Original Research

Health Communications Trial with a Resistant Population to Increase Public Health Compliance during a Pandemic

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ABSTRACT

Background: Georgia has among the worst rates of COVID-19 hospitalization and death rates in the nation. Many identifying as politically conservative resist public health mitigation measures, similar to populations in other politically conservative geographical areas. There are limited peer-reviewed public health communications designed for this population. We aimed to determine if an intervention using a fear appeal approach with efficacy during a pandemic can positively affect knowledge, attitude, perception, and/or behavior (KAP) in Georgia with this population.

Methods: We delivered online video stimuli tailored to the geocultural characteristics of the target population. designed to stimulate fear, encourage efficacy, and counter mis- and disinformation. It used three routes to affect participants: narrative, direct messaging, and non-message cues. We measured risk aversion and conspiratorial ideation as moderating psychological factors using psychological batteries. Census and voting data were used to identify a convenience sample of 829 Georgia adults in an outer Atlanta suburb.

Results: Exposure to the video, moderated by risk aversion, resulted in increased recommended mitigating behavior to prevent COVID-19 (13.7%, 95% CI: 2.7% to 24.7%,) and increased positive attitude toward the recommendations (7.7%, 95% CI: 5.9% to 9.3%). Exposure to the video, moderated by conspiratorial ideation, resulted in an increase in perception of COVID-19 risk (7.6% 95% CI: 1.8% to 13.5%) among participants.

Conclusions: An intervention using a fear appeal approach with efficacy during a pandemic can positively affect attitude and risk perception of a politically conservative population. Scaling similar interventions with resistant geocultural populations has promise of increasing adherence to public health recommendations. The moderating factor of conspiratorial ideation is relevant given conspiracies during pandemics, such as COVID-19. This multidisciplinary study contributes to the extant literature by providing insights of populations influenced by contrary political attitudes.

Keywords: Misinformation, conspiracy, KAP, infodemic, health messages, communications, COVID-19

INTRODUCTION

The public response to the COVID-19 pandemic has been typical for widespread public health crises: denial, scapegoating, conspiracy theories, myths, and misinformation (Taylor, 2020; Quick, 2008; Rosenberg, 2009; Tuchman, 2011). Mis- and disinformation about SARS-CoV-2, the virus that causes COVID-19, has spread further and deeper than factual evidence into “an infodemic” (World Health Organization, 2020). The ongoing pandemic, despite scientific evidence about how to prevent transmission and save lives, challenged public health scientists to understand how to intervene when resistance to public health recommendations persisted. The United Nations and WHO called for research to assist populations who are at "high risk" for dis- and misinformation (2020).

Eschewing public health crisis communications best practices (Seeger, 2006), the initial U.S. federal communications response efforts in early 2020 consisted largely of urging individual Americans to follow a set of public health recommendations: socially distance, avoid events with more than ten people, wash hands frequently, and wear masks (added slightly later). Although evidence-based, the recommendations did not meet APEASE criteria for a successful intervention (Affordability, Practicability, Effectiveness and cost-effectiveness, Acceptability, Side-effects and safety, Equity) (see Appendix A for a discussion of deficits) (West et al., 2020). Indeed, acceptability for these mitigations eroded over time among the group under study; accordingly, these populations displayed lower rates of adopting mitigating behavior (Bekele, 2020; Allcott et al, 2020), including vaccination (Societal Experts Action Network [SEAN], 2021).

The Federal communications response was further complicated throughout the year when Federal and many state government messages conflicted with public health recommendations, contributing to the publics' uncertainty

(Bolsen & Palm, 2022). Information that conflicts with public health recommendations remains pervasive among influencers popular in Georgia, which continues to lag in vaccination rates and has higher infection rates (Ndugga et al, 2021; CDC COVID Data Tracker, 2022). Uncertainty gives rise to anxiety, misinformation, myths, and conspiracies, which reinforce populations' justification to ignore or refuse to comply with public health recommendations, or worse, fall prey to purposeful manipulation (Taylor, 2020).

Conspiratorial thinking impeding public health campaigns is not unknown in the U.S.; similar patterns of misinformation, myths, and conspiracies emerged with efforts to mitigate the spread of other infectious diseases. For example, the White House under the Reagan administration resisted using risk communications best practices during the HIV epidemic, causing misinformation to spread, as well as ultimately, deaths (Epstein, 1996). Influencers turned venereal disease epidemics into public relations campaigns to prevent family planning policies (Brandt, 1987) and tied the HPV vaccine to teen sexual behavior, resulting in stubborn resistance to vaccination uptake (Zimet et al., 2013) and thus lagging progress to prevent cervical cancer in the U.S. compared with other Western countries (WHO, Cervical Cancer, 2022).

Research in the U.S. indicated that much of the ongoing group-specific resistance to public health recommendations to prevent COVID-19 transmission diverged along partisan lines, with Republican partisan identification and in-group loyalty influencing what would otherwise be non-political behaviors (Bekele et al., 2020; Gollwitzer et al., 2020). This divergence was robust when local rates of COVID-19 cases, hospitalizations, and deaths were accounted for; these effects were also consistent for age, income, education, race, ethnicity, and sex, and corresponded to the time leading up to the study period and during the study period, even as cases and deaths rose (Gollwitzer et al., 2020; Allcott et al., 2020).

Geocultural Subgroups and Public Health

Developing health communications interventions for geocultural sub-groups, including those characterized by political identification, is important for several reasons. Public health efforts generally are directed to either the general population or populations defined by their socio-economic status, race, ethnicity, age, or sex (Yuan et al., 2019; Poland et al., 2005), but not political identification, to our knowledge. Public health efforts that emphasize social norm characteristics or determinants of "place," likewise do not include political attitudes or partisanship in a geographic area. Research measuring COVID-19 behaviors and attitudes, primarily fielded at the national level, necessarily do not possess the requisite granularity to increase understanding of subgroups and often obscure normative influences in a geocultural place, e.g., how social ties strengthen partisanship (Poland et al., 2005; Andrews, 2005; Mason & Wronski, 2018). Yet, populations who are resistant to mitigation, sort largely into geographic areas, as evidenced by vaccination rates in Georgia (Georgia Department of Public Health, 2022; John Hopkins, 2022).

Communication campaigns to mitigate public health threats are often based on the way experts think about risk, calculating the "hazard times exposure = consequence," but not the way the public understands risk, as the subjective perception of "the probability of something bad happening" to me (Brown, 2014, p. A276–A279). Our study aimed to address the "me," and by extension, "mine," in a tailored intervention using a fear appeal approach with the extended parallel process model (Witte, 1994; Leventhal & Roger, 1970), to increase perception of risk from the virus. This approach endeavored to heighten perception of threat so the participants would engage in self-preserving actions.

We employed moderate-level fear messaging, guided by positive response efficacy (Bigsby & Albarracín, 2022), which is shown to motivate behavior rather than overwhelm and thus inhibit behavior (Witte & Allen, 2020). We chose this approach for the intervention because it was recommended by social and behavioral science expert guidance to contain the pandemic, "Using Social and Behavioral science to support COVID-19 pandemic response," published in Nature Human Behavior in the beginning of the pandemic (Van Bavel, et al., 2020).

We also followed Bilali and Staub (2017), who demonstrated a successful health communications intervention for a resistant population within a geographically bound area during a public health crisis using culturally-aligned video. The technique of tailoring interventions to geosocial groups was pioneered by HIV/AIDS researchers to better understand why high-risk populations, including those who received prevention education, engage in risky sexual behaviors (Goedel & Duncan, 2015; Contesse et al., 2020). Another successful example of carefully geoculturally tailored interventions is the Freedom from Chew campaign used in rural Virginia (Wagner et al., 2018). Applying these principles to vaccine acceptance, Hao and Shao (2022) noted an "individual decision to take the vaccine [is] a function of their personal characteristics and [is] also rooted in their home state's political, public health, and economic contexts," and that "knowledge of the profile … provides essential information to leverage certain factors and maximize vaccine uptake." Nyhan et al. (2012) also demonstrated the importance of social network perception in vaccine communications in the Southeast.

Risk Aversion and Conspiratorial Ideation

We further examined the influence of two individual-level psychological factors integral to people's responses during a pandemic. Risk aversion and conspiratorial ideation exert an inordinate influence over a variety of attitudes and behaviors, including health decisions and political views (Miller, et al., 2016; O'Connor & Paunonen, 2016). We therefore hypothesized these factors may moderate the effect of an intervention. Risk aversion is an established concept in psychology, public health, and economics.

Studies found individuals vary in the relative risk they assign behaviors and that this individual variance was a longitudinally stable, domain-specific psychological factor that influenced an array of individuals' attitudes and behaviors (Arrow 1971; Pratt 1978; Dyer and Sarin 1982; von Winterfeldt and Edwards 1986; Yates and Stone 1992). Communications research on COVID-19 demonstrated that perception of risk from the virus predicted mitigating behavior (Vacondio et al, 2021; Niepel et al, 2020).

Our conceptual conspiratorial thinking framework was defined as a psychological disposition affecting the likelihood that individuals would assign responsibility and cause to an unevidenced and nebulous explanation over an evidenced explanation based on people's "underlying worldview" (Geortzel, 1944, p. 740; Swami et al., 2011; Uscinski, Klofstad, and Atkinson, 2016, p. 2; Edelson et al., 2017, p. 936). Douglas et al. (2019) found that belief in one conspiracy was likely to be associated with belief in others, which we posited is relevant to understanding who may be more prone to conspiratorial ideation during a crisis brought on by a highly contagious infectious disease. This predisposition was shown to alter information processing and reduce compliance with COVID-19 mitigation behavior, including vaccination (Imhoff & Lamberty, 2020; Bertin et al, 2020; Georgiou et al, 2020; Goldberg & Richey, 2020; Marinthe et al, 2020; Romer & Jamieson 2020; Loomba et al. 2021; Oleksy et al. 2021; Sallam et al. 2021; Winter et al. 2021; Pummerer et al. 2022). If participants responded to the battery question indicating they believed a self-interested cabal runs the government, for example, we hypothesized that they may be highly suspicious of federal government mitigation recommendations and less likely to adopt them.

