Coping with COVID-19

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Data collection

- Data collection took place from the 28th of March until the 24th of April 2020.
- Using the criteria below, this data collection resulted in 8238 responses.
- Data was collected via social media (Facebook, Twitter, Reddit) and the snowball method.

Data has only been used if the survey was filled out just before the fusion questions (which will be used in follow-up research only). This means that for 26 responses in the data (0.3%) we do not have fusion data, but this doesn't matter since the participants cannot sign up for the follow-up (which would use the fusion data) without completing the survey anyway. This however also means that for 63 responses (0.76% of the data), the responses do not include income and education level because the participants simply didn't get to the question (there will be more missing, but that is because participants elected not to fill out the question). We consider this an acceptable number.

We do not use demographic exclusions or method-based outlier criteria (i.e., taking too long to respond to the survey). We also did not include attention checks given recent research indicating it may influence results. In the case of overly consistent responses (simply clicking on extremes to get through the survey), the response will be deleted. We have so far deleted responses that clicked through the survey but left no answers (this was possible), and reserve the right to delete additional data if there is strong reason to suspect that the participant did not complete the survey in earnest. We will report this if this will happen.

Data collection happened via social media. The researchers in this research team (except for CvL) advertised the survey in their social media, including Facebook and Twitter, and contacted acquaintances to distribute the survey amongst them. In addition, the survey was posted on the research project's Twitter account (https://twitter.com/copingwcovid19). Finally, VVM posted the survey in relevant coronavirus/COVID-19 Facebook groups (of several different countries), and used a non-personal account on Reddit to post the research there as well, in relevant coronavirus/COVID-19 subreddits (of several different countries).

Data collection aimed at getting 200 participants from main countries of interest: United States, United Kingdom, Italy, Brazil, Netherlands, Portugal, Germany, France, Finland, Croatia, Australia, and New Zealand. Once this was achieved, the survey was concluded.

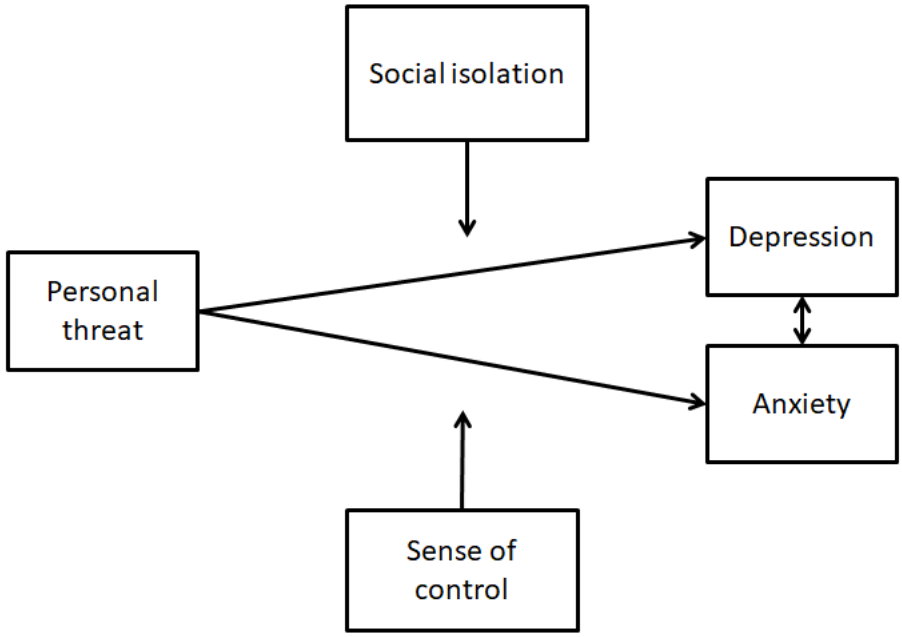
Whilst we have done data collection before pre-registration, we have not yet looked at the data or run analyses.

