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The Psychological Science Accelerator's COVID-19 rapid-response dataset

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In response to the COVID-19 pandemic, the Psychological Science Accelerator coordinated three large-scale psychological studies to examine the effects of loss-gain framing, cognitive reappraisals, and autonomy framing manipulations on behavioral intentions and affective measures. The data collected (April to October 2020) included specific measures for each experimental study, a general questionnaire examining health prevention behaviors and COVID-19 experience, geographical and cultural context characterization, and demographic information for each participant. Each participant started the study with the same general questions and then was randomized to complete either one longer experiment or two shorter experiments. Data were provided by 73,223 participants with varying completion rates. Participants completed the survey from 111 geopolitical regions in 44 unique languages/dialects. The anonymized dataset described here is provided in both raw and processed formats to facilitate re-use and further analyses. The dataset offers secondary analytic opportunities to explore coping, framing, and self-determination across a diverse, global sample obtained at the onset of the COVID-19 pandemic, which can be merged with other time-sampled or geographic data.

Background & Summary

In 2020, the rise of the COVID-19 pandemic presented enormous challenges to people's health and well-being. In response to this challenge, in March 2020, the Psychological Science Accelerator (PSA)¹ announced a call for studies focusing on applied research to answer questions on how to reduce the negative emotional and behavioral impacts of the pandemic, the PSA COVID-Rapid (PSACR) Project. The PSA is a global collaborative network of over 1,000 members across 80+ countries/geopolitical locations that develop large, "big-team science" projects. Three research studies were selected to pursue, paired with a general survey about health behaviors, COVID-19 experiences, and demographic information (<https://osf.io/x976j>). The dataset described here represents three studies on the psychology of message communication: Study (1) how framing affects health communication messages using gain-versus-loss framing²; Study (2) cognitive reappraisal³; and Study (3) how self-determination theory can inform health messaging for social distancing uptake⁴. Participants either completed Loss-Gain Framing (Study 1) and Self-Determination (Study 3) (order counterbalanced), only the Self-Determination (Study 3) or Cognitive Reappraisal (Study 2) (see Figs. 1 and 2).

Loss-gain framing (Study 1). In the first study, participants read health excerpts that framed these messages behaviors as gains or losses, and we subsequently measured participants' intentions to follow guidelines to prevent COVID-19 transmission, attitudes towards COVID-19 prevention policies, propensity to seek additional information about COVID-19, and anxiety (using both self-report and behavioral measures)². This study was designed to examine the role of message framing in influencing compliance with the pandemic recommendations using gain-versus-loss framing. The gain-framed messages in this study highlighted the usefulness of compliance with the messages (e.g., there is so much to gain. If you practice these four steps, you can protect yourself and others), whereas the loss-framed messages spotlighted the negative effects of ignoring the recommendations (e.g., there is so much to lose. If you do not practice these four steps, you can endanger yourself and others)⁵. Research on the

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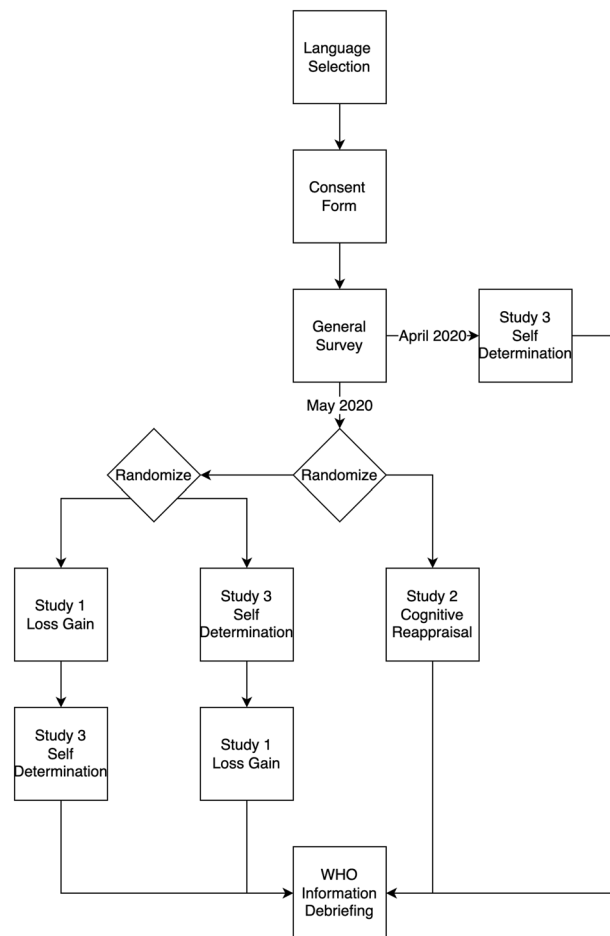


