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Moral decision-making and mental health during the COVID-19 pandemic

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Abstract

The COVID-19 pandemic entails challenging psychological conditions for the population, requiring them to make many decisions under stress. In this study, 641 participants were presented with different moral decision-making tasks, and completed a survey on mental health status and experiences, concerns, behaviors and beliefs related to the COVID-19. Results showed that the pandemic is placing a great psychological burden on the population. Also, that decision-making processes are being affected during the crisis, in a dichotomous way. Altruistic behaviors are promoted when people are suffering with high levels of psychological impact, and when they are concerned about others contracting the disease. However, egoistic behaviors are facilitated when concerns affect the self. Similarly, psychological impact, concerns about the self, and worsened physical health predict more automatic responses to framing problems and moral dilemmas. Nevertheless, when concerns relate to the others, or when people are more informed and/or carefree, more controlled responses emerge.

Keywords: COVID-19; altruism; decision-making; moral dilemmas; psychological impact

1 **Introduction**

2 The 2019 coronavirus disease (COVID-19) pandemic is a severe health threat¹. The
3 gravity of the pandemic and the lockdown policies followed by several countries also
4 entail challenging psychological conditions for the population, who usually present high
5 levels of confusion and anger, and may even develop posttraumatic stress symptoms after
6 quarantine². In a multitudinous survey conducted in China during the COVID-19
7 outbreak, in which most participants spent 20-24 hours per day at home, 53.8% of
8 respondents reported severe levels of psychological impact; 16.5% reported moderate to
9 severe depression levels; 28.8% reported moderate to severe anxiety levels; and 8.1%
10 reported moderate to severe stress levels³. Even higher levels of depression, anxiety and
11 stress have been reported in studies conducted in Italy and Spain^{4,5}, where social isolation
12 has been proved to worsen the population's mental health⁶.

13 In this study, we aim at exploring whether the challenging psychological conditions
14 experienced during the COVID-19 pandemic are affecting moral decision-making
15 processes. This is a very relevant question, as the situational context requires that many
16 decisions must be made under stress (e.g., choosing whether to stock up on toilet paper
17 and groceries or to divide up supplies, deciding who has priority access to respirators,
18 etc.). There is a large amount of evidence supporting the assumption that stress affects
19 decision making, both from laboratory studies that used acute stress induction and from
20 studies that measured the association between naturally occurring stress levels and
21 decision making⁷. For instance, a laboratory study in which stress was induced through a
22 social evaluation condition led participants to give more money (compared to a control
23 group) to a fictitious participant in the dictator game⁸. In this game, participants are
24 allocated with a sum of money, and they have to decide whether to share or not some of
25 this money with a stranger (who cannot accept or reject the offer, thus making sure that
26 the decision is not associated with any uncertainty)⁹. Nevertheless, in personal dilemmas
27 offering egoistic and altruistic alternatives, participants who were induced with acute
28 stress made more egoistic decisions than unstressed participants¹⁰. Along the same lines,
29 in a study recently conducted in Spain during the initial phase of the COVID-19
30 lockdown, researchers used a slightly different version of the dictator game (participants
31 were allocated with 100 euros and they had to decide whether to donate some of that
32 money to charity) and observed that donations and expectations about others' donations
33 decreased throughout the period under study¹¹. Authors suggested that people might

34 donate less over time in their study because the COVID-19 threat may decrease generosity
35 toward outgroup members, and possibly increase solidarity toward in-group
36 members^{12,13}. But this potential explanation remains untested, and the differences in
37 decision-making performance between different studies also stay unexplained. In our
38 study, we will further explore the variables that might predict altruistic and egoistic
39 decisions to moral dilemmas.

40 The framing effect (i.e., information being processed differently depending on the context
41 of presentation) has also been used in the study of how stress can induce changes in
42 decision-making processes. In the classic framing problems¹⁴, participants usually prefer
43 to take the safest alternative when problems are framed in terms of gains (e.g., preferring
44 to save 200,000 out of 600,000 people, compared to taking a risky choice in which there
45 is a 33.3% chance that 600,000 people will be saved and a 66.6% chance that no one will
46 be saved). However, people prefer to take the risky alternative when problems are framed
47 in terms of losses (e.g., preferring to take the risky choice in which there is a 33.3% chance
48 that no one will die and a 66.6% chance that 600,000 will die, vs. the safest option in
49 which 400,000 out of 600,000 people will die). Research on decision-making under stress
50 has shown that participants who are under stress (compared to participants in control
51 groups) present increased response biases, making more conservative decisions (i.e., they
52 are more prompt to choose the safest alternative) when problems are framed in terms of
53 gains, but more risky decisions when problems are framed in terms of losses¹⁵. These
54 observations may be interpreted in light of the dual-process approach¹⁶, with stress
55 facilitating rapid and automatic responses from System 1 (heuristic- and association-
56 based processes) and hampering more controlled responses from System 2 (effortful, rule-
57 based processes).

58 Furthermore, stress alters personal moral decision-making in classic utilitarian/non-
59 utilitarian moral dilemmas¹⁷. In these dilemmas, utilitarian alternatives allow participants
60 to sacrifice one person in order to save the lives of a group of people, hence maximizing
61 the overall benefit. In a laboratory study, participants under stress made fewer utilitarian
62 judgements compared with the unstressed participants, but only in the more personal
63 dilemmas (where participants have to take direct action to sacrifice a person)¹⁷. Again,
64 authors suggested that this observation supported the dual-process approach, with acute
65 stress giving preference to the “automatic” emotional system (System 1)^{17,18}.

Therefore, stress seems to alter the underlying mechanisms of decision making. The lack of balance between automatic responses and controlled information processing under stress may be attributed to an exacerbated reliance on rapid and automatic (System 1) tendencies, thus hampering controlled cognitive processes⁷. Patients with depression and posttraumatic stress disorder (PTSD) also show altered decision-making processes^{19,20}. Taken together, these results point out to the possibility that people's decision-making processes during the COVID-19 crisis may be altered.

In the present study, we examined whether participants' responses to moral decision-making tasks were modulated by the psychological impact of the COVID-19 pandemic, their mental health status, and/or their experiences, concerns, behaviors, and beliefs related to the COVID-19. In an online survey, we asked participants to fill in sociodemographic information, information on variables related to the COVID-19, and the PANAS (measuring positive and negative affect^{21,22}), DASS-21 (measuring depression, anxiety and stress levels^{23,24}), MSE (measuring cognitive, affective, and compassionate state empathy²⁵), and IES-R (measuring psychological impact^{26,27}) questionnaires. In addition, participants were presented with the dictator game, framing problems, classic utilitarian/non-utilitarian moral dilemmas (adding the alternative response of self-sacrifice, to explore possible individual differences in the willingness to self-sacrifice for the greater good), and altruistic/egoistic moral dilemmas.

