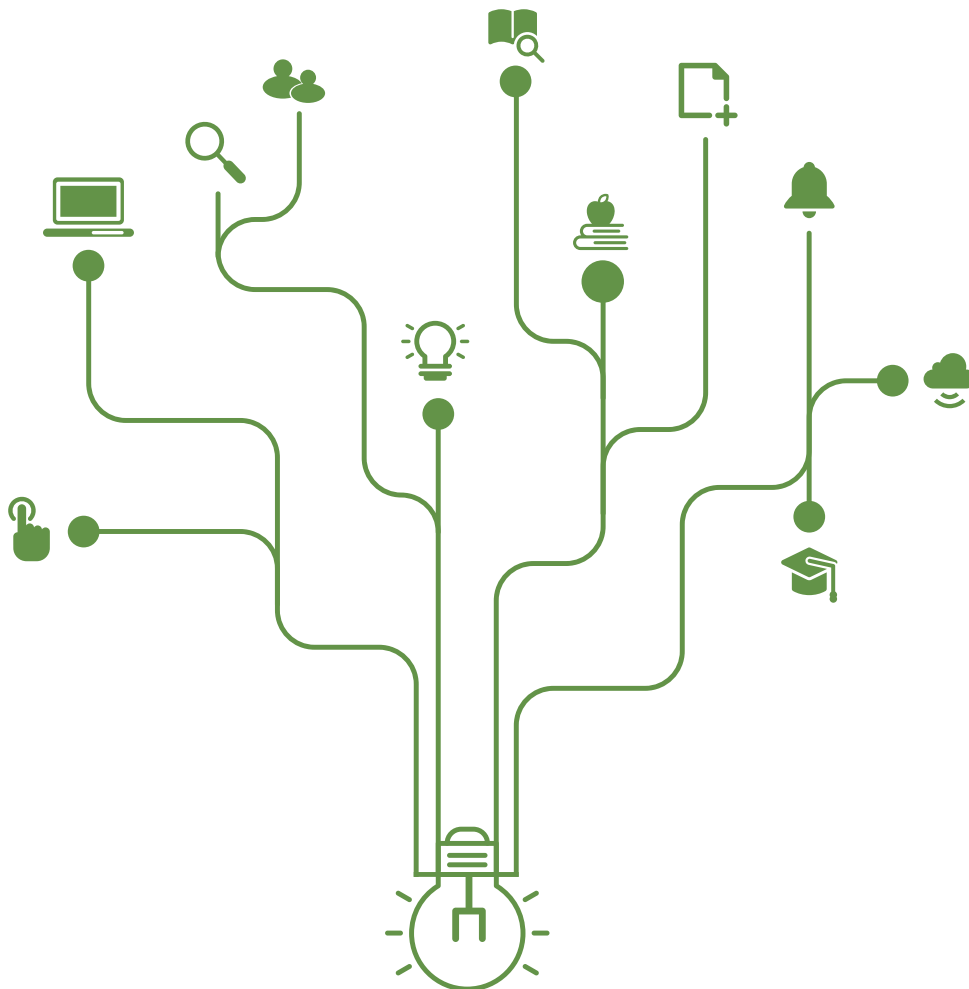# Fear and Favoritism in the Time of COVID-19

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Abstract

Does fear cause us to "circle the wagons" and favor those in our in-group? Or does fear of the "other" cause us to recognize our common humanity and become more charitable to those we might otherwise consider outsiders? The measurement of this effect is confounded by the fact that some groups respond more strongly to fear than others. We run an online experiment on a nationally representative sample in South Korea in which we induce fear via the autobiographical emotional memory task method and examine the impact on donations to either an in-group charity (the Korean Red Cross) or one that caters to an out-group (the Korea Support Center for Foreign Workers). We find that, while the reported level of fear is negatively correlated with donations to the out-group, the induced fear caused by the experimental intervention is positively correlated with donations to the out-group. We also find that the fear effect depends on political views, media exposure, and social preferences. We confirm our experimental results by looking at how regional attitudes toward out-groups have shifted over time and compare those changes to the average level of reported fear during the COVID-19 pandemic. Places that report the most fear of COVID-19 also have had the greatest increases in prosocial attitudes toward out-groups. (Word count: 8,840)

Keywords: Fear, COVID-19, In-group favoritism, Out-group bias

Introduction

The ongoing COVID-19 pandemic has induced fear and anxiety in people around the globe. We seek to understand the effect of that fear on inter-group relations. In a survey conducted by the Pew Research Center in June 2020, 39% of Americans said that racist or racially insensitive views about Asians had become more common since the onset of the pandemic; further, 31% of Asian Americans (and 21% of Black Americans) reported to have been the subject of slurs or jokes because of their race or ethnicity during the period in question (Ruiz et al., 2020). This rise in racial discrimination against Asians and other minorities around the world led Fernand de Varennes, the United Nations Special Rapporteur on minority issues, to warn that, "COVID-19 is not just a health issue; it can also be a virus that exacerbates xenophobia, hate and exclusion" (UN News, 2020).

The uncertainty and fear surrounding COVID-19 could have significant policy and political consequences. According to Human Rights Watch, certain political parties and groups in the United States, United Kingdom, Italy, Spain, Greece, France, and Germany have been exploiting the COVID-19 crisis to advance "anti-immigrant, white supremacist, ultra-nationalist, anti-Semitic, and xenophobic conspiracy theories that demonize refugees, foreigners, prominent individuals, and political leaders" (Human Rights Watch, 2020), raising the potential for violence against them (UN News, 2020). The use of fear in politics is, of course, neither new nor limited to the case of COVID-19 (Furedi, 2018) and is driven by the simple fact that fear seems to be a powerful motivator in elections (Waldroff, 2020). As Tannenbaum et al. (2015) demonstrate in their comprehensive meta-analysis study, messages with fear are nearly twice as effective as messages without fear. Furthermore, the media play a pivotal part in strengthening the role of fear in politics. In recent work, Sacerdote et al. (2020) examine the tone of news articles regarding COVID-19 since January 1, 2020. They find that 91% of stories by the major media in the United States are negative in tone. Even during periods when new cases were declining, news reports of increasing COVID-19 cases outnumbered stories of decreasing cases by a factor of 5.5.

Fear can influence the level of other-regardingness in general and toward specific identity groups in particular. Social psychologists have long studied how emotions influence attention, attitudes, and behavior (Eagly and Chaiken, 1993). For instance, according to Casey (2015) and Aarøe et al. (2017), an emotion such as disgust can sharpen attention to a policy issue and heighten prejudice toward out-groups. More generally, Loewenstein (2000) offers an economic framework for how emotions can drive economic decision making (our focus) or, alternatively, can arise as a consequence of economic decision making (see also Joffily et al., 2014).

We are primarily interested in the relationship between fear and in-group favoritism, where the latter is defined as social preferences that lead to preferential (more prosocial) treatment for one's in-group and biased (less prosocial) behavior against one's out-group(s). We consider three mechanisms in particular: 1) fear increases in-group favoritism as a way to protect those closest; 2) fear decreases in-group favoritism because of a "common enemy effect"; or 3) personality types that tend to be fearful also tend to be more biased against out-groups.

Experiments show that, when our mortality is made salient (e.g., by asking people to think about their death or to take a survey near a cemetery), we exhibit an increase in in-group identification as well as in-group favoritism in prosocial behavior (Hohman and Hogg, 2011; Renkema et al., 2008; Jonas et al., 2002; Li et al., 2015; Cohen et al., 2004, 2017). Cohen et al. (2004) and Cohen et al. (2017) show that, when one's mortality is made salient, they tend to support more right-wing political candidates. This research fits within the body of literature known as terror management theory (Greenberg et al., 1997), which posits that fear of death triggers a move toward self-preservation and a preservation of cultural values. More relevant to our study, O'Shea et al. (2021) have shown that a fear of disease (including COVID-19) is associated with a fear of out-groups, but they do not show the direction of causality.