The main model

Humankind is not unfamiliar with crises on a global scale: after all, just in the last century the world has endured two world wars and two global economic crises. What differentiates the current global crisis around COVID-19 from other crises however, are two main factors: (1) it involves an 'invisible' threat (the virus, and its disease); (2) it has brought countries and its societies, cultures, and economies to a standstill, with many people isolated at home. We hypothesized that as a result of these two factors, the COVID-19 pandemic would cause anxiety symptoms when people experience a loss of control, whereby conspiracy thinking -when present- is considered an attempt at regaining control, and depression symptoms in people who are socially disconnected.

The main aim of this project is to examine when a feeling of threat (in the form of expected severe effects of COVID-19 on one's personal life) results in higher (possibly clinical) levels anxiety and depression. Threat is a powerful experience during the current pandemic, since the disease itself can cause painful illness and even death to oneself or to one's family or friends, and many face economic difficulties due to the lockdowns present in their countries, including loss of employment, with many potential downstream consequences (loss of housing). How one deals with the perceived threat is telling: social connectedness and control mechanisms can manifest resilience in the face of a threat, avoiding ill mental health, such as anxiety and depression.

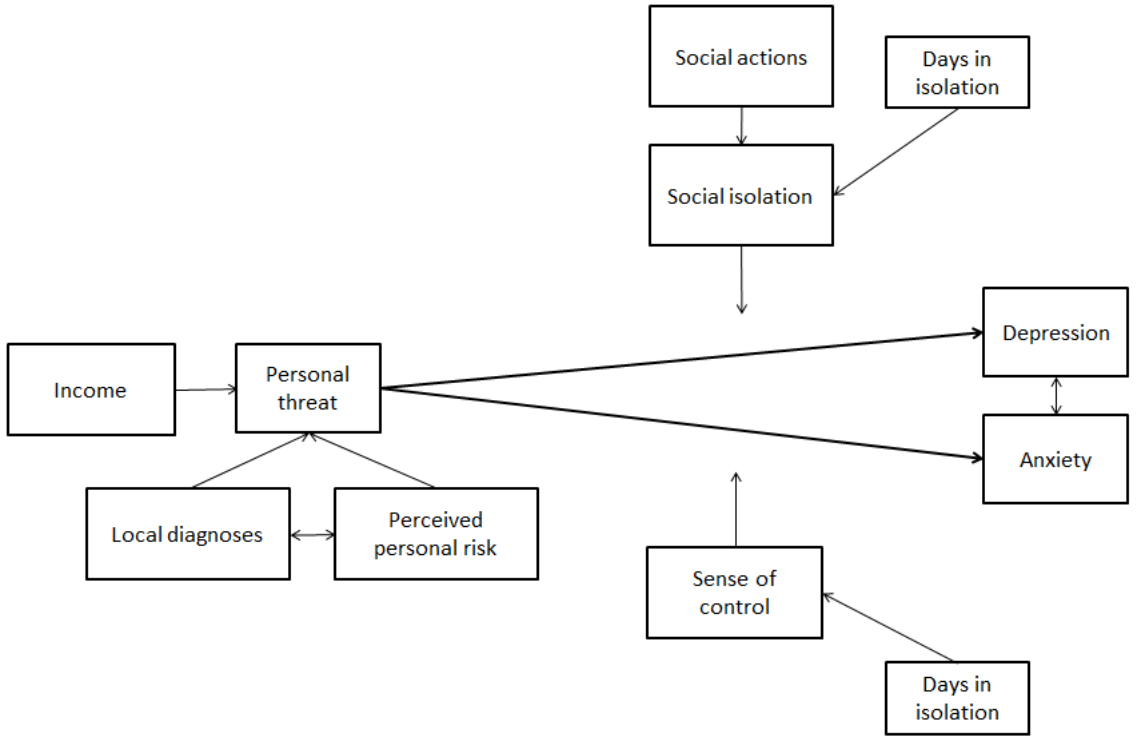
Model (simple):