Based on previous literature, we expected participants suffering with higher levels of psychological impact or stress, and/or those more concerned about the COVID-19, to present augmented biases in the framing problems (i.e., higher chance of safe responses in the gain frame, and higher chance of risky responses in the loss frame)¹⁵, and to make less utilitarian choices in personal utilitarian/non-utilitarian moral dilemmas¹⁷. This outcome would support the dual-process approach proposing that stressful situations promote automatic, non-controlled responses¹⁸. Regarding the dictator game and the altruistic/egoistic moral dilemmas, predictions are more difficult to establish, given that some studies suggest that stress promote altruistic responses⁸, while others propose that it facilitates egoistic responses¹⁰.

Moreover, we conducted exploratory analyses on the factors predicting participants' affect, mental health, empathy, and the psychological impact of the COVID-19 pandemic. We made some preliminary predictions based on previous literature on the topic. For instance, we expected women to report higher levels of psychological impact, depression,

anxiety and stress than men³. We expected the same pattern for younger compared to older participants, due to the heightened sensitivity to social stimuli and the need for peer interaction²⁸. And we also expected that health status and concerns about the COVID-19 may negatively predict mental health status³.

Finally, we made an additional exploratory analysis on the sociodemographic factors that might predict participants' experiences, concerns, behaviors and beliefs related to the COVID-19. Here, we expected women to show more responsible attitudes toward the COVID-19 pandemic than men²⁹.

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Results

Descriptive statistics

Analyses included responses from 641 participants (475 female; M age = 31.63, range = 18-75; see **Table 1** for full disclosure of sociodemographic characteristics and responses to COVID-19 variables).

Overall, participants presented higher levels of positive ($M = 26.85$, $SD = 7.41$) than negative affect ($M = 21.74$, $SD = 7.22$; $t(640) = 10.43$, $p < .001$), measured using the PANAS scale. Respondents' depression, anxiety and stress levels, measured using the DASS-21 scale, had sample mean scores of .81 ($SD = .70$), .47 ($SD = .52$), and .86 ($SD = .58$), respectively. For the depression subscale, 50.9% of participants had normal scores; 13.9% were considered to suffer from mild depression; 18.6% were considered to suffer from moderate depression; 7.5% were considered to suffer from severe depression; and 9.2% were considered to suffer from extremely severe depression. For the anxiety subscale, 63.3% of participants had normal scores; 10% were considered to suffer from mild anxiety; 14.2% were considered to suffer from moderate anxiety; 4.7% were considered to suffer from severe anxiety; and 7.8% were considered to suffer from extremely severe anxiety. For the stress subscale, 49.9% of participants had normal scores; 30.4% were considered to suffer from mild stress; 14.8% were considered to suffer from moderate stress; 4.1% were considered to suffer from severe stress; and .8% were considered to suffer from extremely severe stress.

In addition, participants presented normal to high levels of cognitive ($M = 14.07$, $SD = 3.04$), affective ($M = 11.36$, $SD = 4.01$), and compassionate state empathy ($M = 13.92$,

$SD = 3.25$), measured using the MSE scale. Finally, the psychological impact of the COVID-19 outbreak and lockdown, measured using the IES-R scale, revealed a sample mean score of 1.58 ($SD = .94$). Of all respondents, 47.7% reported normal psychological impact, and 52.3% reported a significant psychological impact (scores higher than 1.5 might be identified as complying with some features of the categorical diagnosis for posttraumatic stress disorder²⁶).

Moral decision-making

In this sub-section, we present participants' responses to the four moral decision-making tasks. Moreover, we examine, via linear regression analyses, whether participants' responses might be predicted based on models including gender, income, household size, other sociodemographic factors, the COVID-19 variables, and responses to the PANAS, DASS-21, MSE, and IES-R scales. For the sake of brevity, we only report significant models and coefficients here. For the full disclosure of models and coefficients of these and the next analyses, see **Supplementary Material** (<https://osf.io/mygnf/>).

In the dictator game, 66.1% of participants chose to share 50 of the 100 euros they were allocated with, 14.7% did not share any money, 16.5% shared an amount between 5-45 euros, and 2.7% shared an amount between 59-100 euros ($M = 40.08$, $SD = 19.84$; **Figure 1**). Participants' responses to the dictator game were significantly predicted by gender, $F(1,634) = 7.23$, $MSE = 391.50$, $p = .007$, $R^2 = .01$, with women sharing more money than men ($b = 4.85$, $p = .007$). Also, the amount of money shared was predicted by responses to the PANAS scale, $F(1,638) = 3.15$, $MSE = 392.74$, $p = .044$, $R^2 = .01$. The more negative affect, the more money participants were willing to share ($b = .29$, $p = .015$).

In the altruistic/egoistic moral dilemmas, most participants responded in an altruistic way (responses ranging from .55 to .90; 54.6% of participants), 28.7% responded mostly in an egoistic way (responses ranging from .15 to .45), and 16.7% did not have an altruistic or egoistic tendency (.50) ($M = .54$, $SD = .12$; **Figure 2**). Responses were significantly predicted by gender, $F(1,634) = 3.88$, $MSE = .01$, $p = .049$, $R^2 = .01$, with women being more altruistic than men ($b = .02$, $p = .049$). Also, responses were significantly predicted by the COVID-19 variables, $F(10,630) = 2.22$, $MSE = .01$, $p = .015$, $R^2 = .03$. The more concerned participants were about the possibility that a close relative/friend might

contract COVID-19 ($b = .01, p = .014$), and the more they followed the pre-emptive measures established by the Government ($b = .01, p = .012$), the greater the odds of choosing altruistic responses in the dilemmas. Conversely, the more concerned they were about the possibility of themselves contracting COVID-19, the more egoistic were their responses ($b = -.01, p = .004$). In addition, responses to the altruistic/egoistic dilemmas were predicted by responses to the MSE ($F(3,637) = 8.84, MSE = .01, p < .001, R^2 = .04$) and IES-R ($F(1,639) = 4.88, MSE = .01, p = .028, R^2 = .01$) scales. The more affective empathy ($b = .003, p = .037$) and compassionate empathy ($b = .005, p = .011$) reported by participants, the more altruistic were the responses given to the dilemmas. Also, the higher the psychological impact reported by participants, the more altruistic were the responses given to the dilemmas ($b = .01, p = .028$).

In the framing problems, participants were randomly presented with one out of four possibilities: the *Asian disease problem-Gain frame* ($N = 218$); the *Asian disease problem-Loss frame* ($N = 155$); the *Financial crisis problem-Gain frame* ($N = 122$); and the *Financial crisis problem-Loss frame* ($N = 146$). Participants presented with the *Financial crisis problem* were more prompt to provide safe responses (77.6%) than participants presented with the *Asian disease problem* (60.6%), $\chi^2(1, N = 641) = 20.67, p < .001, V = .13$. Also, participants presented with the *Gain frame* were more prompt to provide safe responses (78.5%) than participants presented with the *Loss frame* (55.5%), $\chi^2(1, N = 641) = 38.79, p < .001, V = .17$ (**Figure 3**).

