It's Alive! Increasing Protective Action Against the Coronavirus Through Anthropomorphism and Construal

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News outlets often depict the coronavirus as a "burglar" or a "killer"—even though viruses are not technically alive. While imbuing this virus with human-like qualities may enable the public to feel as if they are better able to understand it, does anthropomorphizing the coronavirus lead people to adopt protective behaviors against the spread of the disease? Integrating construal level theory, we argue that anthropomorphizing an agent makes it seem more understandable, which decreases its psychological distance. And through construal matching between the message and consumers' temporal focus, we demonstrate that when the coronavirus is anthropomorphized, people are more likely to adopt protective measures when they are focused on the present versus the future because consumers believe the anthropomorphized coronavirus to be more powerful. Our findings contribute to both anthropomorphism and construal level theory research. Additionally, our findings offer implications for health communication strategies and public policy.

Since the emergence of the novel coronavirus in late 2019, normalcy of life has ceased to exist. Information related to the coronavirus and its impact has dominated media cycles. This virus has been described as "an extremely destructive burglar" (Kaplan and Achenbach 2020) and even, "an angry little ball…perhaps equipped with arms and legs, and definitely an evil grin" (Ulaby 2020). The journal Nature released a recent news feature titled "Profile of a Killer", referring to the category of coronaviruses as a "family of dynamic killers" (Cyranoski 2020). The media, and even scientists and medical experts, often describe the coronavirus in terms of human traits and intentions—however, the fact of the matter is viruses are not truly "alive" nor do they have a conscious mind (Wessner 2010). Viruses cannot replicate on their own and have to rely on living cells to propagate (Villarreal 2008). This can be a difficult concept for lay people to grasp. As such, governments and health agencies alike have invested considerable effort in educating the public about the novel coronavirus.

Imbuing the coronavirus with human-like traits, as described earlier, is one way to make it more understandable. After all, people are more likely to understand and predict other humans compared to non-human objects (Waytz, Cacioppo, and Epley 2010). Thus, increasing understanding of the coronavirus and viewing it as powerful may also result in the adoption of necessary behaviors to minimize continued deleterious effects on society. To this effect, an important question arises: Can anthropomorphizing the coronavirus lead individuals to adopt behaviors aimed to limit its spread? Drawing upon construal level theory, we predict that the extent to which individuals adopt protective measures when the coronavirus is anthropomorphized depends on their temporal focus. In particular, some individuals may focus on the present (e.g., tracking increases in COVID-19 cases, reducing immediate spread), whereas others are more concerned about the future (e.g., dampening the severity of future waves, estimating a timeline for a vaccine). We posit that whether individuals adopt protective behaviors depends upon a construal match between their

temporal mindset and how the coronavirus is depicted, given that construal matching exerts a greater influence on consumers (Kim, Lee, and Choi 2019; Roose et al. 2019). Specifically, if anthropomorphizing a novel, non-human agent can make it easier to understand and predict (Epley, Waytz, and Cacioppo 2007), it may reduce the psychological distance between the agent and the individual. More recent research suggests that, indeed, anthropomorphizing threats may make them seem more proximal (Wang, Touré-Tillery, and McGill 2019). As such, we posit that when the disease is anthropomorphized, a construal match (mismatch) will occur when individuals focus on the present (future). Moreover, we hypothesize that a construal match will make the virus seem more severe, leading to an increased uptake in protective behaviors.

Our experimental findings offer evidence that when individuals are more present-focused, anthropomorphizing the coronavirus leads to increased willingness to adopt protective behaviors to limit its transmission, and this is driven by increased perceptions of the virus's power. Consequently, our research makes three key contributions. First, we identify when and how anthropomorphizing a novel entity can increase or decrease its perceived power. Second, we provide new insights on how anthropomorphism and construal level can be used in conjunction to influence consumers' decisions. And third, our research offers important implications for media strategies and public policy to communicate health information.

THEORETICAL DEVELOPMENT

People naturally anthropomorphize and imbue objects with human traits. For instance, people can spontaneously ascribe intention to almost any type of object, from toys (Morewedge, Preston, and Wegner 2007) to beverage bottles (Aggarwal and McGill 2007), and even to the simplest geometric shapes (Heider and Simmel 1944). One of the key factors underlying people's tendency to anthropomorphize is their need to better understand the world (Epley,

Waytz, and Cacioppo 2007). From a young age, children develop more detailed schemas for human (vs. non-human) entities, which explains why knowledge about human-like schemas is more accessible, even in adulthood, in application to different situations (Guthrie 1993; Epley et al. 2007). People often use this schema to explain the behaviors of novel objects around them because they have an easily accessible knowledge base of "humanness."

An important consequence of anthropomorphizing something unpredictable is that it makes people feel as if they can understand an object better (Waytz et al. 2010a). Indeed, people attribute human-like tendencies to complex agents such as robots (Waytz et al. 2010b) and even random sequences of die rolls and coin tosses (Caruso, Waytz, and Epley 2010) in order to improve their perceived predictability. Within a disease context, the influence that tiny, seemingly invisible microorganisms can exert on humans is arguably a difficult concept to comprehend. In fact, children naturally anthropomorphize bacteria, by envisioning them with faces and human-like limbs, and attributing good (bad) intentions to helpful (harmful) bacteria (Byrne, Grace, and Hanley 2009). This process of anthropomorphizing helps children understand abstract concepts such as bacterial infection. Although adults are likely to acknowledge that bacteria do not literally possess eyes and limbs, they may also anthropomorphize bacteria as a way to understand how these microorganisms function. This inclination to anthropomorphize germs and perceive them as possessing malevolent intentions particularly holds true for those who fear contamination and disease (Riskind and Richards 2018).

