

2023

## **Influence of Conspiracy Mindset, Trust in Science, and Political Affiliation on COVID-19 Reactance**

Bonnie L. Rinato  
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# Walden University

College of Psychology and Community Services

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Bonnie L. Rinato

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Walden University  
2023

Abstract

Influence of Conspiracy Mindset, Trust in Science, and Political Affiliation

on COVID-19 Reactance

by

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BA, The Ohio State University – Newark, 2014

MS, Walden University, 2016

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Social Psychology

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## Abstract

The COVID-19 pandemic exposed extreme divisions in the social and political structure of the United States. When health organizations recommended strategies such as physical distancing, hand hygiene, sanitation of surfaces, and isolating when sick to slow the spread of the disease, Americans appeared to divide into two factions; those who followed the public health guidance and those who persistently ignored it, often voicing perceptions of loss of freedom due to the guidance. The purpose of this quantitative study was to examine the extent to which political affiliation moderated the relationship between conspiracy mindset, trust in science, and reactance responses to COVID-19 public health protocols. The social identity approach, a blend of social identity and self-categorization theories explains the polarization in the United States to public health guidance designed to slow the spread of disease. Online surveys were administered via Survey Monkey to 220 American citizens who were active politically. Results indicated that political conservatives were significantly more likely to endorse conspiracy theories and to resist compliance with COVID-19 public health protocols. Additionally, those who distrusted science were significantly more likely to resist compliance with COVID-19 mitigation practices. Findings from this study have the potential to promote positive social change through a better understanding of the reasons for resistance to public health protocols designed to thwart the spread of COVID-19. Importantly, these results can be used to develop messaging that targets those susceptible to conspiracy beliefs and instead direct their attention to the science that informs public safety protocols in the interest of us all.

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## Chapter 1: Introduction to the Study

### **Introduction**

The COVID-19 pandemic exposed extreme divisions in the social and political structure of the United States. At a time when accurate and effective communication was vital to limit the spread and lessen the impact of the disease (Hua, & Shaw, 2020; Marimuthu et al., 2020), incorrect information, half-truths, and outright lies were propagated (Kulkarni et al., 2020). In the United States, the source of misinformation went all the way to the top with former President Trump downplaying the severity of the crisis (Balogun, 2020; Hahn, 2021) which, amplified by the media (Chung & Jones-Jang, 2021; Hart et al., 2020), created a false sense of safety and increased spread of the disease by those who trusted Trump more than science (Calvillo et al., 2020; Dolinski et al., 2020; Granados Samayoa et al., 2021; Vieira et al., 2020). Hahn (2021) estimated that Trump's downplaying of the disease cost between 4,244 and 12,202 additional Americans their lives in a 3-month period in 2020.

The pandemic also exposed pre-existing concerns over the United States' ability to properly handle an epidemic or pandemic due to polarized political ideologies (Klain, 2018), low enthusiasm for social interventions necessary to curb the spread of pathogens (Schwartz, 2018), the dismantling of the National Security Council's global health security office and the early warning pandemic program in 2019 (Balogun, 2020), and the lack of central decision making to implement needed social interventions (Katz et al., 2019). Additionally, confusion and conflicting advice about the use and effectiveness of

masks further hindered the social mitigation behaviors necessary to slow the spread of the disease (Hickner, 2020; Ramakrishnan, 2020).

The body of literature examining the social and psychological effects of the pandemic has grown exponentially as the pandemic lingers (e.g., Carbone et al., 2021; Clement-Suárez et al., 2020; Li et al., 2021; Van Bavel et al., 2020). However, the separate and cumulative effects of trust in science, conspiracy mindset, and political affiliation, especially as they relate to compliance with public health protocols to slow the spread of COVID-19, have been unclear. This study has the potential to inform positive social change by understanding not just the influence of conspiracies and trust in science but the overarching influence of political affiliation on willingness to comply with public health protocols necessary to reduce the spread of COVID-19. Insights into these relationships may reveal some of the sources of widespread resistance to social mitigation practices, making it possible to address future public health crises more successfully.

### **Background**

The World Health Organization's (WHO) office in the People's Republic of China (PRC) learned about an outbreak of viral pneumonia cases originating in Wuhan, PRC in late 2019 and informed the WHO regional offices (World Health Organization, 2020). Having determined that the pneumonia cases were caused by a novel coronavirus in early January 2020, the WHO declared it a public health emergency of international concern (PHEIC). As cases grew and spread globally at an alarming rate, the WHO set in motion guidelines for treatment and containment of the virus. In mid-March 2020, COVID-19, the disease caused by the novel coronavirus, was declared a global

pandemic. As of the beginning of February 2022, there were almost 400,000,000 cases globally, and almost 6,000,000 deaths, with almost 75,000,000 of those cases and 900,000 of those deaths occurring in the United States.

At the beginning of the pandemic, health organizations recommended basic disease mitigating strategies such as sanitization of surfaces, hand hygiene, covering coughs and sneezes with a tissue, not touching one's face, isolating when sick, and social distancing (Carver & Phillips, 2020). In the United States, political affiliation appeared to influence social mitigation responses to the pandemic. For instance, Chung and Jones-Jang (2021) found that those who got their news from conservative news sources and former president Trump's news briefings were less likely to believe the pandemic was serious and less likely to follow social mitigation practices (e.g., hygiene, masking, and social distancing), while those who got their news from health organizations and traditional media were more likely to take the pandemic seriously and comply with social mitigation practices. Distrust of science and more reliable scientific sources of information such as state health departments, the Center for Disease Control (CDC), research hospitals, and mainstream media was consistently found to be significantly higher for those with conservative political affiliation (Agle, 2020; Latkin et al., 2020). Additionally, the proliferation of conspiracy theories regarding the virus and COVID-19 influenced behaviors, as evidenced by Imhoff and Lamberty (2020), who found that those who believed COVID-19 was a hoax were less likely to comply with public health protocols.

Since the beginning of the pandemic in March 2020, misinformation about the origins and the severity of the virus has been so prevalent that, in addition to pandemic, COVID-19 has also been labeled an “infodemic,” giving rise to conspiracy theories and lowered trust in science and the health system (Hua & Shaw, 2020; Kulkarni et al., 2020; Patel et al., 2020; Thomas et al., 2020). Irrational thinking style (Swami & Barron, 2021), disgust (Moon & Travaglino, 2021), approval of former President Trump (Travis et al., 2021), anger, anxiety, lack of hope, and opposition to government restrictions (Peitz et al., 2021) have all been implicated in the spread of misinformation, leading to a pervasive conspiracy mindset and lowered trust in science. Additionally, conspiracy mindset and lowered trust in science were associated with lower trust in the development of COVID-19 vaccines and lower likelihood of getting vaccinated (Agle et al., 2021; Albrecht, 2022; Eberhardt & Ling, 2021; Ghaddar et al., 2022; Pivetti et al., 2021; Scrima et al., 2022; Travis et al., 2021). Politically conservative affiliation was associated with lower likelihood of sheltering in place early in the pandemic (Hill et al., 2021) and higher likelihood of downplaying the severity of the pandemic (Christensen et al., 2020; Conway et al., 2021). Consequently, states led by Republican governors saw a significantly higher number of COVID-19 cases and death rates from summer through the end of 2020 (Neelon et al., 2021).

This study has the potential to promote positive social change through a better understanding of the reasons for resistance to public health protocols designed to lessen the spread of COVID-19. Much has been learned about this resistance, but much still needs to be examined. Insights into the relationships between trust in science as it

pertains to public health concerns, conspiracy theories that arise when novel events such as a global pandemic with unknown causes and impacts occur (van der Wal et al., 2018), and the overarching influence of political affiliation on both conspiracy mindset and trust in science can minimize resistance to necessary social mitigation practices in the event of future endemics, pandemics, and other public health crises.

### **Problem Statement**

In late 2019, a novel, highly contagious coronavirus, SARS-COV2, emerged from China, causing a serious and sometimes deadly disease, COVID-19. The virus quickly spread. In late January 2020, the WHO proclaimed the virus a PHEIC, and by mid-March 2020, the WHO declared the virus a global pandemic (World Health Organization, 2020). Attempts to decrease the spread of SARS-COV2 via social mitigation recommendations such as hand hygiene, masking, and social distancing (Carver & Phillips, 2020) have been met with substantial resistance from a significant portion of the United States population. This resistance, or psychological reactance response, is the tendency not to do what the directives require (e.g., masking and social distancing) in an effort to restore the perceived loss of personal freedom to do as one wants rather than what one is told to do (Rosenberg & Siegel, 2018). Reactance responses to mandated social mitigation regulations have resulted in the uncontrolled spread of the SARS-COV2 virus in the United States and increased illness and death from COVID-19. Some explanations as to why certain individuals are more prone to psychological reactance can be traced to the rise of conspiracy theories about the virus, a lack of trust in science, and political affiliation (Agle, 2020; Nadelson & Hardy, 2015; Thomas et al., 2020).

Conspiracy theories commonly occur as an attempt to make sense of crises and novel situations (van Prooijen & Douglas, 2017; Thomas et al., 2020), e.g., that COVID-19 is no worse than the flu, that hydroxychloroquine is a safe effective treatment, or that any vaccines are unsafe and a higher risk to one's health than catching COVID-19 (Lewis, 2020). People who believed that the SARS-COV2 virus was a hoax were more resistant to disease mitigation practices (Imhoff & Lamberty, 2020). Additionally, those with a conspiracy mindset were less likely to believe expert sources (Imhoff et al., 2018), more likely to be receptive to disinformation and to endorse alternative medicine options (Evans et al., 2020; Pennycook et al., 2015), less likely to perceive the pandemic as a threat (Romer & Jamison, 2020), and less trusting of government and institutions (Sibley et al., 2020). Belief in any or all these conspiracies may disincline the believer to follow the public health protocols (e.g., masking and social distancing) to prevent the spread of COVID-19.

A lack of scientific trust has also been implicated in reactance responses to the COVID-19 public health protocols. Higher reactance was associated with lower trust in medical professionals and higher likelihood of using unproven and potentially dangerous medicine and treatments (Soveri et al., 2020). A lack of trust in academic journals (Haider & Åström, 2017) and the perception of political bias in scientists (Funk et al., 2019) are also implicated in lower trust in science. Confusion among public health and infectious disease experts struggling to grasp the terms of this novel virus led to contradictory messaging early in the pandemic (e.g., first, masks do not protect against the virus, then masks are *essential* to 'flatten the curve'); this confusion and contradiction

made it easy for some to distrust science (Hickner, 2020; Ramakrishnan, 2020). Hornsey and Fielding (2017) found indications of interactive effects in that conspiratorial ideation was strongly associated with lack of trust in scientific evidence and in science, generally.

The threat of global warming is another good example of factors implicated in individuals' willingness to take heed and take precautions. Skepticism and conspiratorial beliefs about anthropogenic climate change, cult-like belief in political leaders, distrust of science and scientists, and frequent reactance responses were found to be stronger and more consistent among those with conservative principles (Agle, 2020; Drummond & Fischhoff, 2017; Evans et al, 2020; Funk et al., 2019; Hornsey et al., 2018; Hornsey et al., 2020). Conversely, political liberals were found to be more open to new evidence and more trusting in science and scientific consensus; they were also more skeptical of conspiratorial claims (Funk et al., 2019; Lobato & Zimmerman, 2019; Pennycook et al., 2020).

Scientific trust, a conspiracy mindset, and political affiliation have all been studied in various settings and circumstances, but the extent to which political affiliation moderates the relationship between conspiracy mindset, trust in science, and reactance responses to directives issued by public health and infectious disease experts to slow the spread of the SARS COV-2 virus has not yet been examined.

### **Purpose of the Study**

The purpose of this quantitative study was to examine the extent to which political affiliation (IV) moderates the relationship between trust in science (IV), conspiracy mindset (IV), and reactance responses (DV) to public health protocols



intended to stop the spread of COVID-19. Findings from this study can provide insights into reasons for resistance to public health guidance during this current pandemic in order to encourage compliance, given the inevitability of future public health crises.

### **Research Questions and Hypotheses**

RQ1. To what extent does political affiliation, as measured by the political alignment scale (PAS) moderate the relationship between conspiracy mindset, as measured by the belief in conspiracy theories inventory (BCTI) and compliance with COVID-19 public health protocols, as measured by the brief reactance to health warnings scale (RHWS)?

*H<sub>0</sub>1*: Political affiliation (PAS) does not moderate the relationship between conspiracy mindset (BCTI) and compliance with COVID-19 public health protocols (RHWS).

*H<sub>a</sub>1*: Political affiliation (PAS) moderates the relationship between conspiracy mindset (BCTI) and compliance with COVID-19 public health protocols (RHWS).

RQ2. To what extent does political affiliation, as measured by the PAS moderate the relationship between trust in science, as measured by the trust in science and scientists inventory (TSSI) and compliance with COVID-19 public health protocols, as measured by the RHWS?

*H<sub>0</sub>2*: Political affiliation (PAS) does not moderate the relationship between trust in science (TSSI) and compliance with COVID-19 public health protocols (RHWS).

*H<sub>a2</sub>*: Political affiliation (PAS) moderates the relationship between trust in science (TSSI) and compliance with COVID-19 public health protocols (RHWS).

### **Theoretical Framework**

The social identity approach (SIA; Hornsey, 2008), a blend of social identity theory (SIT; Tajfel et al., 1971) and self-categorization theory (Turner, 1975), informs this study. The SIA assumes that group membership is a primary determinant of one's identity, resulting in the favoring one's ingroup and disparaging all outgroups. That said, the SIA would predict that an official political party stance on a given issue would inform the political position held by its party affiliates related to that issue (Van Bavel & Pereira, 2018) and the perceived soundness and valance of that party's policy messages (Jennings, 2019). Hogg (2001) stated that leaders of social groups are generally looked upon as prototypes of what it means to be a member of that group such that the leader sets the example and holds sway over the attitudes, beliefs, and behaviors of group members. Compliance with party-specific behaviors (e.g., refusing to wear a mask) heightens group identification, an effect seen even among political moderates who will change their behaviors to comply with standards set by the referent group's norms (Greene, 2004). This increases the likelihood, for example, that Trump supporters will follow his lead by endorsing conspiracy theories (e.g., QAnon), distrusting science (e.g., COVID-19 is a hoax), and refusing to comply with public health protocols (e.g., social distancing) to curb the spread of COVID-19. The SIA explains how these dynamics can manifest in

perceived threats to personal freedom lost to the whims of dictatorial others (e.g., mask mandates and bar closings) reflected in the refusal to comply with social mitigation practices. Chapter 2 provides a comprehensive review of the SIA and justification for its use in the study.

### **Nature of the Study**

This study used a quantitative, non-experimental, cross-sectional survey design appropriate for determining relationships among variables (Rutberg & Bouikidis, 2018). The study examined the relationships between the independent variables scientific trust, conspiracy mindset, and the dependent variable reactance responses to public health mitigation mandates, defined here as COVID-19 public health protocols. The study also determined the extent to which self-identified political affiliation moderates i.e., affects the strength and/or direction of the relationship between trust in science, conspiracy mindset, and reactance responses to COVID-19 public health protocols (Baron & Kenny, 1986). Participant recruitment, survey administration, and data collection was accomplished virtually via the Survey Monkey online research platform. Participant responses were anonymous. Erişen et al. (2013) stated that survey methodology is invaluable for understanding political attitudes and behavior in that it offers researchers the opportunity to examine multiple variables with large samples, making the planned survey methodology most appropriate for this study.

Data were collected from a convenience sample of English-speaking United States citizens of voting age who were registered and voted in the 2020 presidential election; participants were provided by Survey Monkey. Registered voters who lived

outside the United States were excluded from the study. Data were analyzed using the PROCESS macro for Statistical Package for Social Sciences (SPSS) version 25.0. This is a path analysis modeling tool that allows the research to assess two and 3-way interactions in moderation models (Hayes, 2022) so that the statistically moderating effect of political affiliation on the relationship between scientific trust, conspiracy mindset, and compliance with COVID-19 public health protocols could be tested.

### **Definitions**

*Conspiracy mindset:* A generalized tendency to believe in conspiracy theories (Goertzel, 1994).

*Political affiliation:* One's self-identification of political belief that influences one's worldview (Calvillo et al, 2019).

*Reactance:* The motivation to restore freedom when freedom is perceived to be threatened (Hammock & Brehm, 1966).

*The social identity approach:* A combination of the SIT and self-categorization theory, both of which posit that one's social identity will impact how one perceives others via their social identities. (Hornsey, 2008).

*Trust in science:* The belief and trust in science, empirical evidence, and the scientific process over supernatural or other explanations for natural phenomena (Nadelson, & Hardy, 2015).

### **Assumptions**

I assumed that participants provided honest responses to the survey questions, the likelihood of which is increased due to anonymous data collection. I assumed, further,

that the choice of the SIA to inform the study and that the variables, research questions, and method selected to test its predictions were logically sound (Hornsey, 2008). Finally, I assumed that participants' responses to the questions posed were reflective of their emotional reactions in real-world situations.

### **Scope and Delimitations**

The study was designed to examine factors that may predict reactance responses to social mitigation mandates designed to reduce the spread of disease during public health crises. Recent literature examining how the COVID-19 pandemic has influenced attitudes and behaviors toward this public health guidance has consistently found reactance behaviors correlated with political affiliation in that those with a conservative political affiliation exhibited greater reactance responses to public health guidance and were less likely to follow social mitigation practices (e.g., Ball & Wozniak, 2021; Taylor & Asmundson, 2021).

The target population for the study was English-speaking United States citizens of voting age who were registered voters and who voted in the 2020 presidential election. United States voters who lived outside the United States were excluded as cultural differences may influence attitudes and behavior which is beyond the scope of the study. This population was appropriate as registered voters who voted in the 2020 United States presidential election were more likely to be politically active and have strong political opinions.

Additionally, internet surveys, while advantageous due to cost effectiveness, speed, reduced chance of social desirability or interviewer biases, and convenience also

have inherent problems such as the likelihood of a less representative sample, self-selection biases, issues with validity and generalizability, and greater possibility of fraudulent responses (Kupis-Fijałkowska, 2020; Singh & Sagar, 2021). While internet surveys carry these risks, the reality of collecting data during the pandemic makes internet surveys a safe, efficient alternative.