Only responses to the *Asian disease problem-Gain frame* and to the *Financial crisis problem-Gain frame* were significantly predicted by some of the models we used in the linear regression analyses. In the *Asian disease problem-Gain frame*, participants responses were significantly predicted by the COVID-19 variables, $F(10,207) = 2.59, MSE = .19, p = .006, R^2 = .11$. The more concerned participants were about the possibility that they might contract COVID-19, the more they opted for the safe option ($b = .05, p = .022$). On the contrary, the more concerned they were about the possibility that a close relative/friend might contract COVID-19, the more they opted for the risky option ($b = -.12, p = .002$). Furthermore, the more they thought that there was too much concern about the COVID-19 pandemic, the more they opted for the risky option ($b = -.04, p = .023$), and participants who had direct or indirect contact with people diagnosed with COVID-19 were also more prompt to choose the risky option than those who did not ($b = -.16, p = .044$; **Figure 3A**). In the *Financial crisis-Gain frame*, participants' responses were

significantly predicted by the psychological impact of the COVID-19 crisis (as measured by the IES-R scale), $F(1,120) = 3.92$, $MSE = .09$, $p = .050$, $R^2 = .03$. The higher the psychological impact reported by participants, the more chances to choose the safe option ($b = .06$, $p = .050$; **Figure 3C**).

Finally, in the classic utilitarian/non-utilitarian moral dilemmas, participants were randomly presented with either the *Switch* ($N = 373$) or the *Footbridge* ($N = 268$) dilemma. Responses varied significantly depending on the dilemma participants were presented with, $X^2(2, N = 641) = 213.03$, $p < .001$, $V = .41$ (**Figure 4**). Respondents were more prompt to choose the “Do nothing” alternative in the *Footbridge* (74.3%) than in the *Switch* (20.1%) dilemma ($p < .001$); on the contrary, they were more prompt to choose the “Sacrifice 1” response in the *Switch* (65.7%) than in the *Footbridge* (11.6%) dilemma ($p < .001$). No differences between dilemmas were found for the “Self-sacrifice” response (14.2% of responses in both dilemmas).

Only “Sacrifice 1” responses were significantly predicted by some of the models we used in the linear regression analyses. In the *Switch* dilemma, “Sacrifice 1” responses were significantly predicted by responses to the PANAS scale, $F(2,370) = 3.09$, $MSE = .22$, $p = .047$, $R^2 = .02$. The more positive affect reported by participants, the more chances to choose the “Sacrifice 1” response ($b = .01$, $p = .035$; **Figure 4A**). In the *Footbridge* dilemma, “Sacrifice 1” responses were significantly predicted by the COVID-19 variables, $F(10,257) = 1.91$, $MSE = .01$, $p = .044$, $R^2 = .07$. The more COVID-19 symptoms participants reported, the less prompt they were to choose the “Sacrifice 1” option ($b = -.03$, $p = .010$). Conversely, the more information they seek about COVID-19 ($b = .03$, $p = .017$), and the more they thought that there was too much concern about the COVID-19 crisis ($b = .02$, $p = .036$), the more they opted for the “Sacrifice 1” alternative (**Figure 4B**).

Psychological measures

In this sub-section, we explore whether participants’ responses to the different scales might be predicted by sociodemographic characteristics and responses to the COVID-19 variables.

Responses to the PANAS scale were significantly predicted by gender. Women had lower positive affect ($F(1,634) = 19.46, MSE = 53.78, p < .001, R^2 = .03; b = -2.95, p < .001$) and higher negative affect levels ($F(1,634) = 36.28, MSE = 49.51, p < .001, R^2 = .05; b = 3.86, p < .001$) than men. Positive affect was also predicted by household size, $F(1,607) = 4.33, MSE = 55.15, p = .040, R^2 = .01$, with participants living in larger houses reporting higher levels of positive affect ($b = .43, p = .040$). Both positive ($F(9,631) = 5.83, MSE = 51.85, p < .001, R^2 = .08$) and negative affect ($F(9,631) = 4.05, MSE = 49.97, p < .001, R^2 = .05$) were predicted by the other sociodemographic characteristics, although the only significant coefficient was age, with older people showing higher values for positive affect ($b = .15, p < .001$) and lower values for negative affect ($b = -.09, p = .017$). Positive affect was also significantly predicted by the COVID-19 variables, $F(10,630) = 13.03, MSE = 46.60, p < .001, R^2 = .17$. The more symptoms participants experienced, the less positive affect they reported ($b = -.40, p = .033$); the better health status, the more positive affect ($b = 2.97, p < .001$); the further use of health services they had made, the more positive affect ($b = 1.08, p = .005$); and the more they thought that there was too much concern about the COVID-19 pandemic, the more positive affect they reported ($b = .31, p = .020$). Finally, negative affect was also predicted by the COVID-19 variables, $F(10,630) = 15.24, MSE = 42.63, p < .001, R^2 = .19$. The more symptoms participants experienced, the more negative affect they reported ($b = .71, p < .001$); the better the health status, the less negative affect ($b = -1.21, p = .003$); the more concerned they were about the possibility that they ($b = .81, p < .001$) or their loved ones ($b = 1.08, p < .001$) might contract COVID-19, the more negative affect they reported; and the more information they seek about the pandemic, the higher negative affect ($b = .45, p = .010$).

Regarding the DASS-21 scale, responses were significantly predicted by gender. Women had higher levels of depression ($F(1,634) = 21.01, MSE = .48, p < .001, R^2 = .03; b = .29, p < .001$), anxiety ($F(1,634) = 20.71, MSE = .27, p < .001, R^2 = .03; b = .21, p < .001$), and stress ($F(1,634) = 23.84, MSE = .33, p < .001, R^2 = .04; b = .26, p < .001$) than men.