Importantly, while anthropomorphizing objects can make them easier to understand, the manner in which people react to such objects may vary depending on their mindsets. For instance, the way people respond to anthropomorphized diseases may depend on the extent to which they feel powerful (Kim and McGill 2011). In particular, an anthropomorphized disease may seem simultaneously as having control *over* humans and controllable *by* humans.

Kim and McGill (2011) found that when skin cancer was anthropomorphized, people who felt that they lacked power perceived the disease as more threatening. On the other hand, people who felt power over others believed themselves to be less at risk from the disease. As such, although anthropomorphizing the novel coronavirus may increase the public's perceived understanding of this disease, how people then react to the disease (e.g., whether they take protective actions) may depend on their mindset. Past research indicates that such reactions can be predicted by matching message features with the construal mindset of the individual (Lee, Keller, and Sternthal, 2010). In order to examine anthropomorphism as a message feature, we turn to construal level theory.

Construal level theory describes how people attend to and perceive information (Trope, Liberman, and Wakslak 2007). Individuals tend to adopt a concrete or abstract mindset depending on whether psychological distance is perceived as lower or higher, respectively (Zhao and Xie 2011). Specifically, psychological distance can manifest in different domains: spatial (e.g., geographical), social (e.g., in-group vs. out-group), temporal (e.g., present- or future-orientation), and hypothetical (e.g., certainty vs. uncertainty; Trope et al. 2007). In our research, we focus on the latter two types of distances.

Hypothetical distance cues pertain to associations with certainty or probabilistic likelihood. More probable events are perceived to be psychologically closer and processed more concretely, and less probable events are perceived as being further away and processed more abstractly (Wakslak et al. 2006; Wakslak and Trope 2009). As mentioned earlier, anthropomorphizing an uncertain, unpredictable agent makes it seem more predictable and understandable—this may be due to a reduction of hypothetical distance. The unpredictable agent may become more concrete and tangible in individuals' minds, similar to the way children make use of anthropomorphism to help them understand microorganisms that they cannot see (Byrne et al. 2009). In other words, the humanized coronavirus may seem more

tangible than its non-humanized counterpart. Indeed, some recent research suggests that anthropomorphizing diseases makes them feel more proximal (Wang et al. 2019).

Further, there is also a temporal component of communications about the coronavirus to consider. From a temporal construal perspective, present events are perceived to be more tangible and concrete, whereas future events are thought of more abstractly (Trope and Liberman 2003). Thinking about the present leads people to focus on immediate actions and the means to reach a goal whereas thinking about the future leads people to focus on higher order goals and the end state of reaching that goal (Lutchyn and Yzer 2011). While one may assume that the public should possess a present-focus given the current consequences of the coronavirus, the media messaging pertaining to the coronavirus continually vacillates between a present-focus (i.e., daily new cases, immediate measures to reduce spread) and a future-focus (i.e., predicted mortality rates, vaccine timelines). Therefore, depending on a given message, an individual's temporal focus may be inadvertently redirected between either a present- or future-focus.

When the construal of the message and the construal of the individual's mindset match, messages exert greater influence (e.g., Roose et al. 2018; Kim et al. 2019). That is, if an individual is processing information in a concrete way, a message that is also focused on highlighting concrete (vs. abstract) features is more influential. More specifically, focusing on the present (vs. future) and focusing on something more certain (vs. uncertain) both represent a concrete (vs. abstract) construal (Trope et al. 2007). In this context, a message about an anthropomorphized virus should make the virus seem more certain and predictable (Waytz et al. 2010a), and thus more proximal and concrete (Wakslak et al. 2006; Wang et al. 2019). If individuals are present-focused, they would perceive the humanized virus to be more powerful and impactful, due to a match in mindset and the increased certainty of the virus due to reduced hypothetical distance—and as such, they would be more likely to adopt

protective measures against the humanized coronavirus. However, if individuals are more focused on the future, a mismatch between the message (about the anthropomorphized virus) and the mindset would lead to decreased adoption of protective actions. More formally:

H1. The influence of anthropomorphizing diseases will increase consumers' adoption of protective behaviors when focused on the present (vs. future).

H2. The effect of anthropomorphizing diseases and temporal construal on adoptions of protective behaviors will be mediated by perceived power of the virus.

We test our proposed framework across two experiments. Study 1, employing manipulated temporal construal level, demonstrates that, when the coronavirus is anthropomorphized, individuals are more willing to adopt protective behaviors with a temporally close (vs. distant) mindset (**H1**). Study 2, using measured chronic temporal construal, confirms perceived power as the underlying mechanism (**H2**). All manipulations, measures, manipulation checks, and exclusion criteria are detailed in the Appendix.

STUDY 1

Method

Two hundred and forty-six English-speaking TurkPrime participants (M_{age} = 41.82, 52% male) completed a study that consisted of a 2 (coronavirus: objectified vs. anthropomorphized) x 2 (temporal construal: present vs. future) between-subjects design. Under the cover story that they would be completing a series of unrelated studies, participants were first randomly assigned to a temporal construal prime condition involving the evaluation of an advertisement for dish soap (adapted from Chang, Zhang, and Xie 2015). The

information regarding the dish soap's ingredients, effectiveness, and environmental impact was the same across conditions. The two advertisements' focal taglines differed, such that those in the present (future) condition read: "It's All About Today (the Future). Every Choice Matters," and "Make Your Choice. Make a Difference Today (for the Future)." Participants then answered two questions that served as a temporal construal manipulation check: "To what degree does the advertisement focus on making changes for the present (distant future)," (1 = not at all, 7 = very much), as well as a couple of filler items pertaining to the advertisement.