Merging self-identity and social categorization theories, the SIA was chosen to inform this study as it provided a logical explanation of political group dynamics and especially the influence of party leadership on the attitudes and behavior of party members (Calvillo et al., 2019; Clementson, 2018; Federico & Ekstrom, 2018; Haas et al., 2019; Kidder, 2016). Reactance theory explains the actions taken by individuals whose perceived threat to personal freedom motivates them to restore it (Brehm, 1956; Brehm & Cohen; 1959a; Brehm & Cohen, 1959b).

### **Limitations**

The potential for participants' reluctance to honestly disclose attitudes about highly charged subjects related to their behavior during the pandemic was a possible limitation, potentially mitigated by using anonymous online surveys. Anonymous data collection also addressed the limitation of social desirability bias, the tendency for participants to present themselves in the most favorable light (Larson, 2019). This study used a convenience sample, limiting its representativeness and generalizability of the results. Additionally, taking online surveys makes it more difficult to capture real-world attitudes and behaviors, which could potentially limit the internal validity of this study.

### **Significance**

The study provides an original contribution by offering insight into the values and belief systems of individuals who refuse to comply with the public health protocols necessary to reduce the spread of COVID-19. With a better understanding of what triggers reactance responses to public health guidance, it may be possible to inhibit perceptions of lost freedom and gain the compliance necessary to curtail the spread of future outbreaks, epidemics, and pandemics. Insights gleaned from the study may be used to develop messaging tailored to those prone to reactance responses in hopes they can be convinced that compliance with scientific guidance does not pose a loss but rather a protection of our collective freedom to live safe, healthy lives (Dillard et al., 2018; Farley et al., 2019; Reynolds-Tylus, 2019).

### **Summary**

The COVID-19 pandemic has exposed resistance to mandated social mitigation practices, such as masking, which appears related to conspiracy mindset, distrust of science, and moderated by political affiliation (Agle, 2020; Imhoff & Lamberty, 2020; Latkin et al., 2020). The SIA provides a lens through which to investigate the connections among these variables. This study used a quantitative, non-experimental, cross-sectional survey design, with data collection administered by the Survey Monkey online research platform. Understanding factors implicated in the refusal, by some, to comply with public health guidance may prompt communication experts to persuade the recalcitrant minority that compliance is necessary to protect us all from potentially fatal diseases.

## Chapter 2: Literature Review

### **Introduction**

In late 2019, a novel, highly contagious coronavirus, SARS-COV2, emerged from China, causing a serious and sometimes deadly disease labeled COVID-19. The virus quickly spread. In late January 2020, the WHO proclaimed the virus a PHEIC, and by mid-March 2020, the WHO declared the virus a global pandemic (World Health Organization, 2020). Attempts to decrease the spread of SARS-COV2 via social mitigation recommendations such as hand hygiene, masking, and social distancing (Carver & Phillips, 2020) have been met with substantial resistance from a significant portion of the United States population. This resistance, or psychological reactance response, is the tendency not to do what the directives require (e.g., masking and social distancing) in an effort to restore the perceived loss of personal freedom (Rosenberg & Siegel, 2018). Reactance responses to the suggested, and in some cases mandated social mitigation regulations have resulted in the uncontrolled spread of the SARS-COV2 virus in the United States and increased reports of illness and death from COVID-19. Some explanations as to why certain individuals are more prone to psychological reactance can be traced to the rise of conspiracy theories about the virus, a lack of trust in science, and political affiliation (Agle, 2020; Nadelson & Hardy, 2015; Thomas et al., 2020).

### **Relevance of the Problem**

Conspiracy theories describe the ultimate cause of an event as due to an intentional, often malevolent plot by multiple actors working together (Swami, 2011). Such theories often occur in crises and novel situations as an attempt to make sense of the



situation (van Prooijen & Douglas, 2017; Thomas et al., 2020), e.g., that COVID-19 is no worse than the flu, that hydroxychloroquine is a safe effective treatment, or that any vaccines are unsafe and a higher risk to one's health than catching COVID-19 (Lewis, 2020). People who believed that the SARS-COV2 virus was a hoax were more resistant to social mitigation practices (Imhoff & Lamberty, 2020). Additionally, those with a conspiracy mindset were less likely to believe expert sources (Imhoff et al., 2018), more likely to be receptive to disinformation and to endorse alternative medicine options (Evans et al., 2020; Pennycook et al., 2015), less likely to perceive the pandemic as a threat (Romer & Jamieson, 2020), and less trusting of government and institutions (Sibley et al., 2020). Belief in any or all of these conspiracies may disincline the believer to follow the public health guidance (e.g., masking and social distancing) to prevent the spread of COVID-19.

A lack of scientific trust has also been implicated in reactance responses to the SARS COV-2 virus mitigation practices. Higher reactance was associated with lower trust in medical professionals and higher likelihood of using unproven and potentially dangerous medicine and treatments (Soveri et al., 2020). A lack of trust in academic journals (Haider & Åström, 2017) and the perception of political bias in scientists (Funk et al., 2019) are also implicated in lower trust in science. Confusion among public health and infectious disease experts struggling to grasp the terms of this novel virus led to contradictory messaging early on in the pandemic (e.g., first, masks do not protect against the virus; then, masks are *essential* to 'flatten the curve'); this confusion and contradiction made it easy for some to distrust science (Hickner, 2020; Ramakrishnan,

2020). Hornsey and Fielding (2017) found indications of interactive effects in that conspiratorial ideation was strongly associated with lack of trust in science and evidence.

There is also evidence that political affiliation interacts with scientific trust and a conspiracy mindset in their influence on reactance responses to social mitigation efforts. Skepticism and conspiratorial beliefs about anthropogenic climate change, cult-like belief in political leaders, distrust of science and scientists, and frequent reactance responses were found to be stronger and more consistent among those with conservative principles (Agle, 2020; Drummond & Fischhoff, 2017; Evans et al, 2020; Funk et al., 2019; Hornsey et al., 2018; Hornsey et al., 2020). Conversely, political liberals were found to be more open to new evidence and more trusting in science and scientific consensus; they were also more skeptical of conspiratorial claims (Funk et al., 2019; Lobato & Zimmerman, 2019; Pennycook et al., 2020). Scientific trust, a conspiracy mindset, and political affiliation, have all been studied in various settings and circumstances, but the relationship between these constructs and reactance responses to social mitigation guidance proffered by public health and infectious disease experts to slow the spread of the SARS COV-2 virus had not yet been examined until this study.

The purpose of this quantitative study was to determine how trust in science (IV), conspiracy mindset (IV), and political affiliation (IV) are related to reactance responses (DV) to public health guidance intended to stop the spread of disease. The study provides an original contribution by offering insight into the values and belief systems of individuals who refuse to comply with the public health protocols necessary to reduce the spread of COVID-19. With a better understanding of what triggers reactance responses to

public health guidance, it may be possible to inhibit perceptions of lost freedom, thereby gaining the compliance necessary to curtail the spread of future outbreaks, epidemics, and pandemics. Insights gleaned from the study may be used to develop messaging tailored to those prone to reactance responses in hopes they can be convinced that compliance with the guidance disseminated by medical experts does not pose a threat to their personal freedom (Dillard et al., 2018; Farley et al., 2019; Reynolds-Tylus, 2019).

This chapter will detail the literature search strategy, the theoretical framework for this study, and an exhaustive review of literature as it relates to key variables, finally ending with a summarization and analysis.

### **Literature Search Strategy**

Relevant, peer-reviewed articles were retrieved from the Walden University library. Databases used included Academic Search Complete, Political Science Complete, Thoreau, PsychInfo, SAGE journals, SocINDEX with Full Text, and Taylor and Francis Online. Google Scholar was used to cross-reference sources and locate more recent literature. Key terms used for the literature search included combinations of the following: *COVID-19, Coronavirus, 2019-NCOV, SARS-COV-2, COV-19, SARS, MERS, Ebola, pandemic, epidemic, outbreak, political, deception, dishonesty, conspiracy theory, conspiracy belief, reactance, psychological reactance, trait reactance, ideology, belief, opinion, trust in science, scientific literacy, social identity theory, and self-categorization theory*. With the exception of seminal theoretical sources and some sources from previous epidemics, pandemics, and outbreaks, the majority of the literature accessed was from 2017 to 2022.

## Theoretical Foundation

### Social Identity Approach

The SIA (Hornsey, 2008) incorporates two similar theories, the social identity and self-categorization theory. The SIT posits that group membership is an important part of one's personal identity, establishing one's own place as well as the relative place of others in the social environment (Tajfel, 1972); this *us* versus *them* social positioning creates attitudes favoring one's in-group while discriminating against one's out-group (Tajfel, 1982). Adding to the assumptions of social identity theory, self-categorization theory also posits that personal and social identities are distinct, fluid, and context dependent (Turner et al., 1994) with the context determining whether personal or group identification will motivate an individual's behavior (Turner, 1975). Encompassing both theories, the SIA provides a framework for explaining such social phenomena as political affiliation, social influence, and social power (Hornsey, 2008).

The SIA posits that group membership is socially beneficial; by overvaluing one's own group, the increased value of which accrues to the individual group member, individual self-esteem increases as a function of group identity. This is one of the social benefits that comes with group membership (Turner, 1975). Tajfel and Turner (1979) stated that an individual's social identity influences their behavior through the internalization of the identity, making compliance with the referent group's norms salient (Greene, 2004; Haslam et al., 1995; Hogg & Reid, 2006). Those who strongly identify with the group tend to have high attitude-behavior congruence as it applies to group norms (Terry et al., 1999). For example, individuals who identify as conservative will not

only tend to comply with conservative group norms, but they will also tend to exaggerate those group norms to increase the perceived differences between themselves and liberals, the relevant out-group. Christensen et al. (2004) found that those who followed group norms had higher self-esteem and were held in higher esteem by other group members than those who violated group norms, especially when those norms differentiated in-group members from a rival out-group. Obviously, this would create a strong motivation for someone to follow distinct group norms. Group membership has obvious benefits for the individual but also holds the potential to produce social hostility (Tajfel, 1982; Turner, 1975).

Inherent in the in-group/out-group formula is intergroup conflict where an “us” and “them” mindset exaggerates intergroup differences resulting in opposing group members taking positions at opposite ends of any issue (Hogg et al., 1990). With polarization comes extreme attitudes (Mackie, 1986; Mackie & Cooper, 1984; Terry et al., 2000), which can intensify in-group favoritism and out-group discrimination by accentuating differences between one’s in-group and the relevant out-group (Haslam & Turner, 1995). Groups do not even have to be meaningful for compliance with group norms to be seen. In-group favoritism and out-group discrimination was found even in meaningless and nominal group membership (Billig & Tajfel, 1973; Tajfel et al., 1971). For example, an individual is more likely to hold a positive view of someone who supports the individual’s preferred political candidate while viewing someone supporting an opposing political candidate negatively, even when there is no other relationship with or knowledge of that person (Billig & Tajfel, 1973). Additionally, leaders who were seen

as more prototypical of the group as a whole were also seen as more effective and likable (Hains et al., 1997), more influential (Hogg et al., 1998), and more likely to be defended against negative attributions from out-group members (Haslam et al., 2001); these are all behaviors that have been seen by supporters of former President Trump. (e.g., The Washington, DC. Capitol siege of January 6, 2021).

Recent research examining trust in science through the SIA lens has demonstrated the role of social identity in processing scientific information. Hornsey et al. (2020) examined trust in science both correlationally and experimentally operationalizing trust in science as attitudes toward vaccines in a series of 2 studies. In study 1, ( $N=518$ ) Hornsey et al. hypothesized that those who identified as Trump voters would hold stronger vaccine hesitancy attitudes. Conspiracist ideation, general vaccine concern, specific concern over the MMR vaccine, which has been falsely implicated in causing autism, political conservatism, voting behavior, and demographics were measured. Hornsey et al. found that higher conservatism and higher conspiracy mindset were significantly related to higher anti-vaccine beliefs and vaccine hesitancy, including MMR vaccine hesitancy. Hornsey et al.'s study 2 ( $N=316$ ) sought to determine whether Trump actively helped to shape the vaccine hesitancy attitudes, hypothesizing that those who self-identify as Trump supporters would be more influenced by Trump's anti-vaccine Tweets than by neutral Tweets (i.e., about golf) with no effects from non-Trump supporters. Using a repeated measures design, participants completed measures of voting behavior, vaccine concern, conspiracist ideation, and political conservatism. One week later, returning participants were randomly assigned to either the Trump anti-vaccine Tweets or the golf

Tweets and then measures of vaccine concern were repeated. While Trump voters as a whole held stronger anti-vaccine attitudes than non-Trump voters, Trump voters exposed to Trump's anti-vaccine Tweets had significantly higher concerns about vaccines than those exposed to Trump's golf Tweets. As hypothesized, there was no significant effect for non-Trump voters. Results from both studies suggest that not only does Trump attract the more conservative and more inclined toward conspiracy mindset, but that Trump's well-known anti-vaccination stance is increasing vaccination concerns among his supporters.

Nadelson and Hardy (2015) examined trust in science (i.e., acceptance of biological evolution) as it relates to political affiliation and religious commitment, hypothesizing that those with higher religious commitment and political conservatism would be less likely to trust science. Undergraduate students ( $N=159$ ) completed measures of trust in science and scientists, evolution acceptance, religious commitment, and political affiliation. Results revealed that strong religious commitment and political conservatism were both negatively associated with evolution acceptance and trust in science and scientists, indicating a significant correlation between the two constructs. More recently, early in the COVID-19 pandemic (March 2020), Agle (2020) surveyed 242 participants using a 49-item survey that included questions about the participants' social identities (i.e., political affiliation and religious commitment) followed by a trust in science/scientists measure. Consistent with Nadelson and Hardy, conservative political affiliation and high levels of religiousness were negatively correlated to trust in science.

Hornsey et al. (2020), Agley, and Nadelson and Hardy, all found compelling evidence that an individual's social identity influences their trust in science.

The SIA is also well-suited to examining political affiliation and their effects on political decision making. Jennings (2019) sought to examine three theoretical aspects of political affiliation using SIT, elaboration likelihood model (ELM), and the theory of motivated reasoning (TMR) to support his model of identity motivated elaboration (IME). IME was developed to provide a framework for how people become informed about political issues. Using an experimental design, Jennings collected the demographics for 557 participants who were randomly assigned to one of three conditions where they read op-ed articles that were either: non-partisan (Puerto Rico should be granted full statehood, and it would benefit the United States as a whole), partisan (Puerto Rico should be granted full statehood, and it would benefit mainly the Democratic party), or non-political (the benefits of pet-ownership) as a control. Jennings found that the partisan cues about Puerto Rican statehood benefiting the Democratic party biased how these political messages were received, as well as how elaborately the messages were processed. Jennings found that political affiliation influenced cognitive elaboration and motivated reasoning suggesting that political information processing is more dependent on partisan identification than the argument itself. Given the strength of party affiliation (i.e., group membership) to influence how individuals process information and what they ultimately endorse, these findings may help explain some individuals' refusal to comply with public health protocols needed to halt the community spread of COVID-19.



The SIA perspective can also explain why conspiracy mindset inclines believers toward a conspiracy mindset, or the propensity to believe in conspiracy theories. For example, Cichocka et al. (2016) performed a series of 3 studies, the first two in Poland and the last one in the United States, to examine the influence of collective narcissism, (e.g., a nationalistic belief that one's in-group is outstanding and underappreciated by others) on conspiracy mindset against out-groups. In study 1, 96 Polish participants were shown text that downplayed Poland's role in the fall of Communism, instead marking the end of Communism at the fall of the Berlin wall; this conspiracy theory claimed that Poland was cheated out of recognition for their part in the fall of Communism, insisting that the first Polish free election – which happened months before the fall of the Berlin wall – should have marked the end of Communism. The hypothesis that elevated nationalistic attitudes predicts conspiracy mindset was supported in that those with a conspiracy mindset were more likely to believe that an anti-Polish conspiracy robbed them of credit in the fall of Communism. Study 2 ( $N=223$ ) used a similar design but changed the context to an actual national tragedy, i.e., a plane crash that killed the almost 100 government officials including the Polish President and First Lady. Those who showed elevated attitudes of nationalism were significantly more likely to believe in the conspiracy theory that started spreading shortly after the crash that the crash was caused by a Russian plot to hurt Poland.

Cichocka et al.'s (2016) study 3 used 341 participants who identified as American to determine if elevated nationalistic attitudes were related to a conspiracy mindset, *per se*, or limited to conspiracy theory beliefs about some specific phenomenon. Participants

answered questions about either in-group United States conspiracies (e.g., 9/11 was an inside job) or out-group foreign country conspiracies (e.g., that Princess Diana was killed because she was pregnant by an Egyptian Muslim). Cichocka et al. found that elevated nationalistic attitudes were positively associated with conspiracy mindset generated to explain out-group (i.e., foreign countries) events but was not associated with conspiracy mindset generated to explain in-group (i.e., United States) events. These findings explain how a conspiracy mindset protects group members who perceived threats to their group identities (e.g., negative information about their in-group), especially those holding elevated nationalistic attitudes. This study helps illustrate the relationship between group identity and conspiracy mindset. Given the number of conspiracy theories that have emerged about the origins of SARS CoV-2 (e.g., it's a hoax or China created it) and about the social mitigation behaviors to slow its spread (e.g., masks make one more vulnerable to COVID-19), the SIA can help to guide understanding of the influence of conspiracy mindset on compliance with COVID-19 public health protocols.

### **How the SIA Relates to the Study**

Given the difficulty of convincing people of the need to comply with public health protocols designed to slow the spread of COVID-19, examining the issues through the lens of the SIA is an appropriate framework. Political affiliation affects the political information that individuals are likely to accept as logical and valid (Calvillo et al., 2019; Van Bavel & Pereira, 2018). Additionally, the strength of ideological self-identification, more so than the strength of the evidence presented, was found to moderate evaluations of political statements where stronger identification was related to a higher likelihood of

positive evaluations (Haas et al., 2019). With the importance of the role that social identification and self-categorization play in political affiliation, the SIA is well suited to inform this study.

### **How the Research Questions Relate to the Theory**

The goal of this study is to understand the extent to which political affiliation moderates the relationships between conspiracy mindset, trust in science, and reactance responses to COVID-19 public health protocols. Per SIA, group membership (i.e., political affiliation) is a determinative factor in the development of one's social identity, influencing one's attitudes and behavior. SIA predicts that political affiliation will incline its members to embrace attitudes (i.e., toward conspiracies and science) and take actions (i.e., toward public health mandates) that are consistent with their political party leadership.