The extended model

We measured our model as follows: anxiety and depression were measured by the Hospital Anxiety and Depression Scale (Zigmond & Snaith, 1983). Personal threat (an item asking participants how severe they think the effects of COVID-19 will be on their personal lives) is predicted by the presence of local diagnoses of COVID-19, that is to say, in one's direct environment (household, family, friends, acquaintances, work or school), and by perceived personal risk of contracting the virus (where personal refers to contracting the virus oneself, or one's close family or friends). Another predictor of threat is income, where a lower than average income might increase perceived threat as there are fewer financial resources or buffers to rely on in case of (temporary) unemployment. Social isolation was measured by the social isolation subscale of the Social Connectedness Scale (Lee & Robbins, 1995), and we predicted that this isolation would be negatively predicted by how many 'social actions' one takes. That is, how frequently one is in contact with one's family, friends, and colleagues/fellow students. We further hypothesize that this effect will be less pronounced for those living with partners, flatmates or pets, but not other people (including children). Sense of control was measured by two direct questions asking people how they perceive control in their lives currently. This will be predicted by both primary control, which is the ability to influence the environment in response to personal needs (also known as personal control), and secondary control, which is ability to adapt the self in response to the environment (also known as compensatory control). Finally, days in isolation will create a U-curve effect: when people are initially in isolation, stress is low because people don't notice the big changes yet. Then, stress starts increasing as time goes on, and people are continually locked at home. Stress will drop off again at the tail end however, as people are familiarized with/gotten used to their situation.

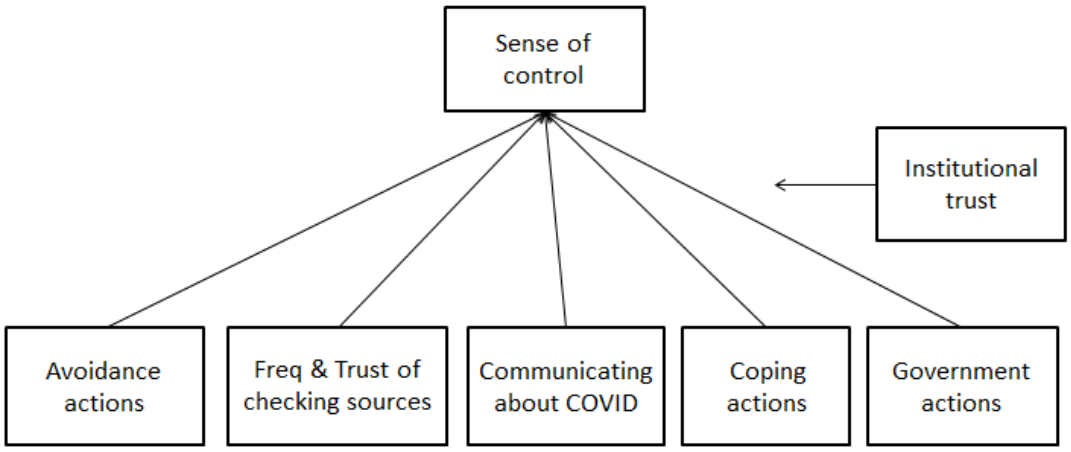
Model (extension):



Control

Control is one of the main constructs of our model and this warrants further extension. A sense of control will be predicted by how many actions people take to avoid contracting the COVID-19 virus, such as washing one's hands frequently, and avoiding physical contact with others. We further hypothesised that taking actions to increase one's information will be an important source of perceived control, given that the COVID-19 pandemic is completely new, and involves an 'invisible' threat. Information action will consist of frequency of checking information sources, when said sources are trusted (e.g., checking sources frequently that participants don't trust will not contribute to a sense of control). Information actions will also consist of the frequency of which participants communicate with their family, friends, and colleagues/fellow students about COVID-19. Perceived control will also be predicted by how much people employ coping mechanisms, as measured by the Brief COPE scale (Carver, 1997), and by the number of helpful actions their government has performed (in particular those recommended by Brooks et al., 2020). However, this latter source of perceived control is moderated strongly by perceived institutional trust (Mayer, Davis, & Schoorman, 1995), that is, whether people believe in the capability, integrity, and benevolence of their government (for the USA, this will be institutional trust in state government).

