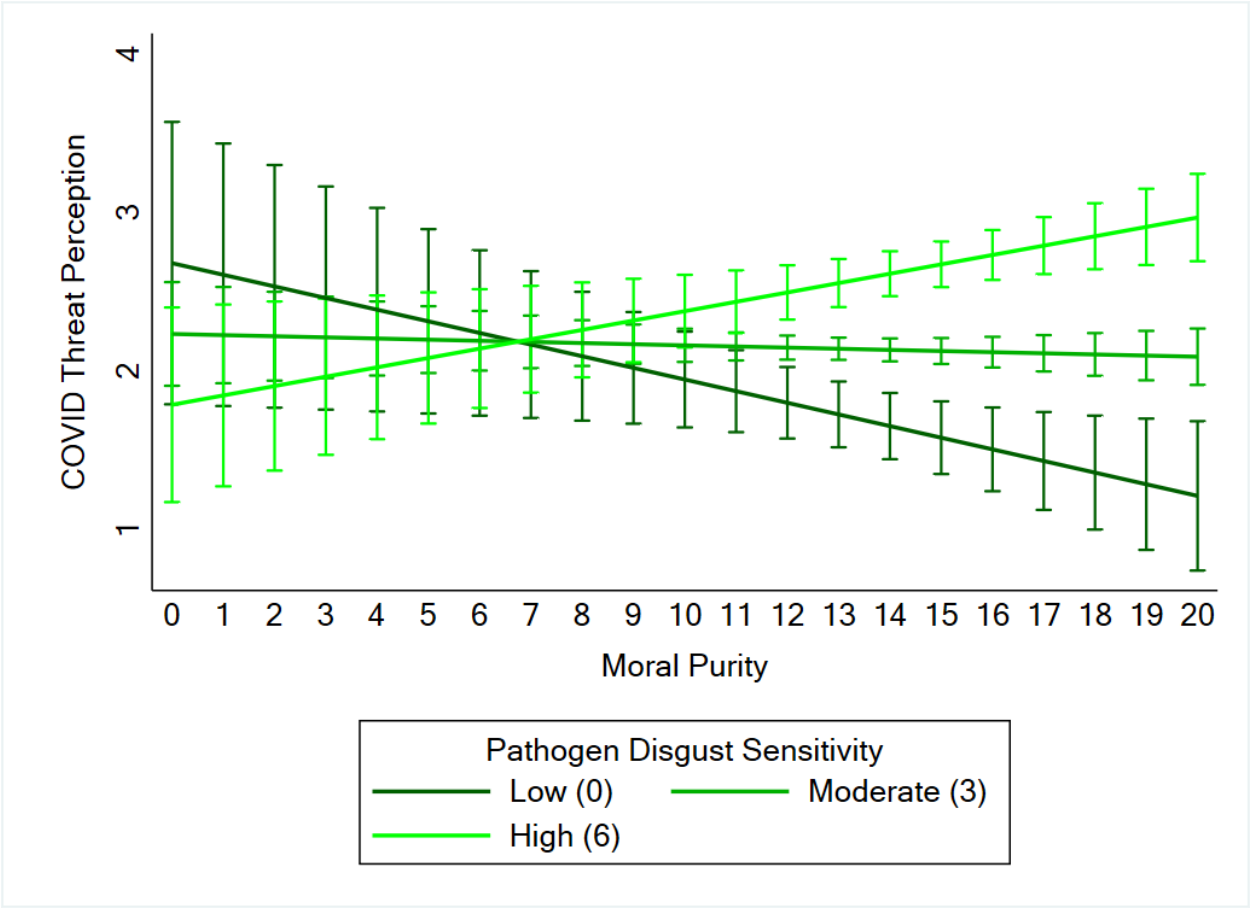
Moderators. There was no significant interaction between political elite threat cue condition and strength of political identity, $F(2, 1945) = 2.09$, $p = .124$, pathogen disgust sensitivity, $F(2, 1943) = .90$, $p = .408$, nor moral purity, $F(2, 1934) = .04$, $p = .963$, on COVID-19 threat perception. There was, however, an interaction between strength of political identity and disgust sensitivity, $F(1, 1944) = 8.52$, β = .33, *b* = .04, *SE* = .01, $p = .004$, controlling for experimental condition (Figure 17). Thus, compared to Democrats, the stronger participants identified as Republican the less they found COVID threatening, and this difference was greater for those lower on pathogen disgust sensitivity. For those higher on disgust sensitivity, the differences in perceived threat of the superbacteria were smaller across the political aisle. There was no significant interaction between strength of political identity and moral purity, $F(1, 1935) = .70$, β = -.13, *b* = -.004, *SE* = .01, $p = .404$, on COVID threat perception. Lastly, controlling for experimental condition and strength of political identity, there was a significant interaction between pathogen disgust sensitivity and moral purity on COVID threat perception, $F(1, 1933) = 7.13$, $p = .008$. As with the fabricated politicized superbacteria, the higher participants scored on both pathogen disgust sensitivity and moral purity, the more threatening they found COVID (Figure 18).

Figure 17



Note. Interaction between strength of political party identity (measured prior to the study) and pathogen disgust sensitivity (Tybur et al., 2009) on perceived threat of COVID; Bars = 95% confidence intervals.

Figure 18



Note. Interaction between pathogen disgust sensitivity (Tybur et al., 2009) and moral purity scores on perceived threat of COVID; Bars = 95% confidence intervals.

Discussion

The aim of Study 3 was two-fold: 1) to experimentally replicate the political polarization seen with COVID-19 and found in Study 2 through the manipulation of partisan elite cues, and 2) to test the individual differences in disgust sensitivity and moral purity in how partisan elite cues shaped responses to the superbacteria. Results from the manipulation check in both studies showed that the elite cues worked in the expected directions. However, perceptions of superbacteria threat did not

follow cues in the same fashion; rather, Republicans found the new superbacteria less worrisome when outgroup Democratic leaders emphasized the threat and ingroup Republican leaders deemphasized it. Yet, Democrats were more worried about the superbacteria than Republicans regardless of political elite cue. This suggests a negative partisanship effect among Republicans that seems to follow what is observed in the real world among responses to COVID-19: that Republicans not only take the threat of COVID-19 less seriously than Democrats, but also actively protest Democratic leaders' public health mandates such as mask wearing (Weisman, 2021. Moreover, results showed that disgust sensitivity is an important predictor of pathogen threat perceptions above and beyond political elite cues. Individual differences in moral purity depended on both political elite threat cues and disgust sensitivity, suggesting that its association with BIS activation may be flexible. These patterns were similarly found for perceptions of COVID-19 threat (another politicized pathogen), but not seasonal flu threat (a non-politicized pathogen).

These findings support research illustrating the effects of partisan bias and ingroup elite messages on people's perceptions of threat (Berinsky, 2007; Bisgaard & Slothuus, 2018; Druckman et al., 2013; Green et al., 2020; Hart et al., 2020; Merkley & Stecula, 2018; Tesler, 2018), and extends this prior literature by demonstrating these effects in a high-powered experimental context with a pathogen participants had no prior knowledge or attitudes about. Interestingly, the stronger participants identified as Democrat the greater threat they perceived for the fake superbacteria, influenza, and COVID-19. On one hand, this could be an anchoring effect whereby answering questions about the threat of the experimentally politicized superbacteria could have primed or anchored participants judgments in perceived threat of the flu and COVID-19. On the other hand, it is possible that once one salient pathogen threat is politicized and perceived through the lens of one's

political identity, then other pathogen threats in the same environment are perceived through the same lens. Further research is needed to better tease apart these effects.