Depression and anxiety levels were also predicted by income, with participants having higher incomes reporting lower levels of depression ($F(1,559) = 10.80, MSE = .46, p < .001, R^2 = .02; b = -.06, p = .001$), and lower levels of anxiety ($F(1,559) = 13.09, MSE = .27, p < .001, R^2 = .02; b = -.05, p < .001$). The other sociodemographic factors also predicted responses to the depression ($F(9,631) = 6.23, MSE = .46, p < .001, R^2 = .08$), anxiety ($F(9,631) = 5.61, MSE = .26, p < .001, R^2 = .07$), and stress ($F(9,631) = 8.07$,

258 $MSE = .31, p < .001, R^2 = .10$) subscales of the DASS-21. Older participants reported
 259 lower levels of depression ($b = -.01, p = .014$), anxiety ($b = -.01, p = .001$), and stress (b
 260 $= -.01, p < .001$) than younger ones; more educated participants had lower levels of
 261 anxiety ($b = -.05, p = .002$); and participants who had a partner had higher level of stress
 262 than those who did not ($b = .10, p = .039$). Finally, the COVID-19 variables significantly
 263 predicted depression ($F(10,630) = 12.92, MSE = .41, p < .001, R^2 = .17$), anxiety
 264 ($F(10,630) = 16.29, MSE = .22, p < .001, R^2 = .20$), and stress levels ($F(10,630) = 12.22,$
 265 $MSE = .29, p < .001, R^2 = .16$). The more symptoms participants experienced, the more
 266 depressed ($b = .06, p = .002$), anxious ($b = .06, p < .001$), and stressed ($b = .06, p < .001$)
 267 they reported to be. The better the health status, the less depressed ($b = -.23, p < .001$),
 268 anxious ($b = -.14, p < .001$), and stressed ($b = -.16, p < .001$) participants were. The further
 269 the use of health services, the less depressed participants were ($b = -.09, p = .014$). The
 270 more concerned participants were about the possibility that they might contract COVID-
 271 19, the more anxious they felt ($b = .03, p = .010$). The more they were concerned about
 272 the possibility that their loved ones might contract COVID-19, the more depressed ($b =$
 273 $.08, p = .005$), anxious ($b = .06, p = .002$), and stressed ($b = .06, p = .009$) they were.
 274 Finally, the more hours per day they stayed at home during lockdown, the more depressed
 275 they felt ($b = .03, p = .012$).

276 As for the MSE scale, responses were significantly predicted by gender, with women
 277 showing higher levels of cognitive ($F(1,634) = 6.95, MSE = 9.24, p = .009, R^2 = .01; b =$
 278 $.73, p = .009$), affective ($F(1,634) = 17.88, MSE = 15.66, p < .001, R^2 = .03; b = 1.53, p$
 279 $< .001$), and compassionate empathy ($F(1,634) = 16.33, MSE = 10.31, p < .001, R^2 = .02;$
 280 $b = 1.18, p < .001$) than men. The other sociodemographic variables also predicted
 281 compassionate empathy ($F(9,631) = 2.88, MSE = 10.30, p = .002, R^2 = .04$), with
 282 participants who had a partner ($b = 1.11, p < .001$), and those who lived with adolescents
 283 aged 12-17 years old ($b = .74, p = .006$) feeling more compassionate empathy. Finally,
 284 cognitive ($F(10,630) = 5.73, MSE = 8.63, p < .001, R^2 = .08$), affective ($F(10,630) =$
 285 $12.61, MSE = 13.59, p < .001, R^2 = .17$), and compassionate empathy ($F(10,630) = 14.21,$
 286 $MSE = 8.76, p < .001, R^2 = .18$) were significantly predicted by the COVID-19 variables.
 287 Participants who had direct or indirect contact with COVID-19 patients felt more
 288 affective ($b = 1.00, p = .007$) and compassionate empathy ($b = .98, p = .001$) than those
 289 who did not. Those who were more concerned about the possibility that they might
 290 contract COVID-19 felt more affective empathy ($b = .42, p < .001$). Those who were more

concerned about the possibility that their loved ones might contract COVID-19 felt more cognitive ($b = .45, p < .001$), affective ($b = .58, p < .001$), and compassionate empathy ($b = .92, p < .001$). The more information participants seek about COVID-19, the more affective ($b = .29, p = .003$), and compassionate empathy ($b = .18, p = .023$) they felt. The more they followed the pre-emptive measures recommended by the Government, the more cognitive ($b = .41, p < .001$), affective ($b = .33, p = .021$), and compassionate empathy ($b = .35, p = .002$) they felt. And the more hours they stayed at home per day during lockdown, the more affective empathy they felt ($b = .22, p = .002$).

Finally, responses to the IES-R scale were predicted by gender, with women suffering higher levels of psychological impact than men ($F(1,634) = 63.87, MSE = .80, p < .001, R^2 = .09; b = .65, p < .001$). Income also predicted responses to the IES-R, with higher incomes predicting lower levels of psychological impact ($F(1,559) = 3.91, MSE = .89, p = .048, R^2 = .01; b = -.05, p = .048$). Moreover, responses to the IES-R were predicted by the other sociodemographic factors ($F(9,631) = 4.91, MSE = .83, p < .001, R^2 = .06$), with younger participants ($b = -.02, p = .001$) and participants living together with a larger number of adults ($b = .08, p = .043$) suffering higher levels of psychological impact. Lastly, the COVID-19 variables significantly predicted responses to the IES-R scale ($F(10,630) = 14.06, MSE = .73, p < .001, R^2 = .18$). The more symptoms participants experienced, the more psychological impact they suffered ($b = .07, p = .005$). The better health status, the less psychological impact ($b = -.17, p = .001$). And the more concerned they were about the possibility that they ($b = .09, p < .001$) or their loved ones ($b = .16, p < .001$) might contract COVID-19, the more psychological impact they suffered.

COVID-19 Variables

In this sub-section, we examine whether participants' responses to the different COVID-19 variables might be predicted by their sociodemographic characteristics.

The number of symptoms related to COVID-19 experienced by participants was significantly predicted by gender, with women reporting more symptoms than men ($F(1,634) = 14.50, MSE = 3.10, p < .001, R^2 = .02; b = .61, p < .001$). Income did also significantly predict the number of symptoms, with participants who reported higher incomes experiencing less symptoms ($F(1,559) = 4.81, MSE = 3.14, p = .029, R^2 = .01; b = -.11, p = .029$). The other sociodemographic factors also significantly predicted the

number of symptoms ($F(9,631) = 2.84$, $MSE = 3.07$, $p = .003$, $R^2 = .04$), although age was the only significant coefficient, with older participants reporting less symptoms ($b = -.04$, $p < .001$).

Health status was only significantly predicted by gender, with women reporting poorer health status than men ($F(1,634) = 7.31$, $MSE = .60$, $p = .007$, $R^2 = .01$; $b = -.19$, $p = .007$). As for the use of health services, it was significantly predicted by the other sociodemographic factors ($F(9,631) = 2.05$, $MSE = .53$, $p = .032$, $R^2 = .03$), but region was the only significant coefficient, with participants living in the more affected regions making further use of health services ($b = .02$, $p = .016$). The same pattern is found for the variable measuring direct and/or indirect contact with COVID-19 patients, being the model containing the other sociodemographic factors the only that significantly predicted it ($F(9,631) = 3.07$, $MSE = .16$, $p = .001$, $R^2 = .04$), and region the only significant coefficient ($b = .02$, $p < .001$), with participants living in the more affected regions being the ones reporting more contacts with patients.