Model of control



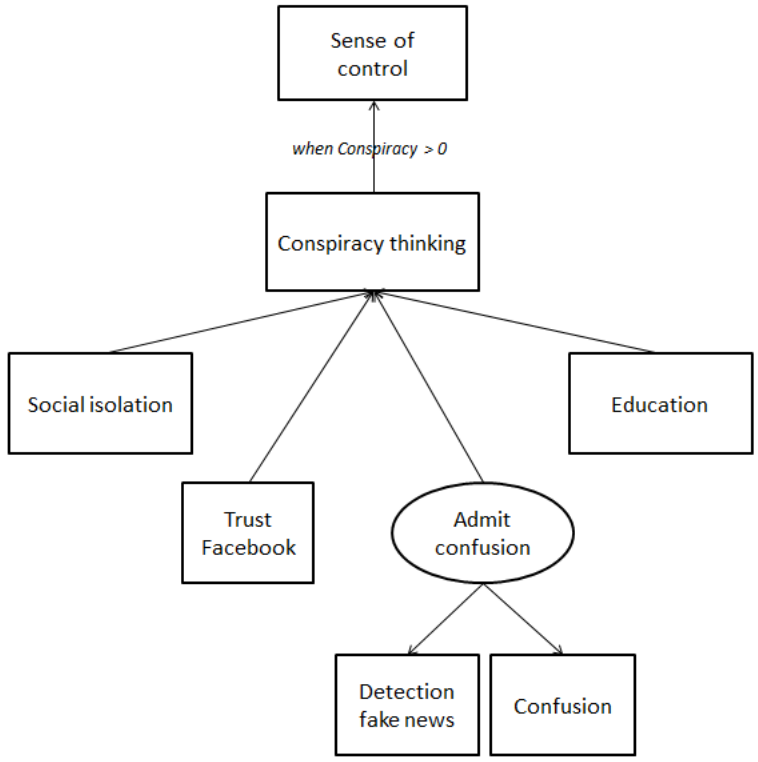
Note: For Freq&Trust of checking sources: Frequency predicts Sense of control only for those sources which the participant rated 2 or higher (3, 4) on Trust.

Conspiracy

In addition, conspiracy thinking is thought of one other attempt of regaining control in a situation in which much of everyday life's control is lost. We don't suggest that everyone will use conspiracy thinking as a way of regaining control, but rather that some do, and that this will contribute to their sense of control. We measured conspiracy thinking in the most prevalent way we have seen conspiracy theories out there: whether the COVID-19 virus is artificial (created in a lab) or naturally occurring. For the purposes of this research, we will classify everyone who scores higher than neutral (Conspiracy >0) on conspiracy thinking as one. We predict that for conspiracy thinkers, the higher they score on conspiracy thinking, the more it will contribute to a sense of control.

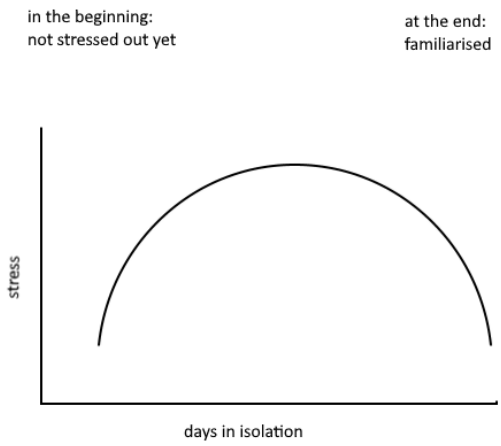
While it is beyond of the scope of this paper to fully predict who engages most in conspiracy thinking, we hypothesize that those who are not likely to admit confusion and those with a lower level of education will score higher on conspiracy thinking. Admitting confusion was measured by an item which asked whether participants had come across ambiguous news or fake news, and simply how confused they felt. Level of education was measured with a simple descriptive demographic question. We also predicted that those engaged in conspiracy thinking trust Facebook more, and that social isolation would predict conspiracy thinking, where those who are isolated are more likely to engage in conspiracy thinking.

Model of conspiracy thinking



Days in isolation

We expect days in isolation to have the shape of a U-curve:



Where ‘stress’ can be replaced with low sense of control and social isolation.

Model analyses

We will use robust maximum likelihood for all analyses, with a weighted least squares estimator in case of ordered categorical observed variables, and monte carlo integration for models with latent variable interactions. These are full information estimators, which make use of all available data without imputing missing values, and provide unbiased estimates under the assumption of MAR.

To simplify the model, for latent variables with more than three indicators, we will compute parcels, matching the highest-loading indicator with the lowest-loading indicator, and second-highest-loading with second-lowest-loading indicator, and so forth.