In an ostensibly separate task, participants were randomly assigned to read an article that featured either an anthropomorphized or objectified coronavirus. The anthropomorphized coronavirus, described as a criminal and assassin, included an image of a spike-covered circle (adapted from Kurzgesagt, 2020, 04:40) with a scowling face and a description that imbued the virus with intentions to target and harm human cells (adapted from Aggarwal and McGill 2007). In the objectified condition, the image of the virus did not include a face and the description was devoid of references about the virus being alive and having intentions. Both conditions informed participants of COVID-19 symptoms caused by the coronavirus. A pretest (see Appendix) with a separate sample of 94 Mturk participants (M_{age} = 39, 56% female) confirmed that participants in the anthropomorphized (vs. objectified) condition were more likely to attribute human-like traits to the coronavirus ($M_{Anthropomorphized}$ = 5.01, SD = 2.45 vs. $M_{Objectified}$ = 3.91, SD = 2.31; $F(1, 92) = 5.01$, $p = .03$).

Following the article, participants read the statement: "Many public health officials are recommending that people should wear cloth face masks and disposable gloves when they are around other people, as a way of preventing the acquisition and spread of the coronavirus." Participants were then asked to indicate the probability (0 – 100%) of them wearing gloves the next time they were at the store, assuming that the store offered the gloves

for free. Eight participants were excluded (see Appendix; Miller 1991; Oppenheimer, Meyvis, and Davidenko 2009), leaving 238 participants.

Results and Discussion

Adoption of Protective Behaviors. Analyses of the manipulation checks showed that our temporal construal manipulation was successful (see Appendix). An ANOVA with temporal construal prime and coronavirus as the independent variables and the protective behavior intentions as the dependent variable yielded a significant temporal construal x coronavirus interaction ($F(1, 234) = 5.57$, $p = .019$; see Figure 1). There were no significant main effects (see Appendix).

[Insert Figure 1 about here]

Planned contrasts within the anthropomorphized condition revealed that participants with a present- (vs. future-) focus reported greater adoption intentions for the gloves (M = 63.11%, SD = 37.39% vs. M = 47.69%, SD = 40.65%, respectively; $F(1, 234) = 4.68$, p = .032). Conversely, among participants in the objectified conditions, no difference in adoption intentions were observed for those in the present (vs. future-) focused conditions (M = 50.21%, SD = 38.25% vs. M = 58.24%, SD = 36.33%, respectively; $F(1,234) = 1.34$, p = .25). Further, participants in the present-focused condition reported greater adoption intentions for the gloves when in the anthropomorphized (M = 63.11%, SD = 37.69%) versus objectified (M = 50.21%, SD = 38.25%) condition ($F(1, 234) = 3.45$, $p = .06$). Conversely, in the future condition, no differences in adoption intentions were observed for those in the anthropomorphized versus objectified condition ($M_{\text{Anthropomorphized}}$ = 47.69%, SD = 40.65% vs. $M_{\text{Objectified}}$ = 58.24%, SD = 36.33%; $F(1, 234) = 2.21$, $p = .14$).

In support of **H1**, Study 1 provides initial evidence for our proposition that when the virus is anthropomorphized, priming individuals with a present-focus results in greater intentions to adopt protective measures. In order to provide robust evidence that it is indeed present versus future temporal construal that influences protective action when the virus is anthropomorphized, we seek to measure, rather than manipulate, participants' temporal focus in Study 2. We also examine the uptake of a different and important protective action—mask-wearing in public settings. Furthermore, we test in Study 2 the process underlying individuals' increased likelihood of adopting protective measures (**H2**).

STUDY 2

Method

Two hundred English-speaking TurkPrime participants (M_{age} = 41.55, 52% male) completed a study that consisted of one manipulated factor (coronavirus: objectified vs. anthropomorphized) and one measured factor, temporal focus (continuous). Participants were first randomly assigned to either an anthropomorphized or objectified coronavirus condition that involved evaluating promotional material for a supposedly upcoming documentary. Participants in the anthropomorphized (vs. objectified) condition viewed promotional material for "Coronavirus: The Deadly Assassin" (vs. "Coronavirus: Pandemic of the 21st Century"). The promotional materials in both conditions featured similar images as the manipulation in Study 1 and the documentary summary included human-like descriptions of the virus or not, depending on condition (see Appendix). Participants then answered a few filler questions about the documentary, followed by manipulation checks assessing the extent to which the virus seemed to have its own intentions/free will/seemed human (α = .88; adapted from Kim and McGill 2011).

In an ostensibly unrelated study, participants read the following: "Imagine that you are in a state where mask-wearing is not mandated. You may choose to wear a mask or not. However, public health officials highly recommend wearing masks." Next, participants indicated the probability (0 – 100%) of them wearing a face mask the next time they were in seven different situations (e.g. walking around in a mall, riding public transportation; $\alpha = .97$, see Appendix) presented in randomized order, assuming that they could get cloth masks for free. Next, we assessed perceived power with the following three items (1 = not at all, 9 = very much; $\alpha = .91$): "To what extent does the coronavirus seem powerful?", "…seem severe?", and "…would impact your life?" Participants then responded to eight items adapted from the present and future subscales of the temporal focus scale (Shipp, Edwards, and Lambert 2009), which included items such as "I tend to live my life in the present" and "I tend to focus on my future," (1 = never, 9 = constantly; see Appendix).