Study 3 also aimed to test individual differences in disgust sensitivity and moral purity in responses to the superbacteria, flu, and COVID-19, and whether these two constructs moderate the effect of the partisan elite cue manipulation. Replicating prior work (Tybur et al., 2009), pathogen disgust sensitivity predicted

The results of this study have important theoretical implications for moral and political psychology. MFT is the dominant view on the nature of morality, which posits that we evolved different moral intuitions to solve issues that arise from our ultra-social nature as a species (Graham et al., 2013). One main criticism is that the purity items of the moral foundations questionnaire are confounded with conservative values (Gray & Keeney, 2015; Kugler et al., 2014). The present results provide a more nuanced view. Moral purity interacted with partisan elite cues in a similar fashion as political identity, with those higher in purity reacting more strongly to the pathogen threat in the Republican elite cues condition, and less so when presented with Democratic elite threat cues, controlling for participant strength of political identity. This suggests that the effect of moral purity on pathogen threat perceptions may depend on political elite cues, and indeed may be confounded in measurement with politics. However, results also showed that Democrats higher in moral purity were significantly more worried about the fake pathogen threat than Democrats lower in moral purity, suggesting that there may be some pathogen-avoidant function to moral purity. On the contrary, pathogen disgust sensitivity predicted stronger responses to the unfamiliar and deadly superbacteria regardless of political elite cues, suggesting that the function of this trait in pathogen avoidance may be stable enough to overcome politically polarized elite threat messages.

Limitations

This research has several limitations that are important to note. First, both Prolific and AmeriSpeak samples found the stimuli, on average, only somewhat believable, which could have led to smaller effect sizes than may be found outside of an experimental context. However, it is difficult to discern whether simply asking if the article was believable in and of itself led to a socially desirable answer, reducing participants mean believability judgment. Moreover, the two experimental conditions were equally believable in both studies, suggesting that differential effects of the experimental partisan elite cues on pathogen perceptions was not due to any difference in believability of the two articles. A second limitation is that this study was conducted during the COVID-19 pandemic, and Americans' perceptions of any new pathogen will be viewed through the same politicized lens as COVID. Thus, the one-sided reactions by Republicans to the Democratic elite threat cue condition may simply be because participants view this new superbacteria threat through the same lens in which they view COVID-19. Indeed, similar interaction effects were found for COVID-19 as the fake superbacteria, but not the seasonal flu.

Chapter 3 Summary

Can any unfamiliar pathogen become politicized? Do political elite cues override people's individual differences in responses to an unfamiliar pathogen? Studies 1 and 2 successfully experimentally politicized a new pathogen by presenting information and political elite cues about the pathogen via an ostensibly real online AP news article. Polarized responses to the pathogen were one-sided, with Republicans responding less strongly when Democratic elites cued threat and Republican elites downplayed the threat, but not vice versa. Results also showed that, controlling for covariates, pathogen disgust sensitivity, but not moral purity, predicted perceived threat of the superbacteria, flu, and COVID-19. These results fail to support the first prediction in Chapter 1 that people higher in conservatism would respond more strongly to pathogen threats. Rather, findings

from Studies 2 and 3 support the second prediction that partisan bias and elite cues shape how people perceive pathogen threats.

CHAPTER 4: GENERAL DISCUSSION

At present, the COVID-19 pandemic has lasted over two years, with new coronavirus variants popping up but serious caseloads remaining lower than earlier in the pandemic, thanks in part to public health vaccination efforts. Among a chaotic news cycle of current events, including the war in Ukraine, climate change, mass shootings, economic inflation, and political upheaval, there is yet again news of a pathogen starting spread: monkeypox. The good news is that the disease is not new, there are already established treatments for it, and it does not spread as easily among people as COVID-19 (https://www.cdc.gov/poxvirus/monkeypox/index.html). Yet, monkeypox causes more visible signs of infection than COVID-19, including skin lesions and pustules. How people respond to the spread of monkeypox will be interesting, given that the visceral symptoms of the disease may more strongly activate peoples' BIS responses, but people may also not react strongly due to fatigue from prolonged worry about COVID-19 and the multitude of other current stressors. Moreover, it is an empirical question whether the politically polarized lens through which partisans perceive COVID-19 will extend to monkeypox. Understanding who responds more strongly pathogen threats and in what contexts is of increasing importance as climate change and increasing global population exacerbate the likelihood of unfamiliar and deadly pathogens spreading widely. Results from the present research suggest that political elite cues will be important in shaping how people perceive and respond to monkeypox and future pathogen threats.

The COVID-19 pandemic has been the worst global pathogen outbreak in a century and will have lasting psychological, geopolitical, and economic impacts for decades to come. Despite the terrible loss of life and distress that it caused, it has also provided a unique opportunity to better understand how psychological mechanisms that theoretically developed throughout ancient tribal

environments influence the way people perceive and respond new pathogen threats in modern technological environments. An extensive review of literature on the BIS, disgust, conservatism, and moral purity was covered in Chapter 1, outlining the prediction that people higher in these pathogen-related attitudes and sensitivities should exhibit stronger responses to an unfamiliar and deadly pathogen. Specifically, numerous studies illustrated that disgust – the main affective component of the BIS – is at least weakly associated with social conservatism (Crawford et al., 2014; Cunningham et al., 2013; Helzer & Pizarro, 2011; Inbar, Pizarro, Knobe, & Bloom, 2009; Inbar, Pizarro, et al., 2012; Olatunji et al., 2017; Smith et al., 2011; Terrizzi Jr. et al., 2010; Terrizzi Jr., et al. 2013), and that social conservatism and disgust are associated with stronger feelings about moral purity (Graham et al., 2009). Conservatism and moral purity are thought to function as attitudinal motivations promoting intragroup cooperation to prevent pathogen spread. However, some of this research has failed to replicate or found only a weak association with BIS activation (Frimer, 2020; Frimer et al., 2017), leaving the empirical question of how these constructs factor into modern pandemics.

When the Ebola outbreak hit the U.S. in 2014, Americans' responses became polarized with Republicans emphasizing the severity of the threat and (Adida et al., 2020). This seemed to confirm the prior literature demonstrating the BIS-conservatism link. However, the Ebola epidemic took place during a Democratic presidential administration and its potential spread in the U.S. was a key policy failure used by Republicans for advantage in the 2014 midterm elections. Consequently, research found that political elite cues played a role in the politicization of Ebola (Singer et al., 2020). In contrast, the COVID-19 pandemic began during a Republican presidential administration and the Trump administration’s apparent failure to contain its spread was seen by Democrats as a key political weakness that could be leveraged to their advantage in the 2020 election. Measures taken by

both administrations to combat the outbreaks became highly politicized (Adida et al., 2020; Gollust et al., 2020), with the opposition party in each case voicing intense criticism of the U.S. government's lack of a sufficiently vigorous response. However, weak responses to COVID-19 by U.S. Republicans called into question the bidirectional effects between BIS activation and social conservatism. Results from all three studies of this dissertation suggest that the association between the BIS and political ideology is dependent on context, particularly whether political ingroup authorities emphasize or deemphasize the seriousness of the pathogen.