Other analyses

Country

In the interest of time, no hypotheses will be currently pre-registered with regards to differences between countries. We do expect that our question as to whether decisions with regards to COVID-19 should be left to individuals or governments will differ between participants of various countries, depending on the level of individualism/collectivism of that country. We also expect the institutional trust in governments to differ substantially between countries (with lower average trust for example for the USA and UK, and higher trust for Finland and New Zealand).

Quality of Life

Two quality of life questions {Whoqol Group, 1998 #51} were included in the survey, asking participants to indicate their satisfaction with their quality of life and health in the past week. Initially, these questions were asked so the answers could be entered as a covariate: Perhaps people score high on anxiety and depression because of low quality of life or low health, rather than the specific COVID-19 situation. However, it has since struck us that there will very likely be an overlap here; people who are suffering due to the COVID-19 situation will likely also rate their quality of life, and potentially health, lower. As such, the quality of life variables have not been included in the model. We will use it in the follow-up research however, to track changes.

Correlations

We have included several variables which will act as 'checks', in the sense that we predict the following correlations to be present and significant:

Anxiety
Positive
- Wanting to get a COVID-19 test
- Feeling afraid
- Being concerned

Negative:
- Thinking one has (had) COVID-19
- Having sufficient PPE

- For those who need to work outside the house (so-called 'essential or key workers'), higher levels of anxiety will be predicted by lower levels of available PPE.

Depression:
Positive
- Feeling bored

Negative:
- Feeling enthusiastic
- Feeling hopeful
- Thinking the country is going to get better this month

- Optimism/pessimism: strong correlation with depression; the inability to imagine a rosy future.

Social isolation:
Positive:
- Feeling lonely

Freq & Trust of checking sources
Communicating about COVID
Positive:
- Feeling informed

Conspiracy thinking:
Positive:
- Misinformedness
- Trust in local groups

Negative:
- Trust in global groups
- Trust in scientists

- Conspiracy thinking is associated with high local trust (trusting in the people and government of one's own country) but low global trust (trusting in people and governments globally), and low trust in scientists (of one's own country and globally). Finally, we predict that conspiracy thinking is actually associated with misinformedness. We included four myths surrounding COVID-19 in our survey, and we predict that those who engage in conspiracy thinking might believe in one or more myths more than those who don't.

Measures
(in order of relevance to the model; for order of items in survey, see Excel file with variables).

All measures which together form a subscale will be tested for reliability with Cronbach's alpha. Cronbach's alpha levels of >.07 will be accepted, levels of 0.5-0.6 examined, and <.05 rejected.

Measures in the main models

Demographics. The following demographics were collected from the participants: Country of residence; home country if not country of residence; Age (in years); Gender (female, male, or other/non-binary); level of education in nine tiers, from "No schooling completed, or less than 1 year" (1) to "Doctorate degree (PhD, EdD, etc)" (9); and household income from "Far below average" (-2) to "Far above average" (2), with the option "I'd rather not say", which will be excluded from the analyses.

Days of self-isolation. Participants were asked how many days they have been in in self-isolation (voluntary or mandatory) for.

Threat. We measured threat by asking participants how severe they think the effects of COVID-19 will be on their personal lives (personal threat) and on global society (global threat). Options for answers were: "Not at all" (0), "A little" (1), "Somewhat" (2), "Considerably" (3), "Very" (4), and "Extremely" (5).

Anxiety and depression. The Hospital Anxiety and Depression Scale (Zigmond & Snaith, 1983) was used to measure symptoms of anxiety and depression. This scale contains seven items measuring depression symptoms (e.g., "I feel as if I am slowed down"), and seven measuring anxiety symptoms (e.g., "I get a sort of frightened feeling as if something awful is about to happen."). For each item, one can score from 0 to 3 points, reflecting the severity of the item for the participant, and the total is summed up each of the subscales. This scores will be summed.

Perceived risk. We asked participants to rate, both for themselves and their family/friends, the risk of becoming infected, of experiencing a severe version of the infection, and of dying from the infection. These questions were answered on a scale from "Very low" (-2), "Low" (-1), "Neither low nor high" (0), "High" (1), to "Very high" (2). These scores will be summed.