Fig. 1 Survey flow for the PSACR project. As shown in Fig. 2, participants were given one path through the study determined by the date they completed the study and randomization factors.

impact of message framing on emotion and behavior is critical⁶, and previous studies suggest that loss-framing elicits negative emotion⁷. This study extended previous research to measure the impact of framing on anxiety.

Summary of study findings. Loss-framed messages (as compared to gain-framed) increased participants' self-reported anxiety. On the contrary, there were no meaningful differences between gain framing and loss framing in effects on 1) behavioral intentions to follow COVID-19 prevention guidelines, (2) attitudes toward COVID-19 prevention policies, and 3) whether participants chose to seek more information about COVID-19. Crucially, most of these results were relatively consistent across 84 countries.

Cognitive reappraisal (Study 2). The second study focused on emotion regulation through cognitive reappraisal³. The COVID-19 pandemic has been shown to decrease positive emotions and psychological health and increase negative emotions^{8–10}. These emotional changes could potentially be mitigated by emotion regulation strategies. Cognitive reappraisal is one such strategy that encourages changes in the way one thinks about a situation in order to change the way one feels¹¹, and this study specifically used reconstrual and repurposing as reappraisal methods. Previous research has shown that participants engaging in cognitive reappraisal can increase resilience in a simple and effective manner¹², especially in comparison to other emotion strategies, such as emotion suppression¹³. Study 2 examined the effectiveness of reappraisal strategies to reduce negative emotions and increase positive ones regarding COVID-19 situations. Moreover, we explored whether cognitive reappraisals influence health behavioral intentions.

Summary of study findings. The two variations of reappraisal strategies tested in this study (reconstrual and repurposing) both reduced negative emotions and increased positive emotions related to COVID-19 situations compared to control conditions. Neither strategy affected health behavior intentions related to stay-at-home behaviors and hand washing behaviors. The two strategies had similar effects to one another.

Self-determination (Study 3). The third study examined motivations/intentions to participate in social distancing using self-determination theory as a framework to design messages that either induced individual autonomy through supportive messaging or pressured individuals through controlling messaging^{14,15}.