Several papers have specifically examined disease vulnerability and out-group bias (Adida

et al., 2020; Faulkner et al., 2004; Navarrete and Fessler, 2006; Schaller and Neuberg, 2012; Reny and Barreto, 2020; Dutta and Rao, 2015). Adida et al. (2020) find that, while explicit association of a deadly disease with a cultural out-group does not affect attitudes toward immigration, politicization and the activation of party identification do increase opposition to immigration. Reny and Barreto (2020) find that the concern about COVID-19 is associated with anti-Asian American attitudes and support for Asian specific Coronavirus policies but not immigration-related policies in general.

On the other hand, the fear of an external threat—a common enemy—such as COVID-19 could lead different groups to come together (Heider, 1946; Simmel, 2010; Coser, 1998). This could happen because, in the face of a common threat, the groups may realize they have more in common than they previously thought (Gaertner et al., 1993). Fighting for a common goal—containing and fighting off COVID-19—may become the superordinate goal that binds the groups together (Sherif, 1958). De Jaegher (2020) provides a recent survey of economic models of the common enemy effect, but experimental evidence has been limited.

Conflict may reinforce collective action. Bellows and Miguel (2009) find that in Sierra Leone those who experienced more intense war violence are more likely to attend community meetings and join local political and community groups. Hartman and Morse (2020) find that those who experienced violence during the Liberian civil war are more likely to support both in-group and out-group refugees. Gilligan et al. (2014) find in a lab-in-the-field experiment in Nepal that, in addition to altruistic and community-centered activities, individuals that experienced more violence were more likely to invest in and reciprocate trust-based transactions. This is in part because during wartime, people are more willing to pay a cost to punish non-cooperation and reward cooperation (Gneezy and Fessler, 2012). The extent of cooperation, however, seems to differ between the in-group and the out-group: in their meta-analysis study, Bauer et al. (2014) find that, while there are positive and significant impacts of war exposure on prosocial behavior toward the in-group, the effects are smaller in magnitude and insignificant toward the out-group.

Thus far, we have presented two competing hypotheses regarding fear and in-group favoritism. One explanation for the opposing findings confounding past studies is possible selection. Recent research suggests that conservatism is correlated with death anxiety, dogmatism-intolerance of ambiguity, uncertainty tolerance, and fear of threat and loss (Jost et al., 2003; Vigil, 2010). For example, conservatives are more reactive to loud noises (Oxley et al., 2008) and respond more physiologically to threatening images (Ahn et al., 2014). Conservative amygdalas are more responsive to fear (Kanai et al., 2011). At the same time, conservatives are found to endorse and use in-group loyalty more than liberals (Graham et al., 2009) and vote accordingly (Enke, 2020). Thus, conservatives may react more strongly to fear stimuli than non-conservatives, and thereby observational cross-sectional studies are likely to find fear and in-group favoritism to be positively correlated.

To summarize, there are three mechanisms that we consider to explain the relationship between fear and in-group favoritism:

1. Fear increases in-group favoritism because of a "circle the wagons" effect.

2. Fear of an external threat (the common enemy or the "other") decreases in-group favoritism because it makes differences between groups feel less salient.

3. Fear is correlated with in-group favoritism because groups that tend to favor loyalty also tend to exhibit increased anxiety and intolerance of uncertainty.

What has been relatively rare in the past literature is experimental evidence grounded in real-world fear. Many of the past studies are lab experiments often devoid of context, while others are observational studies that do not account for causality and are potentially confounded by selection. We conduct an online framed field experiment (Levitt and List, 2009) in which we induce fear in the context of the COVID-19 pandemic accounting for the problem of selection.

More specifically, we carry out a pre-registered online survey experiment using a representative sample of South Korean adults (balanced for gender, age, education, income,

occupation, and geography) of over 6,000 respondents. In order to experimentally manipulate emotions, we employ the autobiographical emotional memory task (AEMT) method, which is widely used in experimental social sciences and involves asking respondents to share their recent experiences of feeling fear or happiness in writing (Callen et al., 2014; Zeitzoff, 2014; Myers and Tingley, 2016; Zeitzoff, 2018; Young, 2019; Kupatadze and Zeitzoff, 2021; Mills and D'Mello, 2014). Following the treatment, we measure the respondents' in-group and out-group preferences based on their intent to donate to either an in-group or an out-group charity if they are selected as one of the ten randomly chosen respondents to receive 10,000 KRW (approximately 9 USD) at the end of the survey. We also incorporate a behavioral measure of out-group preferences by seeing if participants choose to click a link to seek fundraising information about an organization that supports the education of children of multi-ethnic families. Finally, we replicate standard questions from well-established, long-running surveys on out-group attitudes: we ask the respondents if they would like to see an increase or a decrease in the number of people from different out-groups based on questions from the Korean General Social Survey and if they would be willing to have different types of out-group members as their neighbors based on questions from the World Values Survey. We also measure political ideology, media trust, and news consumption using the standard battery of questions from the Pew Research Center (2020) to further explore heterogeneous treatment effects across groups. By linking our results to previous surveys, we can see how people's views have changed during the pandemic.

To further investigate the mechanisms at work, we survey participants using the questions from the Global Preference Survey (Falk et al., 2018) to measure positive and negative reciprocity, altruism, trust in others, patience, and risk aversion. This enables us to both explore the potential heterogeneity of the fear effect and test a number of mediation hypotheses regarding fear. For example, Nguyen and Noussair (2014) find that fear is associated with increased risk aversion.

We find that our fear inducement increases prosocial behavior toward the out-group,

effectively decreasing in-group favoritism. This is reflected in both donations and the seeking of fundraising information, but also in political views regarding immigration and social views about whom people want to see in their neighborhood. However, we find that the baseline reported level of fear is negatively correlated with donations to the out-group (as well as political and social views). Selection in observational studies of fear is important. Personality types that tend to be fearful tend to favor their in-group. But when people are induced to think about fear, they generally become more prosocial. This effect is driven by how people treat out-groups, as there is little movement in how they treat their in-group. We present some suggestive evidence that the selection effect is related to the kind of media people are exposed to, while the causal impact of our fear manipulation is due in part to an increase in altruism.

Context, Data, and Research Design

Context: South Korea

South Korea provides a relevant test case for fear and out-group attitudes due to the prominence of COVID-19 in the domestic political rhetoric and public discourse. As of December 21, 2020, there had been a total of 49,665 confirmed COVID-19 cases—674 of which deceased. Outbreaks were associated with specific identity groups, including a religious cult in Daegu (February and March), a gay club in Itaewon district in Seoul (May), which is popular with foreigners, and conservative Christians (August).

In the last of the three survey waves of the biggest province in South Korea, conducted in October 2020, when asked about fears regarding COVID-19, while 71.2% of the 2,548 respondents feared getting infected, 66% of them were worried about the social stigma that would follow an infection and 50.4% of them feared belonging to a stigmatized group (Gyeonggi Public Health Policy Institute, 2020). 30.1% of the respondents answered that they had come across hate speech regarding COVID-19 the previous week. The targets of the hate speech

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had been, in order of importance, those not practicing social distancing, Christians, quarantine violators, Shincheonji members (religious cult), and the current government and/or the president. Though 73.6% of the respondents answered that hate speech and expression did not help with the prevention of the COVID-19 spread, 45.6% of them sympathized with the sentiment.