### **Literature Review Related to Key Variables**

#### **Conspiracy Mindset**

This study examined relationships between those prone to embracing conspiracy theories and compliance with COVID-19 public health protocols. Summaries of recent research on conspiracy mindset can aid in understanding the concept more clearly. According to van Prooijen and Douglas (2018), conspiracy theories are almost always false, but can be true as well (e.g., Watergate corruption conspiracy). van Prooijen and Douglas found four basic principles that have emerged from previous research on conspiracy mindset: (1) consequential in that it has an effect on the believer's life and behavior, (2) universal in that it is found across time and cultures, (3) emotional, and (4)

correlated with intuitive thinking and social identification. Douglas et al. (2019) found that conspiracy mindset comprises psychological, political, and social factors and is pervasive in both traditional platforms and social media. The social consequences of conspiracy mindset range from the positive of keeping governments transparent to the negative of increasing prejudice toward out-groups (e.g., anti-Semitism), making poor health related choices (e.g., anti-vaccine), denial of science (e.g., climate change denial), levels of political engagement (e.g., loss of trust in government and institutions), violence, radicalization, and extremism (e.g., The Washington, DC. Capitol siege of January 6, 2021).

The examination of formative research on conspiracy mindset offers more background. One of the earlier studies of conspiracy mindset was Goertzel (1994), who sought to understand the prevalence of conspiracy mindset and whether a person with conspiracy mindset was prone to believing in others as well. Hypothesizing that conspiracy mindset is a generalized ideological dimension, Goertzel surveyed 348 participants, asking them which of 10 well-known conspiracies (e.g., President Kennedy was killed by an organized conspiracy) they believed was true. Findings indicated that if an individual believed in one conspiracy theory, they were more likely to believe in more than one, even if the conspiracies were unrelated, and that conspiracy mindset was more likely if one felt anomie (i.e., the feeling that social values and norms are breaking down), social distrust, and employment insecurity. Goertzel's study supports the existence of individuals prone to a conspiracy mindset.

Abalakina-Paap et al. (1999) conducted a correlational study ( $N=156$ ) to examine the relationship between eleven variables (alienation, trust, powerlessness, locus of control, need for cognition, tolerance of ambiguity, attributional complexity, authoritarianism, self-esteem, hostility, and anomie) and measures of belief in specific conspiracies (e.g., government cover-ups of alien landings) and attitudes toward the existence of conspiracies, in general (e.g., underground movements threaten the stability of American society). Findings indicated that (a) high anomie, authoritarianism, powerlessness, and low self-esteem were related to a strong belief in specific conspiracies, and (b) high external locus of control, hostility, and low trust were positively associated with general conspiracy belief (i.e., a conspiracy mindset). No significant correlations were found with alienation, need for cognition, tolerance of ambiguity, and attributional complexity. Interestingly, the fact that no significant relationships were found with need for cognition and attributional complexity was at odds with the well-documented finding that those with a conspiracy mindset are using conspiracy theories to simplify world events and circumstances to make sense of them (Garret & Weeks, 2017; Marchlewska et al., 2017). Taken together, Goertzel (1994) and Abalakina-Paap et al. illustrate the need to look at both individual differences and situational demands to understand conspiracy mindset. Relevant to these findings, SIT would predict that group membership obliges its members to hold attitudes consistent with that group's values and beliefs (i.e., external locus of control) such that conspiracy mindset, if endorsed by the group's leadership, would likewise be endorsed by the group's members.

Other recent research has explored the personality traits of those with a conspiracy mindset. Results indicate that predisposition to believing in conspiracies is associated with such traits as the need to be unique (Imhoff & Lamberty, 2017), a high need for cognitive closure (Marchlewska et al., 2017), an inclination to perceive meaningful patterns and causation where none exists (Garret & Weeks, 2017; van der Wal et al., 2018, van Prooijen et al., 2018), and a propensity to paranoid ideation, odd beliefs, and a fatalistic way of thinking (Dyrendal et al., 2020; Kay, 2021). Those with a conspiracy mindset are also more likely to have an anxious attachment style (Green & Douglas, 2018) and/ or an avoidant attachment style (Leone et al., 2018). Additionally, those with a conspiracy mindset are more likely to endorse alternative medical treatments over biomedical therapies (Lamberty & Imhoff, 2018), are more likely to be anti-vaccine (Rozbroj et al., 2018), and are more likely to be doomsday preppers (i.e., stocking food, water, and other supplies in the event of societal collapse) (Fetterman et al., 2019).

Bensley et al. (2019) hypothesized that conspiracy mindset is generalized such that a person who believes in one is likely to believe in more than one. With a sample size of 286, Bensley et al. examined the relationship among general conspiracy mindset, specific fictitious and false conspiracy theory beliefs, and paranormal, pseudoscientific, and inaccurate psychological beliefs (e.g., the belief that moon phases control moods and behavior). Measures included The Generic Conspiracist Belief scale, a scale constructed for this study measuring belief on a 5-point Likert scale on 10 false conspiracy theories (debunked by evidence), 10 true conspiracies (verified to have actually occurred, e.g., the Watergate break-in), and 10 fictitious conspiracy theories (fabricated for this study), a

measure of psychological knowledge and misconceptions, a measure of knowledge of evidence based theories and practices, a measure to assess respondent's ability to differentiate science from pseudoscience, and a measure of paranormal beliefs. General conspiracy mindset and false and fictitious conspiracy theory beliefs were found to be intercorrelated with paranormal, pseudoscientific, and inaccurate psychological beliefs and scientific knowledge, supporting the hypothesis that those with a conspiracy mindset tend to see conspiracies in multiple situations. Furthermore, Imhoff and Bruder (2014) and Imhoff and Lamberty (2018) suggested that the tendency to believe in conspiracy theories is a distinct trait and a discrete political attitude. This may mean that refusal to comply with COVID-19 public health protocols reflects either a generalized conspiracy mindset or behavior consistent with a specific political position.

Federico et al. (2018) looked at the connection between conspiracy mindset and system identity threat. Similar to anomie (see Abalakina-Paap et al., 1999; Goertzel, 1994), system identity threat is defined as the perception that social change is a threat to the most basic and fundamental values of a culture. Federico et al hypothesized that identity threat will predict general and ideological conspiracy mindset, endorsement of general, non-ideological conspiracies for both liberal leaning and conservative leaning individuals, and that a general propensity to conspiracy mindset would facilitate belief in specific conspiracy theories. Using two large samples ( $N= 870, 2702$ ), Federico et al. collected demographic data along with three measures of system identity threat, knowledge of political information, authoritarianism, political affiliation (i.e., endorsement of liberalism or conservatism and how extreme the endorsement is), and

conspiracy mindset (i.e., general or ideological). Results revealed that system identity threat does indeed predict general, ideological, and specific conspiracy belief, even when knowledge of political information, authoritarianism, and political affiliation are controlled for. These findings are further supported by van Prooijen and Douglas (2017) who found that conspiracy mindset is common in crises as a reaction to perceived negative societal change, which affects believers' perceived sense of control. This is consistent with extreme changes in the social norms (e.g., social distancing and mask wearing) in the United States due to the COVID-19 pandemic and the conspiracy theories that have emerged in response (e.g., masks don't work and/or they make one more susceptible).

Conspiracy mindset also carries social and personal consequences. According to Douglas et al. (2017), the empirical research on political engagement and conspiracy mindset is mixed, with some suggesting that having a conspiracy mindset increases political engagement (e.g., protesting, voting) while others suggesting that a conspiracy mindset decreases engagement. Imhoff et al. (2021) examined this discrepancy in a series of 2 studies, one with German participants ( $N=194$ ) and one with American participants ( $N=402$ ). Applying the question of conspiracy mindset to research by Cichocka et al. (2018) who found a curvilinear relationship between governmental satisfaction and political engagement, Imhoff et al. proposed that the reason for the inconsistencies in the research is that the relationship between conspiracy mindset and political engagement is also curvilinear (an inverted U-shaped relationship), suggesting that moderate conspiracy mindset would result in high political engagement, while both low and high conspiracy



mindset would result in low political engagement (i.e. low belief would see no need to engage, high belief would feel that engaging would do nothing). They hypothesized further that those high in conspiracy mindset would be more likely to resort to non-normative and illegal means of governmental change, rationalizing that those with a conspiracy mindset would feel that illegal and non-normative means would be the only way to change the system given their belief that the government is part of the conspiracy. Both studies collected demographics and had participants read a brief vignette with either a low, intermediate, or high conspiratorial message. Measures of powerlessness and political engagement were then administered. As hypothesized, a clear curvilinear effect was found. Individuals high in conspiracy mindset were less likely to be normatively politically engaged, believing that the government was part of the conspiracy, but were more likely to engage non-normatively. Those low in conspiracy mindset were also less likely to be politically engaged, believing that engagement was not needed since the government is working as it should. Those with moderate conspiracy mindset were more likely to be normatively politically engaged. Given the high number of COVID-19-related conspiracy theories, these findings suggest that those with a conspiracy mindset would be less likely to comply with social mitigation practices owing to a perceived loss of freedom.

Radnitz and Underwood (2015) surveyed a sample of 1997 participants to identify the situational and contextual factors underpinning conspiracy mindset and whether it is contingent or stable. Based on previous research, Radnitz and Underwood theorized that conspiracy mindset is not only associated with specific personality traits but is dependent

on situational cues (e.g., Whitson & Galinsky, 2008, found that feeling anxious and powerless can trigger conspiracy thinking), trust in government and corporations (e.g., Cook & Gronke, 2005, found stronger distrust for corporations among liberals and stronger distrust for government among conservatives), distrust of government by marginalized groups (e.g., Klonoff & Landrine, 1999, found that many African-Americans believed that the government unleashed HIV/ AIDS on the black community), the details revealed about the situation (e.g., Kogut & Ritov, 2005, found multiple anonymous victims are perceived as less tragic than a single victim who is named), and uncertainty about a situation triggering heuristic thinking (e.g., Conover & Feldman (1989) found that people are likely to rely on partisan cues when in doubt about an ambiguous political decision). Based on this logic, Radnitz and Underwood hypothesized that (a) anxiety would trigger conspiracy mindset, (b) African Americans and conservatives would be more likely to perceive the government as a conspirator while liberals would be more likely to perceive corporate conspiracies, and (c) multiple unnamed victims from an incident would increase the likelihood of conspiracy theory belief more than a single named victim. Participants were randomly assigned to either a condition where anxiety is *primed* or to a no-prime control condition where they read a news story about an incident at a biochemical plant run by either the government or a corporation involving either multiple unnamed or one named victim. Radnitz and Underwood found that conspiracy theory formation depends on one's emotional state such that where anxiety was primed, participants were significantly more likely to interpret the biochemical plant incident as a malevolent conspiracy. Findings also

indicated that social identity determined the perceived source of the conspiracy with liberals attributing it to corporations and conservatives to government. Finally, Radnitz and Underwood found that multiple unnamed victims were thought to be the consequences of a conspiracy compared to a single named victim.

Political affiliation also plays a role in conspiracy theory spread. Using an MTurk survey of 1543 participants, Smallpage et al. (2017) hypothesized that (1) political partisans would be more likely to believe that groups associated with their opposing political party are conspiring against them (i.e. Democrats more likely to believe Republicans are conspiring against them and vice versa) than non-partisan groups (i.e., Freemasons) and (2) partisans will recognize whether specific conspiracy theories originate in their own or in the opposing party (i.e. Republicans belief that President Obama was not born in the United States or Democrats belief that the Bush administration delay in addressing the Hurricane Katrina emergency was racist). Results indicated that significantly more Democrats believe that Republicans are conspiring against them and vice versa. Results also revealed that political partisans recognize which party “owns” specific conspiracy theories, strengthening the idea that political affiliation is a likely driver of conspiracy theories.

Another apparent issue with conspiracy mindset is the fact that questionable sources are considered expert while expert sources are considered unreliable, making it difficult to counter a conspiracy with evidence. In a series of 4 studies, one correlational ( $N=275$ ) and three experimental ( $N=195$ ,  $N=464$ , and  $N=225$ ), Imhoff et al. (2018) examined the relationship between conspiracy mindset and perceived source

trustworthiness, credibility, expertise, and power. The studies were informed by the dual process models of cognition (Chaiken, 1980) such that, when motivated and able, people will deeply process the quality of an argument but when unable or unmotivated, they will likely rely on heuristic cues such as the expertise of the source. Imhoff et al. hypothesized that those with high conspiracy mindset would judge powerful and expert sources of information as less credible than lay sources of information. Study 1 was designed to determine if conspiracy mindset affected judgments of source credibility. Participants completed measures of conspiracy mindset, right-wing authoritarianism, social dominance orientation, and anomie; they also indicated their political affiliation. Results suggested that perceived credibility ratings for expert sources were lower for those with a conspiracy mindset, but credibility ratings for a lay expert were not higher. Imhoff et al. concluded that the hypothesis was not fully supported because expert and non-expert sources were poorly operationalized.

Study 2 sought to correct the poor operationalization of study 1. Using a sample of German participants, Imhoff et al. (2018) hypothesized that historical information favorable to German soldiers during WW1 would more likely be accepted, and that those with conspiracy mindset would rate the lay historian as more credible than the expert historian. Participants in two experimental conditions were asked to read historical accounts of war crimes committed by German soldiers in WW1. In the first condition, a lay historian found documents that exonerated the German soldiers (in-group favorable) while an expert historian contradicted the documents (in-group unfavorable). In the second condition, the positions taken by the lay and expert historians were reversed.

Participants completed measures of source credibility, conspiracy mindset, and national identification. Similar to study 1, the expert historian was rated as less credible than the lay historian by those with high conspiracy mindset, but the expected nationalistic effect of agreeing with the in-group favorable condition was not found. Imhoff et al. reasoned that the story was either too long ago or that German citizens were used to hearing about atrocities committed by German soldiers in the first half of the 20<sup>th</sup> century and had no reason to doubt stories about WWI war crimes.

Study 3 used a similar design to study 2 but with American participants who read a more recent incident about sex crimes committed by soldiers during WWII. Participants read stories where (a) the sex crimes perpetrators were either Russian/Soviet soldiers (out-group derogatory) or American soldiers (in-group derogatory), (b) an expert historian suggested that previous reports underestimated the number of cases while a lay historian suggested that the crimes were drastically overestimated, and (c) the positions taken by the expert and lay historian were reversed. Participants indicated their national identification and completed measures of source credibility and conspiracy mindset. Results confirmed that while those measuring high in national identification consistently supported the condition that favored the in-group, higher levels of conspiracy mindset predicted higher trust in the lay historian than the expert historian.

In study 4, Imhoff et al. (2018) corrected what they perceived as a limitation of the first 3 studies by manipulating the *social power* (academic=high power, non-academic=low power) of the source. Imhoff et al. hypothesized that the lower-powered historian would be perceived as more credible and trustworthy by those with higher

conspiracy mindset. Similar to the story participants read in study 3, the academic expert states that sex crimes committed only by American soldiers in WWII were over-estimated (in-group threat/high power) while the non-academic expert claimed the sex crimes were underestimated (in-group favorable/low power). The third and fourth conditions simply reversed conditions 1 and 2. Conspiracy mindset, national identification, and source credibility were measured. The powerful source was seen as less credible by those with higher conspiracy mindset independent of in-group-favorability or threat. That the source with more power and greater expertise was perceived as less trustworthy and credible by participants higher in conspiracy mindset illustrates the difficulty in neutralizing the impact of conspiracy theories. This is because the effectiveness of fact-checking to correct misinformation and misconceptions depends on pre-existing biases, including biases against powerful sources (Walter et al., 2020). Additionally, even when false information is retracted, corrected, or countered, it is still remembered and still influences perceptions (Ecker & Ang, 2019; Strandberg et al., 2018). Reliance on news media that repeat false claims facilitates the spread of conspiracy theories (Anthony & Moulding, 2019; Bantimaroudis et al., 2020; Barfar, 2019; Bronstein et al., 2019; Lukito, 2020; Pennycook et al., 2015; Pennycook & Rand, 2020; Schaffner & Luks, 2018).

Conspiracy mindset has received some attention as a plausible explanation for reactance to COVID-19 public health protocols. Refusal to comply with social mitigation behaviors and less intent to get vaccinated against COVID-19 have been found to be positively associated with conspiracy beliefs about COVID-19 (Bertin et al, 2020;

Earnshaw et al, 2020; Freeman et al, 2020; Karić, & Međedović, 2020). Romer and Jamieson (2020) surveyed respondents in March 2020 ( $N=1050$ ) early in the pandemic and followed up with the same respondents in July 2020 ( $N=840$ ), asking about compliance with social mitigation behaviors (e.g., hygiene, social distancing) in the first survey, adding masking and testing in the follow-up. Survey questions included (a) intent to vaccinate for COVID-19 when a vaccination became available, (b) attitudes toward existing vaccines, and perceptions that the threat of the virus was more serious than (c) illegal immigration, (d) natural disasters, and (e) terrorism. Participants also indicated political affiliation and media preferences. Conspiracy mindset was found to be negatively correlated to social mitigation behaviors and the intent to get the vaccine for COVID-19 when available. Additionally, those with high conspiracy mindset were more likely to perceive illegal immigration, natural disasters, and terrorism as more serious threats than COVID-19 and were more likely to be distrustful of vaccines in general. Finally, reliance on conservative media was associated with the endorsement of COVID-19 conspiracies and less compliance with public health protocols, suggesting that political affiliation is one of the driving forces behind COVID-19 conspiracy mindset.

Past research has demonstrated that a person with belief in one conspiracy is more likely to believe in multiple conspiracies, indicating the existence of a conspiracy mindset (Bensley et al., 2019; Goertzel, 1994, Imhoff & Bruder, 2014; Imhoff & Lamberty, 2018). Conspiracy theories are comprised of psychological, cognitive, social, and political elements (Douglas et al., 2019; Marchlewska et al., 2017; Radnitz & Underwood, 2015) and tend to grow out of crisis situations (van Prooijen & Douglas,

2017), offering an explanation for unusual and ambiguous conditions (Sternisko et al., 2020). The evidence presented has indicated that, among other consequences, conspiracy mindset is positively associated with distrust of conventional biomedical treatments (Lamberty & Imhoff, 2018, Rozbroj et al., 2018) and feeling threatened by cultural and social changes (Abalakina-Paap et al., 1999; Federico et al., 2018; Goertzel, 1994). Finally, there has been support that specifically implicates conspiracy mindset in reactance behaviors in response to perceived threat to freedom from COVID-19 public health protocols (Romer & Jamieson, 2020). Altogether, the evidence strongly suggests that conspiracy mindset is implicated in non-compliance with public health protocols meant to slow the spread of COVID-19.