Research Objectives

This study tested if a health communication intervention using the fear appeal approach with efficacy, customized according to the target population's geocultural characteristics, could address a gap in health communications' effectiveness with a resistant, geocultural subset of the population, and thus positively influence its knowledge, attitude, perception of risk, and/or behavior. Based on the literature discussed above, we posited that the intervention would be more effective for those high in risk aversion or low conspiratorial ideation, even within a resistant population. , and that the inclusion of these psychological factors as significant moderators of mitigation efforts may increase the efficacy of future public health messaging by increasing our understanding of responses to such efforts[1]. To test our concepts, we pre-registered hypotheses, a survey questionnaire, and the research methodology. The pre-registered[2] hypotheses were

1.) Participants with higher values of risk aversion will report more positive changes in one or more of knowledge, attitude, perception (referred to as KAP), or behavior following the intervention than participants with lower values, all else equal.
2.) Participants with lower values of conspiratorial ideation will report more positive changes in one or more of knowledge, attitude, perception, or behavior following the intervention than participants with higher values, all else equal.

METHODS

This research was approved by Georgia State University's Institutional Review Board. All procedures were in accordance with the ethical standards of Georgia State University's Office of Research Integrity and Assurance (IRB approval H21104) and with the 1964 Helsinki declaration and its later amendments of comparable ethical standards.

Participants and Setting

The study was conducted online with a convenience sample of 829 English-speaking adults in a northern outer suburb of Atlanta which primarily votes Republican and an adult population of approximately 517,389 (American Community Survey, US Census, 2019). The inclusion criteria were English-speaking adults, aged 18 years and older, who voted on Republican ballots for the most recent three elections, and who resided in the geosocial target area. Consistent with resistant groups identified in national surveys, the study population was similarly homogenous in terms of income, age, and education; it was nearly all white and Protestant Christian; and was 94% Republican, as indicated by three years of voting records.

The geosocial area where the sample population resided was geographically distinct, bound by highways and natural barriers (Andrews, 2005). It had minimal migration into the community and was in a socially overlapping area utilizing the same schools, churches, and shopping areas. See Figure 1. This area was not subject to widespread local or Georgia state policies mandating masks or social distancing that would have exerted an influence on increased mitigating behavior.

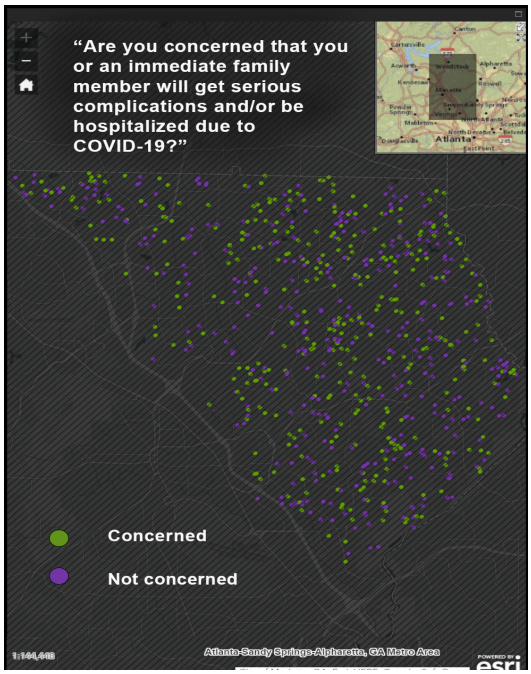
Due to the urgency of the pandemic, the sample was selected to align with characteristics similar to those of populations less accepting of public health recommendations than the majority of Americans. These populations were consistently shown to resist adopting behavioral mitigations according to relevant polling and surveys conducted from the onset of the pandemic (SEAN, 2021; Fivethirtyeight Coronavirus Polls Tracker, 2021).

[1] Our study also included a pre-exposure analysis demonstrating mediating effects of higher conspiratorial belief and institutional trust in both federal and state officials on compliance with public health recommendations. This is submitted to a separate journal.

[2] This study was pre-registered with the Center for Open Science – https://osf.io/kg53u.

Figure 1

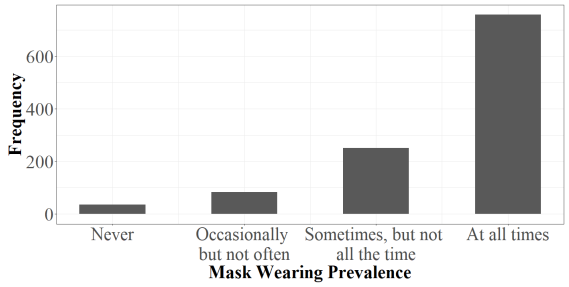
Geocoded Map of Participants in Study Area



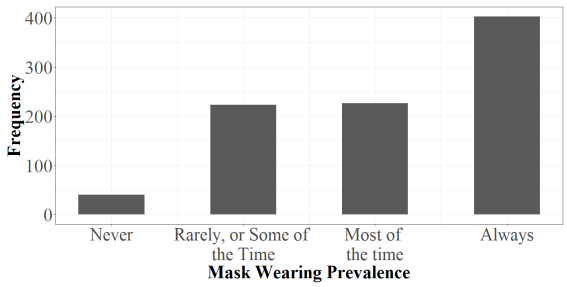
Note: Portions of the study data are available online at www.colemangrpinc.com/protectinghealth. This platform allows various types of maps and levels of examination and restricts inspection at the street level in order to protect personally identifiable identification. The question displayed is answered by control and test groups: *Are you concerned that you or a family member will get seriously ill/hospitalized?*

Figure 2

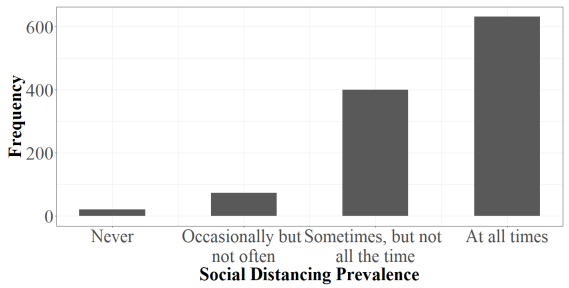
Masking and Social Distancing Prevalence: General Population and Sample



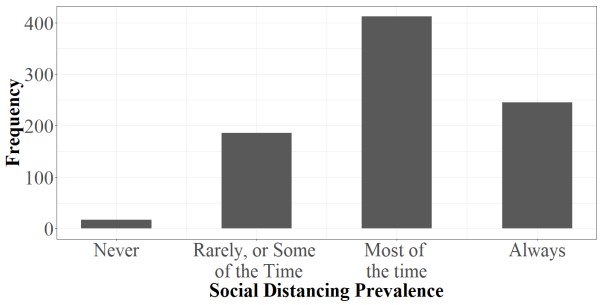
Axios-Ipsos (Population)



Sample



Axios-Ipsos (Population)



Sample

Note: The general population relative frequency data was drawn from the July 31 - August 3, 2020 panel of the recurring Axios-Ipsos survey (wave 19); n=1129, shortly before this study was fielded. The study frequency data was drawn September 2-5, 2020, n=829, wave 1, before exposure. Axios-Ipsos data was accessed from SEAN (Societal Experts Action Network, 2020) at https://covid-19.parc.us.com/client/index.html#/search.

Our sample similarly reported significantly lower rates of following COVID-19 mitigation behaviors when compared to the general public[3], as illustrated in Figure 2.

Beginning in late August 2020, Cygnal, a polling company specializing in reaching Republican voters[4], recruited potential participants by email and text. Using an online link, it administered the survey with the video stimuli in three waves: September 2-5, September 11-14, and September 30-October 7, 2020. It randomly assigned those who gave consent at the start of the first wave to either the control or test group. Participants used their personal electronic devices; all who consented were included. The assignments were maintained across waves, and groups were of approximately equal size throughout. To increase retention, Cygnal offered a $5 Amazon gift card upon completion of all waves and prompted participants with three texts and emails containing the survey link prior to each subsequent wave. The timing of the waves was designed to test for durability and avoid an instrument effect. Rapid online surveys are a promising method to assess and track knowledge and perceptions among the general public during fast-moving infectious disease outbreaks (Geldsetzer, 2020).

Assessments/Survey Instruments

The intervention proceeded as follows: respondents from both groups first answered a series of questions relating to COVID-19 knowledge, attitude, perception (KAP), and mitigation behaviors. The test group was then exposed to the five-minute video and asked for a manipulation check to ensure attention. The control group did not view the video nor a replacement stimulus. Both groups then were asked to rate the perceived threat of COVID-19, as a test of the intervention's efficacy; this 'threat' question was separate to the perception question posed prior to the stimuli and therefore was not included in discussion of KAP. Following these steps, both groups were then asked a) if they or a loved one had contracted COVID-19, and b) demographic questions (race, age, sex, income, education).

The sequencing allowed for collection of KAP and behavior measures prior to exposure to the experimental stimuli, so as to not bias the responses. Personal experience with COVID-19 was asked to account for any influence on key measures. Demographic questions were asked after KAP questions so as not to deter completion due to their sensitive nature. Participants could leave the demographic questions blank but were required to complete other questions.

The second wave proceeded in the same manner, with the addition of a risk aversion battery prior to exposing the test group to the video stimuli. In wave three, both groups answered a conspiratorial ideation battery, KAP and behavior questions, and the COVID-19 threat question, but were not exposed to the video stimuli. In order to test the durability of the stimuli effect, wave three was conducted after a time lag of two-three weeks. (See Appendix B for the survey questionnaires.)

Quality and attention criteria were applied to ensure the robustness and validity of responses. Participants were excluded who: 1) failed the manipulation check by incorrectly reporting information from the video (0%); 2) chose conflicting personal experience answers (e.g., medical test-confirmed diagnosis in wave 1 but no COVID-19 experience in wave 3 (3.9%); 3) did not participate for a credible period of time to have earnestly completed each wave (3.2%); and 4) had missing data on key factors of interest (moved through without selecting answers) (1.8%). Participants who answered 'unsure' were not included in analyses based on that question, though they were not excluded from the sample. Wave 1 N = 829; wave 2 N = to 291; wave 3 N = 181. The test and control group ratios remained functionally equal throughout. Descriptive statistics for all measures and number of responses are available in Appendix C.

Video

The video stimuli followed general principles of the fear appeals approach with efficacy and used well-established factors to increase the perception of risk and to stimulate fear: a) Awareness; b) Trust; c) Personal (Can it happen to me?); d) Dread of suffering; e) Age-affected; f) Uncertainty; g) Familiarity; h) Scope (Ropeik, 2004; Ropeik, 2011; Noar et al, 2016).