The second prediction made in Chapter 1 hypothesized that partisan bias and ingroup authority messages would shape how people respond to new pathogen threats, and this hypothesis was supported by results from all three studies. In Study 1 among a large U.S. nationally representative sample surveyed at the beginning of the pandemic and again six months later, results illustrated that Republicans reported less COVID-19-related fear, risk perceptions, protective behaviors, and vaccination intentions than Democrats, and that these differences diverged over time. Furthermore, Study 1 showed that even among Republicans who had weaker COVID-19 responses there was polarization by support for former President Trump, supporting the importance of ingroup authorities in guiding partisans on how to respond to pathogen threats. Trump supporting Republicans reported less COVID-19 fear, risk perceptions, behaviors, and vaccination intentions than non-Trump Republicans. Importantly, Time 1 political identity and Trump support were measured prior to the pandemic, precluding the explanation that these findings could be due to the pandemic increasing conservatism and Trump support.

This finding was experimentally replicated in Studies 2 and 3 where Republicans found a new pathogen less threatening when outgroup Democratic leaders emphasized the threat and ingroup Republican leaders deemphasized the threat. The inclusion of a no cue control condition allowed for

the interpretation of directionality of the effect – showing that Democrats were worried about the fake superbacteria regardless of political elite cue condition. This suggests an asymmetrical negative partisanship effect where Republicans responded more negatively to outgroup political leader threat cues (and ingroup political leader cues downplaying the threat), while Democrats generally responded equally to ingroup and outgroup authority pathogen threat cues. It is unclear, though, whether this asymmetry is due to the nature of conservative ideology (e.g., having stronger moral intuitions for following ingroup leaders; Altemeyer, 1988; Graham et al., 2009), due to the implications of responses to these pathogens for the ability of Republicans to gain or maintain political power during election years, both possibilities, or some other unknown factor. Additionally, Studies 2 and 3 confounded ingroup and outgroup elite messages such that it is unclear whether the demonstrated effects are due to outgroup leaders emphasizing the pathogen threat, ingroup leaders deemphasizing it, or both. Future research using high-powered samples and careful experimentation will be beneficial in further exploring these potential explanations by better isolating effects due to ingroup versus outgroup elite cues.

Results from Studies 1 and 3 also have theoretical implications for disgust sensitivity and moral purity. Counter to prior studies suggesting that conservatives are more sensitive to disgust (e.g., Inbar et al. 2009, Inbar et al., 2012), there was no zero-order correlation between pathogen disgust sensitivity and conservatism. This might be because of the type of disgust measured. For instance, social conservatism may be specifically related to sexual disgust, but not pathogen or moral disgust (which would explain conservatives' negative attitudes towards sexual minorities and higher moral purity scores; Billingsley et al., 2018; Terrizzi Jr. et al., 2010; Tybur et al., 2015; Tybur et al., 2010). An additional, interesting finding from Study 3 was that pathogen disgust sensitivity predicted stronger perceived superbacteria threat above and beyond partisan elite cues. This suggests that the

visceral experience of disgust may be a strong enough motivator of pathogen avoidance to overcome attempts by political ingroup leaders to regulate pathogen responses. This has implications for understanding who responds more strongly to unfamiliar pathogen threats. For instance, future research may focus on devising public health interventions that target individuals in the population who are lower on sensitivity to disgust to motivate more coordinated public responses to pathogen threats.

Moral purity results were mixed. Consistent with prior research (Graham et al. 2009; Haidt & Graham, 2007), stronger identification as Republican was weakly associated with higher moral purity scores. After controlling for political identity and covariates, Study 1 dd not find a significant association between moral purity and any of the affective, cognitive, nor behavioral COVID-19 response outcomes. This suggests that moral purity may not function to promote avoidance of physical contaminants. It may also be the case that moral purity does have a pathogen-avoidance function, but its measurement is confounded with political ideology. For instance, it could be that disgust-related items of the moral purity scale predict stronger pathogen affect, cognitions, and behaviors, but other items of the subscale that are more related to conservative ideology predict pathogen responses in the opposite direction (consistent with partisan bias and elite cue effects). These opposing directions may then cancel each other out, leading to the null findings in Studies 1 and 3. A third possibility is that no association was found because only a subset of the original moral purity subscale items were used, making it difficult to capture the full construct (although these same items were predictive of COVID-19 responses in a smaller online Prolific sample and the items showed good reliability in both studies). There was, however, a negative correlation with vaccination intentions such that, above and beyond partisan identity and demographic differences, the higher participants scored on moral purity the less they intended to get a COVID-19 vaccine. This may

seem counter-intuitive given that moral purity is theoretically derived from disgust and vaccines provide an effective tool in fighting against viral pathogens. On the contrary, the method of vaccinations – via injection – is an evolutionarily typical way of transmitting disease. Thus, this result does provide some support for a pathogen-avoidance function of moral purity. Moreover, moral purity predicted vaccination intentions in the opposite direction as political identity, suggesting that there is some divergent validity between the two constructs. Future research should continue exploring the boundary conditions between moral purity and BIS functioning, perhaps with the additional of more psychophysiological measurements to better discern the role of physical disgust in moral purity.

In addition to these theoretical considerations, findings from the present research also have implications for public health, communication, and epidemiology. Understanding the conditions under which people exhibit specific responses to pathogens is important for strategizing and deploying community, national, and international efforts to combat disease spread because the decisions made by individuals and authorities in a pathogen-prevalent environment determine the severity of outcome for the broader population (Gollust et al., 2020). The ability to predict population-level variability in pathogen response is necessary for coordinating effective national responses to widespread infectious diseases. The present findings suggest that epidemiologists and public health officials should consider 1) tailoring their messages to the political and cultural narratives of their target audiences, 2) utilizing the target audience's political leaders and authorities to deliver pathogen-related risk communications, and 3) consider the audience's individual differences in sensitivity to disgust, to increase compliance (Gollust et al., 2020), particularly when battling unfamiliar pathogens.

An increasingly global and interconnected society means a greater likelihood of disease spreading beyond the micro-ecologies in which idiosyncratic behavioral immune patterns developed (Kilpatrick, 2011). Understanding the interactive effects political motivations, political authority messages, and individual pathogen-related sensitivities on pathogen threat responses in ideologically-diverse populations could provide insight into best strategies for implementing population-specific risk communications and public health campaigns. Investing into future high-powered research on causal explanations for why and when people respond more strongly to pathogens will be vital for better preparing the world for the next widespread outbreak.

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APPENDIX: SUPPLEMENTAL MATERIAL

Study 1

Model Specification

Each model for the political identity analyses was first specified as a maximal effects model (Barr et al., 2013) with an unstructured covariance structure, by-participant random intercepts, by-participant political identity random slopes, by-participant time random slopes, and by-participant political identity x time interaction random slopes. If the model failed to converge, the following parameters were removed one at a time until the model successfully converged: by-participant time random slopes were removed, by-participant political identity random slopes were removed, by-participant political identity x time interaction random slopes were removed (while adding by-participant political identity and time main effect random slopes back into the model), by-participant time random slopes were then removed, and finally by-participant political identity random slopes were removed. All models included by-participant random intercepts. Main effects models included by-participant random slopes for the main effects of interest (strength of political identity or Trump support), and all interaction models included at least by-participant political identity (or Trump support) x time interaction random slopes.