### **Trust in Science**

Another variable worthy of investigation is the trust that individuals place in science. Recent research has found a connection between trust in science and COVID-19 beliefs and behaviors, including a decline in trust in various sources of information about the pandemic (e.g., state health departments, CDC, mainstream media, and the White House) with conservative political affiliation consistently predicting lower trust levels and threatening the achievement of herd immunity due to vaccine hesitancy (Latkin et al., 2020; Latkin et al., 2021). Franz and Dhanani (2021) measured the relationship between perceived severity of the pandemic, knowledge/fear of the virus, health behaviors and political and religious affiliation, level of scientific trust and trust in media, and xenophobia in a large ( $N=1141$ ) representative sample. Strong religiosity, political conservatism, high xenophobia, and low trust in media and science predicted less fear of



COVID-19, less knowledge, and lower perceived severity, as well as less personal and community health behaviors such as masking and social distancing.

Agley and Xiao (2021) examined the effects of misinformation about COVID-19 on downplaying the severity of the disease. Demographics (age, gender, race, ethnicity, and education level) were collected from a sample of 660 in addition to measures of trust in science and scientists, religious commitment, and political affiliation. Participants were asked about the believability of myths about COVID-19 (e.g., the virus originated from 5G technology; the virus was developed in a laboratory for military or tracking purposes or to restrict liberty) together with the scientifically accepted explanation of zoonotic origin. Although most participants believed the scientifically accepted explanation and indicated a high in trust in science, Agley and Xiao found that low trust in science was associated with belief in the misinformation about COVID-19 but did not find significant effects with religious and political affiliation counter to Franz and Dhanani's findings (2021). While lack of trust in science was consistent between the Agley and Xiao and Franz and Dhanani studies, the inconsistency of religiosity and political affiliation suggests other forces at play. Examining framing and source effects of scientific messages can help uncover some of these influences.

Lu et al. (2017) sought to identify the effects of framing on reactance responses to a question of scientific trust, operationalized as attitudes toward genetically modified (GM) foods. Participants completed basic demographics and political affiliation (5-point scale from very liberal to very conservative) and were randomly assigned to one of the four conditions: framing GM foods as an answer to food shortages due to (a) "global

warming,” (b) “climate change,” (c) a description of climate change without using either term (warming temperatures, flooding, etc.), or (d) a control condition in which there was no prior frame. Participants in the first three conditions read a short message either explicitly naming global warming or climate change or implicitly describing the phenomenon, while participants in the control group did not read any message. Participants then answered measures of attitudes toward GM foods, the intention to consume GM foods, and for the experimental conditions, anger from reading the message, message evaluations on accuracy, fairness, trustworthiness, persuasiveness, pleasantness, and effectiveness, time reading the message, and understandability of the message. Reactance responses were reduced and positive attitudes toward GM foods were increased in the experimental conditions compared to the control, but there was no significant difference between the terms used in the experimental condition and no significant difference between political affiliation. This study indicates that framing an issue in a specific way can change attitudes and trust in scientific issues.

Song et al. (2018) examined the relationship between trustworthiness of a scientific message source and reactance responses. An online sample of 739 deer hunter subscribers to a deer hunting advocacy newsletter were randomly assigned to one of three sources of a policy intended to quash a wildlife disease, including (a) their home state government, (b) the state wildlife agency where they did most of their deer-hunting, or (c) the deer hunting advocacy group that authored the newsletter. Song et al. hypothesized that respondents would perceive the deer-hunting advocacy group as more similar and trustworthy than either the state wildlife agency or the state government.

They hypothesized, further, that similarity to and trustworthiness of the source would be negatively related to perceived freedom threat, resulting in less psychological reactance. Except for the source, the press release was identical across all three conditions; respondents rated the perceived similarity to and trust in the source and their intent to comply with the policy mandate. The results supported the hypothesis in that perceived similarity increased trust in the source and compliance with the policy mandate. Conversely, perceived dissimilarity increased mistrust in the source, increasing perceived loss of freedom, and lower intent to comply with the policy mandate. These results indicate that trust in science might actually be more than simple attitudes.

Supporting the suspicion that trust in science is more than just an attitude, findings from Calvillo et al. (2019) and Bolsen and Druckman (2018) found that scientific trust is influenced by political affiliation in that individuals are more likely to accept scientific conclusions that are consistent with the beliefs of their political group. Pechar et al. (2018) further suggested that specific components of political affiliation (i.e., attitudes toward government and corporations) better predict trust in science than political affiliation, per se. Samples of 1500 American and 1500 German participants, representative of their respective countries for gender, age, race, education, party identification, ideology, and political interest were surveyed about their trust in climate science and genetically modified (GM) food science. Participants provided demographics and completed measures of political affiliation (very liberal to very conservative on a 5-point scale) and attitudes toward government and corporations as they have to do with climate or GM science. Pechar et al. found that liberals tend to trust climate science but

distrust GM science, holding positive attitudes toward the government and negative attitudes toward corporations. Conservatives, on the other hand, tend to trust GM science but distrust climate science and hold positive attitudes toward corporations and negative attitudes toward the government. Consistent these results, Drummond and Fischhoff (2017) found that stronger conservative political affiliation and stronger religiousness was correlated with lower scientific trust on the issues of stem cell research, the big bang theory, and human evolution. Interestingly, Drummond and Fischhoff also found that more education and higher levels of scientific knowledge led to higher polarization levels on these issues such that more highly educated but conservative or religious individuals tended to more strongly distrust the scientific data. These results suggest that there is much more to scientific trust than just attitudes.

Distrust in science has been linked to a higher likelihood of believing misinformation about COVID-19 (Agle & Xiao, 2021) which can lead to such consequences as downplaying the dangers of COVID-19 (Franz & Dhanani, 2021) and hesitancy to vaccinate against the disease (Latkin et al., 2020; Latkin et al, 2021), all of which can prevent the achievement of herd immunity and put more people in grave danger of contracting and succumbing to COVID-19. Distrust in science has been shown to be influenced by how a question is framed, such as whether a legitimate reason is given to support a distrusted scientific concept (Lu et al., 2017) as well as the source, such as whether a message about a scientific concept comes from a governmental or organizational source (Song et al., 2018). Importantly, however, is the fact that distrust in science also appears to have a political ideological element to it (Bolsen & Druckman,

2018; Calvillo et al., 2019; Drummond & Fischhoff, 2017; Pechar et al., 2018).

Additionally, the other independent variable of conspiracy mindset also appears driven by political affiliation as well (Hornsey et al., 2018; Hornsey et al., 2020; Pennycook et al., 2020; Smallpage et al., 2017) all suggesting that political affiliation plays an important role in how trust in science and conspiracy mindset influence public health protocols meant to slow the spread of COVID-19.

### **Political Affiliation**

Understanding the relationships between conspiracy mindset and trust in science to masking, hygiene, and social distancing, all meant to slow the spread of COVID-19 is incomplete unless one examines the moderating effect of political affiliation on these variables. For instance, Kahan et al. (2017) suggested that political affiliation would affect how political partisans interpreted factual information. Kahan et al. hypothesized that those with stronger numerical literacy would either be more likely to interpret a contingency table accurately regardless of experimental condition and political affiliation, supporting the *science comprehension thesis* (i.e., political deficits in public reasoning are due to ignorance), or would interpret the experimental contingency table consistent with their political affiliation, supporting the *identity protective cognition thesis*, (i.e., motivated cognition in the face of identity threat). The subject of gun control was selected specifically due to its politically charged attitudes (i.e., conservatives aggressively protect gun rights and liberals advocate for gun control).

After providing demographic information, including voting intention, political affiliation, and level of mathematical knowledge, 1111 participants were randomly

assigned to one of two experimental (i.e., a concealed carry gun ban increased crime or a concealed carry gun ban decreased crime) or one of two control conditions (i.e., a new skin cream decreased a rash or increased a rash). Participants were asked to interpret identical, but differently labeled 2x2 contingency tables showing number of cases and positive or negative results. The table would be difficult to interpret by someone without stronger numerical literacy or familiarity with contingency tables. Kahan et al. (2017) found support for the identity protective cognition thesis, such that political affiliation predicted how the contingency table was interpreted when numerical competence was higher in the experimental conditions. In the control conditions, results were as expected in that those with higher numerical competence were more likely to accurately interpret the contingency table irrespective of political affiliation. Kahan et al. findings suggest that those with strong political affiliation and high numerical competence were motivated to disregard the factual information represented in the contingency tables, instead interpreting them consistent with their political affiliation.

Using the same procedure as Kahan et al. (2017), Nurse and Grant (2020) examined attitudes toward anthropogenic climate change, hypothesizing that views on human responsibility for global warming would correspond with participants' political affiliation (i.e., liberals support, conservatives deny) rather than factual evidence, especially for the most mathematically competent. Nurse and Grant confirmed the hypothesis, finding that individuals tended to answer questions about anthropogenic climate change consistent with their identified political affiliation, providing further support for the identity-protective cognition thesis. Kahan et al. and Nurse and Grant

suggested that those with stronger mathematical literacy used motivated reasoning to rationalize their politically biased rather than science-based responses. Both of these studies illustrate how political affiliation can influence even highly educated people to interpret information informed by their political affiliation rather than scientific facts and evidence. Given the stance that former President Trump held on the seriousness of COVID-19, these findings may explain why some Republican Party members show distrust and refuse scientific guidance on COVID-19 public health protocols. It is important to note that Kahan et al. (2017) found that politically motivated reasoning is negated by scientific curiosity, suggesting a plausible way to alleviate the political polarization currently centering on scientific consensus.

Similar to Kahan et al. (2017) and Nurse and Grant (2020), Frimer et al. (2017) examined the effect of political affiliation on information that political partisans selectively attend to and information that they avoid. In a series of 5 studies, Frimer et al. found that political partisans on both the left and the right, equally, avoid exposing themselves to the views and opinions of their political opposites. Study 1 gave 202 American participants the choice to read attitude disconfirming information on same-sex marriage for a chance to win \$10 or attitude confirming for the chance to win \$7. The majority (approximately 62%) chose to hear attitude confirming information for the lesser amount with no significant difference between left and right. Study 2 ( $N=179$ , all Americans) and study 3 ( $N=145$  Americans and 146 Canadians) specifically asked participants if they were interested in hearing how political allies or political opponents voted in past (study 2) and future (study 3) elections in the United States and Canada in

order to rule out whether the avoidance of political oppositional information in study 1 was due to knowledge about political opponents and/or election fatigue. Results revealed that participants were more knowledgeable about their political allies than their political opponents and that they showed equal avoidance of learning about their political opponents' past and future voting behaviors, ruling out both prior knowledge of their political opponents and election fatigue as plausible reasons for the effect.

Frimer et al.'s (2017) study 4 examined whether avoidance of attitude disconfirming information generalized to other political culture wars ( $N=190$ ) (e.g., climate change, gun restrictions) as well as non-political issues ( $N=177$ ) (e.g., Coke vs Pepsi, spring vs. autumn). Results indicated that political partisans are not only motivated to avoid attitude disconfirming information about political issues but are similarly motivated to avoid other non-political attitude disconfirming information as well. Study 5 ( $N=236$ ) sought to determine through self-report why people avoid attitude disconfirming information. After being asked whether participants were interested in hearing attitude confirming or disconfirming information about same-sex marriage, they were asked why they feel that way. Results suggested two possible explanations: (a) cognitive dissonance, i.e., listening to such attitude disconfirming or confirming information would make the participant angry/ happy or (b) undermine shared reality, i.e., listening to such information would result in a fight/ build trust with the person explaining their views. A meta-analysis of all 5 studies showed that liberals and conservatives have virtually identical desires to not hear the viewpoints of their political opponents. Supporting Frimer et al., Kahan et al. (2017), and Nurse and Grants' (2020) results that political



affiliation is a defining factor in what information is consumed and how it is perceived and interpreted, van der Linden et al. (2020) found that political partisans consistently associate news that disagrees with their own political affiliation as fake news, with roughly equal levels among liberals and conservatives.

The effect of consuming information that confirms one's own political affiliation is also implicated in resistance to public health protocols aimed at slowing the spread of COVID-19. Calvillo et al. (2020) ran 2 studies in March 2020, shortly after COVID-19 was declared a global pandemic. Calvillo et al. hypothesized that political conservatives would perceive that news about the pandemic, including dangers, personal vulnerability, and confirmed cases and deaths were all exaggerated by the media. Also hypothesized was that conservatives would be less likely to distinguish between accurate and fake headlines. Participants ( $N=587$ ) supplied their demographics, political party identification, political affiliation (extremely liberal to extremely conservative), and Trump approval rating. Participants then answered questions about their perception of the severity of the virus, feelings of personal vulnerability to the virus, conspiracy mindset, perception of media exaggeration, an estimate of confirmed cases and deaths both worldwide and in the United States, and rated the accuracy of headlines including 8 real (e.g., Trump stating that the United States won't close border with Mexico as COVID-19 spreads and 8 fake (e.g., sales of Corona beer drop sharply because consumers associate the beer with COVID-19). Results indicated that those with a conservative political affiliation tended to perceive less vulnerability to and severity of the COVID-19 pandemic, were more likely to agree with conspiracy statements and statements that the

media was exaggerating the seriousness of the pandemic and were less able to discern whether headlines were fake or real. No effect was found about the hypothesis estimating deaths and cases. Following up this study, Calvillo et al. reexamined the variables from study 1 (except the estimates of cases and deaths) and added a COVID-19 knowledge questionnaire and a cognitive reflection test. Again, it was found that, compared to liberals, conservatives rated COVID-19 as less threatening, less severe, as a conspiracy, and as a media exaggeration. Results from this study are consistent with the politization of scientific facts as discussed in Kahan et al. (2017) and Nurse and Grant (2020).

### **Reactance**

This study examined the extent to which political affiliation moderates the influence of conspiracy mindset and trust in science on compliance with COVID-19 public health protocols. Reactance levels are the dependent variable in this study. Reactance theory evolved out of Brehm's work on the effect of cognitive dissonance on choice, removal of choice, and perceptions of loss of freedom (e.g., Brehm, 1956; Brehm & Cohen; 1959a; Brehm & Cohen, 1959b). Reactance, according to Hammock and Brehm (1966), is the motivation to restore freedom when freedom is perceived to be threatened. Recent research on reactance indicates a strong connection between political affiliation and reactance. Using a web survey with 416 South Korean residents, Kim (2017) hypothesized that editorials from media sources expressing political views counter to one's own would be perceived as biased, which would in turn be construed as a perceived threat to freedom, eliciting reactance (i.e., unfavorable attitudes toward the message). Participants were randomly selected to read an identical editorial advocating an

anti-smoking campaign attributed to either a conservative or progressive newspaper or with no media attribution. After reading the anti-smoking editorial, participants completed measures of emotional and cognitive responses, perceived bias, threat to freedom, proneness to reactance, attitudes toward non-smoking campaigns, partisanship, and demographics. Results showed that editorials from media sources that were consistent with the ideology of the participant were perceived as significantly less biased than the same editorial from ideologically opposing media sources. The bias perceived from ideologically opposing media sources was associated with a perceived loss of freedom and reactance responses. This effect was strongest in participants who were smokers; reactance was also found in non-smokers who read the editorial attributed to the ideologically opposing media source. This study supports the existence of a relationship between partisanship and reactance responses.

Ma et al. (2019) examined the extent to which political affiliation moderates the relationship between pre-existing attitudes toward and reactance to basic facts on climate change. The authors hypothesized that, compared to those who accept climate science, psychological reactance will be greater for climate skeptics with the strongest reactance reported by Republicans. The authors hypothesized, further, that messages stating basic facts on climate change would have a boomerang effect, resulting in strengthening the pre-existing attitudes of climate skeptics. Participants ( $N=661$ ) answered questions about their attitudes toward anthropogenic climate change. Participants were then randomly assigned to one of three conditions relaying a basic fact about anthropogenic climate change: (1) non-consensus condition (“Did you know? Human-caused climate change is

happening”), (2) consensus condition (“Did you know? 97% of climate scientists have concluded that human-caused climate change is happening”), or (3) a control condition with no message about climate change. Psychological reactance was then measured along with climate change risk perceptions, climate change beliefs, and support for climate mitigation actions. The results found that simple statements of scientific consensus triggered reactance especially among climate skeptics, resulting in a boomerang effect where the message increased the preexisting belief. No significant effect was found for the non-consensus statement. As hypothesized, higher reactance was seen most frequently among Republicans and more conservative political independents, but reactance was lower in Republicans and absent in independents who do believe in climate change. Those with a pre-existing belief in climate change showed no significant reactance. The relationship between reactance and scientific trust is supported in this study, with political affiliation as a major factor.

Ball and Wozniak (2021) sought to understand why there was so much American resistance to public health protocols meant to slow the spread of COVID-19. Ball and Wozniak hypothesized that perceived threats to freedom due to social mitigation behaviors would be negatively associated with issue importance (whether the pandemic was personally relevant) but positively associated with message fatigue and reactance toward suggested social mitigation behaviors, ultimately resulting in non-compliance with social mitigation behaviors. A sample of United States residents ( $N=268$ ) with a significant percentage (35%) meeting criteria for COVID-19 complications and an even larger percentage (46%) living in a household with a high-risk person was questioned

about their demographics, political affiliation, message fatigue, and perception of importance around the issue of COVID-19. Participants were asked to summarize and report their attitudes toward a message they had received about expected social mitigation behaviors. Consistent with the hypothesis, message fatigue increased the perceived threat to freedom increasing reactance measured in terms of non-compliance with public health protocols (i.e., masking, social distancing, and hygiene behaviors) meant to slow the spread of COVID-19. Extending these findings, Taylor and Asmundson (2021) found that reactance responses were related to belief that masks are ineffective (integral to conspiracy mindset) and that being forced to wear one violates one's civil rights, a perceived threat to freedom restored only by resisting mask mandates.

### **Conclusion**

The aim of the study is to understand the extent to which political affiliation moderates the relationship between conspiracy mindset, trust in science, and reactance where reactance measured as resistance to mandated public health protocols necessary to slow the spread of COVID-19. To date, studies have examined relationships between conspiracy mindset, trust in science, and reactance and found that not only is conspiracy mindset positively related to trust in science but that both are positively related to reactance responses. Individuals who endorse conspiracy theories are inclined to distrust scientific evidence and in the case of COVID-19 public health protocols, are disinclined to comply with public health protocols needed to reduce its spread. What is not yet known is the extent to which political affiliation drives both relationships such that GOP affiliation makes it more likely that conspiracy believers and science deniers will not

comply with public health guidance on grounds that it limits their freedom.