Using "found footage,"[5] the video was designed to personalize risk among the target population, in contrast to how experts often communicate a health risk as calculating the hazard (Brown, 2014) or communicating a general message of the threat. The video also countered prominent misinformation widespread at the time of the experiment.

The video stimuli utilized three routes to affect participants: narrative, central route of direct messaging, and periphery route of non-message cues (Dal Cin et al., 2004; Green, 2006; Hinyard & Kreuter, 2007). The narrative and direct messaging included instructions for taking self-efficacious behaviors consistent with public health recommendations (masking and social distancing). The peripheral route was designed to activate the psychology of in-group affiliation/social identity with culturally applicable influencers specific to the target population (Lunn et al., 2020), corresponding to two types of characterizations. The first type was based on Moral Foundations Theory and the strong characteristics among politically conservative populations: loyalty, authority, and purity (Haidt & Craig, 2004). Loyalty refers to standing with your group, family,

[3] The results of two sample Kolmogorov-Smirnov tests for both responses to masking and social distancing were statistically significant and in the expected direction. Masking: $D=0.451$, $p<0.001$; social distancing: $D=0.285$, $p<0.001$.

[4] Highly rated by FiveThirtyEight (n.d. 2020).

[5] Term for clips of video available in the public domain.

nation; authority as obedience to hierarchical relationships; purity as abhorrence for disgusting things, actions.

The second type of characterization was based on the values and social organization/norms characteristic of the population. In our population, the South is commonly characterized by the triad of service to 'family, flag, and God' (Andrews, 2005). Family is self-evident; flag is understood as a symbol of esteem or reverence for the military, and God as Christian religion. These are exemplified by rates higher than any other U.S. region of military service, participation in organized religion, and of the number of children in families (Pew Research Center, 2021).

The stimuli narrative likewise employed these characterizations using peripheral cues. While 'in-group' authority figures and influencers told the story, the design avoided images of messengers perceived negatively by this population, such as CNN and U.S. government officials Dr. Anthony Fauci, the Surgeon General, and those from the U.S. Centers for Disease Control and Prevention. It avoided imagery that could further deny that COVID-19 could happen to their 'in-group' (Cikara, et al., 2011), such as images of New York scenes, people of color, and primarily elderly people. In the second stimuli exposure, scenes were shortened to maximize engagement and the opening scene was slightly altered; all factors and visual elements remained the same. See Appendix D for examples of the perception of risk messages and the peripheral cues corresponding to each characterization.

To construct the video and questionnaires, we used the same language featured in large public interest panel surveys published by SEAN since February 2020 (e.g. concern vs. worry); the Social Distance Scale instrument (Prachthauser, 2020); and the U.S. Census Household Pulse Survey. We documented and mirrored White House talking points that were amplified by media influencers between mid-June and August 31, 2020, to maximize political resonance. Some questions did not yield significant results regarding the hypotheses and were not discussed in this paper (see Appendix C). We did not include a question about belief in specific COVID-19 conspiracy theories to avoid priming respondents.

KAP

KAP questionnaires are used when there is strong sociocultural influence, religious expression, and/or political stances that may influence resistance to comply, allowing researchers to identify gaps and patterns in a sample of a specific population which encourage or inhibit their ability to adopt healthy behavior (Gumucio, 2011). We used P for "perception," instead of "practice," an oft-used category, and added behavior to provide more depth of understanding.

Measures/Statistical Analysis

Statistical analysis was conducted using R software, version 4.0.3 (2020-10-10; Bunny-Wunnies Freak Out.

In our study, higher values indicated a positive KAP and/or behavior related to COVID-19 and were defined as: a) knowledge informed by scientific evidence of the severity and transmissibility; b) attitude toward public health recommendations; c) perceived risk of COVID-19; and d) behaving in accordance with public health recommendations for masking and social distancing. (See Figure 2.)

We measured knowledge through the average of two questions capturing COVID-19 misinformation – similarity to the flu and lack of threat to those with strong immune systems. This measure was coded such that higher values indicated higher levels of such misinformation. Attitude was measured through the desire for others to socially distance. Perception was measured by concern that 'immediate family members will get serious complications and/or be hospitalized,' capturing severity and transmissibility. Behavior was measured through an identified latent factor from confirmatory factor analysis formed from responses to three questions pertaining to mask-wearing, social distancing, and encouraging social distancing (eigenvalue of 1.65; proportion of variance explained 1.20). These questions were consistent across waves, allowing for longitudinal comparison (see Appendix C). However, these variables did not correlate at the sufficient α values of 0.7 for an additive scale, thus this latent factor approach was preferable to analyzing each behavioral measure individually. The results of individual measure analysis were substantively identical to those of the latent factor approach; see Appendix E, Tables A-H.

Covariates of Risk Aversion and Conspiratorial Ideation

We utilized established psychometric batteries to measure the hypothesized covariates of risk aversion and conspiratorial ideation. We abbreviated the risk aversion battery developed by Weber, Blais, and Betz (2002), selecting those items with the highest factor loadings on four pertinent risk perception subdomains: health/safety, recreational, ethical, and social. We combined responses into an additive index in lieu of a latent factor approach. The results were substantively identical using either the additive or latent factor approach. The scale was coded where higher values indicated a higher aversion to participating in risky behavior and lower values indicated more risk tolerance.

We abbreviated the conspiratorial ideation battery developed by Brotherton, French, and Pickering (2013), excluding personal well-being items that could have primed participants to theories relating to COVID-19. Brotherton et al theorize that conspiratorial ideation remains relatively static over time and captures a propensity towards belief in conspiracies beyond those in their battery. We over-selected government malfeasance and control of information items due to the subject matter under study, then selected items based on their factor loadings (items 1, 2, 5, 6, 8, 10, 11, and 15[6]). We constructed an additive index where higher values denoted higher levels of conspiratorial ideation. Any

[6] Government malfeasance, extraterrestrial cover-up, malevolent global conspiracies, and control of information.

abbreviated battery will suffer from some degree of loss to construct validity, but we viewed our abbreviation criteria as informed by the original research and useful given the subject matter.

Personal experience with COVID-19 was included in the analysis to account for its influence, measured as a trinary variable, where higher values indicated a higher level of personal experience. We assumed participants who had personally experienced COVID-19 were more likely to adopt mitigating behaviors, and/or have increased KAP.

We used a series of linear regression models to analyze the impact of video stimuli and the psychological covariates on COVID-19 KAP and behaviors. We introduced interaction terms between the psychological covariates and an indicator variable for the treatment group to examine our hypothesized moderation effects. A number of these models exhibited heteroskedastic residual structures, as indicated by Breusch-Pagan tests. To compensate, we applied the Efron (1982) standard error calculation; we chose this variant of robust standard errors for its greater efficiency in small sample sizes (Long and Ervin, 2000).[7] Although not ideal, the robust standard error calculation was the optimal approach given the data and sample size: a) the Huber-White calculation remained efficient in low sample sizes, b) there was potential for bias in a weighted approach. Therefore, we excluded influential observations (studentized residuals greater than five) from the specific model so as to not bias the results. Our Hausman tests indicated that OLS was appropriate for all models, instead of ordered logit models, despite the potentially ordinal nature of some variables under study. No other significant issues were illuminated in post-estimation robustness checks. All post-estimation robustness results are available upon request. See Appendix E for full linear regression estimates for all models. All effects discussed as significant were statistically significant at the $p<0.05$ level, and whiskers indicated 95% confidence intervals.

We analyzed the main effects via two-sample t-tests on both an immediate measure of COVID-19 perception of risk following first-wave exposure to video stimuli, and the change in KAP and behaviors from wave 1 to wave 3 ("How much of a health risk is COVID-19 to you, or someone close to you?").

RESULTS

Our findings provide strong suggestive evidence for our pre-registered hypotheses that the effect of the video stimuli will be moderated by risk aversion. We found a positive interaction effect between risk aversion and exposure. Exposure to the video increased both COVID-19 attitude and behavior from wave 1 to wave 3 for participants higher in risk aversion, illustrated in Figure 3 (attitude: 7.7%, 95% CI: 5.9% to 9.3%, p=0.023, N=173; behavior: 13.7%, 95% CI: 2.7% to 24.7%, p=0.006, N=172). There was no significant effect on knowledge or perception.

Contrary to our expectations, exposure to the video increased COVID-19 perception of risk from wave 1 to wave 3 for those higher in conspiratorial ideation. This is illustrated in Figure 4 (7.6%, 95% CI: 1.8% to 13.5%, p=0.012, N=176). The observed effect was likely because those lower in conspiratorial ideation had a higher perception of COVID-19 risk at baseline. Conspiratorial ideation and perception of risk, as measured in the first wave prior to exposure, were negatively correlated (ρ=-0.2909, p=0.0001, N=176).

The observed change after exposure was more consequential than our hypothetical expectation-- this intervention significantly increased the perception of risk among those most resistant to such change. Given that perception of risk is a powerful predictor of behavioral change, it is possible – though not shown herein – that such changes could lead to behavioral changes (Van Bavel et al., 2020). The significant change in perception of risk from waves 1 to 3 also indicated the importance of repeated exposure to stimuli. This was consistent with marketing campaign best practices that recommended multiple exposures of the stimuli. There was no significant effect on mitigation behavior, knowledge, or attitude.

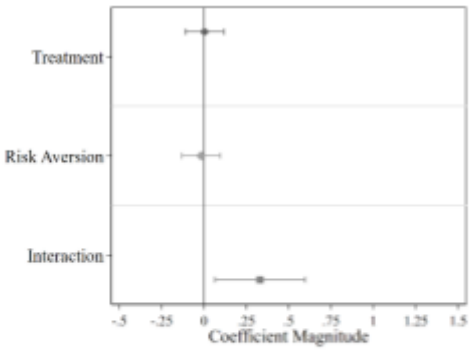
These outcomes measuring risk aversion and conspiratorial ideation were more consequential given that no main effects were observed. That is, the null results appeared to mask variation within our sample along our hypothesized psychological variables. The results of the main effects via two-sample t-tests on both an immediate measure of COVID-19 perception of risk following first wave exposure to video stimuli, and the previously discussed change in KAP and behaviors from wave 1 to wave 3 ("How much of a health risk is COVID-19 to you, or someone close to you?") were: 4.547%, 95% CI: -0.135% to 4.682%, p=0.057, N=729; knowledge: 1.158%, 95% CI: -4.341% to 6.656%, p= 0.678, N= 183; attitude: 0.052%, 95% CI: -3.579% to 3.682%, p=0.978, N= 190; perception: 2.981%, 95% CI: -2.343% to 8.305%, p=0.271, N= 191; behavior: 3.088%, 95% CI: -4.679% to 4.893%, p=0.965, N= 190.)