Descriptive Statistics

Table S1

Study 1 Descriptive Statistics

	Time 1 (March-April 2020)			Time 2 (Sept.-Oct. 2020)		
Variable	Weighted *n* (%)	Weighted mean (95% CI)	Range	Weighted *n* (%)	Weighted mean (95% CI)	Range
Dependent variables						
COVID-19 fear and worry		2.60 (2.56, 2.63)	1, 5		2.45 (2.41, 2.48)	1, 5
COVID-19 infection risk (%)		21.93 (21.13, 22.73)	0, 100		16.42 (15.64, 17.19)	0, 100
Risk of death from COVID-19 (%)		16.74 (15.91, 17.56)	0, 100		16.81 (15.84, 17.78)	0, 100
Seasonal flu risk (%)		16.84 (16.08, 17.60)	0, 100		25.55 (24.55, 26.54)	0, 100
Health-protective behaviors		3.70 (3.67, 3.73)	1, 5		3.76 (3.73, 3.79)	1, 5
COVID-19 vaccine intention (%)		--	--		43.16 (41.69, 44.63)	0, 100
Independent variables						
Strength of political identity		2.89 (2.85, 2.93)	1, 5		2.95 (2.91, 3.00)	1, 5
U.S. Presidential election support	*2016*			*2020*		
Trump-Pence	1,688 (44.58)			1,741 (37.38)		
Not Trump-Pence	2,099 (55.42)			2,917 (62.62)		
Clinton-Kaine	1,773 (46.83)			--		
Biden-Harris	--			2,349 (50.44)		
Other	320 (8.44)			145 (3.11)		
Unsure	--			423 (9.08)		
Did not vote	6 (.15)			--		
Republican subsample	*Unweighted*			*Unweighted*		
Non-Trump Republicans	263 (14.43)			595 (29.02)		
Trump Republicans	1,559 (85.57)			1,455 (70.98)		
Covariates	*Weighted*			*Weighted*		

Self-reported average daily hours of COVID-19 media exposure		7.14 (6.86, 7.43)	0, 33		5.24 (4.99, 5.50)	0, 33
Television, radio, and print news		2.74 (2.63, 2.85)	0, 11		1.91 (1.81, 2.01)	0, 11
Online news sources		2.08 (1.97, 2.18)	0, 11		1.42 (1.33, 1.51)	0, 11
Social media		2.36 (2.23, 2.48)	0, 11		1.92 (1.79, 2.05)	0, 11
Prior mental health diagnosis						
No	5,309 (82.30)			--		
Yes	1,142 (17.70)			--		
Demographics						
Age		47.50 (46.86, 48.15)	18, 97		47.51 (46.81, 48.20)	18, 97
Gender						
Male	3,100 (48.06)			2,716 (47.98)		
Female	3,351 (51.94)			2,945 (52.02)		
Ethnicity						
Black, non-Hispanic	758 (11.75)			668 (11.80)		
Hispanic	1,031 (15.98)			903 (15.96)		
Other / 2+, non-Hispanic	560 (8.68)			492 (8.68)		
Asian, non-Hispanic	220 (3.41)			193 (3.41)		
Other, non-Hispanic	112 (1.74)			100 (1.77)		
2+, non-Hispanic	227 (3.52)			199 (3.51)		
White, non-Hispanic	4,102 (63.59)			3,599 (63.57)		
Education						
No high school diploma	636 (9.86)			552 (9.74)		
High school graduate or equivalent	1,837 (28.47)			1,616 (28.54)		
Some college	1,809 (28.04)			1,588 (28.06)		
BA or above	2,170 (33.64)			1,906 (33.66)		
Household income		3.93 (3.86, 3.99)	1, 8		3.98 (3.91, 4.05)	1, 8
Employment status						
Not working	2,766 (42.88)			2,424 (42.83)		
Working	3,685 (57.12)			3,237 (57.17)		
U.S. Census geographic region						
Northeast	1,117 (17.31)			977 (17.26)		

Midwest	1,353 (20.97)	1,188 (20.99)
South	2,430 (37.66)	2,135 (37.71)
West	1,552 (24.06)	1,361 (24.04)
Time 1 Cohort		
Cohort 1 (March 18 – March 28, 2020)	2,039 (31.60)	
Cohort 2 (March 29 – April 07, 2020)	2,268 (35.16)	
Cohort 3 (April 08 – April 18, 2020)	2,144 (33.24)	

Note. CI = confidence intervals (lower limit, upper limit); -- = not measured; Self-reported strength of political party affiliation ranged from 1 (S*trong Democrat*) to 3 (D*on't lean / Independent / None*) to 5 (S*trong Republican*); COVID-19 vaccine intention higher = more likely to get the vaccine; Household income ranged from *less than $24,999* to *$175,000 or more*; Numbers may vary from total sample size due to missing data; Time 1 N = 6,514, Time 2 N = 5,661.

Study 2

Descriptive Statistics

Table S2

Study 2 Prolific Sample (N = 400) Descriptive Statistics

Variable	*n* (%)	Mean (*SD*)	Range
Dependent			
Perinia Accetis pathogen threat perception		2.93 (1.05)	1, 5
Seriousness		3.19 (1.06)	1, 5
Worry		2.67 (1.19)	1, 5
Manipulation Check			
Strength of perceived partisan elite cue (higher = Republicans more worried)		3.60 (2.16)	1, 7
Democratic threat cue condition		1.49 (.98)	1, 7
Control condition		3.62 (1.09)	1, 7
Republican threat cue condition		6.01 (1.38)	1, 7
Independent			
Experimental Political Elite Threat Cue Condition			
Democratic threat cue condition	141 (35.25)		
Control condition	137 (34.25		
Republican threat cue condition	122 (30.50)		
Moderator			
Strength of political party identity (higher = stronger Republican)		3.94 (2.23)	1, 7
Strong Democrat	87 (21.75)		
Moderate Democrat	63 (15.75)		
Leans Democrat	37 (9.25)		
Independent / other	12 (3.00)		
Leans Republican	62 (15.50)		
Moderate Republcan	80 (20.00)		
Strong Republican	58 (14.50)		
Additional Variables			
Believability of Associated Press article		2.76 (1.09)	1, 5
Democratic threat cue condition		2.55 (1.25)	1, 5
Control condition		2.98 (.95)	1, 5
Republican threat cue condition		2.74 (.99)	1, 5
Associated Press political bias perception (higher = heavier pro-Republican bias)		3.47 (1.27)	1, 7
Democratic threat cue condition		3.16 (1.22)	1, 7

Control condition		3.38 (1.05)	1, 7
Republican threat cue condition		3.93 (1.41)	1, 7
Falsely remembered Perinia Accetis in prior news			
No	392 (98.00)		
Yes	6 (1.50)		
Demographics			
Age		35.30 (13.10)	19, 92
Gender			
Men	183 (45.75)		
Women	206 (51.50)		
Non-binary / other	10 (2.50)		
Race / ethnicity			
Asian / Pacific Islander	11 (2.75)		
Black / African American	29 (7.25)		
Hispanic / LatinX	13 (3.25)		
Multiple / 2+	18 (4.50)		
Other	1 (0.25)		
White / European	328 (82.00)		
Household income		6.36 (2.55)	1, 12
Education		4.48 (1.38)	1, 7
Less than high school	2 (0.5)		
High school diploma	41 (10.25)		
Some college	75 (18.75)		
Associates (2 year) degree	32 (8.00)		
Bachelors (4 year) degree	158 (39.50)		
Masters or professional degree	79 (19.75)		
Doctorate or equivalent	13 (3.25)		

Note. Sample was recruited from June 14th to 16th, 2021; *SD* = standard deviation; Strength of political party identity ranged from 1 (*Democrats very much more worried)* to 4 (*Democrats and Republicans equally worried / unsure) to 7* (*Republicans very much more worried*); Strength of political party identity ranged from 1 (*Strong Democrat*) to 4 (*Independent / Other*) to 7 (*Strong Republican*); perceived Associated Press political bias ranged from 1 (*Heavy pro-Democrat bias*) to 4 (*No political bias / balanced coverage*) to 7 (*Heavy pro-Republican bias*); Household income ranged from 1 (*Less than $5,000*) to 6 (*$60,000 to 79.999*) to 12 (*$250,000 or higher*); numbers may vary from total sample size due to missing data.