Diagnoses. Participants were asked whether there have been diagnoses of COVID-19 in their environment, and given the following options (multiple choices were possible): no, in my country, in my state/province/county, in my city, in my workplace, school, or children's nursery, my acquaintances, my close friends, my family, my household, and I'm infected. These scores will be summed in two subgroups: global (2-4th) and local (5-10).

Social isolation. Participants were asked to indicate how lonely they had felt the past week on a scale from "Not at all" (0), "A little" (1), "A moderate amount" (2), "A lot" (3), to "A great deal" (4). We also used 4 items from the Social Connectedness Scale (Lee & Robbins, 1995) to measure social isolation: "I feel disconnected from the world around me.", "I feel so distant from people.", "I have no sense of togetherness with my peers.", and "I catch myself losing all sense of connectedness with society.". Participants indicated their agreement on the same scale as the loneliness item. These scores will be averaged.

Social actions. Social actions were measured by the frequency with which participants were in contact with their family, friends, and colleagues/fellow students, either through the exchange of messages, calls, or video chats. Participants answered with a scale from "not once/NA" (0), "few times a month" (1), "weekly" (2), "few times a week" (3), "once a day" (4), to "few times a day" (5). These scores will be averaged.

Household situation. Participants were asked who else lives in their household besides themselves. The options available were (selecting multiple options possible): spouse/partner, child/children, sibling(s)/other family under 60 years of age, flatmate(s) under 60 years of age, people over 60 years of age, animal(s), I live on my own.

Avoidance actions. Primary control was measured by an overview of safety precautions with regards to COVID-19. This overview of actions was adapted from a concurrent Stanford survey on COVID-19 by Dr Alia Crum and her team (Zion et al., 2020). The actions included: Wash your hands for at least 20 seconds; Stay home; Avoid shaking hands with other people; Not touch your face; Wear a mask of any kind. Participants were asked: "In the past week, how much have you made it a

priority to..” followed by each of the 13 actions. Participants answered on a scale from “Not at all” (0), “A little bit” (1), “Some” (2), “A lot” (3), to “As much as possible” (4). These scores will be averaged. This set of actions also included a question: “Avoid Asian food/restaurants” which was considered racist by several participants and as such was excluded from the analyses.

Information sources. Participants were asked about nine different information sources for information about COVID-19, and how often they consulted them, and how much they trusted them. These sources included: the World Health Organization (WHO), a national health service (Centers for Disease Control and Prevention (CDC) for the USA, the National Health Service (NHS) for the UK), government website(s), newspaper website(s), Facebook, Twitter, Instagram, websites with maps or tables with counts of COVID-19 cases, and websites showing up after Google searches about COVID-19. Options for frequency were: “Never” (0), “Rarely” (1), “Occasionally” (2), “Sometimes, more than occasionally” (3), “Often” (4), “All the time” (5). Options for trust were: “Not at all” (0), “A little” (1), “A moderate amount” (2), “A lot” (3), to “A great deal” (4). In the analyses, frequency and trust will be matched, and we will only use the frequency for items which score ‘2’ or higher for trust.

Communicating about COVID-19. In addition to the other social actions (see above), participants were asked out of the times that they communicate with family, friends, and colleagues/fellow students, how often they spoke about COVID-19. The options were: “Never” (0), “Rarely” (1), “Occasionally” (2), “Sometimes, more than occasionally” (3), “Often” (4), “All the time” (5), and “We don’t communicate/NA” (6), which will be disregarded in the analyses. These scores will be summed.

Coping actions. We used the Brief COPE scale (Carver, 1997). This scale measuring coping mechanisms consists of 28 items reflecting 14 subscales (i.e., 2 items per subscale), namely: Active Coping, Planning, Positive Reframing, Acceptance, Humor, Religion, Using Emotional Support, Using Instrumental Support, Self-Distraction, Denial, Venting, Substance Use, Behavioral Disengagement, and Self-Blame. These scores will be averaged into subscales, and then into an overall ‘coping actions’ score.