Understanding the dynamics at work in the mass non-compliance that has led to the United States having the highest COVID-19 death and infection rate, globally, is vital not only to controlling the pandemic in the short term but is vital to preparing for future public health crises.

## Chapter 3: Research Design and Methodology

### **Introduction**

The purpose of this study is to determine if political affiliation moderates the relationship between conspiracy mindset, trust in science, and reactance responses to public health protocols intended to curb the spread of COVID-19. Chapter 3 details the quantitative research design, statistical analyses, sample and sampling procedures, participant inclusion/exclusion criteria, recruitment, and data collection. The reliability, validity, and justification for the use of the chosen measures are provided. Descriptive and inferential data analysis procedures, threats to validity, and ethical considerations are also discussed.

### **Research Design and Rationale**

A quantitative, nonexperimental, survey design was used to examine relationships between trust in science (IV), conspiracy mindset (IV) and reactance responses (DV) to public health protocols intended to slow the spread of COVID-19 and to determine if political affiliation (IV) moderates these relationships. Quantitative research designs are appropriate for determining relationships among variables (Wright et al., 2016) compared to qualitative research designs more suitable for making sense of the complexities of the “human experience” (Shaw et al., 2019). This study is non-experimental, meaning that relationships between variables was measured, but, unlike in a true experiment, variables were not manipulated (Rutberg & Bouikidis, 2018). According to Erişen et al. (2013), survey methods are used most often in political psychology, as they are invaluable to understanding political attitudes and behavior in that they offer researchers the

opportunity to examine relationships among multiple variables. This study looked at political attitudes and behavior as they relate to mandated social mitigation practices designed to slow the spread of the SARS-CoV2 virus, which makes a survey method most appropriate for data collection.

## **Methodology**

### **Population**

Registered American voters over 18 years of age who voted in the last presidential election (2020) were the target population. Since this study examined the moderating effect of political affiliation, registered voters who voted recently will likely be politically informed with well-formulated political attitudes.

### **Sampling and Sampling Procedures**

Participants for this study were a self-selected convenience sample using the Survey Monkey online platform. Inclusion criteria are: (a) American citizen, (b) over 18 years of age, (c) registered voter, and (d) voted in the last presidential election (2020). American citizens who live in countries other than the United States were excluded given that differences in cross-cultural voting practices and COVID-19 public health protocols are beyond the scope of this study. While random selection is needed to generate a representative sample and generalizable findings, the limitations of research conducted online preclude that option.

Minimum sample size was determined via a power analysis in G\*Power 3.1. Using an alpha level of .05, power level of .95, and five predictor variables (conspiracy mindset, trust in science, political affiliation, and interactions between political affiliation



and conspiracy mindset and between political affiliation and trust in science), G\*Power recommended a minimum sample size of 138. Since this study was performed online, the drop-out rate, or participants not completing or not complying with the study instructions should be considered (Kang, 2021). Kang's (2021) suggested formula for calculating additional data taking the drop-out rate into account is  $Nd = N/N(1-d)$  where  $N$  is the original calculated sample size and  $d$  is the expected drop-out rate. Estimating the drop-out rate at 20%, a sample size of 173 is suggested to ensure sufficient data despite incomplete data.

### **Recruitment, Participation, and Data Collection**

Upon receiving IRB approval, this study used the Survey Monkey online platform (<https://www.surveymonkey.com>) and participant pool to collect data. Participants who meet criteria were directed to answer some screening questions to confirm that they meet all eligibility requirements and then were directed to a demographic questionnaire and the survey instruments. All data were collected anonymously.

Participants were asked to sign an informed consent form prior to participation. The consent form stated that the study is examining political affiliation and behaviors but did not expressly talk about the full purpose of the study, thereby using passive deception that reduces the chances of bias and socially desirable responses. The informed consent form detailed study procedures, that participation in the study is voluntary, risks, benefits, and privacy practices. Additionally, my contact information and Walden University's participant advocate's contact information were provided in case the participant has any questions about the study or their rights as a participant. After providing informed

consent, participants were screened to ensure that they meet all inclusion requirements: (a) American citizen, (b) over 18 years of age, (c) registered voter, and (d) voted in the 2020 presidential election. If the participant did not meet the inclusion requirements, they were directed to a page thanking them for their time and reiterating the requirements and my contact information. Participants who did meet the inclusion criteria were directed to a brief demographic questionnaire asking their gender, age, stated political affiliation, United States state of residence, education level, whether they follow all suggested COVID-19 public health protocols, some of them, or none of them, and whether they have been vaccinated for COVID-19 followed by the survey measures. All of the survey measures took approximately 20-30 minutes to complete. Upon completing the measures, participants were directed to a page that thanked them for their participation and debriefed them about the study. My contact information was provided in case participants have any questions.

## **Instrumentation and Operationalization of Constructs**

### ***Demographic Questionnaire***

Participants completed a short demographics questionnaire asking their age, gender, education level, voter registration status, and political affiliation needed to describe participant characteristics. Participants were additionally asked where in the United States they live in order to determine other demographic patterns (Appendix A).

### ***Belief in Conspiracy Theories Inventory (BCTI)***

The BCTI was used to assess tendency to believe in conspiracy theories. The BCTI was developed in conjunction with two other measures to investigate the suspicion

that psychological factors mediate belief in 9/11 conspiracies ( $N = 257$ ; Swami et al., 2010). The measure examines belief in widely endorsed conspiracy theories (e.g., “The assassination of John F. Kennedy was not committed by the lone gunman, Lee Harvey Oswald, but was rather a detailed, organized conspiracy to kill the President.”). The BCTI was developed for the study based on findings by Goertzel (1994) that conspiracy belief tends to be indiscriminate, in that belief in one conspiracy generally means belief in others. Swami et al. (2010) reasoned those individuals who believe in 9/11 conspiracy theories were more likely to believe in non-9/11 conspiracy theories as well.

One question (“Government agencies in the UK are involved in the distribution of illegal drugs to ethnic minorities.”) was changed to the US from the UK to make it relevant to examining conspiracy mindset of American citizens. The measure uses a 9-point Likert scale ranging from completely false (1 on the scale) to completely true (9 on the scale). The original measure had 14 questions, and a 15th question about 9/11/01 was added for Swami et al. (2011). This study used all 15 questions (See Appendix B). The scale took approximately 5 minutes to complete; the mean of all 15 items were computed to yield a single score with higher scores indicating a stronger conspiracy mindset. The author of the BCTI gave explicit permission to use this measure in this study.

**Reliability and validity.** Swami et al. (2010) conducted a principal components analysis on the original 15 items using direct oblimin rotation and found that all but one of the items loaded on one factor (eigenvalue = 5.20 with 34.6% of the variance accounted for). The one item that did not load dealt with the belief that Elvis Presley was still alive. That item was dropped, and the single factor (general conspiracist beliefs) was

computed for the remaining 14 questions by taking the mean of the responses associated with the extracted factor. This resulted in a Cronbach's  $\alpha$  of 0.86, indicating very good reliability. Swami et al. (2011) added a 15th item ("The US government allowed the 9/11 attacks to take place so that it would have an excuse to achieve foreign [e.g., wars in Afghanistan and Iraq] and domestic [e.g., attacks on civil liberties] goals that had been determined prior to the attacks") to the BCTI.

Swami et al. (2017) compared the factorial and convergent validity of the BCTI with three other measures of conspiracy mindset: (1) the Conspiracy Mentality Questionnaire (CMQ), (2) the Generic Conspiracist Beliefs Scale (GCBS), and (3) the One-Item Conspiracy Measure (OICM). The four measures were evaluated and compared using a large American sample ( $N = 803$ ) on the Amazon's Mechanical Turk (MTurk) forum. A confirmatory factor analysis found that all items had correlations ranging from  $r = 0.54$  to  $r = 1.00$  on a single factor. Measures of 9/11 conspiracy theories and anti-vaccination conspiracy theories were used to assess convergent validity, which was found to be strongest for BCTI ( $r = 0.78$  and  $.065$ , respectively) of the four measures tested. Of the four measures, the BCTI was found to have the most acceptable factorial validity and convergent validity.

### ***Trust in Science and Scientists Inventory (TSSI)***

Trust in science was measured using the TSSI (Nadelson et al., 2014). The TSSI was developed to assess relationships between trust in science and scientists and such personal characteristics as worldview, religiosity, and political affiliation and was developed by an interdisciplinary team of STEM (science, technology, engineering, and

math) educators. Team expertise and discussions informed the questions. The items were further checked with experts in measurement, science education, and attitude assessment resulting in minor tweaking of question construction. The measure contains 21 items (see Appendix C), both forward and reverse phrased to prevent response bias (e.g., all *strongly agree*) using a 5-point Likert scale ranging from 1 *strongly disagree* to 5 *strongly agree*. The scale took approximately 10 minutes to complete. The author of the TSSI gave explicit permission to use this measure in this study.

**Reliability and validity.** The TSSI (Nadelson et al., 2014) was assessed in two rounds of separate field tests. A convenience sample ( $N = 75$ ) was used for the first field test. A reliability analysis found a Cronbach's  $\alpha$  of 0.84, interpreted as a good to very good level of reliability. Examining the item analysis, Nadelson et al. (2014) simplified some wording to clarify the essence with less confusion. After modifications were made, the second field test ( $N = 301$ ) examined relationships between trust in science, religiosity, and political affiliation. The revised instrument tested at a Cronbach's  $\alpha$  of 0.86. The minor restructuring of items did not significantly influence the means and standard deviations, indicating consistency of the instrument.

Nadelson et al., (2014) performed a correlational analysis of the second field test, which indicated that trust in science and scientists was negatively correlated with religious commitment ( $r = 0.33, p > 0.01$ ) and positively correlated with the number of college level science courses ( $r = 0.24, p > 0.01$ ). Political affiliation was also found to be related in that those with a more conservative worldview had lower trust in science and scientists ( $r = 0.14, p > 0.05$ ). These results are consistent with other literature (see

Agley, 2020; Drummond, & Fischhoff, 2017). Nadelson and Hardy (2015) used the TSSI to examine the relationship between trust in science and scientists and the acceptance of evolution ( $N=159$ ), finding that trust in science and scientists is positively correlated with overall evolution acceptance ( $\beta = .57$ ,  $t(157) = 8.69$ ,  $p < .001$ ) with trust in science explaining approximately 1/3 of the variance of overall evolution acceptance ( $R^2 = .33$ ,  $F(1,157) = 75.52$ ,  $p < .001$ ). High religiosity ( $R^2 = .49$ ) and conservative political affiliation ( $R^2 = .37$ ) were both found to be negatively associated with trust in science, although a higher variance proportion was explained when the variables were taken separately than together ( $R^2 = .50$ ). The consistency with past research on religiosity, political affiliation, and trust in science support the predictive validity of the TSSI measure and justify its use for this study.

### ***Political Alignment Scale (PAS)***

Cohen et al. (2009) developed the PAS for the second and third of a series of three studies, hypothesizing that race has a moderating effect on the relationship between religiosity and political affiliation. Cohen et al. first ran a scale development sample of 199 undergraduate students after which they tested their hypothesis with separate samples of 463 and 571, respectively. The items reflected the politicians from 2004 (President Bush, John Kerry, and Hillary Rodham Clinton); therefore, the items were updated to make them relevant to the current political figures of 2020 (Presidents Trump and Biden) (See Appendix D). Cohen et al. did not specify the scale used for this measure so for the purposes of this study, the TSSI was administered using a 5-point Likert scale ranging from 1 *strongly disagree* to 5 *strongly agree*, with higher scores indicating stronger

endorsement of conservative ideology. This measure should take approximately two minutes to complete. The PAS is published in the public domain and can be used for research purposes without permission.

**Reliability and validity.** Cohen et al. (2009) performed an exploratory factor analysis on the 11 items of the PAS. A scree test suggested a one factor solution which was confirmed through factor analysis when two factors were revealed, but only one had a strong eigenvalue (6.42). That first factor accounted for 58.3% of the variance and the Cronbach's  $\alpha$  was calculated at .94, suggesting strong reliability for the PAS.

Although no actual tests of validity were performed, Cohen et al. (2009) found results consistent with past research in that political affiliation correlates with religiosity; higher conservatism is positively correlated with higher religiosity and higher liberalism is positively correlated with lower religiosity. This suggests acceptable validity of this measure.

### ***Brief Reactance to Health Warnings Scale (RHWS)***

The *brief* RHWS was developed in two studies examining reactance attitudes in response to graphic non-smoking warnings with two large and distinct samples ( $N = 2149$  and 1413, respectively; Hall et al., 2017). The *brief* measure was developed as a shorter and more practical alternative to the 9-factor, 27-item RHWS, also developed by Hall et al. (2016). The *brief* RHWS is a 3-item scale that is measured on a 5-point Likert scale ranging from 1 *strongly disagree* to 5 *strongly agree*, with higher scores indicating higher reactance toward health warnings. The three items have been adapted to this study to reflect attitudes toward the COVID-19 pandemic (see Appendix E). The author of the

BCTI gave explicit permission to use this measure in this study. The RHWS took about 2 minutes to complete.

**Reliability and validity.** The 27-item RHWS identified nine factors through exploratory factor analysis in a study examining reactance attitudes in response to graphic non-smoking warnings (Hall et al., 2016). Cronbach's  $\alpha$  ranged from 0.58 for the factor of discounting to 0.92 for the factor of anger. Hall et al. (2017) selected the items with the highest factor loading from each of the nine factors on the 27-item RHWS, using item response theory (IRT)- based modeling to determine the three items that contributed the most information to the construct of reactance. Reliability for the *brief* RHWS was acceptable for study 1 ( $\alpha = 0.75$ ) and study 2 ( $\alpha = 0.65$ ). Test-retest reliability was also found to be acceptable at one week ( $r = 0.70$ ), three weeks ( $r = 0.68$ ), and four weeks ( $r = 0.59$ ) post-test.

Convergent validity for the 27-item RHWS found that higher reactance factor scores were positively correlated ( $r = 0.30$ ) with higher trait reactance (Hall et al., 2016). Discriminant validity analysis found that the reactance factors were weak and inconsistent for trait anger, internal locus of control, state anxiety, and social desirability ( $r$  values ranged from -0.07 to 0.08), supporting that the RHWS measures trait reactance rather than other constructs. Predictive validity found that lower perceptiveness of message effectiveness ( $r = -0.15$ ), lower motivational ability ( $r = -0.28$ ), and greater avoidance of health warnings ( $r = 0.18$ ) were demonstrated with the RHWS. Hall et al. (2017) calculated convergent validity of the *brief* RHWS by comparing the *brief* and 21-item RHWS, finding strong correlations across both studies ( $\beta = 0.85$  for study 1,  $\beta = 0.88$  for



study 2, with  $p < .001$  for both studies). The *brief* RHWS also exhibited predictive validity for lower perception of effectiveness for the health warnings ( $\beta = -0.15, p < .001$ ), lower support for requiring pictorial warnings on cigarette packs ( $\beta = -0.35, p < .001$ ), and lower intention to quit smoking ( $\beta = -0.18, p < .001$ ). The *brief* RHWS was further associated with greater avoidance of health warnings ( $\beta = 0.09, p < .001$ ) and higher likelihood of smoking more cigarettes per day ( $\beta = 0.07, p < .001$ ).

### **Data Analysis Plan**

All data collected through Survey Monkey was downloaded into IBM Statistical Package for Social Sciences (SPSS) version 25 for data analysis. Assumptions for multiple regression were tested in SPSS prior to the regression analysis (i.e., normality, linearity, homoscedasticity, multicollinearity, and independence of residuals). Normality was tested using histograms and Q-Q plots, linearity was examined using scatterplots, a scatterplot of residuals was used to test for homoscedasticity, multicollinearity was tested using Variance Inflation Factor (VIF) values, and independence of residuals was examined using the Durbin-Watson  $d$  test.

The PROCESS macro for Statistical Package for Social Sciences (SPSS) version 25.0. was used to test the hypotheses. This is a path analysis modeling tool that allows the researcher to assess two and 3-way interactions in moderation models (Hayes, 2022) to statistically test the moderating effect of political affiliation on the relationship between scientific trust, conspiracy mindset, and compliance with COVID-19 public health protocols. It is noted that the two independent variables (conspiracy mindset and trust in

science) may be highly correlated, which justifies the strategy for two separate research questions.

### **Research Questions**

RQ1: To what extent does political affiliation, as measured by the PAS, moderate the relationship between conspiracy mindset, as measured by the BCTI, and compliance with COVID-19 public health protocols, as measured by the brief RHWS?

*H<sub>0</sub>1*: Political affiliation (PAS) does not moderate the relationship between conspiracy mindset (BCTI) and compliance with COVID-19 public health protocols (RHWS).

*H<sub>a</sub>1*: Political affiliation (PAS) moderates the relationship between conspiracy mindset (BCTI) and compliance with COVID-19 public health protocols (RHWS).

RQ2: To what extent does political affiliation, as measured by the PAS moderate the relationship between trust in science, as measured by the TSSI and compliance with COVID-19 public health protocols, as measured by the RHWS?

*H<sub>0</sub>2*: Political affiliation (PAS) does not moderate the relationship between trust in science (TSSI) and compliance with COVID-19 public health protocols (RHWS).

*H<sub>2</sub>*: Political affiliation (PAS) moderates the relationship between trust in science (TSSI) and compliance with COVID-19 public health protocols (RHWS).

### **Threats to Validity**

This study does have several plausible threats to validity. A self-selected convenience sample can threaten validity as it is unknown whether the characteristics of the sample are representative of the population of interest; it is unknown whether those who volunteer to participate in surveys are inherently different from those among the target population who do not volunteer. These threats limit the generalizability of the results. Additionally, surveys rely on participant honesty, and researchers are unable to confirm that the participant actually meets the criteria for participant eligibility. Non-response bias is another threat to validity which was minimized by having a response validation to ensure that participants answer all survey questions. And, finally, social desirability bias can potentially threaten validity given that participants are inclined to present themselves in the best possible light, especially when controversial topics are being explored.

### **Ethical Procedures**

Once approval by the Walden University Institutional Review Board (IRB) has been obtained, participant recruitment and data collection began. The informed consent was presented on the first page of the survey, providing a description of the study, the risks and benefits of participating, and rights to privacy (i.e., no personal identifying information was collected); submission of the consent form indicates agreement to participate. Participants were informed that they are under no obligation to participate and that they may stop at any time without penalty. This study poses minimal risk, but since participants were asked about personal political attitudes, they may have

experienced emotional discomfort. Participants were informed that while the study poses minimal risk, if they experience emotional discomfort, they can locate mental health resources at Mental Health America (<http://www.mentalhealthamerica.net/search/node>). Raw data was downloaded from Survey Monkey into SPSS for analysis and is being kept on a password-protected computer accessible only by me. All data is stored in a password-protected online file in OneDrive accessed only by me and will be destroyed after five years.