COVID-19 and its origins in Wuhan, China, seem to have exacerbated the already heightened prejudice and hostility of Koreans toward the Chinese as well as the Korean Chinese residing in South Korea. In 2019, out of more than 2.5 million foreigners residing in South Korea, 43.6% of them were of Chinese nationality, with approximately 63.63% of these being Korean Chinese (Lee, 2020). Though there has been increasing hostility toward the Chinese among Koreans since the early 2000s (Silver et al., 2020), COVID-19 seems to have elevated that tension to new heights. During February 2–4, 2020, a nationally representative sample of 1,000 individuals were asked whether they had come across hate speech the previous week regarding COVID-19, and 60.4% of them answered that they had and that the target of the hate speech had been the Chinese (82.05%), the infected (8.89%), specific media (2.52%), a specific politician or party (2.52%), the president or senior government officials (1.168%), and the Korean Chinese (1.17%) (You, 2020).

Koreans "feel closer" toward the Korean Chinese (ethnic Koreans who were born in China) than the Chinese but not as close as they feel toward the Americans, Europeans, and North Korean defectors (Chung et al., 2010). According to a 2015 survey of 248 Koreans in their 20s and 30s, 59% of the respondents expressed negative impressions about the word "Joseonjok" (a word used to describe Korean Chinese people): 36% of them thought the term referred to people that one had to be vigilant against, 16% of them thought the term referred to poor people, and 7% of them thought it referred to those lacking civility (Kim, 2015).

Media were filled with reports of the discrimination that the Chinese and the Korean Chinese faced after the first few weeks of the COVID-19 outbreak (Bae et al., 2020). A

member of the congress from the opposition party, Jae-chul Shim, called for a travel ban for any and all Chinese nationals (Fifield, 2020). While the WHO announced the official name of the disease as "COVID-19" on February 11, 2020, search results of Chosun Ilbo—the leading newspaper by market share—show that the terms "Wuhan pneumonia" and "Wuhan Corona" were used till much later on in the year.

Data

The subjects consist of 6,472 adults 19 years old or older drawn from a master sample maintained by the survey firm Hankook Research, which is located in Seoul, South Korea. The master sample consists of 535,086 people (as of June 2020) and is representative of the South Korean population with respect to location, sex, age, occupation, educational attainment, and income distribution. Subjects were paid 2,000 KRW (1.82 USD) for completing the online survey, and ten of them were randomly selected to receive an extra payment of 10,000 KRW (9.08 USD) that they could use to make a donation to one or both of two charities or keep for themselves.

In terms of the survey flow, after the informed consent, the subjects were first asked a battery of questions about their socio-economic background. This was followed by questions measuring the subjects' risk and time preferences for which we used the Global Preference Survey Module developed by Falk et al. (2018). We then asked questions capturing other pre-treatment characteristics, such as political ideology, religion, and exposure to and knowledge of news related to COVID-19. The subjects then received the treatments and the questions capturing the post-treatment outcome variables as explained further in the next section.

Treatments

To experimentally manipulate emotions, we employed the AEMT method, which involves asking respondents to share their recent experiences of feeling fear or happiness in writing. The AEMT method has been widely used in experimental approaches to causally under-

stand the effects of emotions, including the effects of fear on risk preferences in post-conflict Afghanistan (Callen et al., 2014), the role of anger on negative reciprocity in the Israel–Palestine conflict (Zeitzoff, 2014, 2018) and the Georgia–Russia conflict (Kupatadze and Zeitzoff, 2021), the impact of various emotions on trust (Myers and Tingley, 2016), and the effect of fear on opposition-party support in Zimbabwe (Young, 2019). Recent validity check experiments of the AEMT method show that the approach is especially effective when inducing emotions of fear in terms of inducing specific desired emotions while not inducing any other incidental emotions at different levels (Mills and D'Mello, 2014).

The text of the experiment prompt, translated from Korean, reads as follows:

Fear Treatment

We are interested in understanding how and when people feel fear or anxiety in their everyday lives. Such feelings may be due to various reasons, such as [losing your job, the uncertainty of the future, or yourself or your family getting sick]. If you have experienced such feelings of fear or anxiety in the past few months, please briefly describe them below:

Open-ended text entry box: _____

Happiness Treatment

We are interested in understanding how and when people feel happiness or joy in their everyday lives. Such feelings may be due to various reasons, such as [getting a raise, changes in family relations due to marriage or childbirth, or getting a new job]. If you have experienced such feelings of happiness or joy in the past few months, please briefly describe them below:

Open-ended text entry box: _____

The examples in the square brackets for each of the treatments were chosen based on the top three factors identified as the main causes of fear or happiness in the Korean Happiness

Index (Kim et al., 2017). The order of the examples was fully randomized within treatment assignment status in order to avoid any carryover effects.

Note that we effectively consider the happiness treatment as a control. One might think that a more neutral control would be more appropriate. However, when designing our survey experiment, our concern was that in the context of the COVID-19 pandemic a state of fear would be the default and that even a neutral treatment involving asking subjects to recount memories devoid of emotional content would likely bring up fearful ones. In other words, particularly salient shocks, such as the COVID-19 pandemic, may also be recalled under a neutral treatment, undermining its efficacy as a control group (Bogliacino et al., 2017, 2021).[1]

We followed the AEMT treatment with information on a media report about a specific ethnicity committing a quarantine violation:

The Centers for Disease Control and Prevention clearly stated that not only the

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[1] In fact, this issue arose in the first wave of Experiment II of Bogliacino et al. (2017) in which they investigated the effects of exposure to warfare and forced displacement in Colombia on individuals' short-term memory and cognitive control using a violence treatment and a neutral one (as a control condition). As a result, the authors in the second wave of the experiment decided to substitute a joyful treatment for the neutral one as an alternative to the violence treatment (see pp. 47–48 of their Supplementary Information Appendix). Moreover, in Bogliacino et al. (2017, 2021), whenever the subjects in the control group received either a joyful treatment or a neutral one, there was no difference in the results between the two conditions, inducing the authors to merge the two conditions in their analysis (see also Callen et al. (2014)). We also considered hope rather than happiness as a more natural opposite to fear, but the happiness AEMT inducement is more well established, and therefore happiness was selected instead.

confirmed person but also those suspected of contact with the confirmed person should be quarantined (self, facility, hospital) for 14 days from the last contact. However, for example, one [Korean, Korean Chinese, Chinese] violated the self-isolation guidelines and deviated. Have you heard of this?

Our study has a 2 x 3 factorial design with the two AEMT interventions (fear and happiness) and the three ethnicities information in the media report (Korean, Korean Chinese, Chinese) with equal probability of random assignment for all cells. The reason for including this arm of the treatment was to examine the role of story selection by the media and how exposure to different news stories mediates the effect of fear on in-group favoritism. While we will show a media effect in our observational data, our media treatment is not significant in any of our specifications, and thus we do not report them here.

Main Outcome Variables Our key outcome variables capture the respondents' in-group and out-group preferences. Respondents were asked to divide the 10,000 KRW they might win among three different options (self, in-group charity, and out-group charity) and were informed that their allocation decision would be kept anonymous and that the survey firm would make the donations in their names if they were chosen for the lottery. The in-group charity was the Korean Red Cross, and the out-group charity was the Korea Support Center for Foreign Workers. The key programs of the Korean Red Cross are domestic—blood services (54.7%), health (19.5%), and emergency relief (11.2%)—while international programs take up only 0.6% of the total expenditure (Korea Red Cross, 2019). The Korea Support Center for Foreign Workers serves foreign workers residing in South Korea, offering consultations, Korean classes, computer courses, and cultural events. The question text, translated from Korean, reads as follows:

Our research team plans to award 10,000 KRW to ten randomly selected respondents who participated in our survey. You can either keep or donate the 10,000 KRW that you win to the following organizations.

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Some people make donations to non-profit organizations, such as the Korea Support Center for Foreign Workers, which helps foreigners who live and work in Korea but are not eligible for COVID-19 emergency relief funds. Others make donations to organizations such as the Korean Red Cross, which provides general emergency relief activities.

If you are chosen to receive the 10,000 KRW, how would you like to use it?