Regarding participants' concerns about contracting COVID-19, they were more concerned about their relatives and close friends ($M = 6.37$, $SD = 1.02$) than about themselves ($M = 4.38$, $SD = 1.70$; $t(640) = -32.75$, $p < .001$). Gender significantly predicted participants' concerns, with women being more concerned than men both for themselves ($F(1,634) = 4.36$, $MSE = 2.87$, $p = .037$, $R^2 = .01$; $b = .32$, $p = .037$) and for their relatives and close friends ($F(1,634) = 18.87$, $MSE = 1.01$, $p < .001$, $R^2 = .03$; $b = .40$, $p < .001$). In addition, participants' concerns about the possibility of contracting the COVID-19 themselves were significantly predicted by the other sociodemographic factors ($F(9,631) = 3.91$, $MSE = 2.78$, $p < .001$, $R^2 = .05$), with participants living together with a larger number of adults being more concerned ($b = .15$, $p = .034$), and participants living together with children aged below 12 being less concerned ($b = -.31$, $p = .030$). Additionally, participants' concerns about the possibility of their loved ones contracting COVID-19 were significantly predicted by income, with participants reporting higher incomes being less concerned ($F(1,559) = 17.36$, $MSE = 1.05$, $p < .001$, $R^2 = .03$; $b = -.12$, $p < .001$).

Seeking more or less information about COVID-19 was significantly predicted by income, with participants reporting higher incomes seeking more information ($F(1,559) = 4.15$, $MSE = 2.34$, $p = .042$, $R^2 = .01$; $b = .09$, $p = .042$).

Following the pre-emptive measures established by the Government was significantly predicted by gender, with women following these measures to a higher extent than men ($F(1,634) = 11.54, MSE = 1.17, p = .001, R^2 = .02; b = .34, p = .001$). It was also predicted by income, with participants reporting higher incomes following these measures to a lesser extent ($F(1,559) = 6.69, MSE = 1.19, p = .010, R^2 = .01; b = -.08, p = .010$).

The hours per day (on average) participants stayed at home during the lockdown was significantly predicted by gender, with women staying more hours at home than men ($F(1,634) = 11.58, MSE = 4.27, p = .001, R^2 = .02; b = .64, p = .001$). This was also significantly predicted by the other sociodemographic factors ($F(9,631) = 2.95, MSE = 4.20, p = .002, R^2 = .04$). The more educated participants were, the more hours they stayed at home ($b = .18, p = .006$). Also, those actively working or studying stayed less hours at home than those who did not ($b = -.81, p < .001$); and the more adults participants lived together with, the more they stayed at home ($b = .21, p = .015$).

Finally, participants' beliefs about whether there was not enough or too much concern about the COVID-19 pandemic were significantly predicted by gender, with women believing that there was too much concern to a higher extent than men ($F(1,634) = 13.32, MSE = 4.16, p < .001, R^2 = .02; b = .68, p < .001$). In addition, participants' beliefs were predicted by income, with participants reporting higher incomes being more prompt to believe that there was not enough concern about the COVID-19 ($F(1,559) = 4.26, MSE = 4.26, p = .039, R^2 = .01; b = -.12, p = .039$). Participants' beliefs were also significantly predicted by the other sociodemographic factors ($F(9,631) = 2.37, MSE = 4.15, p = .012, R^2 = .03$). The more educated participants were, the more they thought there was not enough concern about the pandemic ($b = -.17, p = .012$), and the more children aged below 12 participants lived together with, the more they thought there was not enough concern about the COVID-19 ($b = -.39, p = .026$).

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Discussion

In this study, we aimed at examining whether the challenging psychological conditions experienced by people during the COVID-19 crisis may alter their moral decision-making processes. A large sample of participants ($N = 641$), who showed heightened levels of psychological impact, depression, anxiety and stress, were presented with different moral decision-making tasks. In addition, they had to answer to some questions about their

experiences, concerns, behaviors and beliefs related to the COVID-19, and to psychological questionnaires measuring affect, mental health, empathy, and the psychological impact of the COVID-19 crisis. Our main results were that:

- Women made more altruistic decisions in the dictator game and in the altruistic/egoistic moral dilemmas than men.
- Negative affect predicted responses in the dictator game, with participants reporting higher levels of negative affect being more altruistic.
- Participants suffering with higher levels of psychological impact, as well as those who were more concerned about their loved ones contracting COVID-19 and those following to a higher extent the pre-emptive measures, were more altruistic in the altruistic/egoistic moral dilemmas. Conversely, those participants who were more concerned about themselves contracting COVID-19 made more egoistic decisions.
- Participants suffering with higher levels of psychological impact, and those who were more concerned about contracting COVID-19 were more prompt to make safe choices in dilemmas framed in terms of gains. On the contrary, those who were more concerned about their loved ones contracting COVID-19, those who had a contact history with COVID-19 patients, and those who thought that there was too much concern about the pandemic were more prompt to take risks.
- Lastly, in the more personal utilitarian/non-utilitarian moral dilemma, the *Footbridge* dilemma, those participants who experienced more symptoms related to the COVID-19 were less prompt to make utilitarian decisions. However, those who seek more information and those who thought that there was too much concern about the pandemic were more prompt to make utilitarian decisions.

Results from the dictator game task and the altruistic/egoistic moral dilemmas may help us to shed some light on the actual effects of stressful events on altruistic behaviors. Results from previous studies were dichotomous: whilst some investigations found that stress increased altruistic behavior⁸, others observed the opposite, with induced acute stress or natural stress promoting egoistic behavior^{10,11}. Our results partially support both trends, which may help us to clarify this dichotomy: when concerns affect the self, people act more selfishly, but when concerns affect other members of the in-group (or when the psychological impact of a critical event is heightened) people behave more altruistically.

This is consistent with previous studies showing that events that are subject to social evaluation⁸, and extended exposure to external threats (such as a war)¹², exacerbate altruistic behavior toward the in-group.

In addition, we observed that women (vs. men) and participants who reported higher levels of negative affect also behave more altruistically. The gender effect on altruism may be explained by the fact that women tend to be more equalitarian, sharing resources evenly³⁰. And the positive relationship between negative affect and altruism might be caused by affective reactivity inducing prosocial behavior³¹. Lastly, we observed that affective and compassionate state empathy predicted selfless responses in the altruistic/egoistic moral dilemmas, which is congruent with previous research supporting a strong link between empathy and altruism³².

Regarding the framing problems, our results partially support previous studies suggesting that stress exacerbates response biases¹⁵, as this effect only became apparent when the dilemmas were framed in terms of gains. Higher levels of psychological impact (as measured by the IES-R questionnaire) and participants' concerns about themselves contracting COVID-19 did indeed promote response biases (i.e., participants were more prompt to choose the safest alternative when problems were framed in terms of gains). However, concerns about others, contact with COVID-19 patients, and "carefree" beliefs (i.e., believing that there was too much concern) about the pandemic had the opposite effect. This duality renders an interesting point for the dual-process approach: heightened stress levels¹⁸ and concerns about the self might promote rapid responses from System 1 (heuristic- and association-based processes); but when concerns affect others (not the self), or when people are more carefree, responses from System 2 (effortful and controlled processes) might be facilitated.