Materials

Participants were instructed: "In this study you will be presented with one of several brief Associated Press articles that were just released within the last few hours (with hyperlinks disabled). Please read the article carefully. You will then be asked a few questions about the article and about yourself. All responses will remain confidential and anonymous. Of course, there are no right or wrong answers. Please complete the questions honestly and in the order they are presented. At this time, please minimize any distractions (e.g., music, open tabs and programs). Please stay on the survey page for the entirety of the survey unless you no longer consent to participate. Thank you for your help!". Upon clicking to the next page of the study, participants were then randomly assigned to one of the three mock online Associated Press (AP) news articles below. Each article included an ostensibly real AP online news article layout, the name of a real AP journalist, an indicator of when the story was supposedly published ("an hour ago"), ostensibly disabled hyperlinks, and a picture of an actual superbacteria up-close under a microscope. The three experimental conditions consisted of:

Measures

Attention Check. The attention check item was embedded among items about the stimulus material before demographic items. Participants were asked, "In general, to what extent do you think the sky in blue? (please choose the answer very)" with response options 1 (*Not at all*), 2 (*A little*), 3 (*Somewhat*), 4 (*Very*), and 5 (*A great deal*).

AP Article Stimulus Check. To assess perceived partisan bias of Associated Press as a news outlet, participants were asked, "In general, to what extent do you think Associated press is a politically biased source of news?" with response options 1 (*Heavy pro-Democrat bias*), 2

(*Moderate pro-Democrat bias*), 3 (*Slight pro-Democrat bias*), 4 (*No political bias / balanced coverage*), 5 (*Slight pro-Republican bias*), 6 (*Moderate pro-Republican bias*), and 7 (*Heavy pro-Republican bias*). To assess potential false memory of this pathogen, participants were asked, "Have you heard or read about the Perinia Accetis superbacteria in any prior news reports?" with response options *yes* and *no*.

Age. Participants were asked, "What is your age?" and input a number.

Gender. Participants were asked, "What is your gender" with response options *male*, *female*, *non-binary / other*, and *prefer not to say*.

Race / Ethnicity. Participants were asked, "What ethnicity or ethnicities do you identify most as? (please select all the apply) with response options *Asian / Pacific Islander*, *Black / African American*, *Hispanic / LatinX*, *Middle Eastern*, *Native American / Indigenous Peoples*, *Other*, and *White / European*.

Education. Participants were asked, "What is your highest level of completed education?" with response options 1 (*Less than high school*), 2 (*High school diploma*), 3 (*Some college*), 4 (*Associated (2 year) degree*), 5 (*Bachelors (4 year) degree*), 6 (*Masters or Professional degree*), and 7 (*Doctorate or equivalent*).

Household Income. Participants were asked, "What is your approximate household income from the past 12 months?" with response options 1 (*Less than $5,000*), 2 (*$5,000 to $14,999*), 3 (*$15,000 to $19,999*), 4 (*$20,000 to $39,999*), 5 (*$40,000 to $59,999*), 6 (*$60,000 to $79,999*), 7 (*$80,000 to $99,999*), 8 (*$100,000 to $119,999*), 9 (*$120,000 to $149,999*), 10 (*$150,000 to $199,999*), 11 (*$200,000 to $249,999*) , 12 (*$250,000 or more*).

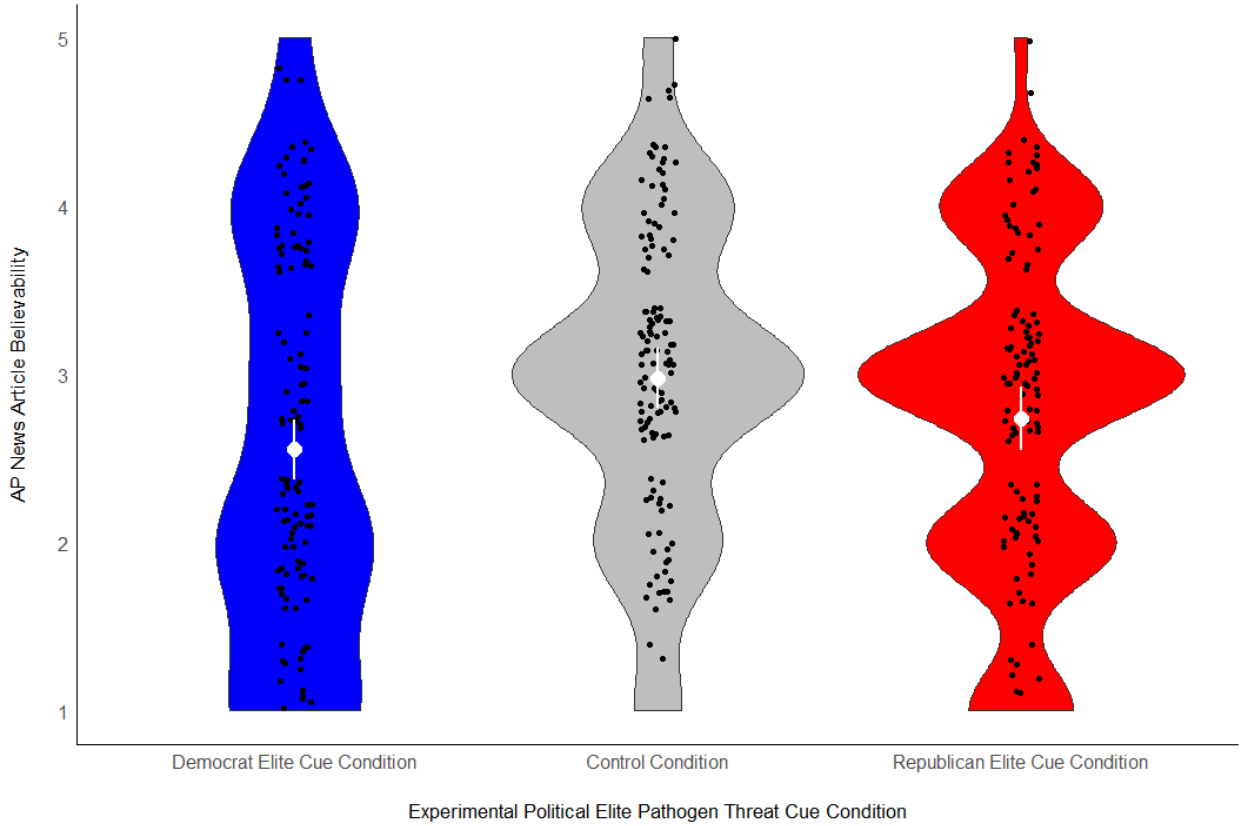
Language. As a double check of the screener to be eligible to participate in the study, participants were asked, "Is English your first language?" with response options *Yes* and *No*.

Current Country Residence. As a double check of the screener to be eligible to participate in the study, participants were asked, "Do you currently reside in the United States?" with response options *Yes* and *No*.

Nationality. As a double check of the screener to be eligible to participate in the study, participants were asked, "Is your current nationality United States?" with response options *Yes* and *No*.

Associated Press Article Stimulus Believability ANOVA By Condition

Figure S1



Note. Study 1 experimental stimulus believability check; Higher Associated Press (AP) new article believability = more believable; Black dots = data points with a small amount of random variation to the location of each point; White circle = mean with 95% confidence intervals (white lines).