A) Keep to myself: _____ out of 10,000 KRW

B) Donate to Korea Support Center for Foreign Workers: _____ out of 10,000 KRW

C) Donate to Korean Red Cross: _____ out of 10,000 KRW

Second, we included another behavioral outcome measure toward the end of the survey: respondents were presented with the option of clicking on a web link to a fundraiser organized by a prominent non-profit organization to support the education and learning of children of multi-ethnic households. As of the year 2020, the proportion of school-aged children from multi-ethnic households in Korea reached 4.8%, which has shown a small but steady increase from 1.9% in 2012 when the statistic was first released (Korean Educational Statistics Service, 2020). We captured whether the respondents clicked the hyperlink to be redirected to the fundraiser campaign web page and consider this to be another costly behavioral measure capturing the respondents' out-group preferences. The question text, translated from Korean, reads as follows:

Currently there is a fundraiser organized to support the education and learning for children of multi-ethnic households who are suffering from the COVID-19 pandemic. Are you willing to make a donation to such a fundraiser at this time?

A) Yes

B) No

We also asked a battery of self-reported survey questions capturing out-group attitudes and social preferences by replicating existing questions from well-established surveys. First, from the Korean General Social Survey (KGSS), we asked the question, "[D]o you want the number of the following people to increase or decrease in Korea?" using a 4-point Likert scale for groups such as North Koreans defectors, low-skilled foreign workers, high-skilled foreign workers, Korean Chinese, foreign students, or foreign investors. Second, from the World Values Survey (WVS), we replicated and asked, "[O]n this list there are various groups of people. Could you please mention any that you would not like to have as neighbors?" with a yes or no binary response for groups such as disabled people, sexual minorities, immigrants/foreign workers, North Korean defectors, religious cult group members, refugees, and people with a criminal record. Third, we measured social preferences—altruism, trust, and positive and negative reciprocity—using questions from the Global Preference Survey (Falk et al., 2018).

Finally, we also asked a number of questions capturing pre-treatment covariates, including socioeconomic status, political views, time and risk preferences as well as media usage.

After the first behavioral measure of donation intention and right before the self-reported survey questions on out-group attitudes, we asked for participants' current emotional state as a manipulation check following Young (2019). Six primary emotions—anger, fear, disgust, sadness, surprise, and happiness—were measured on a four-point scale—not at all, a little bit, somewhat, and a lot.

Table 1 shows the summary and the balance check of the main pre-treatment covariates and the main outcome variables broken down by treatment status. Overall, we do not see any statistically significant differences between the treatment groups regarding the pre-treatment covariates.

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	Fear Treatment			Happiness Treatment		
	N	Mean	Std.Dev.	N	Mean	Std.Dev.
Panel A : Demographic Characteristics						
Age	3239	46.97	15.01	3233	46.62	14.99
Sex	3239	0.51	0.50	3233	0.50	0.50
Panel B : Education						
Up to middle school	63	0.019	0.14	58	0.018	0.13
High school(Graduated)	1622	0.50	0.5	1591	0.49	0.5
College(Enrolled)	217	0.067	0.25	193	0.60	0.24
College(Graduated)	1105	0.34	0.47	1127	0.35	0.48
Graduate school(Enrolled)	24	0.0074	0.086	33	0.01	0.10
Graduate school(Graduated)	208	0.064	0.25	231	0.071	0.27
Panel C : Religion						
Christianity	657	0.20	0.40	642	0.20	0.40
Buddhism	538	0.17	0.37	554	0.17	0.38
Catholicism	358	0.11	0.31	390	0.12	0.33
No Religion	1652	0.51	0.5	1603	0.49	0.5
Etc.	34	0.01	0.10	44	0.013	0.12
Panel D : Political View						
Ideology	3111	3.00	0.92	3088	2.99	0.90
Ruling Party Support	3239	0.50	0.50	3233	0.49	0.50
Panel E : Main Outcome Variables						
Keep to Self	3221	6.23	4.23	3224	6.38	4.17
Ingroup Donation	3221	2.23	3.37	3224	2.23	3.39
Outgroup Donation	3221	1.50	2.93	3224	1.36	2.74
Total Donation	3221	3.73	4.216	3224	3.58	4.16
Clicked	2863	0.51	0.5	2867	0.47	0.50

Note: For Education and Religion, which are categorical variables, we convert them to dichotomous coding and report the mean for each of the categories here. Ideology is coded using a five point scale (1=Very liberal, 2 = Somewhat liberal, 3=Neither liberal nor conservative, 4=Somewhat conservative, 5=Very conservative) and the Ruling party in Korea at the time of the survey was a liberal party.

Table 1: Summary and Balance Check

Estimation

We provide three main specifications of the effect of fear on donations. The outcome of interest, y_i, is donations to the in-group charity (the Korean Red Cross), donations to the out-group charity (the Korea Support Center for Foreign Workers), total donations, and whether participants sought further information on ways to support multi-ethnic households, both at the time of the initial experiment and then again one and four weeks later.

$$y_i = Treatment_i + X_i + i \tag{1}$$

$$y_i = Fear_i + X_i + i \tag{2}$$

$\overrightarrow{X}$ is a vector of controls that includes Global Preference Survey parameters, demographic controls, political views, and media consumption.

Equation (1) estimates the causal effect of the fear treatment on the outcomes of interest. Equation (2) estimates the association between reported fear and the outcomes of interest. Moreover, to further investigate the connection between fear and our outcome variables, we consider a third specification that provides an IV estimate of the impact of fear on the outcomes of interest, where fear is induced by our AEMT treatment.

Table 2 presents the summary statistics for the variables capturing the six basic emotions and the manipulation check using these variables. We see that manipulation worked well and increased reported fear by 0.108 on the 4-point Likert scale. The fear treatment moves fear but also sadness and surprise by a smaller amount consistent with past experiments using the same autobiographical memory task (Mills and D'Mello, 2014). We use the effect of our AEMT treatment on reported fear as a first stage for IV. It is also worth noting that there is no significant difference in reported happiness between the fear and the happiness treatments, consistent with other work (Callen et al., 2014; Bogliacino et al., 2017, 2021) that suggests that fear is indeed the primary channel.

	(1)	(2)	(3)	(4)	(5)	(6)
	Fear	Anger	Happiness	Sadness	Disgust	Surprise
Mean	2.33	2.23	2.76	2.09	1.76	1.74
Std. Dev.	(0.91)	(0.99)	(0.85)	(0.93)	(0.90)	(0.84)
Observations	6,472	6,472	6,472	6,472	6,472	6,472
Fear Treatment	0.108***	0.014	-0.016	0.042*	0.015	0.036*
	(0.023)	(0.025)	(0.021)	(0.023)	(0.022)	(0.021)
R^2	0.004	0.000	0.000	0.000	0.000	0.000

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 2: Summary statistics for Emotions measured on a four point Likert scale and manipulation check on the effect of the fear treatment on the Emotion measures

Results

Table 3 presents the results of our main specifications. Each column presents the same set of specifications, where Column 1 has no controls, and each additional column adds Global Preference Survey measures of time preference, risk preference, positive and negative reciprocity, altruism, and trust, demographic controls, political ideology controls, and media consumption controls.

The first thing we observe across Panels A, B, and C is the effect of our fear treatment. Notably, the fear treatment has no effect on donations to the in-group charity but significantly increases donations to the out-group charity by 0.12 to 0.14 (in thousand KRWs), a roughly 9% increase. The increase in total donations overall is not significant. Taken together, these results suggest that the common enemy effect dominates and that the impact is seen primarily in out-group donations.