We did not find an effect of personal experience with COVID-19 on KAP or behaviors in any wave. This finding was consistent with polls and surveys among people resistant to getting vaccinated between February and July 2021 (SEAN, 2021).

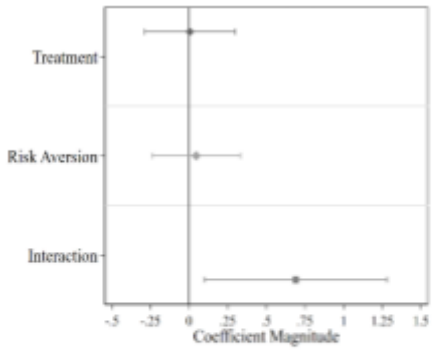
[7] This calculation is noted in the regression tables by square brackets, whereas the normal standard error calculations are denoted with parentheses.

Figure 3

Effect of Video Stimuli Exposure, Risk Aversion, and their Interaction



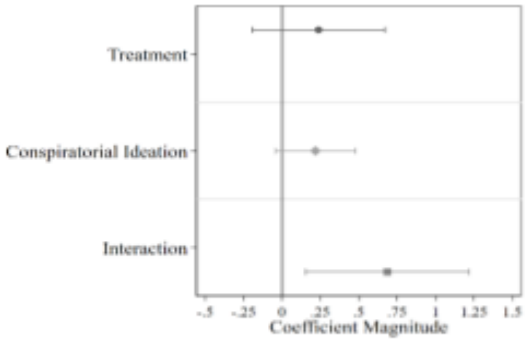
COVID-19 Behavior Change: Wave 1 to Wave 3



COVID-19 Attitude Change: Wave 1 to Wave 3

Figure 4

Effect of Video Stimuli Exposure, Conspiratorial Ideation, and their Interaction



Perception of Risk Change: Wave 1 to Wave 3

DISCUSSION

The lack of main effects on the total sample highlighted both the difficulty of influencing resistant populations and the promise of our approach during a pandemic. By designing our intervention to target relevant and stable individual-level psychological factors among the population, we were able to meaningfully affect subsets of a resistant population. Our multidisciplinary approach (public health, political science, psychology, private sector) allowed for robust innovation to target a resistant population with tailored messaging. This study contributes to the extant literature by providing insights into successfully gaining acceptance for public health recommendations among populations resistant to mitigations and influenced by political attitudes (Van Bavel & Pereira, 2018).

We find that a geographically and culturally distinct population in the South, resistant to adopting behaviors to protect themselves and others from COVID-19, can be motivated by a fear appeal communications intervention during a pandemic and infodemic. The knowledge that the effects of public health communications can be moderated by individual psychological factors such as risk aversion/seeking and conspiratorial ideation, provides additional information from which to design effective interventions.

This study demonstrates promise for similar interventions given that health communications campaigns' effects on behavior are limited (the average is r=.09 with a 95% CI of .07 to .10) and that there is even lower success for resistant populations (Snyder et al., 2004; Mahajan & Peterson, 1985; Rogers, 1983). Our results with this population were especially notable given the target population's influencers promoted misinformation and conspiracies. Health communications are important prevention tools as a small effect can benefit large numbers of people, and as resistant populations continue to stress health systems and take a toll on families.

This experiment found a significant increase in positive COVID-19 attitude, perception, and behavior as compared to the control group among participants exposed to the health communication video, moderated by risk aversion and conspiratorial ideation. A significant positive behavior change was meaningful due to the difficulty in changing behavior. It was unsurprising that fear appeal messaging significantly improved attitude and behavior among more risk-averse persons; however, it is significant that this occurred in such a resistant population as our sample.

It was also notable that our video stimuli increased the perception of risk among participants higher in conspiratorial ideation, perhaps the most difficult subset of the population to meaningfully affect. Extending previous findings of the fear appeal with efficacy approach (extended parallel process model) in health communications (Witte, 1994) – that greater risk perception leads to more protective behavior – we expect that a campaign designed with additional exposure to stimuli might increase mitigating behaviors amongst this subset (Clinton et al., 2017; Synder et al., 2004; Tannenbaum et al., 2015; Brewer et al., 2015; Witte & Allen, 2000).

Countering the widely circulating conspiracy theories, especially "cures" and vaccine danger, with a stronger conspiracy frame may prove more effective than focusing on factual knowledge messaging as in our video. For example, using messaging that the conspiracy theory is the actual conspiracy. A similar narrative was used in the successful anti-smoking Truth campaign aimed at adolescents, exposing the industry's purposeful manipulation of them (where teens confront tobacco marketing departments with lie detectors) (Healton, 2001). Tailoring messaging to a segmented audience was also recommended by Lewandowsky et al. (2012), who researched techniques to counter conspiracies without threatening someone's worldview.

We did not find our tailored fear appeal to be an effective approach for risk-seeking individuals. While a logical outcome, the effect of the participant's psychological dispositions has not, to our knowledge, been studied. It was possible that risk aversion/seeking was an understudied factor in health communications campaigns, and effective interventions could be pivotal for improving public health among resistant populations (e.g., wearing helmets, seatbelts, or protection from sexually transmitted infections). Verma et al. (2021) suggested using the Nobel Prize-winning prospect theory (Kahneman & Tversky, 1979) to market COVID-19 vaccines to risk-seeking individuals who perceived a low probability of serious consequences from contracting COVID-19 using gain and loss frames. Future research should systematically explore the effect of both risk aversion and conspiracy ideation, perhaps among other psychological factors, on to the effects of public health communications.

Limitations of this study include: 1) The large attrition after Labor Day, between waves 1 and 2, may have reduced our ability to detect differences. While it is not unusual to have a large drop-off with online surveys, we did not increase the incentive or otherwise account for the effect of summer vacations ending, and participants who may have vied for online school/telework Internet availability. 2) Exposure to video stimuli was limited to two administrations. 3) Video and audio quality relied on publicly available material. 4) Engagement with the video could not be monitored in person due to the pandemic's distancing practices. 5) Surveys present the possibility of self-selectivity bias. 6) Due to the urgency of rising death rates during the pre-vaccine period, minimal pre-testing of the video was conducted. Stronger outcomes may have been achieved with a larger budget to address attrition, marketing best practices of three or more exposures, and a professionally produced video with sufficient beta testing.

CONCLUSION

This research highlights the possibilities of tailoring public health communications interventions to geographically and culturally distinct areas. Absent widespread government policies to curb an infectious disease crisis, such as highly effective opt-out vaccination policies in schools and other congregate settings (see APEASE discussion, Appendix A), interventions affecting the social norm of subgroups can achieve desired normative behavior (Campbell et al., 2008). Given that many southern states have among the highest transmission and lowest vaccination rates (John Hopkins, 2021; Albrecht, 2022), as well as a higher rate of anti-masking and anti-vaccine sentiment (Albrecht, 2022), interventions aimed at similar subgroups as the one we studied could have propagating effects at containing COVID-19.

To advance these findings and vaccine uptake, Census and voter data can be similarly used to identify homogeneous, geosocial populations affected by the infodemic (Forati & Ghose, 2021), including in rural Georgia. It is our hope that this multidisciplinary study will provide an additional health communications method for policy leaders, public health practitioners, community leaders, and researchers to increase vaccination and other public health mitigations during a pandemic. By utilizing a multidisciplinary approach, this study expanded our knowledge of health communication interventions for resistant populations.

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Appendix A: APEASE Criteria for Evaluating Intervention Approaches or Components

Criterion		To What Extent…
A)	Acceptability[8]	is it judged to be acceptable by all key stakeholders?
B)	Practicability[9]	can it be delivered as intended, at the scale intended and, in the context, intended?
C)	Effectiveness[10]	will it deliver the desired outcome in the target population?
D)	Affordability[11]	can it be afforded within an acceptable budget?
E)	Spill-Over Effects[12]	is it likely to have additional negative or positive consequences?
F)	Equity[13]	is it likely to increase or decrease inequalities in society?

Note. 'It' refers to the intervention under evaluation.

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Appendix B: Questionnaires (Waves 1, 2, 3)

WAVE 1

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1. Currently, how often do you interact with your neighbors?

(FLIP OPTIONS 1 - 4)

o Frequently
o Occasionally
o Rarely
o Never
o Unsure (DNR)

Thinking about COVID-19, also known as the coronavirus ...

2. On a scale of 1 - 7, with 1 being the least severe and 7 being the most severe, how big of a threat to peoples' health is COVID-19 in Georgia?

(FLIP OPTIONS 1 - 8)

o 7
o 6
o 5
o 4
o 3
o 2
o 1
o COVID-19 is not a threat in Georgia
o Unsure (DNR)

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3. Do you think the threat of COVID-19 is being exaggerated or downplayed?

(FLIP OPTIONS 1 - 5)

o Very exaggerated
o Somewhat exaggerated
o Neither exaggerated nor downplayed
o Somewhat downplayed
o Very downplayed
o Unsure (DNR)

---

4. How concerned are you that you or an immediate family member will get serious complications and/or be hospitalized due to COVID-19?

(FLIP OPTIONS 1 - 5)

o Very concerned
o Somewhat concerned
o Neither concerned nor unconcerned
o Somewhat unconcerned
o Very unconcerned
o Unsure (DNR)

---

5. Which of the following statements is closest to how you think Georgia should handle the COVID-19 pandemic?
(FLIP OPTIONS 1 - 3)

o All public health measures to keep people safe should be mandatory
o Some public health measures to keep people safe should be voluntary and some – such as wearing masks and social distancing in public – should be mandatory
o All public health measures to keep people safe should be voluntary
o No public health measures are necessary
o Unsure (DNR)

Below you will read several statements related to COVID-19. Please indicate whether you agree or disagree with each statement.
(RANDOMIZE Q7 - Q10) ***(FLIP OPTIONS 1 - 5)***

AGREE			DISAGREE		**(DNR)**
Strng	Smwht	Nthr	Smwht	Strng	Unsure
1	2	3	4	5	6

6. People with strong immune systems do not need to worry about COVID-19.
7. COVID-19 poses the same risk as the seasonal flu.
8. There will be a widely available vaccine for COVID-19 by the end of the year.
9. During this pandemic, I wish people who are not a part of my household would stay at least six feet away from me.