Study 3

Descriptive Statistics

Table S3

Study 3 NORC AmeriSpeak Sample (Weighted N = 1,947) Descriptive Statistics

Variable	Unweighted *n* (%)	Weighted *n* (%)	Unweighted Mean (*SD*)	Weighted Mean (*SE*)	Range
Demographics					
Age			49.99 (16.64)	48.54 (.58)	18, 93
Gender					
Men	951 (48.84)	934 (47.96)			
Women	996 (51.16)	1013 (52.05)			
Race / ethnicity					
Black, non-Hispanic	208 (10.68)	231 (11.88)			
Hispanic	222 (11.40)	244 (12.52)			
Other, non-Hispanic	135 (6.93)	167 (8.59)			
Asian	56 (2.88)	105 (5.40)			
Other	28 (1.44)	22 (1.14)			
2+	51 (2.62)	40 (2.05)			
White, non-Hispanic	1382 (70.98)	1305 (67.00)			
Household income			10.45 (4.10)	10.32 (.14)	1, 18
Education			3.32 (1.01)	3.13 (.04)	1, 5
Less than high school	63 (3.24)	139 (7.14)			
High school graduate or equivalent	297 (15.25)	505 (25.92)			
Vocational school / some college / associates	837 (42.99)	565 (29.02)			
Bachelor's degree	458 (23.52)	441 (22.65)			
Post graduate study / Professional degree	292 (15.00)	297 (15.27)			
U.S. Census Bureau-designated geographic region					
Northeast	258 (13.25)	337 (17.32)			
Midwest	534 (27.43)	422 (21.67)			
South	646 (33.18)	747 (38.36)			

West	509 (26.14)	441 (22.66)			
Employment status					
Not working	749 (38.47)	773 (39.69)			
Working	1198 (61.53)	1174 (60.31)			
Marital status					
Never married	418 (21.47)	480 (24.67)			
Married / cohabitating	1207 (61.99)	1152 (59.15)			
Widowed / divorced / separated	322 (16.54)	315 (16.18)			
Strength of political party identity			3.52 (1.86)	3.41 (.05)	1, 6
Strong Democrat	415 (21.31)	425 (21.83)			
Not so strong Democrat	303 (15.56)	329 (16.88)			
Lean Democrat	231 (11.86)	266 (13.67)			
Lean Republican	271 (13.92)	252 (12.94)			
Not so strong Republican	308 (15.82)	293 (15.06)			
Strong Republican	419 (21.52)	382 (19.61)			
Strength of political ideology					
Very liberal	258 (13.64)	242 (12.87)			
Somewhat liberal	207 (10.94)	225 (11.97)			
Moderate	806 (42.60)	826 (43.87)			
Somewhat conservative	348 (18.39)	321 (17.05)			
Very conservative	273 (14.43)	268 (14.23)			
2020 Presidential Election Vote					
Joe Biden	810 (46.98)	780 (47.19)			
Donald Trump	712 (41.30)	645 (39.02)			
Other	47 (2.73)	43 (2.62)			
Did not vote	155 (8.99)	185 (11.12)			
Religion					
Agnostic (not sure if there is a God)	126 (6.50)	139 (7.13)			
Atheist (do not believe in God)	118 (6.09)	128 (6.61)			
Buddhist	16 (.83)	23 (1.18)			
Christian	1361 (70.23)	1345 (69.20)			
Just Christian (general)	389 (20.07)	418 (21.53)			

Mormon (Church of Jesus Christ of Latter-Day Saints)	44 (2.27)	31 (1.57)			
Orthodox (Greek, Russian, or other Orthodox church)	5 (.26)	4 (.19)			
Protestant (Baptist, Methodist, Non-denominational, Lutheran, Presbyterian, Pentecostal, Episcopalian, Reformed)	585 (30.19)	536 (27.59)			
Roman Catholic (Catholic)	338 (17.44)	356 (18.32)			
Hindu	6 (.31)	9 (.48)			
Jewish (Judaism)	17 (.88)	16 (.83)			
Muslim (Islam)	11 (.57)	7 (.35)			
Nothing in particular	223 (11.51)	215 (11.07)			
Something else	47 (2.43)	48 (2.45)			
Unitarian (Universalist)	13 (.67)	14 (.70)			
Belief in a God or gods			2.84 (1.42)	2.81 (.04)	0, 4
Religious service attendance			3.73 (2.73)	3.63 (.08)	1, 9
Survey Metrics			8.10 (5.65)	7.91 (.16)	2, 47
Survey duration (minutes)					
Stimulus page duration (seconds)			60.38 (75.00)	58.55 (2.02)	5, 1305
Control condition			44.22 (68.73)	41.33 (2.86)	5, 954
Democrat threat cues condition			66.82 (77.76)	65.77 (4.15)	5, 1305
Republican threat cues condition			69.77 (75.64)	67.28 (3.21)	5, 863

Note. *SD* = standard deviation; *SE* = standard error; Range = lower limit, upper limit; Self-reported household income was measured from 1 (*Less than $5,000*) to 9 (*$40,000 to $49,999*) to 18 (*$200,000 or more*); Strength of political identity higher = stronger Republican; Strength of political ideology higher = more conservative; Belief in a God or gods higher = stronger belief; Self-reported religious service attendance higher = more frequent; Numbers may vary from total sample size due to missing data.

Table S4

Study 3 Variable Descriptive Statistics

Variable	Unweighted *n* (%)	Weighted *n* (%)	Unweighted Mean (*SD*)	Weighted Mean (*SE*)	Range
Dependent					
Pathogen seriousness					
Perinia Accetis superbacteria			1.96 (1.17)	1.97 (.04)	0, 4
Influenza (seasonal flu)			1.76 (1.07)	1.79 (.03)	0, 4
SARS-CoV-2 (COVID-19)			2.35 (1.18)	2.39 (.04)	0, 4
Pathogen worry					
Perinia Accetis superbacteria			1.77 (1.23)	1.79 (.04)	0, 4
Influenza (seasonal flu)			1.54 (1.15)	1.57 (.03)	0, 4
SARS-CoV-2 (COVID-19)			2.11 (1.28)	2.17 (.04)	0, 4
Perinia Accetis U.S. resource response			1.99 (1.16)	2.02 (.03)	0, 4
Pathogen threat composite					
Perinia Accetis superbacteria			1.91 (1.06)	1.93 (.03)	0, 4
Influenza (seasonal flu)			1.65 (1.05)	1.68 (.03)	0, 4
SARS-CoV-2 (COVID-19)			2.23 (1.17)	2.29 (.04)	0, 4
Independent					
Political elite threat cue condition					
Control condition	641 (32.92)	619 (31.77)			
Democrat threat cues condition	648 (33.28)	628 (32.25)			
Republican threat cues condition	658 (33.80)	701 (35.98)			
Perceived strength of political elite threat cue			3.75 (1.93)	3.86 (.06)	1, 7
Democrat threat cues condition			2.13 (1.43)	2.26 (.08)	1, 7
Control condition			3.74 (.83)	3.75 (.04)	1, 7
Republican threat cues condition			5.35 (1.78)	5.37 (.09)	1, 7
Covariates					