The second thing we observe from Panel B of Table 3 is that reported fear is negatively associated with donations to the out-group. A one-point increase in the Likert scale for fear is associated with a 0.08 to 0.12 KRW decrease in out-group donations, a decrease of 6–9%. The 0.12 decrease comes from Column 1 where there are no controls. Adding in the

GPS parameter (risk, time, and social preferences) controls in Column 2 brings that effect down to 0.08. All additional controls (demographic, political, media consumption) have no appreciable effect on the estimated effect of fear, suggesting that those economic parameters fully capture any additional relationship between fear and out-group preferences. We will return to the mediating effects of these additional controls more formally in the Discussion section. As in the case of the fear treatment, the effect is mainly seen in donations to the out-group charity.

The third thing to observe is the IV estimate, where we use the treatment as an instrument for reported fear. A one-point increase in the 4-point Likert scale for fear induced by our memory task increases donations to the out-group by 1.1 to 1.3 thousand KRW, a 79–92% increase.

	(1)	(2)	(3)	(4)	(5)
Panel A: Ingroup Donation					
Fear Treatment	0.001	-0.041	-0.049	-0.064	-0.064
	(0.084)	(0.081)	(0.081)	(0.083)	(0.083)
Reported Fear	-0.106**	-0.052	-0.032	-0.039	-0.044
	(0.046)	(0.045)	(0.045)	(0.046)	(0.046)
IV Estimate	0.010	-0.373	-0.440	-0.562	-0.574
	(0.775)	(0.744)	(0.725)	(0.735)	(0.757)
Panel B: Outgroup Donation					
Fear Treatment	0.144**	0.122*	0.139**	0.138*	0.134*
	(0.070)	(0.069)	(0.068)	(0.070)	(0.070)
Reported Fear	-0.117***	-0.079**	-0.074**	-0.079**	-0.080**
	(0.039)	(0.038)	(0.038)	(0.039)	(0.039)
IV Estimate	1.332*	1.113*	1.242*	1.208*	1.211*
	(0.716)	(0.674)	(0.664)	(0.667)	(0.687)
Panel C: Total Donation					
Fear Treatment	0.146	0.081	0.090	0.074	0.070
	(0.104)	(0.098)	(0.097)	(0.099)	(0.099)
Reported Fear	-0.223***	-0.131**	-0.106**	-0.118**	-0.124**
	(0.057)	(0.054)	(0.053)	(0.055)	(0.055)
IV Estimate	1.342	0.740	0.802	0.646	0.637
	(1.013)	(0.912)	(0.881)	(0.881)	(0.907)
Obs.	6,472	6,472	6,472	6,199	6,199
Panel D: Seek Fundraiser Information As Outcome Variable					
Fear Treatment	0.051***	0.044***	0.046***	0.047***	0.047***
	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)
Reported Fear	-0.013	-0.006	-0.003	-0.002	-0.004
	(0.008)	(0.008)	(0.008)	(0.009)	(0.009)
IV Estimate	0.553**	0.470**	0.486**	0.475**	0.491**
	(0.243)	(0.217)	(0.217)	(0.209)	(0.217)
Obs.	4,188	4,188	4,188	4,003	4,003
GPS pref. Control	N	Y	Y	Y	Y
Demo. Control	N	N	Y	Y	Y
Poli. Control	N	N	N	Y	Y
Media Control	N	N	N	N	Y

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 3: Effects of Treatment on Donations shows the main coefficient of interest for each of our three main specifications 1) the causal effect of fear, 2) the effect of reported fear and 3) the IV estimate of the causal treatment on reported fear. Each panel shows a different outcome variable and each column adds additional controls. Effects of Treatment on Hyperlink Click shows the main coefficient for each of the three main specifications on whether the subject clicked to seek further fundraiser information. Each column adds additional controls.

Panel D presents the same estimates for the fear treatment, reported fear, and IV for whether the subject sought additional information for a fundraiser to support multi-ethnic families during COVID-19. Here we find no relationship with reported fear, but the treatment induces a 5% increase in the probability of seeking information.

Appendix Tables A1–A2 reproduce our main results adding in interaction terms for political ideology and media consumption. We find no significant interaction effect of political ideology with our main treatment, suggesting that the fear manipulation increases prosocial behavior toward out-groups across ideological lines. Also, conservative ideology is correlated with less prosociality toward out-groups; controlling for conservative ideology makes the relationship between baseline reported fear and out-group bias become insignificant. Similarly, media consumption interacted with the fear treatment has no significant effect. We do, however, see a significant interaction between media consumption and Reported Fear— those who consume more conservative news sources decrease out-group donations when they report more fear.

Appendix Tables A3–A4 reproduce our main results with survey questions taken from the KGSS and the WVS as the outcome variable. We ask which groups would you want to see decrease in Korea (KGSS) and which groups would you not want as neighbors. Consistent with our main results, we find that reported fear is correlated with out-group bias for nearly all specifications, while our fear inducement leads to more prosocial attitudes toward "Foreign Professional Workers," "Ethnic Koreans from China," "Former Convicts," and "Refugees." Induced fear has no significant effect on the other groups tested.

Discussion

The results reported suggest that the short-term effect of induced fear is to increase prosocial behavior and attitudes toward out-groups. However, our results are also consistent with observational studies that find that fear is positively correlated with anti-immigrant, anti-

out-group attitudes due to selection (Jost et al., 2003; Vigil, 2010; Graham et al., 2009). Conservatives tend to be more fearful and more opposed to immigration and other out-groups.

Economic Channels

Appendix Table A5 looks at how the four social preferences measured using the Global Preference Survey mediate the effect of our treatment. We find that the fear treatment increases both altruism and trust, but a generalized mediation analysis (Imai et al., 2011; Tingley et al., 2014) shows that only altruism significantly mediates the effect of the fear treatment, accounting for 16.3% of the treatment effect on out-group donations.

Mechanisms Using the Contents of the AEMT Text

To further consider the mechanisms through which the effects of fear treatment operate, we exploit the contents of the raw AEMT response text. Specifically, we employ a supervised learning algorithm to classify the response text to the fear treatment into those related to economic, health, or other causes of fear. Figure A1 in the Appendix displays a simple world cloud of the pooled AEMT response text (panel a) and the response text by classified topics for the fear treatment. By dividing the fear treatment by machine-classified cause, we re-estimate the effects of the fear relative to the happiness treatment on donations and fundraiser info-seeking behavior. The results, shown in Table 4, show that our main finding that fear induces prosocial behavior toward out-groups is mostly driven by those who are afraid for health-related reasons. Those who are afraid for economic reasons also exhibit less favoritism but do so by reducing prosocial behavior toward in-groups but not toward out-groups.

| | (1) | (2) | (3) | (4) |
	Ingroup	Outgroup	Total	Seek Info
Fear: Health	0.133	0.319***	0.452***	0.042**
	(0.110)	(0.092)	(0.136)	(0.017)
Fear: Economic	−0.279**	−0.064	−0.344**	0.033
	(0.129)	(0.108)	(0.160)	(0.020)
Fear: Other	0.213	0.269*	0.482**	0.098***
	(0.169)	(0.142)	(0.209)	(0.027)
Constant	2.227***	1.357***	3.584***	0.467***
	(0.059)	(0.050)	(0.074)	(0.009)
Observations	5,879	5,879	5,879	5,299
R^2	0.002	0.003	0.004	0.003

Note: *p<0.1; **p<0.05; ***p<0.01

Table 4: Effects of Fear Treatment (Relative to Happiness Treatment as a Baseline) for the Economic, Health, and Fear AMET Subgroups on Donations and Fundraiser Info-seeking Behavior

External Validity

To get a sense of the external validity of our analysis and take advantage of the fact that we have a nationally representative sample that uses the same questions from the World Value Survey (WVS) and the Korean General Social Survey (KGSS), we consider the changes in the group means of attitudes toward out-groups for sub-groups of the population and compare that change with the relative fear in each group.

We select the survey questions for which our induced fear treatment causes a significant prosocial change in attitudes and that are also available in recent national surveys. The groups for which we can compare changes in attitudes from prior surveys with ours are: foreign workers, Korean Chinese, and immigrant neighbors.