An interesting question is why response biases were modulated when problems were framed in the gain domain, but not when framed in terms of losses. At this moment, we have no answer for this question, and future studies should clarify what factors modulate individuals' decisions in dilemmas formulated in terms of losses. Another interesting observation is that participants were more prompt to choose the safest alternative in the *Financial crisis* than in the *Asian disease* problem (although the preference for the safest response in the gain vs. loss frame was rather similar across the two problems, $\Delta = 21.5$ and 28.6, respectively). This tendency has already been reported in previous studies using both framing problems³³.

Finally, the results obtained in the classic utilitarian/non-utilitarian moral dilemmas are congruent with previous research pointing out that decision making in personal and highly emotional moral dilemmas (e.g., the *Footbridge* dilemma³⁴) is biased when under stress, promoting automatic responses (in this case, reducing the odds of utilitarian responses)^{17,18}. In our study, the more symptoms related to COVID-19 participants experienced (and, possibly, the more concerned they were about their health), the less prone they were to choose the utilitarian response. Nevertheless, and interestingly, the more information participants seek about the pandemic, and the more carefree were their thoughts about it, the more prompt they were to choose the utilitarian response. Again, this dichotomy might be supporting the dual-process approach: worsened physical health would promote System 1 (automatic) responses, but seeking information and carefree thoughts would facilitate System 2 (more controlled) responses.

As for the less personal and low emotional moral dilemma (i.e., the *Switch* dilemma), utilitarian responses were only predicted by positive affect, with participants experiencing higher levels of positive affect being more biased toward the automatic response (in this case, the low emotionality of this dilemma makes the utilitarian response more salient³⁴). This might be explained by positive affect augmenting fluency, and thus facilitating automatic responses³⁵.

In addition, it is noteworthy to remark that the percentages of self-sacrifice responses were identical in both dilemmas, and that none of the predictor models significantly explained why some participants decided to sacrifice themselves for the greater good. A tentative explanation would be that self-sacrifice is mainly motivated by factors that we did not include in our study, such as identity fusion (“a visceral sense of oneness with the group”)³⁶, and cognitive style (with people more inclined toward intuition being more likely to sacrifice themselves for the greater good)³⁷. Therefore, the tendency to self-sacrifice should be further explored in future studies by considering identity fusion and cognitive style.

Psychological measures

We were also interested in exploring the relationship between participants’ mental health status and sociodemographic factors and experiences, concerns, behaviors and beliefs related to the COVID-19. We observed that 52.3% of the sample had very high levels of

psychological impact (very similar to the 53.8% reported in China³), and worrying levels of depression, anxiety and stress (very similar to those observed in Italy and Spain during the COVID-19 lockdown^{4,5}).

Consistent with previous observations³, we found worsened mental health status in women compared to men, with the former showing lower levels of positive affect, and higher levels of negative affect, depression, anxiety, stress, and psychological impact (although they also had higher scores in the state empathy scales). We came across the exact same pattern for younger compared to older adults, possibly due to their heightened sensitivity to social stimuli and their need for peer interaction²⁸. Non-surprisingly, we also found that participants reporting higher incomes and those living in larger residences during the lockdown reported lower levels of depression, anxiety and psychological impact, and higher levels of positive affect, respectively. Lastly, and, again, non-surprisingly, poor mental health was related to low physical health status, spending a higher number of hours at home per day, and higher concerns about themselves and their loved ones.

COVID-19 Variables

Finally, we made an exploratory analysis on the sociodemographic factors that might predict participants' experiences, concerns, behaviors and beliefs related to the COVID-19. Consistent with previous studies on the topic²⁹, we found that women had more responsible attitudes toward the COVID-19 than men, with the former being more concerned about the possibility that they or their loved ones might contract the disease, and following the pre-emptive measures to a higher extent. Interestingly, we also observed that participants reporting higher incomes were less concerned about others contracting the COVID-19, and were less prompt to follow the pre-emptive measures. This is congruent with studies showing that higher social class is associated with patterns of attending to the self rather than to others³⁸.

Conclusions

To sum up, the COVID-19 pandemic is placing a great psychological burden on the population. Also, our data show that the psychological impact of the COVID-19 crisis

and participants' experiences, concerns, behaviors and beliefs related to the pandemic had significant effects on their decision-making processes. These effects were dichotomous. The psychological impact of the COVID-19 crisis and concerns about others contracting the disease predicted altruistic behaviors; however, when concerns were related to the self, people acted more selfishly. In addition, psychological impact and concerns about the self predicted more automatic responses to framing problems, but when concerns were related to others, more controlled responses were promoted. Furthermore, worsened physical health facilitated automatic responses to personal utilitarian/non-utilitarian moral dilemmas, but the more information participants seek and the more carefree were their thoughts about the pandemic, the more controlled were their responses. Taken together, the results of this study indicate that decision-making processes can be affected during the COVID-19 pandemic.

Method

Participants

A snowball sampling strategy was used in order to recruit as many responses as possible from people living in all Spanish regions. We received 685 responses to the survey, from March 25th to April 5th 2020 (that is, from the 10th to the 21st day of lockdown in Spain). Eventually, we included 641 responses (22 responses were not included because participants left some questionnaires unanswered; 9 because respondents were living in a country other than Spain; 8 because participants send their responses twice; and 5 because respondents were diagnosed with learning or intellectual disabilities that could affect their responses).

The final sample included participants from all the regions of Spain. Based on the data daily offered by the Spanish Government, data regarding participants' regions were ordered from the least affected by COVID-19 on the day the survey was closed (Ceuta and Melilla, coded "1" in the dataset) to the most affected (the Autonomous Community of Madrid, coded "18" in the dataset).

Survey Development

The survey was structured following previous literature on the topic³. It consisted of the following parts: (1) sociodemographic data; (2) information about symptoms and health

status, contact history with patients, and concerns, behaviors and beliefs about the COVID-19 (COVID-19 variables); (3) the PANAS scale; (4) the DASS-21 scale; (5) the MSE scale; (6) the IES-R scale; (7) the dictator game task; (8) the framing problems; (9) the classic utilitarian/non-utilitarian moral dilemmas; and (10) the altruistic/egoistic moral dilemmas.