10. Once a COVID-19 vaccine is available in the U.S., which of the following statements most closely matches what you'll do?
(FLIP OPTIONS 1 - 5)

o I will get the vaccine immediately
o I will get the vaccine when I get around to it
o I will get the vaccine eventually, but I'll wait to make sure it is safe
o I will not get the vaccine because COVID-19 is not a real danger
o I will not get the vaccine because I don't think vaccines are safe in general
o Unsure (DNR)

---

11. In the past month, how many times have you attended a group event with more than 10 people in attendance, such as a religious gathering, party, funeral, wedding, sporting event, etc.?
(FLIP OPTIONS 1 - 5)

o More than 10 times in the past month
o 7 - 10 times in the past month
o 3 - 6 times in the past month
o 1 - 2 times in the past month
o I have not attended a group event with more than 10 people in attendance in the past month
o Unsure (DNR)

---

12. When out in public and around people, how often do you wear a mask or face covering?
(FLIP OPTIONS 1 - 5)

o Always
o Most of the time
o Some of the time
o Rarely
o Never
o Unsure (DNR)

---

13. Which of the following reasons best describe why you don't regularly wear a mask or face covering? You may select up to **three** options.

MULTI SELECT UP TO 3 (RANDOMIZE OPTIONS 1 - 11)

o Other people in the area were not wearing masks
o I was concerned about what others would think of me
o Masks are awkward/uncomfortable
o Masks cannot protect me or stop the spread of COVID-19
o There is little risk that I can contract or spread COVID-19
o Masks are unnecessary because COVID-19 is not a threat
o I don't care about the risks
o Being forced to wear a mask violates my personal freedom
o The government doesn't require masks
o I forget to bring a mask
o Wearing a mask is a greater threat to my health than COVID-19
o Other (please specify)
o Unsure (DNR)

---

14. When out in public and around people, how often do you socially distance by staying six or more feet away from others?

(FLIP OPTIONS 1 - 5)

o Always
o Most of the time
o Some of the time
o Rarely
o Never
o Unsure (DNR)

---

15. Which of the following reasons best describe why you don't regularly socially distance by staying six or more feet away from others? You may select up to **three** options.

MULTI SELECT UP TO 3 (RANDOMIZE OPTIONS 1 - 10)

o Other people in the area were not socially distancing
o I was concerned about what others would think of me
o Socially distancing is awkward/uncomfortable
o Socially distancing cannot protect me or stop the spread of COVID-19
o There is little risk that I can contract or spread COVID-19
o Socially distancing is not necessary because COVID-19 is not a threat
o I don't care about the risks
o Being forced to socially distance violates my personal freedom
o The government doesn't require social distancing
o I forget to socially distance
o Other (please specify)
o Unsure (DNR)

---

16. How often do you ask or encourage your family or friends to wear a mask and/or stay six feet away from others for their own safety?

(FLIP OPTIONS 1 - 5)

o Always
o Most of the time
o Some of the time
o Rarely
o Never

o Unsure (DNR)

---

17. Generally, when you are in public, how many of the people around you are wearing masks and/or social distancing by staying at least six feet away from others?

(FLIP OPTIONS 1 - 5)

o Practically everyone
o Not everyone, but more than half
o Some people, but less than half
o Practically no one
o I never go out
o Unsure (DNR)

---

18. Which of the following statements most closely reflects how your shopping habits have changed due to COVID-19, if at all?

(FLIP OPTIONS 1 - 3)

o I go to the store more often
o My shopping habits haven't changed – I go to the store the same amount
o I go to the store less often
o Unsure (DNR)

19. CONTROL GROUP: SKIP TO DEMOGRAPHIC QUESTIONS

TEST GROUP ONLY:

Now you will be shown a short video about COVID-19 …<<SHOW VIDEO>>

20. Was any part of the video new information to you? You may select up to **three** options.

o Seeing that healthy young people have suffered
o Hallucinations among people who were placed in a medical coma suffer
o Seeing that people who downplayed the risk of getting the virus got seriously ill
o The Army General's statements of how to be vigilant to stop the virus
o Learning that people who worked at the grocery store infected their family
o The doctor's description of why the virus is much worse than the fluOther (please specify)
o None of the above
o Unsure (DNR)

---

21. Are you or someone in your household considered an essential worker, such as a worker in the medical field, home care, manufacturing, the service industry, etc.?

(FLIP OPTIONS 1 - 3)

o Yes, I am
o Yes, someone in my household is
o No

---

22. How many people, including yourself, do you have medical responsibility over such as children, a disabled or elderly relative, etc.?

(FLIP OPTIONS 1 - 5)

o 1
o 2
o 3
o 4
o More than 4

---

23. What are your primary sources for trustworthy news about COVID-19? You may select up to **three** options.

MULTI SELECT UP TO 3 (RANDOMIZE OPTIONS 1 - 9)

o Friends and family
o Local TV news
o CNN cable TV
o MSNBC cable TV
o FOX News cable TV
o Radio
o Facebook
o Twitter
o YouTube
o Print and/or online newspapers
o Other online publications (please specify)
o Other
o I don't follow news related to COVID-19
o Unsure (DNR)

---

24. How often do you read, watch, or listen to news related to COVID-19?

(FLIP OPTIONS 1 - 6)

o Once a month or less
o A few times a month
o Once a week
o Several times a week
o Once a day
o More than once a day
o Unsure (DNR)

---

25. Regardless of whether or not you're currently able to meet in person, are you an active member of a community organization such as a church group, a service organization, business organization, sports/recreation team, neighborhood association, or other similar group?

(FLIP OPTIONS 1 - 2)

o Yes
o No

---

26. What is your annual household income?

o Less than $17,000
o Less than $50,000
o $50,000 - $100,000
o More than $100,000

27. With what you know now, on a scale of 1 - 7, with 1 being an insignificant risk, and 7 being a serious risk, how much of a health risk is COVID-19 to you, or someone close to you?

(FLIP OPTIONS 1 - 8)

o 7
o 6
o 5
o 4
o 3
o 2
o 1
o COVID-19 is not a health threat in general
o Unsure (DNR)

---

28. Last question! Reminder: This is a confidential survey and strictly for research purposes. Your information will not be released. Do you believe you or someone in your household, a friend, or a coworker has been infected with COVID-19 at any time?

(FLIP OPTIONS 1 - 3)

o Yes, a medical test confirmed COVID-19
o Yes, the symptoms were consistent with the virus but not confirmed by a test
o No, I do not believe myself or an immediate family member has had COVID-19
o Unsure **(DNR)**

WAVE 2

Thinking about COVID-19, also known as the coronavirus ...

1. How concerned are you that you or an immediate family member will be infected with COVID-19?

(FLIP OPTIONS 1 - 5)

o Very concerned
o Somewhat concerned
o Neither concerned nor unconcerned
o Somewhat unconcerned
o Very unconcerned
o Unsure (DNR)

---

2. How concerned are you that you or an immediate family member will get serious complications and/or be hospitalized due to COVID-19?

(FLIP OPTIONS 1 - 5)

o Very concerned
o Somewhat concerned
o Neither concerned nor unconcerned
o Somewhat unconcerned
o Very unconcerned
o Unsure (DNR)

For each of the following statements, please indicate your likelihood of engaging in each activity or behavior.

(RANDOMIZE Q3 - Q10)(FLIP OPTIONS 1 - 5)

Very Likely	Likely	Not Sure	Unlikely	Very Unlikely	Prefer Not to Answer **(DNR)**
1	2	3	4	5	6

3. Not wearing a seatbelt when being a passenger in the front seat.
4. Exposing yourself to the sun without using sunscreen.
5. Going whitewater rafting at high water in the spring.
6. Going on a two-week vacation in a foreign country without booking accommodations ahead.
7. Illegally copying a piece of software.
8. Passing off somebody else's work as your own.
9. Arguing with a friend about an issue on which he or she has a very different opinion.
10. Defending an unpopular issue that you believe in at a social occasion.

Below you will read several statements related to COVID-19. Please indicate whether you agree or disagree with each statement.
(RANDOMIZE Q11 - Q15) ***(FLIP OPTIONS 1 - 5)***

AGREE			DISAGREE		**(DNR)**
Strng	Smwht	Nthr	Smwht	Strng	Unsure
1	2	3	4	5	6

11. I trust COVID-19-related news from official Georgia government sources, such as the Georgia Department of Public Health and the Governor's Office.

12. I trust COVID-19-related news from official national government sources, such as the Centers for Disease Control (CDC) and the National Institutes of Health (NIH).

13. People with strong immune systems do not need to worry about COVID-19.

14. COVID-19 poses the same risk as the seasonal flu.

15. During this pandemic, I wish people who are not a part of my household would stay at least six feet away from me.

---

16. Once a COVID-19 vaccine is available in the U.S., which of the following statements most closely matches what you'll do?

(FLIP OPTIONS 1 - 5)

o I will get the vaccine immediately
o I will get the vaccine when I get around to it
o I will get the vaccine eventually, but I'll wait to make sure it is safe
o I will not get the vaccine because COVID-19 is not a real danger
o I will not get the vaccine because I don't think vaccines are safe in general
o Unsure (DNR)

---

17. In the past month, how many times have you dined in a restaurant, bar, café, etc?

(FLIP OPTIONS 1 - 5)

o More than 10 times in the past month
o 7 - 10 times in the past month
o 3 - 6 times in the past month
o 1 - 2 times in the past month
o I have not dined out in the past month
o Unsure (DNR)

---

18. When out in public and around people, how often do you wear a mask or face covering?

(FLIP OPTIONS 1 - 5)

o Always [SKIP Q19]

o Most of the time [SKIP Q19]
o Some of the time
o Rarely
o Never
o Unsure (DNR) [SKIP Q19]

---

19. Which of the following reasons best describes why you don't regularly wear a mask or face covering?
(RANDOMIZE OPTIONS 1 - 5)
o Masks are awkward/uncomfortable
o Masks cannot protect me or stop the spread of COVID-19
o There is little risk that I can contract or spread COVID-19
o Being forced to wear a mask violates my personal freedom
o Wearing a mask is a greater threat to my health than COVID-19
o Other (please specify)
o Unsure (DNR)

---

20. When out in public and around people, how often do you socially distance by staying six or more feet away from others?
(FLIP OPTIONS 1 - 5)
o Always [SKIP Q21]
o Most of the time [SKIP Q21]
o Some of the time
o Rarely
o Never
o Unsure (DNR) [SKIP Q21]

---

21. Which of the following reasons best describes why you don't regularly socially distance by staying six or more feet away from others?
(RANDOMIZE OPTIONS 1 - 4)
o Socially distancing is awkward/uncomfortable
o Socially distancing cannot protect me or stop the spread of COVID-19
o There is little risk that I can contract or spread COVID-19
o Being forced to socially distance violates my personal freedom
o Other (please specify)
o Unsure (DNR)

---

22. How often do you ask or encourage your family or friends to wear a mask and/or stay six feet away from others for their own safety?
(FLIP OPTIONS 1 - 5)
o Always
o Most of the time
o Some of the time
o Rarely
o Never
o Unsure (DNR)

---

23. Generally, when you are in public how many of the people around you are wearing masks and/or social distancing by staying at least six feet away from others?
(FLIP OPTIONS 1 - 5)
o Practically everyone

o Not everyone, but more than half
o Some people, but less than half
o Practically no one
o I never go out
o Unsure (DNR)

---

24. Which of the following statements most closely reflects how your shopping habits have changed due to COVID-19, if at all?