Panel (a), Figure 1 divides the population by age decile. The green bar plots the relative

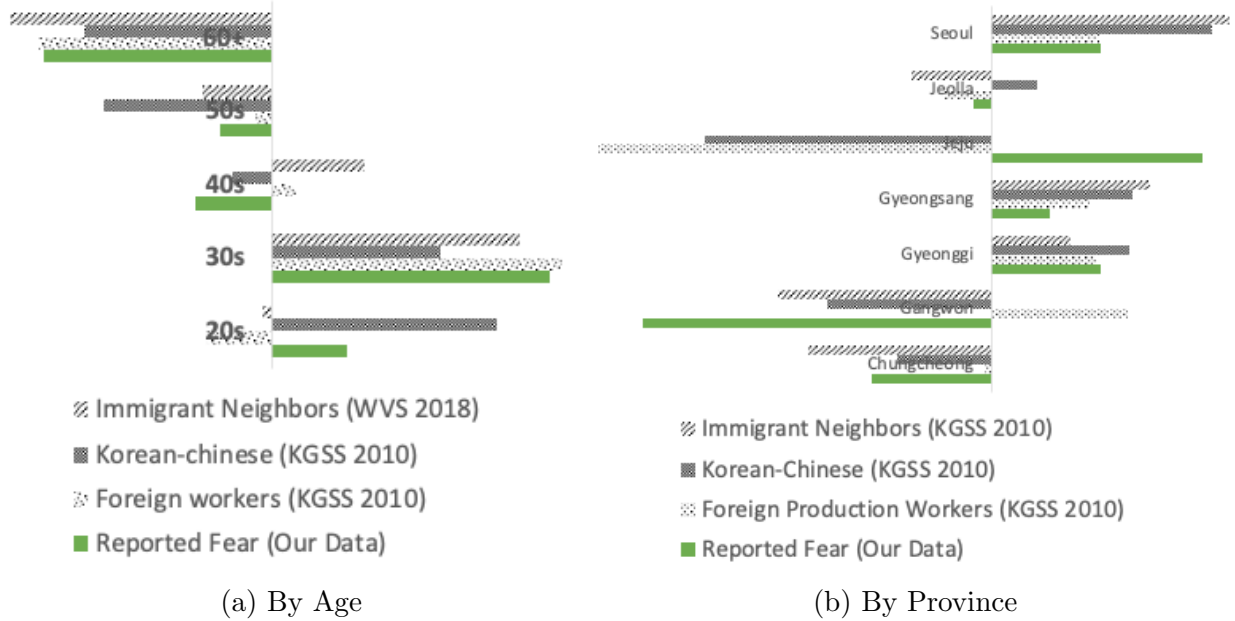|	
(a) By Age	(b) By Province

Figure 1: Fear and Change in Prosocial attitudes by Age (left) and by Province (right) shows the relative amounts of reported fear in our data compared to the change in prosocial attitudes toward out-groups from past surveys and the same questions asked during the Covid-19 pandemic in our survey.

level of expressed fear. Consistent with other research (Carstensen et al., 2020; Klaiber et al., 2021) on responses to COVID-19, we find that older subjects are less likely to report being afraid: while those in their 30s report the most fear, those in their 60s report the least fear relative to the population mean. Above those green bars, we plot the change in prosocial attitudes toward three out-groups. While attitudes toward all three groups become more prosocial in our survey, the largest increases occur for those in their 30s and the smallest increases occur for those in their 60s.

We redo the same exercise by province (Panel (b), Figure 1). The provinces that express the most fear relative to the population are Seoul and Jeju, and the provinces that express the least fear are Gangwon and Chungcheong. For the most part, a similar pattern emerges. Places that see the most relative fear have the greatest increase in prosocial attitudes, while places that express the least relative fear have the smallest increase in prosocial attitudes. The exception is the province of Jeju, which is somewhat of an outlier in that it is a small resort island with a somewhat separate culture and language from the South Korean

mainland.

Other Implications

As a way to get a sense of the impact of fear on out-group biases in the US, we take advantage of the data provided by the University of Southern California Understanding America Study (UAS) in which question ei023 is whether subjects agree or disagree about the statement "There are too many strangers in my neighborhood" (Kapteyn et al., 2020). There is no direct measure of fear in the UAS study, but there is the cluster of questions PHQ-4—standard health screening questions for anxiety and depression—that ask about anxiety, being worried, or being depressed. Finally, we take advantage of the questions related to COVID-19 in the panel survey that ask about the number of friends hospitalized for COVID-19. Using both individual fixed effect specifications and IV specifications (in which we use the number of friends who have been hospitalized for COVID-19 as an instrument for fear), we find that fear and anxiety are associated with an increasing distrust of strangers (see Appendix Table A6 for details). On the surface, these results suggest that increased fear induces distrust of outsiders. However, our experiment points to a different interpretation based on selection: the people who are most likely to be alarmed by COVID-19 are the ones who are most likely to become distrustful of outsiders.

Conclusion

Our study finds that while fear is correlated with less prosocial attitudes toward out-groups, the causal effect of our induced fear is more prosocial attitudes toward out-groups. We establish causality by inducing fear using an autobiographical memory task and show through a nationally representative survey that the places and age groups that reported the most fear also had the largest increases in prosocial attitudes toward out-groups.

While we, of course, have to be cautious in interpreting the generalizability of our par-

ticular fear inducement, we hope it provides some evidence that the causal effect of fear is prosocial. While we began this discussion with anecdotes and news stories of how COVID-19 has pulled people apart and sowed division, there are also stories of people coming together, of people clapping for essential workers, of record charitable donations, of Korean pop groups and Spanish language songs topping US pop charts for the first time. In a year with much to be afraid of, there was also reason for people to come together; our evidence suggests that many of us did.

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Online Appendix: Fear and Favoritism in the Time of COVID-19

August 4, 2021

Contents

1 Main Effect Interacted with Political Ideology and Media Consumption

Table A1 presents our main results interacted with political ideology. Interestingly enough, while a conservative political ideology does indeed predict lower donations to the out-group, the interaction term between political ideology and fear is not significantly different from zero. This could be because reported fear is already highly correlated with political ideology, which is consistent with the hypothesis that reported fear acts as a proxy for conservative ideology because conservatives tend to be responsive to fearful stimuli.

	(1) Outgroup Donation	(2) Outgroup Donation	(3) Seek Info	(4) Seek Info
Panel A: Political Var. × Fear Treatment				
Ideology × Fear Treatment	0.027 (0.080)	0.045 (0.077)	-0.014 (0.017)	-0.012 (0.017)
Ideology	-0.237*** (0.057)	-0.222*** (0.058)	-0.028** (0.012)	-0.016 (0.013)
Fear Treatment	0.055 (0.249)	-0.002 (0.242)	0.093* (0.054)	0.082 (0.053)
Ruling Party Support × Fear Treatment	-0.025 (0.141)	-0.047 (0.141)	0.011 (0.031)	-0.014 (0.031)
Ruling Party Support	0.310*** (0.099)	0.219** (0.105)	0.067*** (0.022)	0.065*** (0.023)
Fear Treatment	0.156 (0.099)	0.158 (0.099)	0.046** (0.022)	0.054** (0.022)
Panel B: Political Var. × Reported Fear				
Ideology × Reported Fear	0.016 (0.043)	0.030 (0.042)	0.005 (0.009)	0.009 (0.009)
Ideology	-0.260** (0.107)	-0.267** (0.106)	-0.047** (0.023)	-0.043* (0.023)
Reported Fear	-0.170 (0.135)	-0.171 (0.131)	-0.026 (0.029)	-0.031 (0.029)
Ruling Party Support × Reported Fear	-0.004 (0.077)	-0.013 (0.077)	0.015 (0.017)	0.013 (0.017)
Ruling Party Support	0.308 (0.192)	0.228 (0.197)	0.037 (0.042)	0.028 (0.043)
Reported Fear	-0.116** (0.054)	-0.073 (0.054)	-0.020* (0.012)	-0.010 (0.012)
Obs.	6,472	6,199	4,188	4,003
Control	No	Full	No	Full

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table A1: Interactions with Political Variables shows our main effect for our main treatment effect and the effect of reported fear interacted with political ideology and ruling party support for the two main outcomes of interest, out-group donation and whether they sought more info.