Government actions. We gleaned six government actions from the recommendations by Brooks and colleagues (2020) in their very recent paper on COVID-19. They suggested that if quarantine has to happen, then their results suggest that officials should try to ensure to make the experience as tolerable as possible for people, in particular through six key actions: Telling people what is happening and why; Explaining how long it will continue; Providing meaningful activities for people to do while in quarantine; Providing clear communication; Ensuring basic supplies (such as food, water, and medical supplies) are available; Reinforcing a sense of togetherness. Participants were asked to indicate how much they think the government of the country they reside in has accomplished each of these actions, on a scale from “Not at all” (0), “A little” (1), “A moderate amount” (2), “A lot” (3), “A great deal” (4), and finally “I'd rather not say”, which will be excluded from the analyses. These scores will be summed.

Institutional trust. We measured institutional trust through three factors of perceived trustworthiness: capability, trust, and benevolence (Mayer et al., 1995), measured by two items in the survey. Participants were asked: “To what degree do you perceive that..” “..the government is capable of stopping the COVID-19 outbreak?” (capability); “..the actions of the government in regard to COVID-19 outbreak are driven by sound values and principles?” (benevolence); “..the government tries to counteract COVID-19 outbreak?”. Items were rated on the following scale “Not at all” (0), “A little” (1), “A moderate amount” (2), “A lot” (3), “A great deal” (4), and finally “I'd rather not say”, which will be excluded from the analyses. For respondents from the USA, in addition to these questions with regards to the government, these questions were asked again, but about their state government. These scores will be averaged into subscales as well as overall institutional trust.

Conspiracy thinking. Conspiracy will be assessed a slider question, with two extremes at -10 and 10. The slider always started exactly in the middle, at 0. The question was: “Do you think COVID-19 is a naturally occurring virus or an artificially made virus (e.g., created in a lab)?” (labels: “Naturally occurring” -10, “Artificially made” 10). Every participant who scores a value greater than 0 (not inclusive) will be classified as a conspiracy thinker for the purposes of the current research project.

Admit confusion. We included two items measuring the characteristic of admitting confusion. First, we had an item measuring how much people felt confused in the past week (on a scale from "Not at all" (0), "A little" (1), "A moderate amount" (2) "A lot" (3), to "A great deal" (4)). Second, we asked participants how often they have come across contradictory news, including what turned out to be fake news. Answer options included: "Never" (0), "Rarely" (1), "Occasionally" (2), "Sometimes, more than occasionally" (3) "Often" (4), "All the time" (5).

Trust. In addition to the institutional trust measure (see above), the survey included six sliders to measure general trust. Participants were asked how they trust their country's (i.e., "local" trust) and the world's (i.e., "global" trust) governments, scientists, and people. The sliders ranged from ranging from -10 "Strongly distrust", 0 "Neutral", to 10 "Strongly trust" (labels, but not values shown).

Misinformedness. To examine how informed the participants were, four facts were gleaned from the WHO's Whatsapp list of common COVID-19 myths, and participants were asked to indicate if they thought them to be true or false, or to indicate that they did not know. The answer to all fact statements was "False": Only people of a certain age can get COVID-19; Pets can transmit COVID-19; Vaccines against pneumonia provide protection against COVID-19. (We also had a fact statement "Taking antibiotics is effective against COVID-19.", but this was removed when it was pointed out that antibiotics do help with the recovery of pneumatic infection following COVID-19). The sum of all 'true' (i.e., incorrect) answers was used as an indicator of 'misinformedness'.

Descriptives & correlations

COVID-19 testing. Participants were asked several questions about COVID-19 testing, starting with whether they had been tested for COVID-19 (answers: yes, no, I'd rather not say/I don't know the outcome). If participants answered yes, they were subsequently asked what the outcome of the test was "Positive (I am infected)", "Negative (I am not infected)", or "I'd rather not say". If participants answered no to COVID-19 testing, then they were asked whether they would like to get tested for COVID-19 and whether they thought they might have (had) COVID-19. Both questions were answered with a slider scale from "Definitely not" (-10) to "Definitely" (10), with 1-point increments. For the 'might have (had)' question there was a middle point label "Don't know" (0).