Moral foundations			
Harm	3.80 (.85)	3.78 (.03)	1, 5
Fairness	4.02 (.92)	4.02 (.03)	1, 5
Loyalty	3.39 (1.12)	3.35 (.04)	1, 5
Authority			1, 5
Purity	13.81 (3.39)	13.68 (.10)	4, 20
Decency important virtue	3.53 (1.10)	3.49 (.03)	1, 5
Should not do disgusting things	3.42 (1.07)	3.41 (.03)	1, 5
Some unnatural acts are wrong	3.30 (1.06)	3.27 (.03)	1, 5
Controlling sexual desires important	3.59 (1.07)	3.53 (.03)	
Sensitivity to disgust (pathogen subscale)	3.84 (1.27)	3.92 (.04)	0, 6
Standing next to body odor	3.89 (1.50)	3.97 (.05)	0, 6
Shaking hands with sweaty palms	3.30 (1.62)	3.35 (.05)	0, 6
Stepping in dog feces	4.39 (1.53)	4.45 (.05)	0, 6
Touching someone's bloody cut	3.80 (1.83)	3.91 (.05)	0, 6
Feeling thermometers			
Biden	41.83 (34.53)	43.59 (1.03)	0, 100
Trump	39.05 (38.02)	39.02 (1.14)	0, 100
Self-reported average daily hours of media exposure over past week	5.09 (5.34)	5.30 (.18)	0, 33
TV, radio, print news	1.98 (2.38)	1.98 (.07)	0, 11
Online news (Yahoo, NYTimes, etc.)	1.38 (2.01)	1.40 (.07)	0, 11
Social media (Facebook, Twitter, etc.)	1.74 (2.44)	1.94 (.09)	0, 11
Believability of AP news article stimulus	1.80 (1.00)	1.82 (.03)	0, 4
Control condition	2.01 (.95)	2.00 (.05)	0, 4
Democrat threat cues condition	1.70 (1.02)	1.75 (.05)	0, 4
Republican threat cues condition	1.70 (.98)	1.72 (.05)	0, 4

Note. *SD* = standard deviation; *SE* = standard error; Range = lower limit, upper limit; Perceived strength of political elite threat cue (manipulation check) ranged from 1 (*Democrats very much more worried*) to 4 (*Democrats and Republicans equally worried / unsure*) to 7 (*Republicans very much more worried*); The first four moral foundations are top loading items from Graham et al.,

2013, and purity consists items are the same as Study 2; Disgust sensitivity consisted of the top four loading items of the Pathogen Subscale of the Three-Domain Disgust Scale (Tbybur et al., 2009); Numbers may vary from total sample size due to missing data.

Measures

Moral Foundations. Each of the other four moral foundations were measured using a single item chosen from the MFQ-30 based on the top loading item for each foundation (Graham et al., 2011), and included harm ("Compassion for those who are suffering is the most crucial virtue"), fairness, ("When the government makes laws, the number one principle should be ensuring that everyone is treated fairly"), ingroup ("I am proud of my country's history"), and authority ("Respect for authority is something all children need to learn"). All moral foundation items were measured from 1 (Strongly disagree) to 3 (Neither agree nor disagree) to 5 (Strongly agree).

Education. Highest completed education was measured as part of a panel demographics survey prior to the current study and consisted of response options 1 (*Less than high school*), 2 (*High school graduate or equivalent*), 3 (*Vocational / tech school / some college / associates*), 4 (*Bachelor's degree*), and 5 (*Post grad study / professional degree*).

Household Income. Household income was measured as part of a panel demographics survey prior to the current study and consisted of response options 1 (*Less than $5,000*), 2 (*$5,000 to $9,999*), 3 (*$10,000 to $14,999*), 4 (*$15,000 to $19,999*), 5 (*$20,000 to $24,999*), 6 (*$25,000 to $29,999*), 7 (*$30,000 to $34,999*), 8 (*$35,000 to $39,999*), 9 (*$40,000 to $49,999*), 10 (*$50,000 to $59,999*), 11 (*$60,000 to $74,999*), 12 (*$75,000 to $84,999*), 13 (*$85,000 to $99,999*), 14 (*$100,000 to $124,999*), 15 (*$125,000 to $149,99*), 16 (*$150,000 to $174,999*), 17 (*$175,000 to $199,999*), and 18 (*$200,000 or more*).

Employment Status. Employment status was measured as part of a panel demographics survey prior to the current study and consisted of response options 1 (*Working – as a paid employee*), 2 (*Working – self-employed*), 3 (*Not working – on temporary layoff from a job*), 4

(*Not working – looking for work*), 5 (*Not working – retired*), 6 (*Not working – disabled*), and 7 (*Not working – other*). These categories were collapse into two levels such that the latter four levels were collapsed into 0 (*Not working*) and the first two levels were collapsed into 1 (*Working*).

Marital Status. Marital status was measured as part of a panel demographics survey prior to the current study and consisted of response options 1 (*Married*), 2 (*Widowed*), 3 (*Divorced*), 4 (*Separated*), 5 (*Never married*), and 6 (*Living with partner*). These were collapsed into three categories: 1 (*Never married*), 2 (*Widowed / Divorced / Separated*), and 3 (*Married / Cohabitating*).

Geographic Region. Participants' home state was measured as part of a panel demographics survey prior to the current study. A variable was created that categorized participants into one of four U.S. Census Bureau-designed geographic regions based on the state participants live in, with the categories 1 (*Northeast*), 2 (*Midwest*), 3 (*South*), and 4 (*West*).

2020 U.S. Presidential Election Vote. 2020 U.S. presidential election vote was measured as part of a panel demographics survey prior to the current study and included the categories *Voted for Biden*, *Voted for Trump*, *Voted for another candidate*, and *Did not vote*.

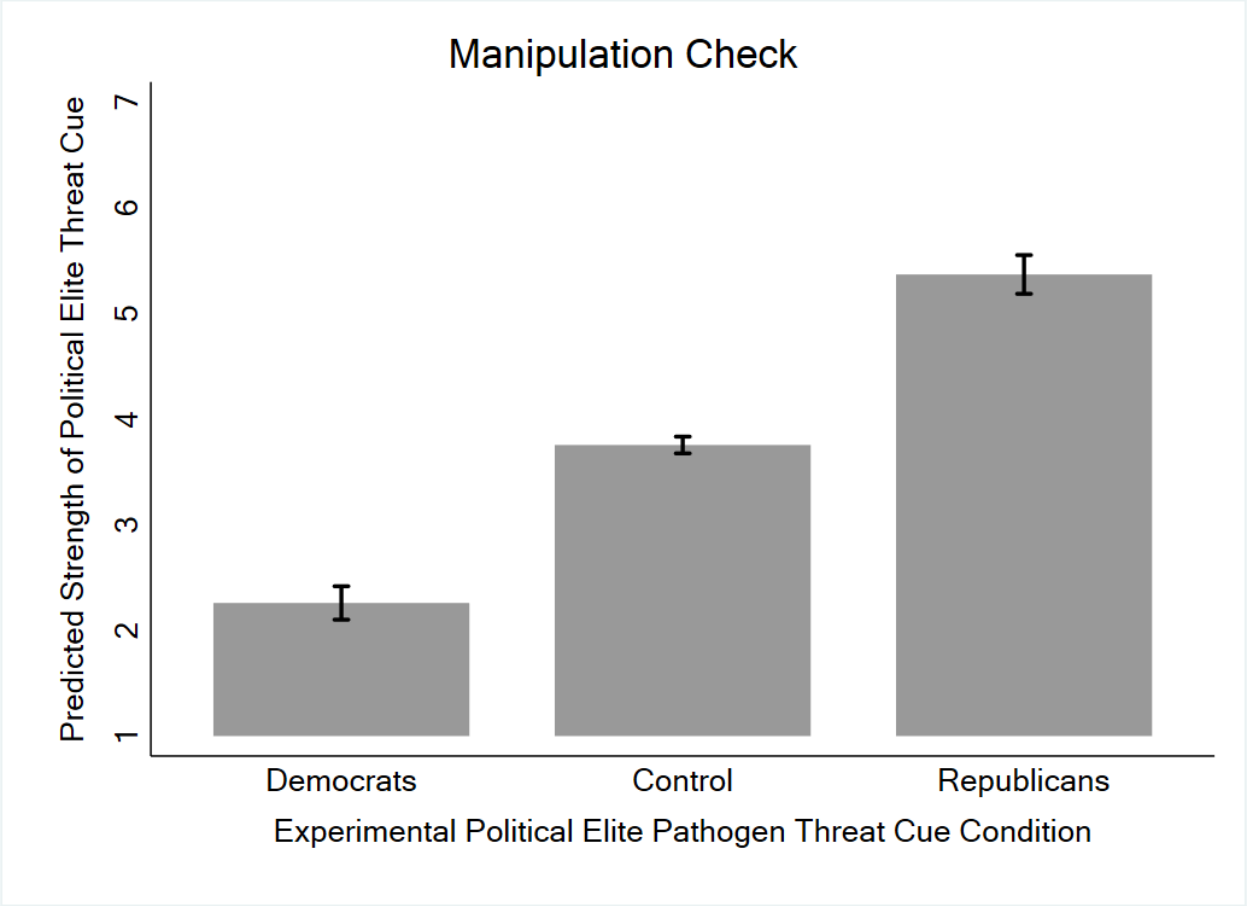
God Belief. As part of a panel survey prior to the current study, participants were asked, "To what degree do you believe in a God or a deity?" with response options 1 (*Not at all*), 2 (*A little*), 3 (*Somewhat*), 4 (*Very much*), or 5 (*A great deal*). For participants missing this item in the prior panel survey, they were asked this item at the end of the current survey.