(FLIP OPTIONS 1 - 3)

o I go to the store more often
o My shopping habits haven't changed – I go to the store the same amount
o I go to the store less often
o Unsure (DNR)

CONTROL GROUP: SKIP TO DEMOGRAPHIC QUESTIONS

TEST GROUP ONLY:

Now you will watch the same short video about COVID-19 that you watched about a week ago. Please pay close attention, as there will be a question about the information.
<<SHOW VIDEO>>

25. What information do you recall from the video?

o The body bags are from a country in Europe
o There is a hospital bed shortage in Georgia
o Only COVID-19 patients get ICU delirium
o All of the above
o None of the above
o Unsure (DNR)

---

26. On a scale of 1 - 7, with 1 being an insignificant risk, and 7 being a serious risk, how much of a health risk is COVID-19 to you, or someone close to you?

o 7
o 6
o 5
o 4
o 3
o 2
o 1
o COVID-19 is not a health threat in general
o Unsure (DNR)

---

27. Last question! Reminder: This is a confidential survey and strictly for research purposes. Your information will not be released. Do you believe you or someone in your household, a friend, or a coworker has been infected with COVID-19 at any time?

(FLIP OPTIONS 1 - 3)

o Yes, a medical test confirmed COVID-19
o Yes, the symptoms were consistent with the virus but not confirmed by a test
o No, I do not believe myself or an immediate family member has had COVID-19

o Unsure (DNR)

WAVE 3

Thinking about COVID-19, also known as the coronavirus ...

1. How concerned are you that you or an immediate family member will be infected with COVID-19?
(FLIP OPTIONS 1 - 5)
o Very concerned
o Somewhat concerned
o Neither concerned nor unconcerned
o Somewhat unconcerned
o Very unconcerned
o Unsure (DNR)

---

2. How concerned are you that you or an immediate family member will get serious complications and/or be hospitalized due to COVID-19?
(FLIP OPTIONS 1 - 5)
o Very concerned
o Somewhat concerned
o Neither concerned nor unconcerned
o Somewhat unconcerned
o Very unconcerned
o Unsure (DNR)

---

3. Generally speaking, would you say that most people can be trusted, or that you can't be too careful in dealing with people?

o Most people can be trusted
o Can't be too careful
o Depends
o Unsure (DNR)

---

4. Do you think that most people would try to take advantage of you if they got a chance, or would they try to be fair?

o Would take advantage
o Would try to be fair
o Depends
o Unsure (DNR)

---

5. Would you say that most of the time people try to be helpful, or are they mostly looking out for themselves?

o Try to be helpful
o Just look out for themselves
o Depends
o Unsure (DNR)

Below you will read several statements related to COVID-19. Please indicate whether you agree or disagree with each statement.
(RANDOMIZE Q6 - Q9) (FLIP OPTIONS 1 - 5)

AGREE			DISAGREE		**(DNR)**
Strng	Smwht	Nthr	Smwht	Strng	Unsure
1	2	3	4	5	6

6. People with strong immune systems do not need to worry about COVID-19.

7. COVID-19 poses the same risk as the seasonal flu.

8. There will be a widely available vaccine for COVID-19 by the end of the year.

9. During this pandemic, I wish people who are not a part of my household would stay at least six feet away from me.

10. Once a COVID-19 vaccine is available in the U.S., which of the following statements most closely matches what you'll do?

(FLIP OPTIONS 1 - 5)

o I will get the vaccine immediately
o I will get the vaccine when I get around to it
o I will get the vaccine eventually, but I'll wait to make sure it is safe
o I will not get the vaccine because COVID-19 is not a real danger
o I will not get the vaccine because I don't think vaccines are safe in general
o Unsure (DNR)

---

11. In the past two weeks, how many times have you attended a group event with more than 10 people in attendance, such as a religious gathering, party, funeral, wedding, sporting event, etc.?

(FLIP OPTIONS 1 - 4)

o More than 5 times in the past two weeks
o 3 - 4 times in the past two weeks
o 1 - 2 times in the past two weeks
o I have not attended a group event with more than 10 people in attendance in the past two weeks
o Unsure (DNR)

---

12. In the past two weeks, how many times have you dined in a restaurant, bar, café, etc?

(FLIP OPTIONS 1 - 4)

o More than 5 times in the past two weeks
o 3 - 4 times in the past two weeks
o 1 - 2 times in the past two weeks
o I have not dined out in the past two weeks
o Unsure (DNR)

---

13. When out in public and around people, how often do you wear a mask or face covering?

(FLIP OPTIONS 1 - 5)

o Always [SKIP Q14]
o Most of the time [SKIP Q14]
o Some of the time
o Rarely
o Never
o Unsure (DNR) [SKIP Q14]

---

14. Which of the following reasons best describes why you don't regularly wear a mask or face covering?

(RANDOMIZE OPTIONS 1 - 5)

o Masks are awkward/uncomfortable

o Masks cannot protect me or stop the spread of COVID-19
o There is little risk that I can contract or spread COVID-19
o Being forced to wear a mask violates my personal freedom
o Wearing a mask is a greater threat to my health than COVID-19
o Other (please specify)
o Unsure (DNR)

---

15. When out in public and around people, how often do you socially distance by staying six or more feet away from others?
(FLIP OPTIONS 1 - 5)
o Always [SKIP Q16]
o Most of the time [SKIP Q16]
o Some of the time
o Rarely
o Never
o Unsure (DNR) [SKIP Q16]

---

16. Which of the following reasons best describes why you don't regularly socially distance by staying six or more feet away from others?
(RANDOMIZE OPTIONS 1 - 4)
o Socially distancing is awkward/uncomfortable
o Socially distancing cannot protect me or stop the spread of COVID-19
o There is little risk that I can contract or spread COVID-19
o Being forced to socially distance violates my personal freedom
o Other (please specify)
o Unsure (DNR)

---

17. How often do you ask or encourage your family or friends to wear a mask and/or stay six feet away from others for their own safety?
(FLIP OPTIONS 1 - 5)
o Always
o Most of the time
o Some of the time
o Rarely
o Never
o Unsure (DNR)

---

18. Generally, when you are in public how many of the people around you are wearing masks and/or social distancing by staying at least six feet away from others?
(FLIP OPTIONS 1 - 5)
o Practically everyone
o Not everyone, but more than half
o Some people, but less than half
o Practically no one
o I never go out
o Unsure (DNR)

You're almost done! There is often debate about whether or not the public is told the whole truth about various important issues. Please indicate how true you believe each statement to be.
(RANDOMIZE Q19 - Q26)

NOT TRUE TRUE

Def Prob Not Prob Def Unsure **(DNR)**

1 2 3 4 5 6

19. The government is involved in the murder of innocent citizens and/or well-known public figures, and keeps this a secret.

20. The power held by heads of state is second to that of small unknown groups who really control world politics.

21. Groups of scientists manipulate, fabricate, or suppress evidence in order to deceive the public.

22. The government permits or perpetrates acts of terrorism on its own soil, disguising its involvement.

23. Evidence of alien contact is being concealed from the public.

24. New and advanced technology which would harm current industry is being suppressed.

25. The government uses people as patsies to hide its involvement in criminal activity.

26. A lot of important information is deliberately concealed from the public out of self-interest.

---

27. On a scale of 1 - 7, with 1 being an insignificant risk, and 7 being a serious risk, how much of a health risk is COVID-19 to you, or someone close to you?

(FLIP OPTIONS 1 - 8

o 7
o 6
o 5
o 4
o 3
o 2
o 1
o COVID-19 is not a health threat in general
o Unsure (DNR)

---

28. Last question! Reminder: This is a confidential survey and strictly for research purposes. Your information will not be released. Do you believe you or someone in your household, a friend, or a coworker has been infected with COVID-19 at any time?

(FLIP OPTIONS 1 - 3)

o Yes, a medical test confirmed COVID-19
o Yes, the symptoms were consistent with the virus but not confirmed by a test
o No, I do not believe myself or an immediate family member has had COVID-19
o Unsure (DNR)