Lastly, given the recent increased politicization of mask-wearing (Syal 2020) and the prevalence of state-wide mask mandates which may inform consumers' mask-wearing habits, participants reported their political orientation (1 = liberal, 9 = conservative) and current state of residence as control variables. Four participants were excluded (see Appendix), leaving 196 participants.

Results and Discussion

Adoption of Protective Behaviors. Analyses of the manipulation checks showed that our anthropomorphism manipulation was successful (see Appendix). We created two indices reflecting the respective items in the present-focus ($\alpha = .93$) and future-focus ($\alpha = .96$) sub-scales. We then created a composite index reflecting participants' dominant temporal focus by subtracting their present-focus score from their future-focus score (Winterich and Haws 2011); thus, higher numbers reflected a more dominant future-focus. A regression analysis

(PROCESS Model 1; Hayes 2013) was conducted with mask-wearing intentions as the dependent variable, coronavirus condition (0 = objectified, 1 = anthropomorphized), temporal focus (mean-centered), and the coronavirus x temporal focus interaction as independent variables. The analysis yielded only the predicted significant coronavirus x temporal construal interaction (b = -5.22, t = -2.81, p = .005) without significant main effects (see Appendix).

Relative comparisons revealed that when the coronavirus was anthropomorphized, participants with a stronger present- versus future-focus reported stronger adoption intentions (b = -3.91, t = -2.91, p = .004). These results replicate the findings from Study 1. In contrast, no difference in adoption intentions was observed among present-focused and future-focused participants (b = 1.31, t = 1.28, p = .31) in the objectified coronavirus condition. A floodlight analysis using Johnson-Neyman tests indicated that the effect of coronavirus condition was significant for those with a temporal focus lower than -2.55 (b_{JN} = 12.08, SE = 6.13, p = .05) and greater than 1.65 (b_{JN} = -9.84, SE = 4.99, p = .05; see Figure 2). Specifically, those with a stronger present-focus reported greater intentions to adopt protective measures after seeing the anthropomorphized (vs. objectified) coronavirus, while those with a predominant future-focus reported lower intentions when the coronavirus was anthropomorphized, rather than objectified. Further, controlling for whether participants lived in a state with a mask mandate (0 = no, 1 = yes) and their political orientation replicated the coronavirus x temporal construal interaction (b = -4.83, t = -2.73, p = .007).

[Insert Figure 2 about here]

Mediating Role of Perceived Power. To explore the mediational role of perceived power, an analysis using PROCESS Model 8 (Hayes 2013) was conducted with adoption of protective

behaviors as the dependent variable, coronavirus condition, temporal construal (mean-centered), and their interaction as independent variables, and perceived power as the mediator. The results revealed a significant effect of the mediator on intentions (b = 8.82, t = 10.53, $p < .001$) and the inclusion of perceived power as a mediator rendered the coronavirus x temporal construal interaction non-significant (b = -.78, t = -.50, p = .61). Bootstrap analysis showed a significant indirect effect of the highest order interaction with perceived power as the mediator (b = -4.44, SE = 1.55, 95% CI: [-7.78, -1.67]). Further supporting our hypotheses, increased power perceptions was found to mediate in the present-focused condition (b = 9.34, SE = 3.91, 95% CI: [2.14, 17.55]), and decreased power perceptions mediated in the future-focused condition (b = -8.97, SE = 4.10, 95% CI: [-17.51, -1.61]), when the coronavirus was anthropomorphized.

In support of our hypotheses, we find that individuals who hold a present- (vs. future-) focused mindset reported greater willingness to adopt protective measures when the disease was anthropomorphized. Also, extending our previous findings, Study 2 provides mediational evidence implicating increased perceived power underlying the increased adoption of protective measures among those in the anthropomorphism condition.

General Discussion

The current research demonstrates that anthropomorphizing diseases can lead to greater intentions to adopt protective measures, such as wearing masks and gloves. Specifically, individuals are more likely to adopt protective actions when they have a temporally present (vs. future) construal (Studies 1 and 2). Moreover, perceived power mediates this effect (Study 2). When the coronavirus is anthropomorphized, reducing its hypothetical distance, individuals in a present (vs. future) construal mindset feel that the disease is more powerful, resulting from a construal match, which increases protective action.

Past anthropomorphism research suggests that by interacting with anthropomorphized (vs. non-anthropomorphized) agents, we are able to predict and exert influence on them (e.g., Aggarwal and McGill 2007; Epley et al. 2007; Kim and McGill 2011). Yet, in certain cases, anthropomorphized agents are able to influence us and our sense of autonomy (e.g., Hur, Koo, and Hofmann 2015; Kim, Chen, and Zhang 2016; Puzakova and Aggarwal 2018). Our findings contribute to this body of research by identifying situations where anthropomorphizing an agent—in particular, a negative one—can make it seem more powerful and can influence how willing consumers are to take up action against this agent. Furthermore, we contribute to this literature by identifying a key moderator: temporal construal. Anthropomorphizing an agent may make it more understandable, but individuals are receptive to the message about the agent only when the message characteristics match their temporal mindset. While the primary focus of the current research was to investigate how anthropomorphizing (vs. objectifying) the coronavirus can make it more understandable, it may be worthwhile for future research to examine how explicitly presenting the coronavirus in more abstract terms interacts with a more distal temporal mindset and influence individuals' willingness to engage in protective actions.