Current situation. Participants were asked what their current situation was with regards to COVID-19. The following options were given: I am in mandatory self-isolation/quarantine (mandated by government or public health sector); I am in voluntary self-isolation/work or study from home; I am going about my daily business like usual (going to work, school, etc.), but don't visit restaurants, cinemas, etc.; I am going about my daily business like usual (going to work, school, etc.), AND visit restaurants, cinemas, etc.; My work requires me to go out (e.g., medical professionals, delivery, public transport, etc.), while others are recommended/mandated to stay at home.

Essential/key/frontline workers' occupation. If participants answered for the 'Current situation' question that their work requires them to go out, they were presented with a follow-up question to describe their occupation. The following options were given: Medical professional (e.g., doctor, nurse, paramedic, etc.); Delivery or post personnel (e.g., for supermarkets or other companies (e.g., Amazon), or to delivery post or parcels (e.g., the mail, ParcelForce, Yodel, etc.); Supermarket or shop personnel (working inside a supermarket or shop); Garbage or recycling collection; Driver in public transport (e.g., bus, subway, etc.); Nursery or childcare employee, or work in education (e.g., teacher); Construction worker; Police or armed forces or similar; and finally "Other, namely:" with a box to enter text.

Essential/key/frontline workers' PPE availability. If participants answered for the 'Current situation' question that their work requires them to go out, they were also asked whether they have access to sufficient personal protective equipment (PPE)? (E.g., masks, gloves, antibacterial gel or soap, etc.). Answers were given on a slider from "Not sufficient; nothing" (-10) to "Sufficient; plenty" (10).

Feeling informed. Participants were asked how informed they felt with regards to four aspects of COVID-19: The risk of contracting COVID-19, symptoms of COVID-19, how COVID-19 spreads, and how to prevent COVID-19 from spreading. (Participants were also asked how informed they felt about the treatment of COVID-19, but this option was removed as it was considered too medically niche). Participants were asked to include in their judgment how much they felt they know, and how much they trusted that information. The options they had for each of the four options were: "Not at

all" (0), "Not very; a little" (1), "A moderate amount" (2), "A lot" (3), and "A great deal" (4). These scores will be averaged.

Emotions. We asked for a number of emotions, how much they had felt said emotions in the past week rated on a scale from "Not at all" (0), "A little" (1), "A moderate amount" (2) "A lot" (3), to "A great deal" (4). The emotions were: Enthusiastic, Hopeful, Afraid, Bored, Lonely, Confused.

Concerned. How concerned they are about COVID-19. on a scale from "Not at all" (0), "A little" (1), "A moderate amount" (2) "A lot" (3), to "A great deal" (4).

Optimism/pessimism. In this composite measure, we assessed participants future predictions. More specifically, we asked them whether they thought that in the coming month, the COVID-19 crisis in their country of residence will: "Get much worse" (-10), "Stay more or less the same" (0), "Get much better" (10) on a slider.

Follow-up research:

Quality of life and health. Two items of the WHOQOL-BREF quality of life assessment (Whoqol Group, 1998) were used to assess people's satisfaction with their quality of life and health in the past week. Options for answers were: "Very dissatisfied" (-2), "Dissatisfied" (-1), "Neither satisfied nor dissatisfied" (0), "Satisfied" (1), and "Very satisfied" (2).

Feeling of bondedness. To measure the participants' feelings of bondedness, we included a pictorial measure of self-in-group from the identity fusion literature (Swann Jr, Gómez, Seyle, Morales, & Huici, 2009). This measure shows five pictures in a row, with a small circle representing the 'self' and a larger circle representing the 'group', with different stages of overlap (no overlap for the first picture, total overlap in the last). Participants were asked to indicate which picture reflected their relationship with a group best for the following groups: family, friends, country of residence, home country (if applicable), and all of humanity. This measure will be used in our follow-up research.

Unused:

Likelihood of future occurrences. We asked the participants how likely it is that this event, or a very similar event, will occur again in the future? Participants could answer "Very unlikely" (-2), "Somewhat unlikely" (-1), "Neither likely nor unlikely" (0), "Somewhat likely" (1), "Very likely" (2).

Number of close friends. To assess the participants' number of close friends, we asked them to indicate how many friends they feel they could call for help. Options were: 0, 1, 2, 3-4, 5-8, 9+.

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