Appendix C: Descriptive Statistics of Variables						
Variable	**Mean**	**Median**	**S. Dev.**	**Min.**	**Max.**	**N**
Explanatory Variables						
Treatment Group	0.467	0	0.499	0	1	829
Risk Aversion	3.807	3.875	0.546	2.375	5	303
Conspiratorial Ideation	2.598	2.500	0.838	1	5	177
Social Trust	2.232	2.333	0.559	1	3	188
Institutional Trust: State	3.401	4	1.202	1	5	307
Right Wing News Consumption	0.375	0	0.485	0	1	820
Outcome Variables						
Knowledge: Wave 1	3.044	3	1.292	1	5	786
Knowledge: Wave 2	3.424	3.5	1.189	1	5	303
Knowledge: Wave 3	3.458	3.5	1.221	1	5	190
Knowledge Change: Wave 1 to 2	0.345	0	1.108	-4	4	267
Knowledge Change: Wave 2 to 3	-0.003	0	0.915	-4	3	175
Knowledge Change: Wave 1 to 3	0.354	0	0.909	-2	3	185
Attitude: Wave 1	3.439	4	1.454	1	5	808
Attitude: Wave 2	3.683	4	1.362	1	5	309
Attitude: Wave 3	3.798	4	1.297	1	5	193
Attitude Change: Wave 1 to 2	0.135	0	1.223	-4	4	281
Attitude Change: Wave 2 to 3	0.101	0	1.092	-4	4	179
Attitude Change: Wave 1 to 3	0.276	0	1.014	-4	4	192
Perception: Wave 1	2.915	3	1.402	1	5	825
Perception: Wave 2	2.975	3	1.407	1	5	316
Perception: Wave 3	2.820	3	1.426	1	5	194
Perception Change: Wave 1 to 2	0.024	0	1.606	-4	4	289
Perception Change: Wave 2 to 3	-0.150	0	1.758	-4	4	180
Perception Change: Wave 1 to 3	-0.104	0	1.496	-4	4	193
Behavior Factor: Wave 1	0.009	0.213	0.880	-2.371	1.074	772
Behavior Factor: Wave 2	0.011	0.197	0.898	-2.543	1.038	304
Behavior Factor: Wave 3	-0.002	0.184	0.891	-2.540	1.092	192
Behavior Change: Wave 1 to 2	-0.049	-0.036	0.589	-2.220	2.469	277
Behavior Change: Wave 2 to 3	0.026	0.041	0.489	-2.381	1.829	175
Behavior Change: Wave 1 to 3	-0.023	0.018	0.392	-1.249	1.160	192
Norm Perception: Wave 1	3.088	3	0.786	1	4	764
Norm Perception: Wave 2	3.103	3	0.758	1	4	300
Norm Perception: Wave 3	3.107	3	0.789	1	4	187
Norm Change: Wave 1 to 2	-0.041	0	0.727	-3	2	271
Norm Change: Wave 2 to 3	-0.006	0	0.844	-3	3	168
Norm Change: Wave 2 to 3	-0.070	0	0.743	-3	2	186

Appendix D: Video Stimuli Examples of the Fear Appeal EPPM Approach

Target population: Resistant group in the geosocial area; politically conservative.

Central messages: Examples of the direct messaging to elicit fear and increase perceptions of risk (as defined by Ropeik[1, 2]) are explained below.

Peripheral messages: Influencers, images, and testimonials chosen to align with elements characteristic of the target population are identified below. These include: 1) loyalty, authority, purity (abhorrence for disgusting things) as per the Moral Foundations Theory; 2) flag (military), family; 3) demographic affinities.

Narrative: Show your loyalty to your country and family by joining in winning the war against COVID-19.

All treatment narrative and imagery in the video were designed to elicit fear based on the characteristics of the target population. The overarching narrative is that the US is in a war, and the video aims to engage viewers to join in to show their loyalty to their country and family. Direct messaging activates self-efficacy to protect themselves/family by demonstrating how viewers can join the war effort against COVID-19. Stimuli are all found footage and audio on YouTube.

1. Ropeik D. Consequences of fear. *Science and Society*. 2004;5(1) 56-60. doi:10.1038/sj.embor.7400228.
2. Ropeik D. The psychology of risk perception. *Harvard Health* website. Accessed June, 21 2011. https://www.health.harvard.edu/newsletter_article/the-psychology-of-risk-perception.

A) *Awareness. Media coverage of high-profile disasters, often saturating the news, raises awareness of particular risks more than others.*

Central message(s): Tucker Carlson contradicts the FOX coverage downplaying COVID-19 and says it is very dangerous.
Peripheral cue(s): Influencer among target group.

B) *Trust. When people trust the officials providing information about a particular risk or the process used to assess risk.*

Central message(s): Doctor gently explains that COVID-19 is highly transmissible - much more than the flu. Supporting graphics to explain.
Peripheral cue(s): White doctor. University of Florida is popular and may be a positive influencer in the area. Doctors are authority figures.

C) *Personal: Any risks that affect people personally are more frightening than those that affect strangers.*

Central message(s): Narrator says he was a healthy 18-year-old athlete, thought COVID-19 couldn't make him sick. Counters narrative of strong immune systems.
Peripheral cue(s): Two white young men. Connotations of family and protection of young and vulnerable. Hospital scenes to illicit visceral reaction of disgust.

Central message(s): Hospitals in your area are strained, personal threat from falling ill.
Peripheral cue(s): Local news channel from catchment area can be an influencer.

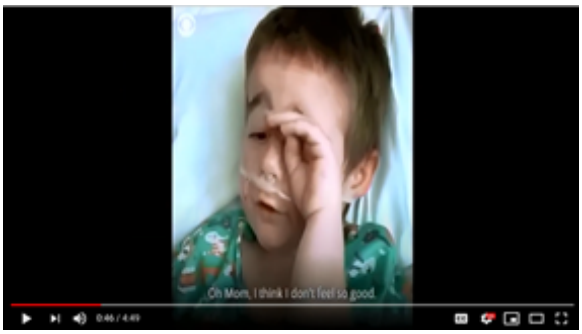
Central message(s): Testimonial of matriarch saying they had planned to get better together.
Peripheral cue(s): White, Southern family, long-term marriage.

D) *Dread. Events that invoke dread — such as drowning or being eaten alive — scare people more than those that do not.*

Central message(s): Doctors and testimonials in scenes about hallucinations as a side effect of being on a ventilator (e.g snakes being put into their arms)
Peripheral cue(s): White patients, family (mother giving testimonial); doctor as authority.

Caption message(s): Doctor explains long-term effects of patients' difficulty earning a living.
Peripheral cue(s): Doctor as authority.

E) *Age affected:* Risks are more frightening when they affect children.



Central message(s): Small child in a hospital with COVID-19 tells his mother he doesn't feel well.
Peripheral cue(s): White child; family.

F) *Uncertainty:* Events inspire more fear when the risks are simply unknown.

Central message(s): Thinking COVID-19 was a hoax, Florida man was shocked and scared when he and his wife became seriously ill. Challenge to authority: COVID-19 is not what he was told it was.
Peripheral cue(s): White man; southerner. Family message. Images to elicit disgust.

G) *Familiarity:* New threats are perceived to be more dangerous than more familiar ones.

Central message(s): Doctor says this is a new disease and there is not much information about how it spreads, it is not the flu.
Peripheral cue(s): White doctor from University of Florida, an influencer in the area. Doctors are authority figures.

Central message(s): The disease is unknown, and there is no cure or vaccine. Testimony asks for loyalty to nation.
Peripheral cue(s): Influencer is an authority figure — a general and a doctor.

8) *Scope:* Cataclysmic events, capable of killing many people at the same time, are scarier than chronic conditions.

Central message(s): Make-shift wards for hospital overflow.
Peripheral cue(s): Images of body parts of dead people challenge purity, evoke disgust.

Central message(s): Narration states that the U.S. is losing the war, thousands are dying, evoking "flag" and "loyalty."
Peripheral cue(s): Images of body bags challenge purity, evoke disgust.

Central message(s): Mass gravesite; funerals not feasible.
Peripheral cue(s): Video caption states it's the USA, evoking "flag" and loyalty. Image of burial pit challenges purity, evokes disgust.

9) *Flag*

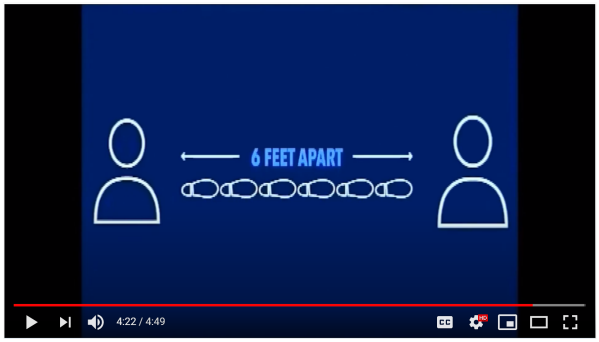
Central message(s): A dead US soldier's coffin draped in the U.S. flag.
Peripheral cue(s): Image cues demographic affinity of white soldiers taking recommended masking behavior.

10) *Family*

Central message(s): Survivor explaining his wife has been on a ventilator for three weeks.
Peripheral cue(s): White family; Southerners.

11) *Efficacy*

Central message(s): Survivor explaining suffering and entreats people: Be careful, wear a mask, protect yourself, protect your kids, protect your family"
Peripheral cue(s): White man speaking; family loyalty; white family.



Central message(s) Military doctor provides instruction about how to mitigate, mask, distancing. Ad Council graphic shown while officer is speaking.
Peripheral cue(s): Military officer and doctor are authority figures; decorated military general evokes "flag" and loyalty to nation.

Appendix E: Results of Linear Regression Analyses (A-H)

Table A. Effect of Risk Aversion, Treatment, and their Interaction on COVID-19 Behaviors

	Behaviors: Wave 1	Behaviors: Wave 2	Behaviors: Wave 3	Behavior Change: Wave 1 to Wave 2	Behavior Change: Wave 2 to Wave 3	Behavior Change: Wave 1 to Wave 3
Treatment	1.168	0.095	-0.209	-0.647	-0.227	-1.271**
	(0.763)	[0.776]	(0.988)	(0.542)	(0.525)	[0.523]
Risk Aversion	0.390***	0.445***	0.237	0.034	-0.180**	-0.138
	(0.115)	[0.108]	(0.156)	(0.082)	(0.083)	[0.096]
Interaction	-0.283	-0.036	0.071	0.166	0.076	0.330**
	(0.197)	[0.195]	(0.257)	(0.140)	(0.137)	[0.135]
Constant	-1.429***	-1.666***	-0.893	-0.183	0.691**	0.488
	(0.437)	[0.420]	(0.590)	(0.311)	(0.316)	[0.377]
Observations	276	295	172	269	168	172
Adjusted R^2	0.036	0.060	0.012	0.001	0.018	0.028

Note: Dependent variable is predicted latent factor of COVID-19 behaviors. Treatment denotes exposure of treatment group to video stimuli. Risk aversion scale abbreviated from Weber, Blais, and Betz.[1] Standard errors in parentheses. Efron[2] variant standard errors in brackets to account for heteroskedastic residual structure. * $p<0.1$, ** $p<0.05$, *** $p<0.01$.

1. Weber EU, Blais AR, Betz NE. A domain‐specific risk‐attitude scale: Measuring risk perceptions and risk behaviors. *Journal of Behavioral Decision Making.* 2002;15(4):263-290. doi:10.1002/bdm.414.
2. Efron B. Maximum likelihood and decision theory. *The Annals of Statistics.* 1982; 10(2): 340-356. doi:10.1214/aos/1176345778.