Sociodemographic data were collected on gender, age, education, residential location during lockdown, marital status (later recoded to whether participants had a romantic partner or not), employment status (later recoded to whether participants were actively working/studying during the lockdown or not), monthly income, number of adults living together in the residential location, parental status, number of adolescents aged 12-17 living with the respondent in the residential location, number of children aged below 12 living with the respondent in the residential location, and household size. COVID-19 related symptoms included fever, chills, headache, myalgia, cough, difficulty in breathing, dizziness, coryza, sore throat, and fever. Participants were also asked to rate their physical health status (from “1 = Very bad”, to “5 = Very good”), and to state any history of chronic medical illness (including physical, mental, neurodevelopmental and/or neurodegenerative illnesses). Health service utilization in the past 14 days included consultation via telephone, consultation with a doctor in the clinic, being quarantined by a health authority, being tested for COVID-19, positive test on COVID-19, and admission to the hospital. Contact history included direct and/or indirect contact with a confirmed COVID-19 individual. Concern about COVID-19 variables included concern about respondents and other family members/close friends contracting COVID-19 (from “1 = Not at all” to “7 = A lot”). Participants were also asked how much information they seek about the COVID-19, and how much they were following the pre-emptive measures (e.g., washing their hands repeatedly, covering their mouth when coughing, etc.) against COVID-19 established by the Spanish Government (from “1 = Not at all” to “7 = A lot”). Finally, participants were asked how many hours per day (on average) they stayed at home during lockdown, and whether they thought that there was too much concern about the COVID-19 pandemic or not (from “1 = Not at all” to “7 = A lot”).

Positive and negative affect were measured using the *Positive and Negative Affect Schedule* (PANAS)^{21,22}. This scale is widely used in the literature on emotion evaluation, and it presents two sub-scales with 10 items each, one for positive affect (e.g., “Excited”), and another one for negative affect (e.g., “Upset”). Scores for each item range from 1 to

5, and from 10 to 50 for each sub-scale. Participants were asked to evaluate their affect during the last week, including the day in which they filled the survey. Cronbach's alpha for the positive and negative affect sub-scales were .88 and .87, respectively.

Mental health status was measured using the short form of the *Depression, Anxiety and Stress Scale* (DASS-21)^{23,24}. This questionnaire contains 21 items, 7 for each sub-scale: depression (e.g., "I couldn't seem to experience any positive feeling at all"), anxiety (e.g., "I was aware of dryness in my mouth"), and stress (e.g., "I found it hard to wind down"). Scores for each item and sub-scale ranged from "0 = Did not apply to me at all" to "3 = Applied to me very much, or most of the time". Participants were asked to answer to the items by choosing the most applicable option to them during the last week, including the day they filled the survey. Calculation of scores were based on previous studies^{3,39}: item scores for each sub-scale were summed and then doubled up. Then, the total depression score was divided into normal (0-9), mild depression (10-12), moderate depression (13-20), severe depression (21-27), and extremely severe depression (28-42). The total anxiety score was divided into normal (0-6), mild anxiety (7-9), moderate anxiety (10-14), severe anxiety (15-19), and extremely severe anxiety (20-42). The total stress score was divided into normal (0-10), mild stress (11-18), moderate stress (19-26), severe stress (27-34), and extremely severe stress (35-42). Cronbach's alpha for the depression, anxiety and stress sub-scales were .90, .82, and .82, respectively.

State empathy was measured using the *Measure of State Empathy* (MSE)²⁵ scale. This is a 9-item scale containing three 3-item 7-point Likert sub-scales (0 = Not at all, 6 = Entirely) to measure state levels of cognitive ("understanding how someone is feeling, but not necessarily also feeling it"), affective ("physically feeling the same way as another person is feeling"), and compassionate empathy ("in-the-moment feelings of compassion, sympathy or concern")⁴⁰. As there is no Spanish translation for the scale, items were translated by a bilingual researcher, and back-translated by another bilingual researcher for comparability⁴¹. Scores may range from 0 to 18 for each sub-scale. Participants were asked to evaluate how they felt about the people they have interacted with during the last week, including the day they filled the survey. Cronbach's alpha for the cognitive, affective, and compassionate state empathy sub-scales were .84, .82, and .66, respectively.

The psychological impact of COVID-19 was measured using the *Impact of Event Scale-Revised* (IES-R)^{26,27}. This questionnaire measures avoidance (e.g., "I tried not to think

about it”), intrusion (e.g., “Any reminders brought back feelings about it”) and hyper-arousal (e.g., “I felt irritable and angry”) after being exposed to a traumatic event. Scores for each item and for the scale range from “0 = Not at all” to “4 = Often”. In the literature on the topic, a cut-off of 1.5 (equivalent to a total score of 33) on the IES-R has been described as matching some features of a categorical diagnosis for posttraumatic stress disorder^{3,26}. Participants were asked to answer to the items by choosing the most applicable option to them during the last week, including the day they filled the survey. Cronbach’s alpha for the IES-R was .93.

We also presented participants with four moral decision-making tasks: the dictator game, framing problems, classic utilitarian/non-utilitarian moral dilemmas, and altruistic/egoistic moral dilemmas. In the dictator game, participants were asked to imagine that they entered a room together with a stranger. There, participants would be allocated with 100 euros, and the stranger would not receive any money. They were told that they might give the stranger any sum of money, from 0 to 100 euros, and that the stranger would have to accept any offer.

In the framing problems, participants were randomly allocated to one out of four possible conditions: the *Asian disease problem-Gain frame*, the *Asian disease problem-Loss frame*, the *Financial crisis problem-Gain frame*, and the *Financial crisis problem-Loss frame*. The formulation of the *Asian disease problem* was the following⁴²: “Recently, a dangerous new disease has been going around. Without medicine, 600,000 people will die from it. In order to save these people, two types of medicine are being made.”

Gain frame version: “If you choose Medicine A, 200,000 people will be saved. If you choose Medicine B, there is a 33.3% chance that 600,000 people will be saved and a 66.6% chance that no one will be saved. Which medicine do you choose?”

Loss frame version: “If you choose Medicine A, 400,000 people will die. If you choose Medicine B, there is a 33.3% chance that no one will die and a 66.6% chance that 600,000 will die. Which medicine do you choose?”

The formulation of the *Financial crisis problem* was the following³³: “Recently, a serious financial crisis has started. Without any action, the company you manage will lose 600,000 euros. In order to save this money, two types of action are possible.”

643 *Gain frame version*: “If you choose Action A, 200,000 euros will be saved. If you choose
644 Action B, there is a 33.3% chance that 600,000 euros will be saved and a 66.6% chance
645 that no money will be saved. Which action do you choose?”

646 *Loss frame version*: “If you choose Action A, 400,000 euros will be lost. If you choose
647 Action B, there is a 33.3% chance that no money will be lost and a 66.6% chance that
648 600,000 euros will be lost. Which action do you choose?”

649 In all framing problems, Medicine/Action A were considered the safest option, and
650 Medicine/Action B the risky option.