### **Summary**

The purpose of this study is to examine the moderating effects of political affiliation on conspiracy mindset and trust in science as they relate to reactance responses to public health protocols intended to slow the spread of COVID-19. A quantitative non-experimental survey design was used with a target population of US registered voters over 18 years of age who voted in the 2020 election. Those who do not live in the US are excluded from the study. The survey utilized the Survey Monkey research platform and participants were recruited from the pool of survey takers on that site. Standard multiple regression and a multiple regression test for moderation was used to analyze and report the data. Ethical considerations and potential threats to validity were addressed. A detailed discussion of the data analysis and research findings is provided in chapter 4.

## Chapter 4: Results

### Introduction

The purpose of this quantitative study is to examine the extent to which political affiliation (IV) moderates the relationship between trust in science (IV), conspiracy mindset (IV), and reactance responses (DV) to public health protocols intended to stop the spread of COVID-19. Findings from this study can provide insights into reasons for resistance to public health guidance during this current pandemic in order to encourage compliance, given the inevitability of future public health crises.

### Research Questions and Hypotheses

RQ1: To what extent does political affiliation, as measured by the PAS, moderate the relationship between conspiracy mindset, as measured by the BCTI, and compliance with COVID-19 public health protocols, as measured by the brief RHWS?

$H_01$ : Political affiliation (PAS) does not moderate the relationship between conspiracy mindset (BCTI) and compliance with COVID-19 public health protocols (RHWS).

$H_a1$ : Political affiliation (PAS) moderates the relationship between conspiracy mindset (BCTI) and compliance with COVID-19 public health protocols (RHWS).

RQ2: To what extent does political affiliation, as measured by the PAS moderate the relationship between trust in science, as measured by the TSSI and compliance with COVID-19 public health protocols, as measured by the RHWS?

*H<sub>0</sub>2*: Political affiliation (PAS) does not moderate the relationship between trust in science (TSSI) and compliance with COVID-19 public health protocols (RHWS).

*H<sub>a</sub>2*: Political affiliation (PAS) moderates the relationship between trust in science (TSSI) and compliance with COVID-19 public health protocols (RHWS).

### **Data Collection**

Data collection occurred across a 4-day period in June 2022. Study participants were recruited from the SurveyMonkey participant panel based on the study's inclusion criteria requiring participants to be over 18, United States citizens, registered voters, and voted in the 2020 presidential election. United States citizens not living in the United States were excluded to prevent possible confounds due to cultural differences beyond the scope of this study. The survey took place in an online format and began with the consent form that explained that the purpose of the study was "to examine attitudes toward public health guidance and mandates that were put in place to reduce the spread of COVID-19." The consent form also included a description of procedures, the voluntary nature of the study, risks and benefits, privacy, and contact information. The survey was anonymous; no identifying information was collected to maintain participant anonymity and protect their privacy. Participants who did not provide consent were directed to the end of the survey. Participants who did provide consent were directed to three screening questions designed with a skip-logic feature to disqualify those who did not meet the inclusion/exclusion criteria. Participants who did not meet the inclusion/exclusion criteria were directed to a thank you page ending the survey.

Participants who met all inclusion criteria were directed to the survey portion of the study. After all survey questions were answered, participants were directed to a debriefing page that explained the use of incomplete disclosure about the purpose of the study, a passive deception practice typically used when revealing the true purpose of the study might bias participant responses. Debriefing informed participants of the true nature of the study, which was to determine if political affiliation influenced relationships between conspiracy mindset, trust in science, and compliance with COVID restrictions. Participants were given the option to withdraw their data without penalty after the true nature of the study was disclosed. The survey had a 75% completion rate.

Two hundred ninety-four expressed an interest in participating. Of those, 31 did not provide consent, 23 reported not being registered to vote or not having voted in the 2020 presidential election, and 20 were missing 10% or more answers; all were removed from the sample pool leaving a total of 220 participants. Survey responses missing less than 10% of answers were completed using median scores. The total sample size need for the study was 138, alpha level of .05, power level of .95. With a total sample of 220, there is more than sufficient power to detect an effect.

### **Demographics**

The demographics (i.e., gender, age, U. S. region of residence, education level, household income) for participants are displayed in Table 1. Ages of participants were fairly evenly distributed: 18-29 years (19.2%); 30-44 years (21.7%); 45-60 years (19.1%); over 60 years (16.6%), with 8.9% not answering the question of their age group. There were slightly more female (45.9%) than male (41.1%) participants. All regions of

the U.S were represented, with 18.6% residing in East Central United States, 13.2% from west central United States, 10.8% in the Middle Atlantic coast states, 15.0% from the south Atlantic coast states, 9.1% in the mountain states, and 16.8% along the Pacific coast. Education levels for the sample were as follows: 35.9% had a bachelor's degree, 27.3% had a master's degree, 19.1% had some college, 11.4% had a PhD or other professional degree, and 6.4% had a high school diploma.

Convenience sampling was used in this study making it impossible to know whether sample characteristics are representative of the population at large. Accordingly, the results of this study cannot be generalized to all United States citizens. Although probability sampling would increase the sample representativeness and generalizability of the findings, the constraints specific to conducting research online make random sampling unavailable; external validity is therefore limited.



**Table 1**

*Frequencies: Gender, Age, United States Region of Residence, Education Level, and Household Income*

Variable		<i>N</i>	%
Gender	Male	97	44.1
	Female	101	45.9
	Did not answer	22	10.0
Age	18-29	27	17.2
	30-44	34	21.7
	45-60	30	19.1
	> 60	26	16.6
	Did not answer	14	8.9
U. S. region of residence	East Central	41	18.6
	Middle Atlantic	24	10.9
	Mountain	20	9.1
	Pacific	37	16.8
	South Atlantic	33	15.0
	West Central	29	13.2
	Did not answer	23	10.5
Education level	High School	14	6.4
	Some College	42	19.1
	Bachelor's Degree	79	35.9
	Master's Degree	60	27.3
	PhD or professional degree	25	11.4
Household income	\$0 - \$49,999	38	17.3
	\$50,000 - \$99,999	88	40.1
	> \$100,000	76	34.5
	Did not answer	43	19.5

## Results

### Descriptive Statistics

The sample included 220 participants who completed the study. Reverse scored items were inverted, and means and standard deviations were calculated for the three predictor variables: trust in science ( $M = 3.90$ ,  $SD = .76$ ), conspiracy mindset ( $M = 3.15$ ,  $SD = 1.47$ ), and political affiliation ( $M = 2.64$ ,  $SD = 1.22$ ), as well as for the outcome variable of reactance responses to COVID-19 public health protocols ( $M = 1.97$ ,  $SD = 1.27$ ). Table 2 displays the means and standard deviations for the predictor and outcome variables.

**Table 2**

*Descriptive Statistics for Predictor and Outcome Variables*

Variable	<i>N</i>	<i>M</i>	<i>SD</i>	<i>Min</i>	<i>Max</i>	<i>Skewness</i>	<i>Kurtosis</i>
Trust in science	220	3.90	.76	1.90	5.00	-.57	-.67
Conspiracy mindset	220	3.15	1.47	1.00	5.00	.60	-1.07
Political affiliation	220	2.64	1.22	1.00	5.00	1.06	-.26
Reactance responses	220	1.97	1.27	1.00	7.73	.65	-.24

Participants were asked about compliance with COVID-19 public health protocols and COVID-19 vaccination status. The vast majority ( $N = 205$ , 93.1%) reported following some or all of the suggested COVID-19 public health protocols while the remainder ( $N = 15$ , 6.8%) reported not following any of the guidelines. The majority also reported being partially or fully vaccinated ( $N = 193$ , 87.7%), while the remainder ( $N = 27$ , 12.3%) reported not being vaccinated. Tables 3 and 4 illustrate those statistics.

**Table 3***Question: Compliance With COVID-19 Health Guidelines*

	N	%
All of them	151	68.6
Some of them	54	24.5
None of them	15	5.8

**Table 4***Question: Vaccination Status*

	N	%
Yes	187	85.0
No	27	12.3
Yes, but not fully	6	2.7

### Evaluations of Statistical Assumptions

Assumptions for multiple regression were tested prior to the regression analysis (i.e., normality, linearity, homoscedasticity, multicollinearity, and independence of residuals). Normality was determined via examination of histogram, P-P plots, and Q-Q plots as well as the Shapiro-Wilk test. As shown in Table 5, results of Shapiro-Wilk tests confirmed that the distributions of all variables were not normally distributed. This represents some concern, particularly since the dependent variable (reactance responses) was somewhat positively skewed. However, Hair et al. (2018) and others have indicated that in sample sizes greater than  $n=200$ , regression procedures are fairly robust with respect to normality of the dependent variable.

Next, a histogram, P-P plot, and Q-Q plot of residuals, which can be found in Appendix F, were examined. The histogram, P-P plot, and Q-Q plot revealed that the distribution of residuals was relatively normal. One outlier was found via inspection of

studentized residuals. Despite the outlier and the abnormal Shapiro-Wilk test indicating that the distributions are not completely normal, the moderation regression was still run as regression is robust and able to withstand data that are not completely normal (Ernst & Albers, 2016).

**Table 5**

*Shapiro-Wilk Test of Normality*

Variable	Statistic	df	Sig.
RHWS	.77	220	<.001
TSSI	.94	220	<.001
PAS	.89	220	<.001
BCTI	.95	220	<.001

Linearity between predictor and outcome variables was examined using scatterplots. Scatterplots demonstrating linear relationships between each predictor and outcome variable are provided in Appendix G. The linearity assumption was met for the data.

Multicollinearity was first assessed by examining correlations among the variables. All predictor variables correlated significantly with the dependent variable as well as correlated significantly with each other, pointing to risk of multicollinearity. The correlations matrix is displayed in Table 6. Multicollinearity was then assessed by examining the tolerance and variance inflation factor (VIF). Table 7 displays the tolerance and VIF for the predictor variables. The data suggest that the predictor variables are not highly correlated; the multicollinearity assumption has been met, as VIF values are well below 10 and tolerance scores are above 0.2.

**Table 6***Correlations*

		reactance.mean	TSSI.mean	PAS.mean	BCTI.mean
reactance.mean	Pearson Correlation	--			
	N	220			
TSSI.mean	Pearson Correlation	-.69**	--		
	Sig. (2-tailed)	<.001			
	N	220	220		
PAS.mean	Pearson Correlation	.67**	-.74**	--	
	Sig. (2-tailed)	<.001	<.001		
	N	220	220	220	
BCTI.mean	Pearson Correlation	.36**	-.58**	.45**	--
	Sig. (2-tailed)	<.001	<.001	<.001	
	N	220	220	220	220

\*\* . Correlation is significant at the 0.01 level (2-tailed).

**Table 7***Collinearity Diagnostics for Predictor Variables*

Variable	Tolerance	VIF
TSSI	.45	2.23
PAS	.45	2.23
BCTI	.67	1.51

Homoscedasticity was examined using scatterplots of the standardized residual and standardized predicted values for the regressions (Appendix H). Examination of the scatterplots indicates the variance of residuals is constant for all regressions. The assumption of homoscedasticity was met. Independence of residuals was tested using the Durbin Watson test. There was independence of residuals, as assessed by a Durbin-Watson statistic of 2.16. In addition to testing the assumptions for multiple regression, Cronbach's alpha was computed to test the reliability of the instruments used for the current sample. Table 8 details the Cronbach's alpha coefficients ( $\alpha$ ) for each instrument, and each had excellent internal consistency, ranging from .90 to .95.

**Table 8**

*Cronbach's Alpha Coefficients for Study Instruments*

Instrument	$\alpha$
TSSI	.95
BCTI	.90
PAS	.95
RHWS	.91

**Moderation Analyses**

Two moderation analyses were conducted using the Hayes (2022) PROCESS macro to statistically test the moderating effect of political affiliation on the relationships between scientific trust, conspiracy mindset, and compliance with COVID-19 public health protocols. The Hayes PROCESS macro is a path analysis modeling tool that allows the researcher to assess two and 3-way interactions in moderation models. This macro removes the necessity of creating dummy variables to analyze moderation models, not only making moderation analyses simpler, but also preventing the possibility of data

entry errors. The results indicated interactions between predictor variables as well as direct effects of predictor variables on the outcome variable.

### **Moderation Model: Research Question 1**

The first analysis examined the moderating effect of political affiliation on the relationship between conspiracy mindset and reactance responses to COVID-19 public health protocols meant to slow the spread of the disease. To test the hypothesis that conspiracy mindset is related directly to reactance responses to COVID-19 public health protocols, and more specifically, to test whether political affiliation moderates the relationship between conspiracy mindset and reactance responses, another multiple regression was run using the Hayes (2022) PROCESS Macro in SPSS v. 28.

Conspiracy mindset was found to have a significant, positive, direct relationship to reactance responses, ( $R^2 = .68$ ,  $F(3,216) = 63.10$ ,  $p < .001$ ) in that higher levels of conspiracy mindset were significantly related to higher levels of reactance response. Therefore, the null hypothesis was rejected, and the alternative hypothesis was accepted. Additionally, it was found that political affiliation moderated the relationship between conspiracy mindset and reactance responses ( $\Delta R^2 < .01$ ,  $F(1, 216) = 3.90$ ,  $p = .05$ ) such that higher levels of political conservatism strengthened the positive relationship between higher levels of conspiracy mindset and higher levels of reactance responses to COVID-19 public health protocols. Therefore, the null hypothesis was rejected, and the alternative hypothesis was accepted. As shown in Table 9, both BCTI and PAS coefficients were statistically significant. A visualization of the effect is in Appendix J.

**Table 9**

*Influence of Conspiracy Mindset on Reactance Responses as Moderated by Political Affiliation*

	<i>b</i>	<i>se</i>	<i>t</i>	<i>p</i>	<i>CI</i>	
constant (Reactance)	-.61	.36	-1.69	.09	-1.33	.10
BCTI	.28	.12	2.37	.02	.05	.50
PAS	.92	.142	6.51	.002	.64	1.20
Int_1	-.08	.04	-1.97	.05	-.15	-.0001

### **Moderation Model: Research Question 2**

The second analysis examined the moderating effect of political affiliation on trust in science as it relates to reactance responses to COVID-19 public health protocols. To test this, a multiple regression was run using the Hayes (2022) PROCESS Macro in SPSS v. 28. Results indicated that trust in science was significantly negatively related to reactance responses as a direct relationship, ( $R^2 = .53$ ,  $F(3,216) = 81.57$ ,  $p < .001$ ) such that lower levels of trust in science predicted higher levels of reactance responses. However, the moderating effect of political affiliation on the relationship between trust in science and reactance responses was not significant ( $\Delta R^2 < .001$ ,  $F(1, 216) = .27$ ,  $p = .61$ ). Therefore, the null hypothesis was not rejected. The coefficients in Table 11 indicate TSSI's significant negative influence on reactance responses and PAS non-significant positive influence on reactance responses. While higher trust in science predicted significantly lower reactance responses, conservative political affiliation predicted slightly higher reactance responses but did not significantly moderate this relationship. Thus, while PAS was significantly positively correlated with reactance response ( $r = .67$ ,  $p < .001$ ), it did not contribute any unique moderating (e.g., interaction



with TSSI) effect on the dependent variable. Appendix K provides a visualization of the effect.

**Table 10**

*Influence of Trust in Science on Reactance Responses as Moderated by Political*

*Affiliation*

	<i>b</i>	<i>se</i>	<i>t</i>	<i>p</i>	<i>CL</i>	
Intercept	3.22	1.09	2.94	.004	1.06	5.38
TSSI	-.56	.26	-2.25	.03	-1.08	-.07
PAS	.53	.31	1.73	.08	-.07	1.14
Int_1	-.04	.08	-.52	.61	-.20	.12

### Summary

Two moderation multiple regression analyses were performed using the Hayes (2022) PROCESS macro to examine the extent to which political affiliation moderates the relationship between conspiracy mindset and reactance responses to COVID-19 public health protocols and the relationship between trust in science and reactance responses, using a convenience sample of 220 participants recruited from the Survey Monkey platform. The results indicated that conservative political affiliation strengthened the positive relationship between conspiracy mindset and reactance responses. Results also found that while political affiliation was highly correlated with reactance responses, conservative political affiliation did not moderate the relationship between trust in science and reactance responses. Chapter 5 will discuss the interpretation of the findings, limitations of the study, recommendations for future research, and the implications for social change.

## Chapter 5: Discussion, Conclusions, and Recommendations

### Introduction

The purpose of the study was to determine the extent to which political affiliation moderates the relationship between trust in science, conspiracy mindset and reactance responses to public health protocols designed to slow the spread of COVID-19. Attitudes toward COVID-19 public health protocols were polarized from the earliest days of the pandemic (Chen & Fan, 2022; Choi & Fox, 2022; Chung & Jones-Jang, 2021; Hart et al., 2020; Lang et al., 2021).

Conspiracy theories about the origins of COVID-19 (Neeraj et al., 2022; Rozado, 2021; Xiong et al., 2022), its seriousness (Romer & Jamieson, 2020), its treatments (Fuhrer & Cova, 2020), and vaccines (Bertin et al., 2020; Earnshaw et al., 2020; Larson & Broniatowski, 2021) have proliferated throughout the pandemic, leading to mass misinformation and disinformation (Lanier et al., 2022). A widespread lack of trust in science (Agle & Xaio, 2021; Latkin et al., 2020) and sources of scientific information (Latkin et al., 2021), especially among those who self-identify as conservative (Agle, 2020; Franz & Dhanani, 2021), has led to vocal resistance and outright refusal to comply with COVID-19 public health protocols (i.e., reactance responses) on grounds that it restricts their personal freedom (Ball & Wozniak, 2021; Taylor & Asmundson, 2021).