Table B. Effect of Risk Aversion, Treatment, and their Interaction on COVID-19 Knowledge

	Knowledge: Wave 1	Knowledge: Wave 2	Knowledge: Wave 3	Knowledge Change: Wave 1 to Wave 2	Knowledge Change: Wave 2 to Wave 3	Knowledge Change: Wave 1 to Wave 3
Treatment	0.782	1.114	0.598	0.432	0.863	-1.930*
	(1.175)	(1.028)	(1.406)	(1.019)	(1.060)	(1.031)
Risk Aversion	0.444**	0.428***	0.349	0.021	-0.012	-0.270*
	(0.179)	(0.158)	(0.219)	(0.155)	(0.165)	(0.162)
Interaction	-0.170	-0.249	-0.087	-0.078	-0.236	0.527*
	(0.303)	(0.265)	(0.365)	(0.263)	(0.275)	(0.268)
Constant	1.329*	1.715***	2.047**	0.193	0.082	1.339**
	(0.677)	(0.599)	(0.829)	(0.589)	(0.625)	(0.611)
Observations	266	295	171	260	170	166
Adjusted R^2	0.021	0.024	0.017	-0.008	-0.010	0.009

Note: Dependent variable is additive index of COVID-19 knowledge. Treatment denotes exposure of treatment group to video stimuli. Risk aversion scale abbreviated from Weber, Blais, and Betz[1]. Standard errors in parentheses. * $p<0.1$, ** $p<0.05$, *** $p<0.01$.

Table C. Effect of Risk Aversion, Treatment, and their Interaction on COVID-19 Attitudes

	Attitudes: Wave 1	Attitudes: Wave 2	Attitudes: Wave 3	Attitudes Change: Wave 1 to Wave 2	Attitudes Change: Wave 2 to Wave 3	Attitudes Change: Wave 1 to Wave 3
Treatment	2.304*	0.392	0.557	-1.161	-0.374	-2.604**
	(1.266)	[1.293]	(1.437)	(1.113)	(1.238)	(1.155)
Risk Aversion	0.554***	0.573***	0.462**	0.009	-0.091	-0.206
	(0.194)	[0.183]	(0.224)	(0.171)	(0.194)	(0.181)
Interaction	-0.554*	-0.120	-0.092	0.272	0.089	0.690**
	(0.327)	[0.328]	(0.374)	(0.287)	(0.322)	(0.300)
Constant	1.379*	1.542**	1.991**	0.158	0.437	1.037

	(0.736)	[0.716]	(0.849)	(0.648)	(0.733)	(0.683)

Table D. Effect of Risk Aversion, Treatment, and their Interaction on COVID-19 Perceptions

	Perceptions: Wave 1	Perceptions: Wave 2	Perceptions: Wave 3	Perceptions Change: Wave 1 to Wave 2	Perceptions Change: Wave 2 to Wave 3	Perceptions Change: Wave 1 to Wave 3
Treatment	0.645	-0.168	2.854*	-0.792	2.400	2.050
	(1.240)	(1.201)	(1.610)	(1.454)	(2.020)	(1.628)
Risk Aversion	0.473**	0.398**	0.140	-0.122	-0.248	-0.272
	(0.187)	(0.184)	(0.251)	(0.220)	(0.315)	(0.253)
Interaction	-0.179	0.020	-0.667	0.208	-0.543	-0.454
	(0.320)	(0.310)	(0.418)	(0.375)	(0.525)	(0.424)
Constant	1.203*	1.473**	2.176**	0.459	0.676	0.756
	(0.710)	(0.699)	(0.951)	(0.832)	(1.193)	(0.958)
Observations	277	303	174	277	174	173
Adjusted R^2	0.017	0.015	0.010	-0.010	0.013	0.024

Note: Dependent variable is additive index for severity and transmissibility of COVID-19. Treatment denotes exposure of treatment group to video stimuli. Risk aversion scale abbreviated from Weber, Blais, and Betz[1]. Standard errors in parentheses. * p<0.1, ** p<0.05, *** p<0.01.

Observations	275	300	174	273	173	173
Adjusted R^2	0.025	0.036	0.025	-0.004	-0.016	0.014

Note: Dependent variable is respondent desire for others to socially distance due to COVID-19. Treatment denotes exposure of treatment group to video stimuli. Risk aversion scale abbreviated from Weber, Blais, and Betz[1]. Standard errors in parentheses. Efron[2] variant standard errors in brackets to account for heteroskedastic residual structure. * p<0.1, ** p<0.05, *** p<0.01.

Table E. Effect of Conspiratorial Thinking, Treatment, and their Interaction on COVID-19 Behaviors

	Behaviors: Wave 1	Behaviors: Wave 2	Behaviors: Wave 3	Behavior Change: Wave 1 to Wave 2	Behavior Change: Wave 2 to Wave 3	Behavior Change: Wave 1 to Wave 3
Treatment	0.576	0.279	0.758**	0.357	0.047	0.163
	(0.377)	[0.388]	[0.328]	(0.236)	[0.285]	(0.206)
Conspiratorial Thinking	-0.436***	-0.431***	-0.407***	0.025	-0.013	0.020
	(0.085)	[0.089]	[0.082]	(0.053)	[0.050]	(0.047)
Interaction	-0.215	-0.070	-0.285**	-0.179**	0.001	-0.061
	(0.138)	[0.163]	[0.132]	(0.089)	[0.122]	(0.076)
Constant	1.134***	1.049***	1.031***	-0.114	0.053	-0.085
	(0.232)	[0.218]	[0.200]	(0.145)	[0.125]	(0.127)
Observations	177	163	176	161	161	176
Adjusted R^2	0.251	0.195	0.248	0.022	-0.016	-0.013

Note: Dependent variable is predicted latent factor of COVID-19 behaviors. Treatment denotes exposure of treatment group to video stimuli. Conspiratorial ideation scale abbreviated from Brotherton, French, and Pickering[3]. Standard errors in parentheses. Efron[2] variant standard errors in brackets to account for heteroskedastic residual structure. * p<0.1, ** p<0.05, *** p<0.01.

3.Brotherton R, French CC, Pickering AD. Measuring belief in conspiracy theories: The generic conspiracist beliefs scale. *Frontiers in Psychology.* 2013:4(1):279. doi:10.3389/fpsyg.2013.00279.

Table F. Effect of Conspiratorial Thinking, Treatment, and their Interaction on COVID-19 Knowledge

	Knowledge: Wave 1	Knowledge: Wave 2	Knowledge: Wave 3	Knowledge Change: Wave 1 to	Knowledge Change: Wave 2 to Wave 3	Knowledge Change: Wave 1

				Wave 2		to Wave 3
Treatment	-0.357	0.103	0.226	0.359	0.097	0.506
	(0.581)	(0.566)	(0.539)	(0.539)	[0.608]	(0.473)
Conspiratorial Thinking	-0.883***	-0.595***	-0.758***	0.289**	-0.160	0.106
	(0.136)	(0.131)	(0.125)	(0.126)	[0.101]	(0.110)
Interaction	0.211	0.093	-0.006	-0.108	-0.057	-0.198
	(0.213)	(0.210)	(0.198)	(0.200)	[0.261]	(0.173)
Constant	5.278***	4.838***	5.302***	-0.386	0.421	0.071
	(0.369)	(0.353)	(0.339)	(0.342)	[0.273]	(0.299)
Observations	170	162	174	156	161	169
Adjusted R^2	0.253	0.159	0.257	0.024	0.008	-0.010

Table G. Effect of Conspiratorial Thinking, Treatment, and their Interaction on COVID-19 Attitudes

	Attitudes: Wave 1	Attitudes: Wave 2	Attitudes: Wave 3	Attitudes Change: Wave 1 to Wave 2	Attitudes Change:Wave 2 to Wave 3	Attitudes Change: Wave 1 to Wave 3
Treatment	1.366**	0.411	1.075**	-0.754	0.569	-0.318
	[0.607]	(0.653)	[0.531]	(0.600)	(0.550)	(0.507)
Conspiratorial Thinking	-0.539***	-0.448***	-0.432***	0.116	0.002	0.093
	[0.176]	(0.151)	[0.143]	(0.140)	(0.127)	(0.118)
Interaction	-0.441*	-0.052	-0.355	0.261	-0.215	0.099
	[0.241]	(0.243)	[0.216]	(0.223)	(0.204)	(0.187)
Constant	4.811***	4.731***	4.824***	-0.090	0.065	0.041
	[0.445]	(0.407)	[0.349]	(0.376)	(0.343)	(0.318)

Table H. Effect of Conspiratorial Thinking, Treatment, and their Interaction on COVID-19 Perceptions

	Perceptions: Wave 1	Perceptions: Wave 2	Perceptions: Wave 3	Perceptions Change: Wave 1 to Wave 2	Perceptions Change: Wave 2 to Wave 3	Perceptions Change: Wave 1 to Wave 3
Treatment	1.319*	-0.373	-0.398	-1.315	-0.014	-1.699**
	(0.675)	(0.718)	(0.707)	(0.832)	(0.932)	(0.734)
Conspiratorial Thinking	-0.299*	-0.404**	-0.339**	0.007	0.125	-0.041
	(0.152)	(0.166)	(0.159)	(0.192)	(0.215)	(0.165)
Interaction	-0.491**	0.146	0.208	0.464	0.085	0.686**
	(0.247)	(0.267)	(0.259)	(0.310)	(0.346)	(0.269)
Constant	3.679***	3.956***	3.614***	0.023	-0.523	-0.065
	(0.414)	(0.448)	(0.434)	(0.519)	(0.582)	(0.450)
Observations	176	165	177	164	165	176
Adjusted R^2	0.090	0.026	0.013	0.006	-0.010	0.035

Note: Dependent variable is additive index for severity and transmissibility of COVID-19. Treatment denotes exposure of treatment group to video stimuli. Conspiratorial ideation scale abbreviated from Brotherton, French, and Pickering[3]. Standard errors in parentheses. * p<0.1, ** p<0.05, *** p<0.01.

Observations	175	164	176	163	164	175
Adjusted R^2	0.174	0.083	0.135	0.016	-0.008	-0.003

Note: Dependent variable is respondent desire for others to socially distance due to COVID-19. Treatment denotes exposure of treatment group to video stimuli. Conspiratorial ideation scale abbreviated from Brotherton, French, and Pickering[3]. Standard errors in parentheses. Efron[2] variant in parentheses. Efron[2] variant standard errors in brackets to account for heteroskedastic residual structure. * p<0.1, ** p<0.05, *** p<0.01.