Table A2 considers the interaction of media consumption on our main outcome variables. As with the political variables, media consumption interacted with the fear treatment had no significant effect. However, we do see a significant interaction between media consumption and Reported Fear. In particular, those who consume more conservative news sources contributed less to the out-group (foreign workers) non-profit when they reported more fear. This was also true for those who consumed a greater diversity of social media, suggesting the fear amplification effect of the media operates both through traditional news sources and social media. Taken together with other results, it appears that the relationship between fear and out-group bias depends more on how the out-group is framed in the media we consume than in our underlying ideology per se. Of course consumption of conservative news could be confounded with other variables we do not control for, which is why our experimental design included a media report arm to better understand the causal effect of exposure to different kinds of news. However, our media report treatment yielded no significant differences in behavior.

	(1) Outgroup Donation	(2) Outgroup Donation	(3) Seek Info	(4) Seek Info
Panel A: Media × Fear Treatment				
News Consumption	0.001	0.011	-0.009	-0.013
× Fear Treatment	(0.099)	(0.100)	(0.022)	(0.022)
Media Diversity	-0.019	-0.016	0.001	0.002
× Fear Treatment	(0.016)	(0.016)	(0.003)	(0.003)
SNS Diversity	-0.000	0.027	0.003	0.006
× Fear Treatment	(0.038)	(0.038)	(0.008)	(0.008)
Conserv. Newspaper	-0.045	-0.095	0.047	0.044
× Fear Treatment	(0.161)	(0.160)	(0.035)	(0.035)
Conserv. TV	-0.117	-0.102	-0.035	-0.026
× Fear Treatment	(0.153)	(0.152)	(0.034)	(0.034)
Panel B: Media × Reported Fear				
News Consumption	-0.095*	-0.083	-0.020*	-0.023**
× Reported Fear	(0.052)	(0.053)	(0.011)	(0.012)
Media Diversity	-0.006	-0.010	0.000	-0.001
× Reported Fear	(0.008)	(0.008)	(0.002)	(0.002)
SNS Diversity	-0.038*	-0.038*	0.001	-0.001
× Reported Fear	(0.021)	(0.021)	(0.005)	(0.005)
Conserv. Newspaper	-0.201**	-0.215**	-0.006	-0.011
× Reported Fear	(0.088)	(0.087)	(0.019)	(0.019)
Conserv. TV	-0.030	-0.041	0.006	0.003
× Reported Fear	(0.084)	(0.084)	(0.018)	(0.018)
Obs.	6,472	6,199	4,188	4,003
Control	No	Full	No	Full

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table A2: Interactions with Media Consumption shows our main effect for our main treatment effect and the effect of reported fear interacted with self-reported media consumption for the two main outcomes of interest, out-group donation and whether they sought more info.

2 KGSS and WVS Survey Questions about Out-group as Outcome

Tables A3 and A4 show the same three main specifications (the Fear Treatment, Reported Fear, and IV Fear) on other outcome variables. Specifically, we are interested in self-reported political attitudes regarding whether they wanted a lower number of various ethnic groups in their country or whether they would be opposed to having members of various marginalized groups as their neighbor. The results all go in the same direction as our donation effects. Exposure to our fear treatment caused people to be more welcoming to outsiders, while reported fear itself was correlated with a less welcoming attitude. In particular, we observed significant fear effects for questions pertaining to foreign workers, ethnic Koreans from China, foreign immigrants, former convicts, and refugees. In the Discussion section we examine how attitudes toward these groups have shifted since the onset of COVID-19. Tables A3 and A4 help confirm that our fear effects do not apply only to the arguably artificial setting of donating experimental money but also to reported political and social attitudes.

	(1) North Korea Defectors	(2) North Korea Defectors	(3) Foreign Production Workers	(4) Foreign Production Workers	(5) Foreign Professional Workers	(6) Foreign Professional Workers	(7) The Ethnic Koreans From China	(8) The Ethnic Koreans From China	(9) Foreign Students	(10) Foreign Students	(11) Foreign Businessmen and Investors	(12) Foreign Businessmen and Investors
Fear Treatment	-0.022 (0.029)	-0.014 (0.029)	-0.019 (0.026)	-0.019 (0.026)	-0.060** (0.027)	-0.060** (0.027)	-0.096*** (0.026)	-0.088*** (0.025)	0.010 (0.026)	0.004 (0.026)	0.009 (0.027)	0.011 (0.026)
Reported Fear	0.113*** (0.016)	0.076*** (0.016)	0.078*** (0.014)	0.057*** (0.015)	0.063*** (0.015)	0.036** (0.015)	0.084*** (0.014)	0.054*** (0.014)	0.104*** (0.014)	0.079*** (0.014)	0.074*** (0.015)	0.043*** (0.015)
IV Fear	-0.190 (0.260)	-0.120 (0.251)	-0.166 (0.232)	-0.168 (0.234)	-0.543** (0.271)	-0.547** (0.270)	-0.841*** (0.298)	-0.788*** (0.286)	0.096 (0.241)	0.032 (0.239)	0.084 (0.240)	0.099 (0.239)
Obs.	5,796	5,609	6,117	5,901	6,137	5,919	6,158	5,920	6,159	5,936	6,210	5,986
Control	No	Full	No	Full	No	Full	No	Full	No	No	No	Full

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table A3: Outcome Variables, ”Do you want the following groups to decrease in Korea?” - shows the main coefficient of interest for our three main specifications applied to six different out-groups using a question from the KGSS. We find significant causal effects for foreign professional workers and Korean Chinese.

	(1) Persons With Disabilities	(2) Persons With Disabilities	(3) Foreign Immigrants/ Workers	(4) Foreign Immigrants/ Workers	(5) Members Of A Cult	(6) Members Of A Cult	(7) Former Convicts	(8) Former Convicts	(9) Sexual Minorities	(10) Sexual Minorities	(11) North Korean Defectors	(12) North Korean Defectors	(13) Refugees	(14) Refugees
Fear Treatment	-0.001	-0.004	-0.021*	-0.022**	0.004	0.005	-0.018**	-0.016*	-0.007	-0.014	0.000	-0.001	-0.037***	-0.041***
	(0.006)	(0.006)	(0.011)	(0.011)	(0.009)	(0.009)	(0.009)	(0.009)	(0.012)	(0.012)	(0.011)	(0.011)	(0.012)	(0.012)
Reported Fear	0.001	-0.002	0.028***	0.017***	0.003	0.002	0.014***	0.008	-0.004	0.011*	0.031***	0.018***	0.024***	0.012*
	(0.003)	(0.003)	(0.006)	(0.006)	(0.005)	(0.005)	(0.005)	(0.005)	(0.007)	(0.007)	(0.006)	(0.006)	(0.006)	(0.007)
IV Fear	-0.012	-0.036	-0.192*	-0.203*	0.037	0.044	-0.166*	-0.141	-0.068	-0.126	0.001	-0.009	-0.342**	-0.375***
	(0.055)	(0.055)	(0.110)	(0.108)	(0.083)	(0.083)	(0.089)	(0.086)	(0.115)	(0.111)	(0.099)	(0.098)	(0.133)	(0.133)
Obs.	6,472	6,199	6,472	6,199	6,472	6,199	6,472	6,199	6,472	6,199	6,472	6,199	6,472	6,199
Control	No	Full	No	Full	No	Full	No	Full	No	Full	No	Full	No	Full

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table A4: Outcome Variables, "Mention any that you would not like to have as neighbors?" shows the main coefficient of interest for our three main specifications applied to seven different out-groups using a question from the WVS. We find significant causal effects for foreign immigrants, former convicts and refugees.