While political affiliation, conspiracy mindset, and trust in science as they relate to COVID-19 public health protocols compliance, have been examined independently (e.g., Agle, 2020; Clark et al., 2021; Freeman et al., 2020), the current cross-sectional, quantitative, survey study addressed a gap in the research by examining the potential for

political affiliation to moderate these relationships. This study used survey data obtained from adult United States registered voters who voted in the 2020 presidential election and were recruited from the Survey Monkey platform. Two moderation analyses were conducted using the Hayes (2022) PROCESS macro to statistically test the moderating effect of political affiliation on the relationships between scientific trust, conspiracy mindset, and compliance with COVID-19 public health protocols. Results indicated that political affiliation moderated the relationship between conspiracy mindset and reactance responses toward COVID-19 public health protocols, such that conservative political affiliation strengthened the positive association between conspiracy mindset and reactance responses. Additionally, a direct positive effect between conspiracy mindset and reactance responses was found. Political affiliation was not found to moderate the relationship between trust in science and reactance, but a direct effect was seen in that trust in science was negatively related to reactance toward COVID-19 public health protocols. Conservative political affiliation was also found to have a direct effect in high reactance responses toward COVID-19 public health protocols.

### **Interpretation of the Findings**

#### **The Direct Effect Between Conspiracy Mindset and Reactance Responses**

Research Question 1 examined the relationship between conspiracy mindset and reactance responses to COVID-19 public health protocols. Results indicated a significant positive relation between conspiracy mindset and reactance responses toward COVID-19 public health protocols, such that participants who were more inclined toward conspiracy mindset were more likely to resist compliance with COVID-19 public health protocols.

This is consistent with previous research that found conspiracy mindset predicted reactance such as anti-vaccine attitudes (Bertin et al., 2020; Douglas et al., 2019; Rozbroj et al., 2018) and lower intent to follow public health mitigation behaviors (Imhoff & Lamberty, 2020; Karić & Međedović, 2020; Romer & Jamieson, 2020). Freeman et al. (2020) found that participants ( $N=2501$ ) who showed high endorsement of conspiracy theories as to the source and risks associated with COVID-19 were less likely to comply with public health protocols to slow the spread of the disease as well as less likely to test for it or vaccinate to prevent it. According to Freeman et al., COVID conspiracy theory thinking was also associated with vaccination and climate change conspiracy thinking, paranoia, a conspiracy mentality, and general distrust.

### **Political Affiliation as a Moderator of Conspiracy Mindset and Reactance Responses**

A significant moderation effect was found for political affiliation such that identifying as conservative strengthened the positive relationship between conspiracy mindset and reactance responses to COVID-19 public health protocols. In other words, a self-identified conservative who also strongly endorses conspiracy theories is more likely to refuse to comply with COVID-19 public health protocols than one who does not identify as politically conservative. This finding was consistent with research indicating that a positive association between conservative political affiliation and conspiracy mindset was significantly related to climate science skepticism (Hornsey et al., 2018), denial of credible evidence that refutes a preconceived stance (Pennycook et al., 2020), and support for prematurely easing COVID-19 public health protocols (Gerace et al.,

2022). Results of the current study also supported cross-cultural research that found a positive association between conservative political affiliation and conspiracy mindset in China, a collectivistic culture (Zhai & Yan, 2022).

The findings in this study also supported Enders and Smallpage (2019) finding that political affiliation and conspiratorial thinking were the two strongest factors implicated in conspiracy mindset, stating that only conspiracy theories with partisan political content were found to be more strongly predicted by political affiliation. Results of the current study also supported Enders et al.'s (2020) findings, indicating that conspiracy theories that were political and partisan in nature (e.g., that President Obama was not an American citizen or that President Trump actually won the 2020 presidential election) were strongly predictive of belief in political conspiracy theories with the level of support for political conspiracy theories being strongest for outgroup conspiracies (i.e., liberals are more likely to believe conspiracy theories about conservatives and vice versa). However, Enders et al. found no significant difference in the level of support for political conspiracy theories about political outgroups between conservatives and liberals, contrary to the findings of this study that found stronger support for political conspiracy theories among conservatives compared to liberals. Enders et al. contended that conspiratorial thinking patterns were stronger predictors for belief in non-political conspiracy theories. This suggests that the connection between political affiliation and conspiracy mindset might not be as clear as found in the current study and points to the need for further research to differentiate among political affiliation, conspiracy mindset, and political versus non-political subjects.

### **The Direct Effect Between Trust in Science and Reactance Responses**

This study found a significant negative relationship between trust in science and reactance responses. Participants who trusted science were less likely to have reactance responses to COVID-19 public health protocols, such that those who distrusted science were more likely to refuse to comply with COVID-19 public health protocols. These results are consistent with Franz and Dhanani (2021), who found that low trust in science was one of the factors predicting less fear of, less knowledge about, and lower perceived severity of COVID-19, as well as fewer self and community mitigation behaviors. Similarly, Soveri et al. (2020) measured the attitudes of 770 parents with at least one child 4.5 years or younger and found that high trait reactance predicted lower trust in medical professionals and a higher likelihood of using complementary and alternative medicine (e.g., homeopathy or reiki). Taken together, the results from this study support previous studies that found a negative relationship between trust in science and reactance responses to compliance with COVID-19 public health protocols.

### **Political Affiliation as a Moderator of Trust in Science and Reactance Responses**

Research Question 2 examined the extent to which political affiliation moderated the relationship between trust in science and reactance responses toward COVID-19 public health protocols. The findings failed to reject the null hypothesis, such that political affiliation did not moderate the relationship between trust in science and reactance responses. Pechar et al. (2018) examined the relationship between components of political affiliation (attitudes toward government and attitudes toward corporations) and the fact that people tend to trust some scientific data, such as climate science, but not

other scientific data, such as GMO science in a large multi-national sample ( $N = 3,000$ , half American and half German). Pechar et al. found that differentiating between the more nuanced measures of political affiliation and specific types of scientific information better predicted trust in science than the generic measures of political affiliation and trust in science. It is possible that by not measuring these more finely tuned constructs, this study failed to find an effect.

It is also important to note that there were complications of multicollinearity and irregularity in the data. Although the VIF and tolerance statistics were within acceptable levels, the correlation between the variables of trust in science and political affiliation was very high ( $r = -.74$ ). Running a stepwise multiple regression analysis revealed that trust in science explained 47% of variance, but due to the high correlation between these variables, political affiliation explained only an additional, but insignificant, 6% of the variance. Additionally, the dependent variable, reactance responses, was not normally distributed, but rather highly skewed toward *no reactance* responses. It is possible that there were not enough cases of higher reactance to detect a moderating effect for political affiliation on the relationship between trust in science and reactance responses.

### **The Direct Effect Between Political Affiliation and Reactance Responses**

Results indicated that political affiliation was positively related to reactance responses in that conservative political affiliation predicted higher reactance to COVID-19 public health protocols. This is consistent with previous findings such as Calvillo et al. (2020), who found that conservatives judged the pandemic as less threatening than liberals. Chung et al. (2021) found that those who got their news from conservative news

sources and former president Trump's briefings were less likely to believe the pandemic to be serious and less likely to follow social mitigation behaviors (e.g., hygiene, masking, and social distancing), while those who got their news from liberal media, health organizations, and mainstream media were more likely to take the pandemic and social mitigation behaviors seriously. Moore et al. (2021) found that conservative political affiliation, and more specifically, trust in former President Trump, predicted the likelihood of contracting COVID-19 due to lack of mitigation practices. Finally, Hornsey et al. (2020) found that Trump supporters were more apt to change their minds about vaccine safety if Trump publicly declared (i.e., Tweeted) that vaccines are bad. In sum, it is clear that political affiliation was implicated in whether individuals complied with public health protocols to slow the spread of COVID-19.

### **The Social Identity Theoretical Approach**

This study consistently found that self-identifying with a particular political party predicted participants' trust in science, conspiracy mindset, and their respective association with reactance to COVID-19 mitigation practices. Political affiliation appears to have more to do with social identity than with policy preferences (Federico & Ekstrom, 2018; Iyengar, 2012; Kidder, 2016). According to Tajfel (1982), belonging to a social group is an important aspect of an individual's identity. However, identifying with a social group also creates an in-group/ out-group, or us versus them, mindset characteristic of the political and social polarization seen today (Iyengar et al., 2019). For instance, polarization as the result of social identity leads individuals to see their own social group as enthusiastic, industrious, and good citizens while seeing the out-group as



conforming, incompetent, and insubordinate (Steffens et al., 2018). Furthermore, not only are politicians of the opposing party seen as more corrupt while politicians from the same party seen as more trustworthy (Clementson, 2018), but when intergroup differences are made salient, those who hold the most extreme views of an outgroup (e.g., Marjorie Taylor Greene or Alexandria Ocasio-Cortez) are seen as the most prototypical members of that outgroup by other groups (Haslam et al., 1995).

Identifying as a member of one or the other political parties, shapes one's worldview, as membership means embracing the political stance advanced by that party; this includes endorsing information accepted by the party as logical and valid (Calvillo, 2019), including beliefs about anthropogenic climate change (Nurse & Grant, 2020), civility toward politically dissimilar co-workers (He et al., 2019), dating preferences (Hernandez & Sarge, 2020), religious identities (Margolis, 2017), and the media that they consume (Dvir-Gvirsman, 2019; Long et al., 2019). According to Van Bavel and Pereira (2018), political attitudes are more likely to concur with one's political social identification rather than actual ideological beliefs. Findings from this study support the SIA in that political identity was a consistent predictor of reactance responses to compliance with COVID-19 public health protocols.

### **Limitations of the Study**

This study was limited to United States registered voters who voted in the 2020 presidential election. Therefore, insights gleaned from the findings cannot be generalized beyond this population. Additionally, this study used a convenience sample, limiting its representativeness and the generalizability of the results. Self-selection bias is another

limitation to generalizability in that those who volunteer to participate in scientific research may be different demographically from individuals who do not volunteer to participate. Because participation was anonymous, it was impossible to verify that participants actually met the inclusion criteria or that they responded honestly to survey questions. Social desirability bias, or the desire to be seen in the best light possible, may influence participants' honest responses to potentially sensitive survey questions; however, the risk of social desirability bias was likely mitigated by the anonymous nature of the survey (Larson, 2019). Finally, while cross-sectional designs are limited to the attitudinal and behavioral snapshot at the time they reflect, time and resource constraints preclude the use of a longitudinal design.

### **Recommendations**

Research on attitudes related to COVID-19 has exploded as the pandemic has lingered, but there is much to still learn about the social consequences of political polarization. Public health professionals have made it clear that refusal to comply with COVID-19 public health protocols, including vaccinations once available, allowed the virus to proliferate and mutate, extending its human impact indefinitely (i.e., cases numbers and deaths). With what was seen during the COVID-19 pandemic in the United States, there is a critical need to better understand how people react to public health emergencies to prevent the conflicts experienced during the pandemic. This study attempted to examine how those variables interact, but this study does bring up other questions.

To better understand attitudinal predilections and increase generalizability, future research should replicate the current study and, in particular, determine if exposure to political rhetoric, independent of political affiliation, predicts political attitudes and behavior. Using populations excluded from this study (e.g., registered voters residing abroad) who may have had less exposure to political rhetoric and its influence might also prove useful to better understanding the relationship between political affiliation and attitudes toward public health protocols. Research on other cultures and how they manage public health crises in the face of similar conspiracy mindset, distrust in science, and polarized political affiliations would also be valuable to compare to American responses. Additionally, research on the social responses to past health emergencies (e.g., bird flu), other public health emergencies (i.e., monkey pox), and future public health emergencies would be valuable to add to the pool of knowledge. Examining other variables that might be implicated in lack of compliance to public health protocols (e.g., scientific knowledge or news source consumption) as well as using a more representative sample, would add a more complete picture to this phenomenon. Finally, designing an experimental study, manipulating variables such as political rhetoric exposure could help to gain valuable insight into other causes for non-compliance of social mitigation strategies when faced with public health crises.

### **Implications**

The results of this study have the potential to promote positive social change in several ways. Public health crises like COVID-19 have been and will continue to be a part of life (ex., Endris et al., 2022 on cholera in Ethiopia; Soeters et al., 2018 on Ebola in

Guinea; Yeshanew et al., 2022 on pertussis in Ethiopia). Gaining a better understanding of how people act and react during public health crises, especially in the face of political polarization has the potential to make sure public health messaging disabuses ordinary citizens of any truth to conspiracy disinformation. At the time of this writing, over 1.09 million Americans have died of COVID-19 and almost 300 per day are still dying (Coronavirus in the U.S., 2022). Hahn (2021) estimated that polarization produced by misinformation in political messaging caused up to an additional 12,200 people to needlessly lose their lives as of mid-July 2020. One can only imagine how many people needlessly lost their lives since. Through a better understanding of how distrust in science, conspiracy mindset, and political affiliation are related to reactance responses, it is possible that public health messaging can more effectively manage future public health crises. More effective framing and communication of the facts, delivered by reliable and trusted sources, may encourage those inclined toward conspiracy beliefs to challenge, rather than embrace them, thereby increasing compliance with public health protocols designed to prevent disease and disruption to normal daily life.

### **Conclusion**

The COVID-19 pandemic exposed extreme political polarization in the United States that has been implicated in reactance responses toward public health mitigation protocols (Chen & Fan, 2022; Choi & Fox, 2022; Chung & Jones-Jang, 2021; Hart et al., 2020; Lang et al., 2021). Conspiracy theories about the pandemic flourished (e.g., Bertin et al., 2020; Fuhrer & Cova, 2020; Neeraj et al., 2022; Romer & Jamieson, 2020) and a marked lack of trust in science was seen (Agle & Xaio, 2021; Latkin et al., 2020; Latkin

et al., 2021). Conspiracy mindset and distrust in science were predicted by conservative political affiliation (Agle, 2020; Franz & Dhanani, 2021). The goal of this study was to examine the extent to which political affiliation moderated the relationship between trust in science, conspiracy mindset, and reactance responses to COVID-19 public health protocols. Results indicated that political affiliation moderated the relationship between conspiracy mindset and reactance responses, such that political conservatives were significantly more likely to endorse conspiracy theories and to resist compliance with COVID-19 public health protocols. No moderating effect for political affiliation on the association between trust in science and reactance was found, but a direct positive relationship between trust in science and reactance indicated that those who distrusted science were significantly more likely to resist compliance with COVID-19 mitigation practices. Political affiliation also predicted reactance responses, such that conservatives were significantly more likely to resist public health mandates. These results provide a better understanding of factors that led to non-compliance with public health mandates. With better understanding, it is possible to improve public health messaging to gain trust, minimize belief in conspiracy theories, and reduce or prevent resistance to lifesaving public health protocols.

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## Appendix A: Demographics Questionnaire

1. What is your age range?
  - a. 18-25
  - b. 26-35
  - c. 36-45
  - d. 46-60
  - e. Over 60
2. What is your gender?
  - a. Male
  - b. Female
  - c. Non-binary
  - d. Transgender
  - e. Other
3. Are you a current registered voter?
  - a. Yes
  - b. No
4. Did you vote in the 2020 presidential election?
  - a. Yes
  - b. No
5. What is your highest education level?
  - a. Did not graduate high school
  - b. High school
  - c. Some college
  - d. Graduated college (Bachelor's degree)
  - e. Graduated college (Master's degree)
  - f. Graduated college (PhD or other professional degree)
6. In which US state do you live? \_\_\_\_\_
7. Do you follow suggested COVID-19 health guidelines such as masking, hand hygiene, and social distancing?
  - a. All of them
  - b. Some of them
  - c. None of them
8. Have you been vaccinated for COVID-19?
  - a. Yes
  - b. No
  - c. Yes, but not fully vaccinated

## Appendix B: Belief in Conspiracy Theories Inventory (BCTI)

1. A powerful and secretive group, known as the New World Order, are planning to eventually rule the world through an autonomous world government, which would replace sovereign government.
2. SARS (severe acute respiratory syndrome) was produced under laboratory conditions as a biological weapon.
3. The US government had foreknowledge about the Japanese attack on Pearl Harbour but allowed the attack to take place so as to be able to enter the Second World War.
4. US agencies intentionally created the AIDS epidemic and administered it to Black and gay men in the 1970s.
5. The assassination of Martin Luther King, Jr., was the result of an organized conspiracy by US government agencies such as the CIA and FBI.
6. The Apollo moon landings never happened and were staged in a Hollywood film studio.
7. Area 51 in Nevada, US, is a secretive military base that contains hidden alien spacecraft and/or alien bodies.
8. The US government allowed the 9/11 attacks to take place so that it would have an excuse to achieve foreign (e.g., wars in Afghanistan and Iraq) and domestic (e.g., attacks on civil liberties) goals that had been determined prior to the attacks.



9. The assassination of John F. Kennedy was not committed by the lone gunman, Lee Harvey Oswald, but was rather a detailed, organized conspiracy to kill the President.
10. In July 1947, the US military recovered the wreckage of an alien craft from Roswell, New Mexico, and covered up the fact.
11. Princess Diana's death was not an accident, but rather an organized assassination by members of the British royal family who disliked her.
12. The Oklahoma City bombers, Timothy McVeigh and Terry Nichols, did not act alone, but rather received assistance from neo-Nazi groups.
13. The Coca Cola company intentionally changed to an inferior formula with the intent of driving up demand for their classic product, later reintroducing it for their financial gain.
14. Special interest groups are suppressing, or have suppressed in the past, technologies that could provide energy at reduced cost or reduced pollution output.
15. Government agencies in the US are involved in the distribution of illegal drugs to ethnic minorities. \*

\*Original statement had the UK as the country in question. Changed to reflect that the sample is US citizens.

## Appendix C: Trust in Science and Scientists Inventory (TSSI)

1. When scientists change their mind about a scientific idea it diminishes my trust in their work.\*
2. Scientists ignore evidence that contradicts their work.\*
3. Scientific theories are weak explanations.\*
4. Scientists intentionally keep their work secret.\*
5. We can trust scientists to share their discoveries even if they don't like their findings.
6. Scientists don't value the ideas of others.\*
7. I trust that the work of scientists to make life better for people.
8. Scientists don't care if laypersons understand their work.\*
9. We should trust the work of scientists.
10. We should trust that scientists are being honest in their work.
11. We should trust that scientists are being ethical in their work.
12. Scientific theories are trustworthy.
13. When scientists form a hypothesis they are just guessing.\*
14. People who understand science more have more trust in science.
15. We can trust science to find the answers that explain the natural world.
16. I trust scientists can find solutions to our major technological problems.
17. We cannot trust scientists because they are biased in their perspectives.\*
18. Scientist will protect each other even when they are wrong.\*
19. We cannot trust scientists to consider ideas that contradict their own.\*
20. Today's scientists will sacrifice the well-being of others to advance their research.\*
21. We cannot trust science because it moves too slowly.\*

\* Reverse coded item.