It is worth noting that some research suggests that comparing anthropomorphized entities against each other may induce a more holistic processing mindset (Huang, Wong, and Wan 2019). Our findings do not necessarily contradict this, but rather, it is likely that whether or not anthropomorphizing an entity would lead to more holistic or concrete mindsets is context dependent. Choosing between two desirable product options may induce a holistic mindset during the comparison process (Huang et al. 2019), but trying to understand an unpredictable entity by anthropomorphizing it may lead individuals to perceive the entity as more concrete (Caruso et al. 2010; Wang et al. 2019). In the present research, we posited that anthropomorphizing the coronavirus makes the virus seem more concrete by reducing

hypothetical distance. Perhaps for other motives to anthropomorphize (e.g. desire to form social connections), other forms of psychological distance (e.g. social) are relevant. Future research can more systematically examine this hitherto unexplored connection between anthropomorphism and construal.

The aim of this project was to investigate whether anthropomorphizing the coronavirus increased people's intention to engage in protective actions, depending on their temporal focus. However, it is worth recognizing that coronavirus-related messages from the government or other health organizations often include more than just these two elements. For instance, a campaign in the United Kingdom advocates, "Stay alert, control the virus, save lives," while a campaign in Alberta simply states, "Help Prevent the Spread." Thus, it would be worthwhile to explore the effect of anthropomorphizing the coronavirus using different message framings. Specifically, given that promotion- versus prevention-focused messages are also linked to different construal level mindsets (Chandran and Menon 2004), how might layering elements of message framing influence the uptake of protective actions? The mixing of these different message elements presents a fruitful opportunity for future research.

Finally, our research has important implications for health and medical communication pertaining to the coronavirus. Currently, the use of anthropomorphized language to describe the coronavirus seems to be more or less random, with news articles relating to both present concerns and future outcomes. Our findings suggest that the receptiveness of messages about taking precautions against the virus depends on a match between how the virus is depicted and the temporal construal of the individual. As such, health messages pertaining to present issues may be more effective if the coronavirus was described in humanized terms.

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Figure 1

Study 1: Effect of temporal construal on probability of wearing gloves as a function of anthropomorphism

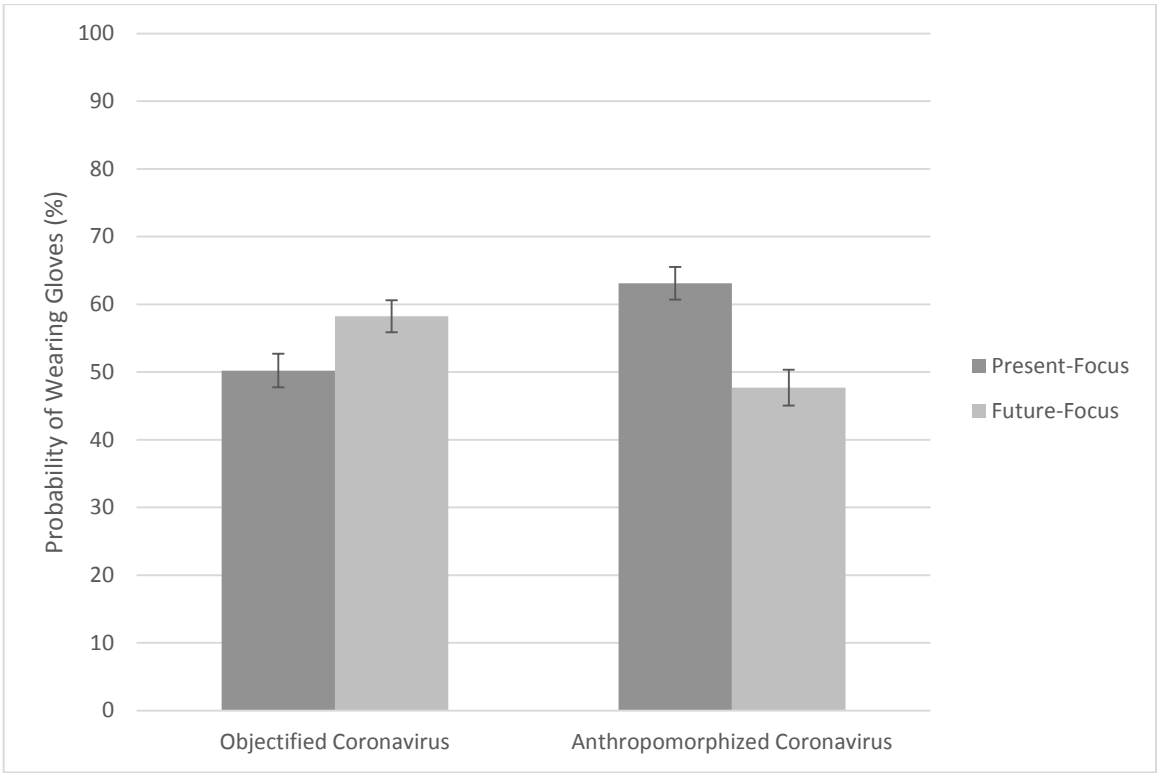
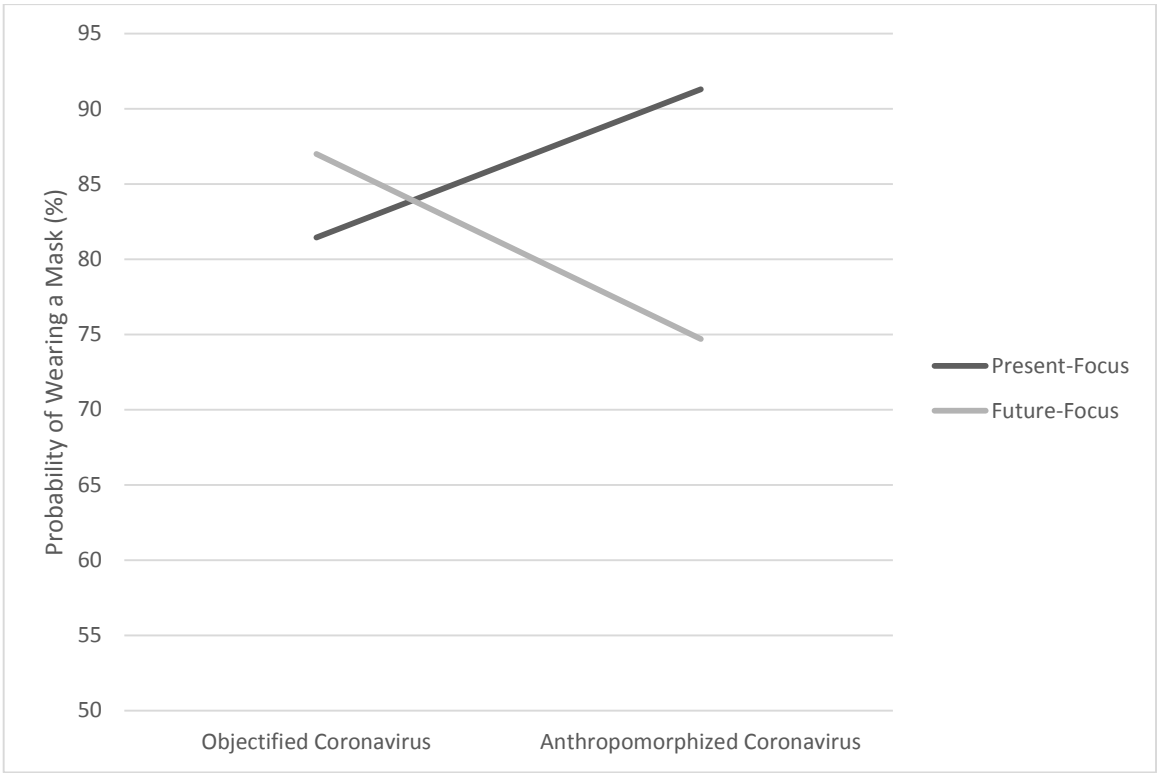