	Altruism		Positive Reciprocity		Negative Reciprocity		Trust	
	Estimate	p-value	Estimate	p-value	Estimate	p-value	Estimate	p-value
ACME	0.023*	0.062	0.0057	0.504	0.00016	0.926	0.0025	0.170
ADE	0.120*	0.074	0.1377**	0.046	0.14528**	0.042	0.1429**	0.042
Total Effect	0.143**	0.024	0.1435**	0.040	0.14544**	0.040	0.1454**	0.042
Prop. Mediated	0.163*	0.086	0.0364	0.500	0.00030	0.922	0.0142	0.204

Table A5: Social Preferences as Mediators for out-group donations - presents the estimates of a generalized mediation analysis which shows that only altruism is a significant mediator for the effect of our fear treatment on out group donations.

3 GPS Social Preferences as Mediators using General Mediation Analysis

The experiment was also designed to examine the economic channels through which fear operates to change prosociality toward out-groups. Table A5 measures the effect of the fear treatment on four social preferences (as measured by the Global Preferences Survey). We find that the Fear Treatment has a significantly positive effect on altruism and trust but not on reciprocity, suggesting altruism and trust as possible mechanisms for the observed charitable behavior. To further test this mechanism, we employ a nonparametric causal mediation model to estimate the average causal mediation effect (ACME) of our treatment on out-group donation that is mediated by the social preferences (Imai et al., 2011; Tingley et al., 2014). The results, presented in Table A5 with uncertainty measures based on the quasi-Bayesian Monte Carlo method based on normal approximation, partially confirm our expectation that the ACME is positive and statistically significant for altruism but not the other social preference variables. The total effect and average direct effect (ADE) are statistically significant across all model specifications. In particular, we find that the altruism channel (as measured by the GPS) accounts for 0.23 of the effect of fear on out-group donations, or 16.3% of the total effect of the fear on donations.

4 Most common words categorized from AEMT Induction

(a) Word Cloud of the Pooled AMET (Fear)

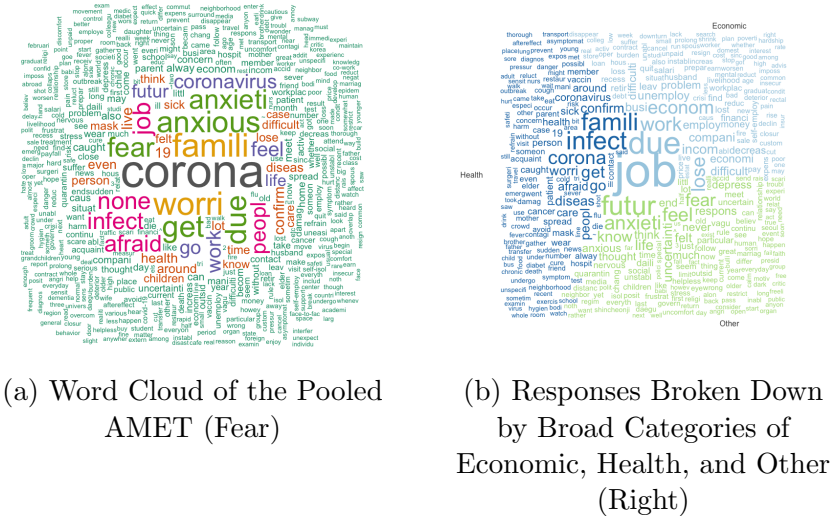(b) Responses Broken Down by Broad Categories of Economic, Health, and Other (Right)

Figure A1: Word Cloud of the Pooled AMET (Fear) Responses (Left) and the Responses Broken Down by Broad Categories of Economic, Health, and Other (Right)

To further consider the mechanisms through which the effects of fear treatment operate, we exploit the contents of the raw AEMT response text. Specifically, we employ a supervised learning algorithm to classify the response text to the fear treatment into those related to economic, health, or other causes of fear. Figure A1 displays a simple world cloud of the pooled AEMT response text (panel (a)) and the response text by classified topics for the fear treatment. In order to conduct the supervised machine learning classification algorithm, we first employed two human coders to read through the open-ended text and consider the possible categories into which the texts can potentially be classified. Based on close qualitative examination and discussions, we decided to consider four distinct categories of Economic, Health, Other, or None. In the case when the text may contain some information about both the Economic and Health, we asked our coders to force classify the text into either Economic or Health, based on the degree of emphasis in the text. The resulting coding decisions between the two human coders displayed a Cohen's Kappa for two raters of 0.746 with

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a Z-score of 95.1, suggesting a very high substantial agreement by conventional standards. Next, one third of the texts were randomly chosen as a training set, and the other two third as a test set. Using these, we fit seven different classification models, namely support vector model (SVM), supervised latent Dirichlet allocation (sLDA), boosting, bagging, random forest, neural network, and tree, and create an ensemble summary following (Jurka et al., 2013). The results show that with a mix of four models, we reach the optimal coverage of 0.89 and recall of 0.80. Using the classification results, we divide the fear treatment by machine-classified cause, and re-estimate the effects of the fear relative to the happiness treatment on donations and fundraiser info-seeking behavior. The results, shown in Table 4 of the main text, show that our main finding that fear induces prosocial behavior toward out-groups is mostly driven by those who are afraid for health-related reasons. Those who are afraid for economic reasons also exhibit less favoritism but do so by reducing prosocial behavior toward in-groups but not toward out-groups.

5   Fear and Favoritism in US Data

Table A6 provides results from an IV and Individual Fixed Effects analysis of the USC Understanding America Study (UAS) where question ei023 is whether subjects agree or disagree about the question "There are too many strangers in my neighborhood" (Kapteyn et al., 2020), PHQ-4, is a standard health screening questions for anxiety and depression that asks about anxiety, being worried, or being depressed. Finally we take advantage of the COVID related questions on the panel survey, where they ask about the number of friends hospitalized for COVID-19. In column 1, we see that the number of friends hospitalized is associated with an increase in anxiety, worry, and depression. We see from column 2 that that the number of friends hospitalized also is associated with more agreement that there are too many strangers. Column 3 shows the direct effect of the PHQ-4 score on the belief that there are too many strangers, while Column 4 shows the same effect, where the

PHQ-4 score is instrumented using the number of friends who were hospitalized. Finally, column 5 considers an alternative fixed effects specification with day and person fixed effects, and still finds a positive relationship between PHQ4 score and the belief that there are too many strangers. Taken together, we find a positive association between friends who were hospitalized with a wariness of strangers, and that the increase in anxiety is at least one channel for that aversion.

We also decomposed PHQ4 into its individual questions about anxiety and worry and got similar results. We also found similar results with other COVID questions but the number of friends hospitalized was perhaps the most plausibly exogenous to other attitudes about fear or strangers.

	(1) PHQ1	(2) ei023	(3) ei023	(4) ei023	(5) ei023
# of Friends Hospitalized	0.0173* (0.00616)	0.0121*** (0.00173			
PHQ4 Score (Anxiety, Worried, Depressed)			0.0498*** (0.00105)	0.697** (0.250)	0.00834*** (0.00123)
	OLS	OLS	OLS	IV	FE (ID, T)
N	60874	60807	67391	60756	67182

Table A6: Observed COVID Fear and Out-group Bias within the US - shows the effect of the reported number of friends hospitalized for COVID and the patient's PHQ4 score which measures anxiety and depression, on the patient's likelihood of agreeing with the statement: "there are too many strangers in my neighborhood."

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