## Appendix D: Political Alignment Scale (PAS)

1. In terms of my political identity, I consider myself to be conservative.
2. I have positive feelings about the Republican Party.
3. In terms of my political identity, I consider myself to be liberal. \*
4. I have positive feelings about the Democratic Party. \*
5. I admire President Trump.
6. President Trump makes me proud to be an American.
7. I admire President Biden. \*
8. In the last [2020] election, I voted for President Trump (or would have if I voted).
9. In the last [2020] election, I voted for President Biden (or would have if I voted).
- \*  
10. I feel that the US is now on the right track. \*
11. I feel that the US is now on the wrong track.

\* Reverse coded item.

\*\*Items were changed to reflect current political attitudes

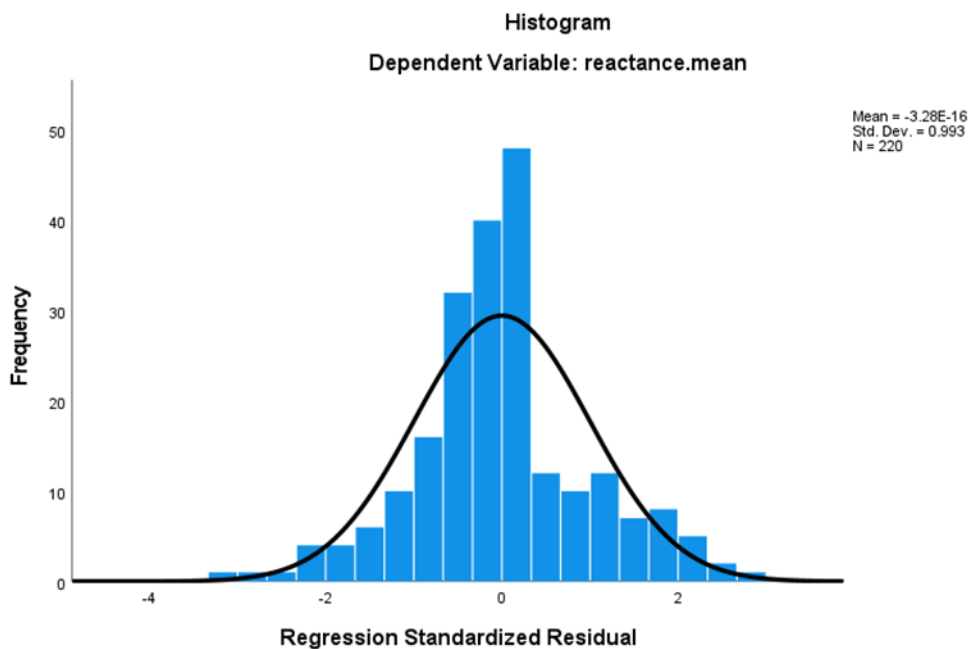
Appendix E: The Brief Reactance to Health Warnings Scale (RHWS)

1. Warnings about masks, vaccines, and other COVID-19 precautions are trying to manipulate me.
2. The health effects on COVID-19 are overblown.
3. These warnings about COVID-19 annoy me.

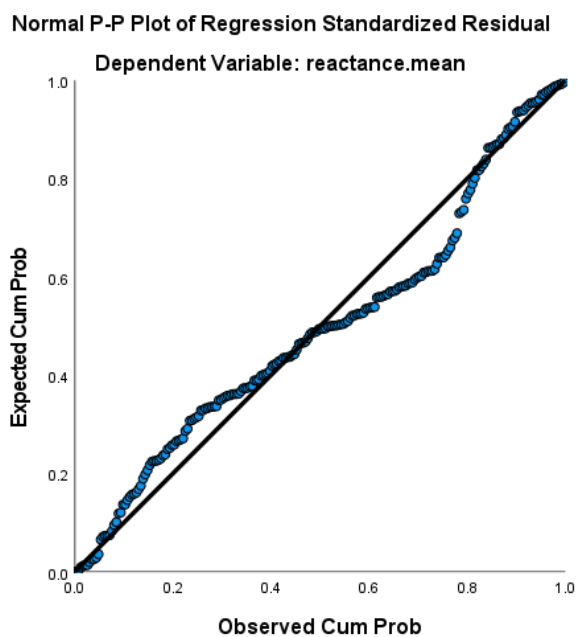
\*Statements were changed to reflect attitudes toward the COVID-19 pandemic

## Appendix F: Normality Graphs and Plots

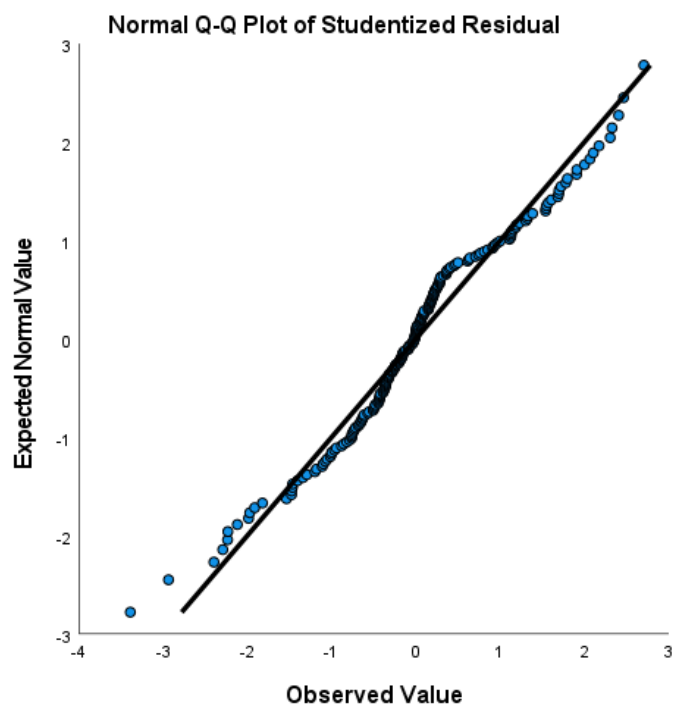
## Histogram Measuring Normality



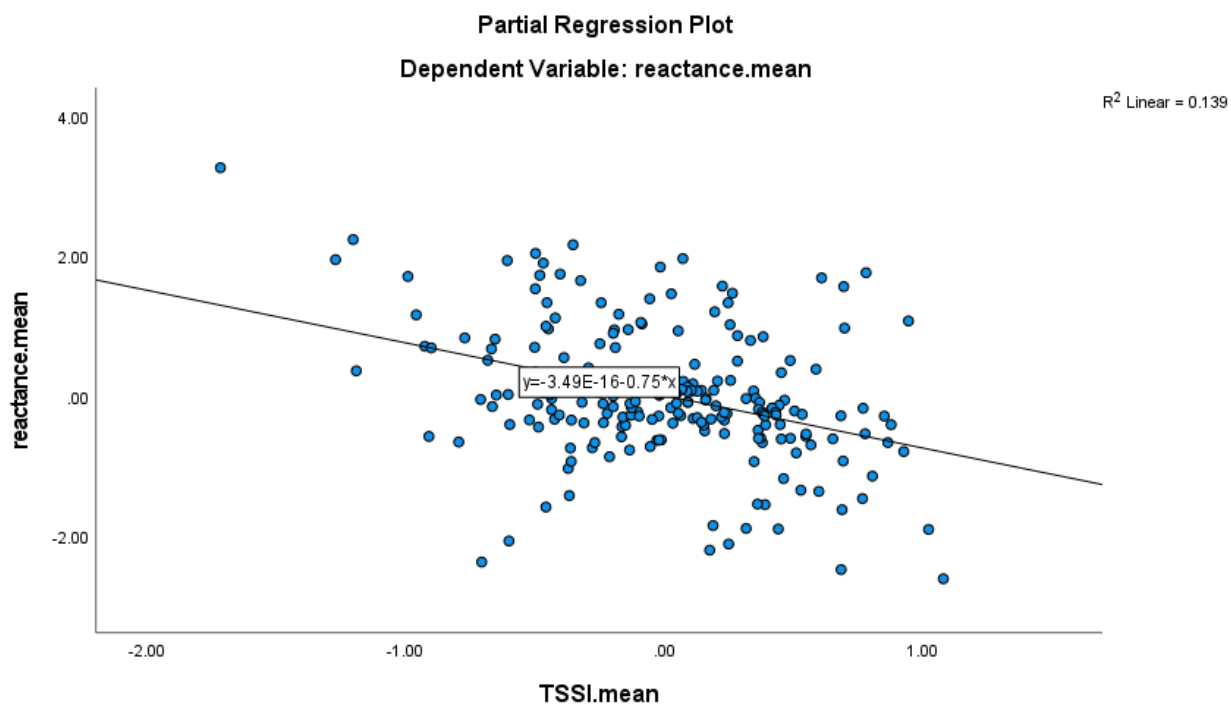
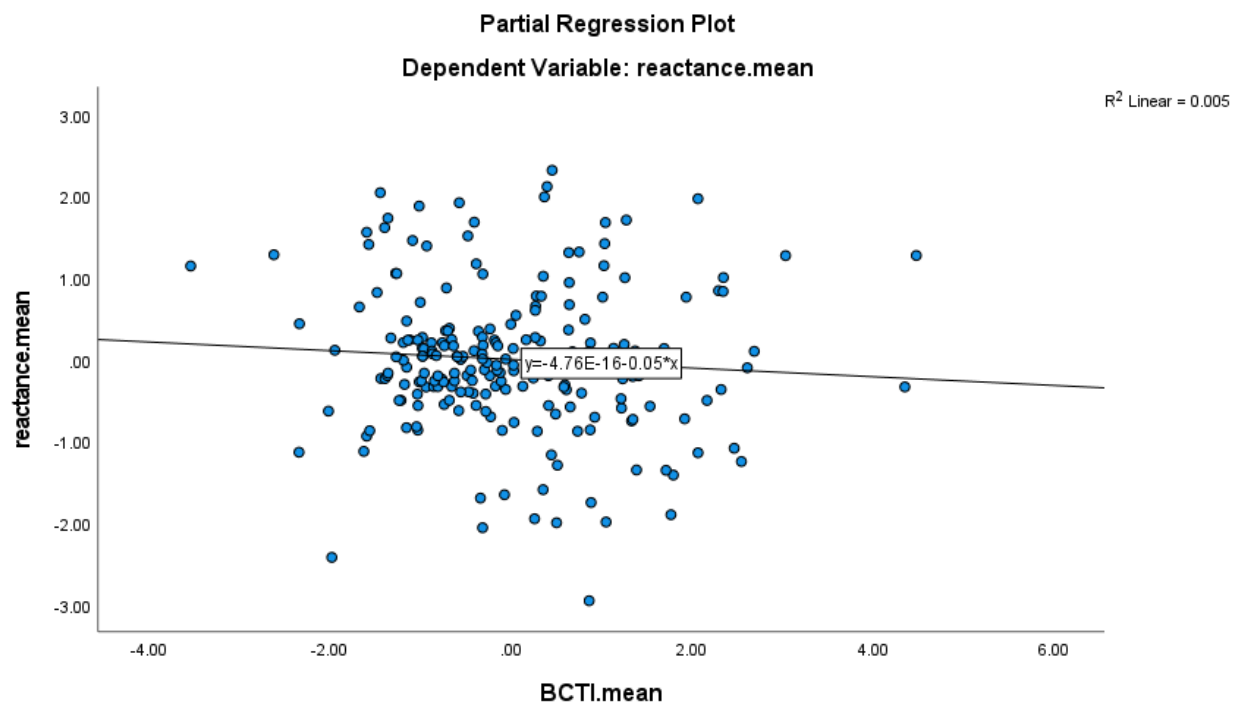
## P-P Plot Measuring Normality

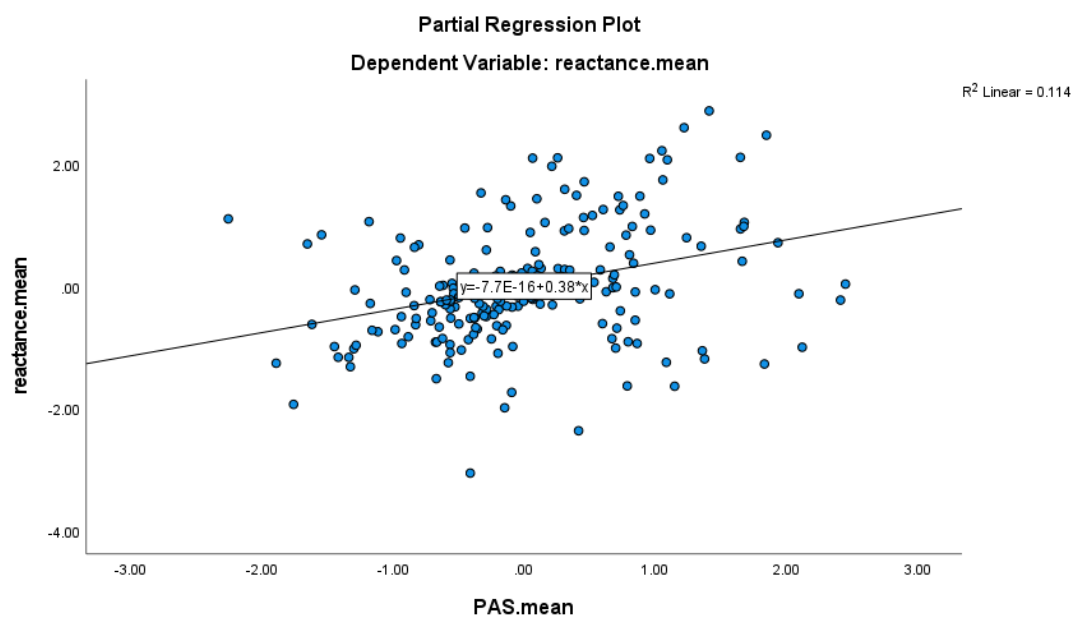


## Q-Q Plot Measuring Normality



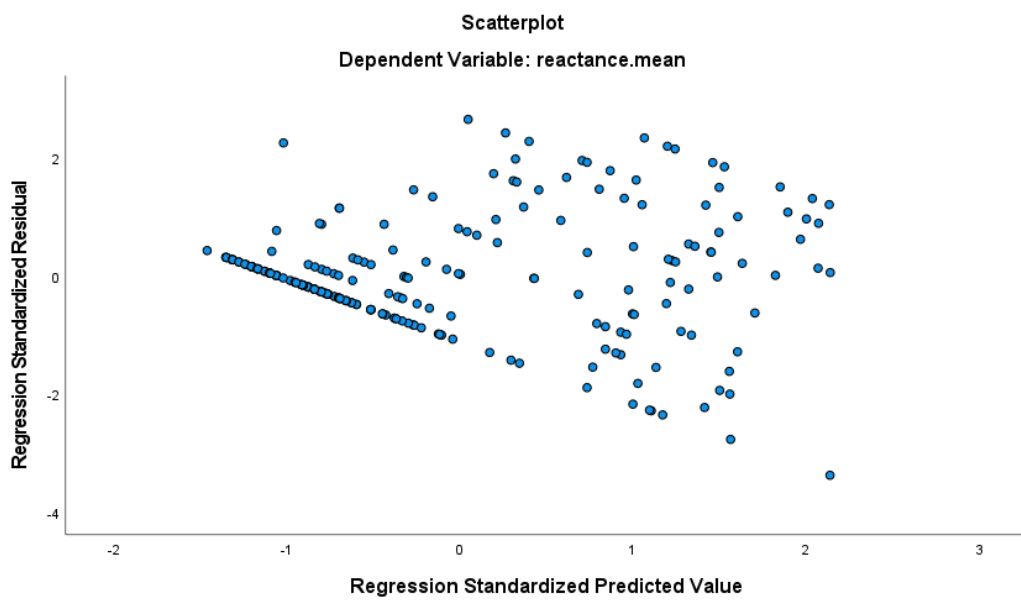
## Appendix G: Scatterplots Examining Linearity



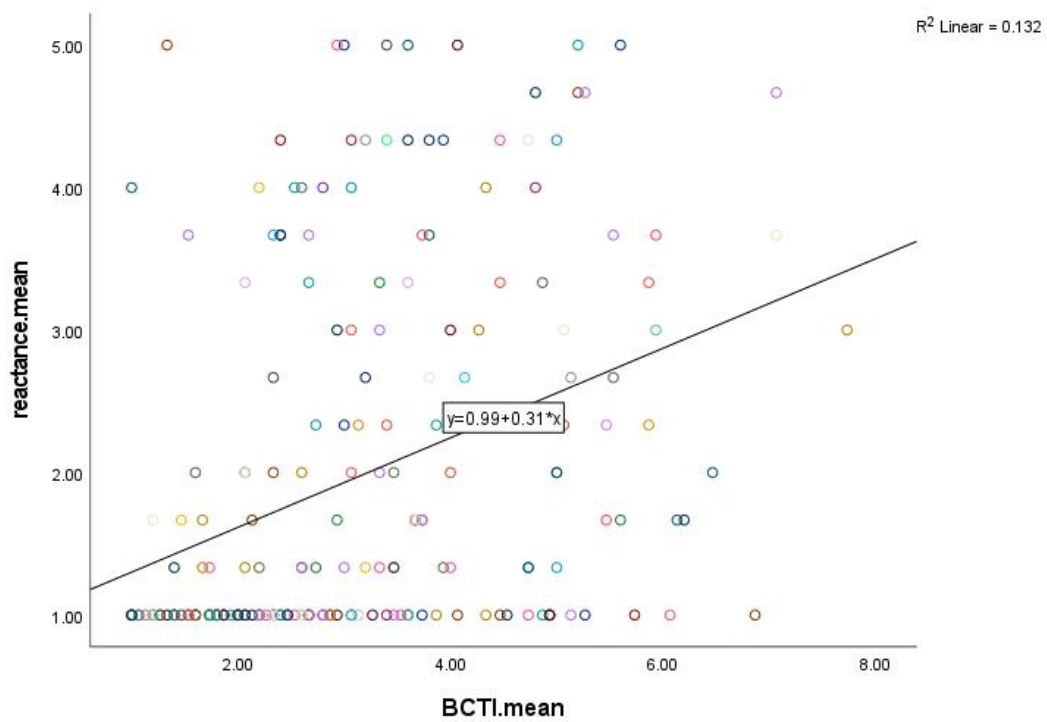




## Appendix H: Scatterplot for Measure of Homoscedasticity



## Appendix I: Graph of Relationship Between Reactance and Conspiracy Mindset



## Appendix J: Graph of Relationship Between Reactance and Trust in Science