Figure 2

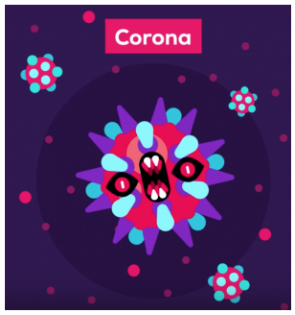
Study 2: Effect of dominant temporal focus on probability of wearing masks as a function of anthropomorphism



WEB APPENDIX

STUDY 1 Pretest

Coronavirus Anthropomorphized Condition



Coronaviruses are a large family of viruses - almost like a crime family. They are named after the crownlike spikes that surround their body. Their skins are covered in a bubble of oily lipid molecules. This family includes SARS and MERS--but the current, most widespread and dangerous criminal member is the newly-born coronavirus that causes the COVID-19 disease.

The sneaky virus, travels inside droplets, projected from coughs and sneezes from infected others. They hitch a ride in the droplets to sneak inside the human body. Their destinations are to the lungs, intestines, and spleen—locations where they know they can cause the most damage.

Once these sneaky viruses gets inside the body, and like well-trained assassins, they purposefully target the cells lining organs. They choose a victim cell and inject their genetic material into the cell. They send a command to the cell to replicate more viral material before giving the cell its final order: to self-destruct. More trained assassins emerge from the dying cell, ready to attack new cells.

After several days of this, billions of tiny assassins swarm the lungs. They cleverly target the immune system in order to create more confusion and chaos. In extreme cases, they overwhelm the body's immune system cells and can eventually destroy the lining of the lungs.
This novel family of coronavirus assassins can move fast and spreads far quicker than the common flu virus.

Coronavirus Objectified Condition

Coronaviruses are a specific type of viruses. They are named after the crownlike spikes that stick out from their surface. The virus is enveloped in a bubble of oily lipid molecules. There are some different types of coronaviruses like SARS and MERS, but the current, most widespread and dangerous type is the novel coronavirus that causes the COVID-19 disease.

The coronavirus is transmitted through droplets, projected from coughs and sneezes from infected others. Through the droplets, the virus can easily end up inside the human body—particularly in the lungs, intestines, and spleen, where the virus causes the most damage.

Cells lining organs are especially vulnerable to the coronavirus. The virus is able to inject its genetic material into the cell, which leads to replication of more viral material within the cell. After the cell dies off, more coronaviruses emerge and infect new cells.

After several days of this, billions of viruses build up within the lungs. The coronavirus can also cause damage to the immune system. In extreme cases, the immune system shuts down and the lining of the lungs can be eventually destroyed.
This novel coronavirus spreads more easily from human-to-human, and is far more contagious than the common flu virus.

Note: Three outlier participants were excluded for spending more than +/- 3 SD's from the mean time spent (Miller 1991) on the page displaying the article about the coronavirus (M = 55.90 seconds).

Coronavirus Manipulation Check

9-point scale (1 = not at all, 9 = very much; $\alpha = .85$)

Think back to the passage you read about the Coronavirus....
To what extent does the virus seem to have its own intentions?
To what extent does it seem like the virus has free will?
To what extent does it seem like the virus is human?

Attention Check (adapted from Oppenheimer, Meyvis, and Davidenko 2009)

Please review the colors listed in this set: red, green, blue, orange and yellow. What position is the color red in this list?

Note: Zero participants were excluded for answering this question incorrectly.