Frequency of Religious Service Attendance. As part of a panel demographics survey prior to the current study, participants were asked, "How often do you attend religious services?" with response options 1 (*Never*), 2 (*Less than once a year*), 3 (*About once or twice a year*), 4

(*Several times a year*), 5 (*About once a month*), 6 (*2-3 times a month*), 7 (*Nearly every week*), 8 (*Every week*), and 9 (*Several times a week*). For participants missing this item in the prior panel survey, they were asked this item at the end of the current survey. ***Religion.*** Religious affiliation was measured as part of a panel demographics survey prior to the current study and included the categories: *Protestant (Baptist, Methodist, Non-denominational, Lutheran, Presbyterian, Pentecostal, Episcopalian, Reformed)*, *Roman Catholic (Catholic)*, *Mormon (Church of Jesus Christ of Latter-day Saints / LDS)*, *Orthodox (Greek, Russian, or some other orthodox church)*, *Jewish (Judaism)*, *Muslim (Islam)*, *Buddhist*, *Hindu*, *Atheist (do not believe in God*), *Agnostic (not sure if there is a God)*, *Nothing in particular*, *Just Christian*, *Unitarian (Universalist)*, and *Something else*. For participants missing this item in the prior panel survey, they were asked this item at the end of the current survey.

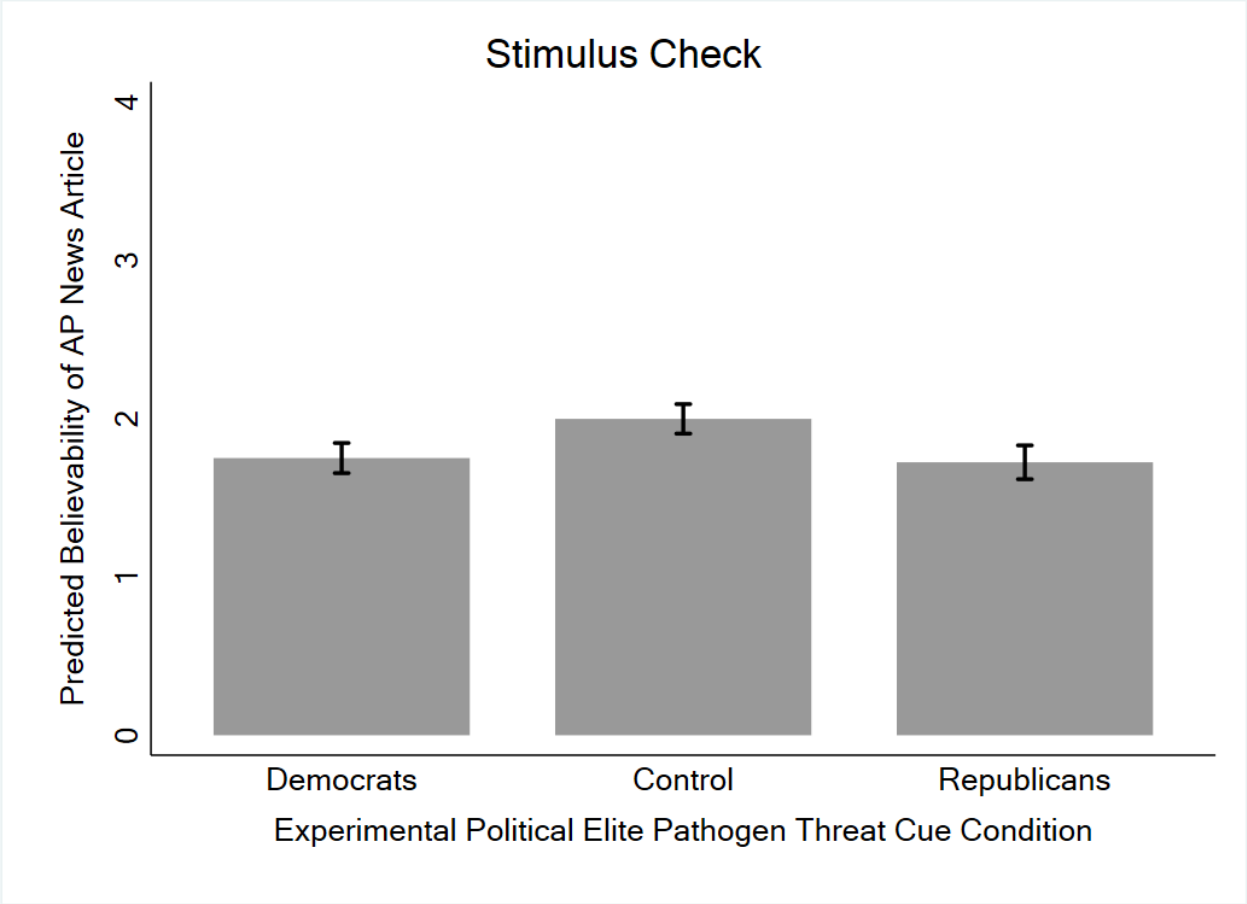
Manipulation and Stimulus Checks

Figure S2



Note. Study 2 manipulation check conducting an ANOVA on perceived strength of political elite pathogen threat cue by experimental political elite pathogen threat cue condition. Perceived trength of political elite threat cue ranged from 1 (*Democrats very much more worried*) to 4 (*Democrats and Republicans equally worried / unsure / no political information was given*) to 7 (*Republicans very much more worried*).

Figure S3



Note. Study 2 Associated Press news article stimulus check; An ANOVA was conducted on reported believability of the stimulus article by experimental political elite threat cue condition. Believability ranged from 0 (*Not at all*) to 2 (*Somewhat*) to 4 (*A great deal*).