651 In the classic utilitarian/non-utilitarian moral dilemmas, participants were randomly
652 presented with either the *Switch* or the *Footbridge* dilemma^{43,44}. In these dilemmas, an
653 on-coming train is about to kill five people, and the only way to stop it is by killing an
654 innocent bystander. In the *Switch* dilemma (the less personal dilemma) participants
655 choose whether to flip a switch or not to move the train to another track where it would
656 only kill one man. In the *Footbridge* dilemma (the more personal and emotional
657 dilemma³⁴) participants have to decide whether to push or not a man off a footbridge in
658 front of the train in order to save the other people. Additionally, we added the alternative
659 option of self-sacrifice to both dilemmas⁴⁵. Therefore, in the *Switch* dilemma, three
660 options were available for participants: 1) Do nothing; 2) Flip the switch to the right
661 (“Sacrifice 1”); and 3) Flip the switch to the left (“Self-sacrifice”). In the main text of this
662 dilemma, it was made clear that flipping the switch to the right would make the train to
663 kill an innocent bystander, and that flipping the switch to the left would make the train to
664 kill the participant. In the *Footbridge* dilemma, three options were available: 1) Do
665 nothing; 2) Push the stranger onto the track (“Sacrifice 1”); and 3) Jump onto the track
666 (“Self-sacrifice”).

667 Finally, we presented participants with 20 altruistic/egoistic moral dilemmas¹⁰. Each of
668 the 20 dilemmas offered a more altruistic and a more egoistic decision alternative.
669 Participants had to answer with “yes” or “no” (e.g., “Your partner is suicidal and you feel
670 uncomfortable in this relationship. Would you leave your partner?”; “You have slightly
671 scratched another car while parking. It is dark and nobody has seen you. Would you leave
672 a message for the owner of the car?”). For the purpose of analysis, the percentage of
673 altruistic decisions for the 20 dilemmas was calculated.

674 *Procedure*

675 Participants completed the survey in Spanish through Google Forms. The research
676 conformed to the principles of the Declaration of Helsinki and the code of ethics of the
677 General Council of Psychology of Spain. All respondents provided informed consent, and
678 were reminded that they may exit the survey at any point if they wanted to. Also, it was
679 made explicit that in case they were uncomfortable at some point, they may exit the
680 survey and were invited to call the psychological assistance number provided by their
681 regional health institutions.

682 *Statistical Analyses*

683 Descriptive statistics were calculated for the different variables. Then, we used linear
684 regressions to calculate the univariate associations between gender, income, household
685 size, other sociodemographic factors, the COVID-19 variables, responses to the
686 psychological questionnaires, and responses to the moral decision-making tasks. Gender,
687 income and household size were considered independently because some participants
688 responded “Prefer not to say” to these items, rendering reduced sample sizes for these
689 predictor models.

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792 **Figure 1.** Above, distribution of responses to the dictator game. Below, standardized
 793 coefficients (β) predicting responses to the task.

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Figure 2. Above, distribution of responses to the altruistic/egoistic moral dilemmas. Below, standardized coefficients (β) predicting responses to the task.

Figure 3. Above, distribution of responses to the *Switch* and *Footbridge* dilemmas. Below, standardized coefficients (β) predicting “Sacrifice 1” responses to the dilemmas.

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834 **Figure 4.** Above, distribution of responses to the framing problems. Below, standardized coefficients (β) predicting responses to the dilemmas.

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841 **Table 1.** Descriptive statistics for the sociodemographic and COVID-19 variables.

Sociodemographic	N (%)	COVID-19	N (%)
Gender		N Symptoms	
Male	161 (25.1)	0	197 (30.7)
Female	475 (74.1)	1	154 (24)
Prefer not to say	5 (.8)	2	118 (18.4)
Age (Years)		3	69 (10.8)
18-20	161 (25.1)	4+	103 (16.1)
21-28	172 (26.9)	Health Status	
29-39	150 (23.4)	Very Bad	3 (.5)
40-75	158 (24.6)	Bad	33 (5.1)
Education		Neither Bad or Good	183 (28.5)
Compulsory	45 (7)	Good	331 (51.6)
Profess. Training	77 (12)	Very Good	91 (14.2)
Upper Sec. School	21 (3.3)	Health Services	
Univ. - Bachelors	339 (52.9)	No use	521 (81.3)
Univ. - Masters	109 (17)	Telephone	75 (11.7)
Doctorate	50 (7.8)	In Person	31 (4.8)
Couple		Quarantine	9 (1.4)
Yes	390 (60.8)	COVID Tested	2 (.3)
No	251 (39.2)	COVID Positive	2 (.3)
Working/studying		Hospitalized	1 (.2)
Yes	479 (74.7)	COVID-19 Contact	
No	162 (25.3)	Yes	138 (21.5)
Monthly income		No	503 (78.5)
-1000 €	62 (9.7)	Concern Self	
1000 – 2000 €	182 (28.4)	1-3	188 (29.3)
2000 – 3000 €	168 (26.2)	4-5	283 (44.2)
+ 3000 €	149 (26.6)	6-7	170 (26.5)
Prefer not to say	80 (12.5)	Concern Others	
N Adults		1-3	15 (2.3)
Alone	77 (12)	4-5	91 (14.2)
2	239 (37.3)	6-7	535 (83.5)
3	179 (27.9)	Information COVID-19	
4+	146 (22.8)	1-3	117 (18.3)
Paternity		4-5	251 (39.1)
Yes	164 (25.6)	6-7	273 (42.6)
No	477 (74.4)	Measures COVID-19	
N 12-17		1-3	23 (3.6)
0	525 (81.9)	4-5	122 (19)
1	98 (15.2)	6-7	496 (77.4)
2+	18 (2.9)	Hours Lockdown	
N -12		24	514 (80.2)
0	522 (81.4)	23	69 (10.9)
1	75 (11.7)	22	16 (2.5)
2+	44 (6.9)	18-21	21 (3.3)
Household size		-18	21 (3.3)
-45 m ²	22 (3.4)	Beliefs COVID-19	
45-70 m ²	143 (22.3)	1-3	243 (37.9)
70-100 m ²	238 (37.1)	4-5	185 (28.9)

100-150 m ²	114 (17.8)	6-7	213 (33.3)
+150 m ²	92 (15.1)		
Prefer not to say	32 (5)		

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843 *Note: age, N Adults (number of adults living together in the residential location), N 12-*
844 *17 (number of adolescents aged 12-17 living with the respondent), N -12 (number of*
845 *children aged -12 living with the respondent), N Symptoms (number of experienced*
846 *symptoms related to the COVID-19), Concern Self (respondents' concern about*
847 *contracting COVID-19), Concern Others (respondents' concerns about their loved ones*
848 *contracting COVID-19), Information COVID-19 (amount of information related to the*
849 *COVID-19 seek by respondents), Measures COVID-19 (how much respondents were*
850 *following the pre-emptive measures), and Beliefs COVID-19 (how much respondents*
851 *thought that there was too much concern about the pandemic) were introduced as*
852 *continuous variables in the analyses, but are presented blocked here for the sake of*
853 *brevity*