STUDY 1

Present-Focus Manipulation

Future-Focus Manipulation

Temporal Construal Manipulation Checks

7-point scale (1 = not at all, 7 = very much)

To what degree does this advertisement focus on making changes for the present?
To what degree does this advertisement focus on making changes for the distant future?

To confirm the effectiveness of the temporal construal prime, we ran a one-way ANOVA with temporal construal prime as the independent variable and the extent to which the ad was present-focused as the dependent variable. The analysis yielded only a significant main effect of temporal construal prime ($F(1, 236) = 13.32$, $p < .001$), such that those in the present ($M = 8.25$, SD = 1.35) versus future ($M = 7.48$, SD = 1.87) felt that the ad was more present-focused. A similar analysis on the extent to which the ad was future-focused as the dependent variable revealed that those in the present ($M = 8.13$, SD = 1.65) versus future ($M = 8.56$, SD = 1.51) felt that the ad was less future-focused ($F(1, 236) = 4.45$, $p = .036$).

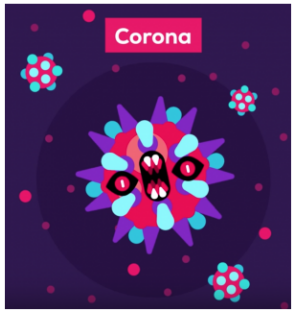
Ancillary Ad Measures

7-point scale (1 = not at all, 7 = very much; $r = .84$)

To what degree is this advertisement appealing?
How likable is the brand Yaya Maria's?

An independent samples t-test revealed a marginally significant difference in ad evaluations in the present-focus (M = 7.95) and future-focus (M = 7.58) ad conditions; $t(236) = 1.83$, $p = .07$.

Coronavirus Anthropomorphized Condition



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This novel coronavirus spreads more easily from human-to-human, and is far more contagious than the common flu virus.

Note: Six outlier participants were excluded for spending more than +/- 3 SD's from the mean time spent (Miller 1991) on the page displaying the article about the coronavirus (M = 57.09 seconds).

Dependent Variable

Now, many public health officials are recommending that people should wear cloth face masks and disposable gloves when they are around other people, as a way of preventing the acquisition and spread of the coronavirus.
The next time that you go to the store, assuming the store offers disposable gloves for free, what is the probability (0-100%) that you will wear the gloves?

Attention Check (adapted from Oppenheimer, Meyvis, and Davidenko 2009)

Please review the colors listed in this set: red, green, blue, orange and yellow. What position is the color red in this list?

Note: Two participants were excluded for answering this question incorrectly.

Main Effects from 2x2 ANOVA on Glove-wearing Intentions

Temporal Construal Condition: $F(1, 234) = .55$, $p = .46$
Coronavirus Condition: $F(1, 234) = .055$, $p = .81$

STUDY 2

Introduction to the Coronavirus

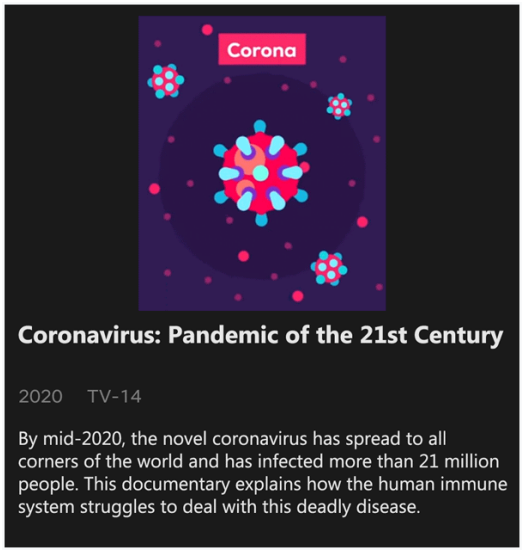
In the first study, we would like you to view a copy for an upcoming documentary. Please spend as much time as you would like on the next screen examining the material and answer the questions that follow.

Coronavirus Anthropomorphized Condition

Please imagine that you received a recommendation for this new documentary:

Coronavirus Objectified Condition

Please imagine that you received a recommendation for this new documentary:



Note: Four outlier participants were excluded for spending more than +/- 3 SD's from the mean time spent (Miller 1991) on the page displaying the article about the coronavirus (M = 20.13 seconds).

In the original Qualtrics study, the images of the coronavirus in both conditions were animated.

Ancillary Documentary Measures

7-point scale (1 = not at all, 7 = very; α = .97)

How likely is it that you would watch this documentary?
How interested are you in this documentary?
How likely would you recommend this documentary to someone else?

An independent samples t-test revealed no differences in documentary evaluations in the objectified (M = 7.27) and anthropomorphized (M = 6.95) virus conditions; $t(194)$ = 1.08, p = .28.

Coronavirus Manipulation Check

9-point scale (1 = not at all, 9 = very much; α = .88)

Think back to the passage you read about the Coronavirus...To what extent does the virus seem to have its own intentions?

To what extent does it seem like the virus has free will?
To what extent does it seem like the virus is human?

To confirm the anthropomorphism prime was successful, we conducted a regression analysis with coronavirus condition, temporal construal (mean-centered), and the coronavirus x temporal construal interaction as independent variables, mask-mandate and political orientation as covariates, and perceived humanness of the virus as the dependent variable. The analysis yielded only a significant main effect of anthropomorphism prime (b = 1.27, t = 3.61, p =.004).

Dependent Variable

Imagine that you are in a state where mask-wearing is not mandated. You may choose to wear a mask or not. However, public health officials highly recommend wearing masks.

Assuming you could get cloth masks for free, what is the probability (0-100%) that you will wear a face mask in the following situations (α = .97)?

- Working out in a gym
- Visiting a crowded neighborhood park
- Walking around in a mall
- Shopping in a store
- Sitting in a movie theater
- Riding public transportation
- Flying in an airplane

Perceived Power Measures

9-point scale (1 = not at all, 9 = very much; α = .91)

How severe of a problem do you think Coronavirus is?
How powerful do you think Coronavirus is?
To what extent do you think Coronavirus would impact your life?

Temporal Construal Measures

Present Focus (1 = Never, 9 = Constantly; α = .93):
I try to focus on what is currently happening in my life.
My mind is usually on the here and now.
I often think about where I am today.
I try to live my life in the present.

Future Focus (1 = Never, 9 = Constantly; α = .96):
I often think about what my future has in store.

I often think about times to come.
I tend to focus on my future.
I often imagine what tomorrow will bring for me.

Political Views and Mask Mandates

In general, how would you describe your political views? (1 = Liberal, 9 = Conservative)

Which state do you currently live in?

Note: these responses were crosschecked with the list of states that had mask mandates at the time of the study, and were coded as (1 = state with mask mandate, 0 = state without mask mandate)

Attention Check (adapted from Oppenheimer, Meyvis, and Davidenko 2009)

Please review the colors listed in this set: red, green, blue, orange and yellow. What position is the color red in this list?

Note: Zero participants were excluded for answering this question incorrectly.

PROCESS Model 1 with Mask-wearing Intentions as the Dependent Variable

<u>PROCESS model 1 without covariates:</u>
Coronavirus Condition (b = -1.21, t = -.31, p = .76)
Temporal Construal (b = -1.25, t = -1.35, p = .18)
Coronavirus Condition*Temporal Construal Interaction (b = -5.22, t = -2.81, p = .005)

<u>Moderator Values defining Johnson-Neyman significance regions:</u>
Temporal Construal Value = -2.55, Effect = 12.08, t = 1.97, p = .05
For values ≤ -2.47, the anthropomorphized (vs. objectified) condition increases mask-wearing intentions
Temporal Construal Value = 1.65, Effect = -9.84, t = -1.97, p = .05
For values ≥ 1.65, the anthropomorphized (vs. objectified) condition decreases mask-wearing intentions

<u>PROCESS 1 model with covariates:</u>
Coronavirus Condition (b = .85, t = .22, p = .82)
Temporal Construal (b = -1.36, t = -2.73, p = .12)
Mask Mandate Covariate (b = -6.55, t = -1.39, p = .17)
Political Orientation Covariate (b = -3.51, t = -4.81, p < .001)
Coronavirus Condition*Temporal Construal Interaction (b = -4.83, t = -2.73, p = .007)

Moderator Values defining Johnson-Neyman significance regions:
Temporal Construal Value = -1.85, Effect = 9.80, t = 1.97, p = .05
For values ≤ -1.85, the anthropomorphized (vs. objectified) condition increases mask-wearing intentions
Temporal Construal Value = 2.60, Effect = -11.68, t = -1.97, p = .05
For values ≥ 2.60, the anthropomorphized (vs. objectified) condition decreases mask-wearing intentions

PROCESS Model 8 with Perceived Power as the Mediator

PROCESS model 8 without covariates.

Dependent variable as perceived power:
Coronavirus Condition (b = .01, t = .04, p = .97)
Temporal Construal (b = .09, t = 1.42, p = .16)
Coronavirus Condition*Temporal Construal Interaction (b = -.50, t = -3.95, p < .001)

Dependent variable as Mask-wearing Intentions
Coronavirus Condition (b = -1.31, t = -.42, p = .68)
Perceived Power (b = 8.82, t = 10.53, p < .001)
Temporal Construal (b = -2.05, t = -2.76, p = .006)
Coronavirus Condition*Temporal Construal Interaction (b = -.78, t = -.50, p = .61)

Indirect Effect of Mediation:
Predominant Present-Focus: Effect = 9.34, Boot SE = 3.94, 95% CI (2.16, 17.44)
Predominant Future-Focus: Effect = -8.97, Boot SE = 4.10, 95% CI (-17.52, -1.35)

Index of Moderated Mediation:
Index = -4.44, Boot SE = 1.55, 95% CI (-7.65, -1.65)

PROCESS model 8 with covariates:

Dependent variable as perceived power:
Coronavirus Condition (b = .14, t = .54, p = .59)
Temporal Construal (b = .08, t = 1.35, p = .18)
Mask Mandate Covariate (b = -.24, t = -.75, p = .45)
Political Orientation Covariate (b = -.25, t = -4.88, p < .001)
Coronavirus Condition*Temporal Construal Interaction (b = -.47, t = -3.86, p < .001)

Dependent variable as Mask-wearing Intentions
Coronavirus Condition (b = -.28, t = -.09, p = .93)
Perceived Power (b = 8.09, t = 9.21, p < .001)
Temporal Construal (b = -2.02, t = -2.75, p = .01)
Mask Mandate Covariate (b = -4.57, t = -1.16, p = .25)

Political Orientation Covariate (b = -1.53, t = -2.37, p = .02)
Coronavirus Condition*Temporal Construal Interaction (b = -1.03, t = -.68, p = .50)

Indirect Effect of Mediation:
Predominant Present-Focus: Effect = 9.01, Boot SE = 3.56, 95% CI (2.62, 16.43)
Predominant Future-Focus: Effect = -6.61, Boot SE = 3.37, 95% CI (-13.52, -.34)

Index of Moderated Mediation:
Index = -3.79, Boot SE = 1.35, 95% CI (-6.65, -1.34)