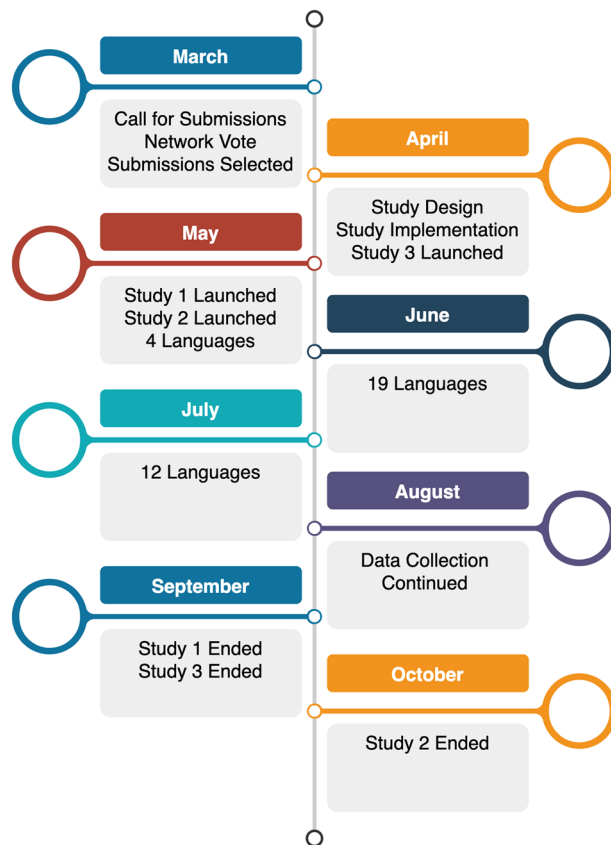


Fig. 2 Timeline for the PSACR project in 2020. In April, only the English version of the study was available for participants. In May, Hungarian, Dutch, Polish, and Portuguese were added to the study. In the next month, French, Macedonian, Swedish, Spanish, Farsi, Norwegian, Russian, Turkish, Bulgarian, Urdu, Czech, Greek, Italian, Japanese, Slovak, Arabic, Hebrew, Filipino, and Korean were launched. In July, Croatian, German, Yoruba, Armenian, Chinese, Serbian, Finnish, Romanian, Uzbek, Bengali, Slovenian, and Hebrew were included. Languages were generally launched with its dialect variants (e.g., Dutch and Dutch-Belgian).

Autonomy-supportive communication styles include information on perspective-taking, the rationale for changing behavior, and engaging an individual's autonomy of choice in a scenario¹⁶. Controlling communication styles use shame and blame to induce a change in behavior¹⁷. In general, autonomy-supportive messages have been shown to increase behavior change¹⁸, whereas controlling messages often lead to behaviors that are the opposite of what was intended^{19,20}. Study 3 examined the effects of autonomy-supportive versus controlling messages about social distancing on the quality of motivation, feelings of defiance, and behavioral intentions to engage in social distancing.

Summary of study findings. The controlling message increased controlled motivation for social distancing, a relatively ineffective form of motivation concerning avoiding shame and social consequences, relative to the control group who received no message. On the other hand, the autonomy-supportive message decreased feelings of defiance compared with the controlling message. Unexpectedly, neither autonomy-supportive or controlling messages influenced behavioral intentions, though existing motivations did, with autonomous motivation predicting greater long-term intentions, and controlled motivation predicting fewer long-term intentions to social distance.

Here, we present the aggregated data from all studies and from a health behavior survey assessing demographics and COVID-19 experience and local restrictions²¹. These data can be further merged with corresponding data using time and/or location information, potentially to track responses in tandem with COVID-19 rates (<https://data.humdata.org/dataset/oxford-covid-19-government-response-tracker>), vaccinations²², hospitalizations (<https://ourworldindata.org/coronavirus-data-explorer>), or other psychological variables (e.g., anxiety, depression; <https://www.nih.gov/news-events/news-releases/all-us-research-program-launches-covid-19-research-initiatives>). The dataset provides an array of untapped insights into human emotion, motivation, persuasion, and other topics that can be unlocked through secondary analyses (e.g., regional moderator analyses).

Methods

Survey flow. The PSACR project consisted of a general survey (i.e., consisting of health behaviors, COVID-19 information, and demographics) and the three studies described above (see the survey flow in Fig. 1). Data were collected online, and participants were able to complete the study from any internet-enabled device. First, participants were shown a landing page to select their language or regional variation of a language, with 44 languages included as options. Participants then read an informed consent form to familiarize themselves with the general

objectives of the study and indicate their consent to participate in the study (yes/no choice). The entire study was approved by the Institutional Review Board at Ashland University as the main research hub, and local approval was obtained from other research labs depending on individual institution requirements.

The participants were then shown a general survey, COVID-19 experience, and demographics survey designed by the PSACR admin team (described below). Participants were then randomly invited to complete either (a) Cognitive Reappraisal (Study 2), or (b) both the Loss-Gain Framing (Study 1) and Self-Determination (Study 3) studies in random order. However, a small portion of participants received only Study 3 (Self-Determination), as this study was deployed before the other two studies were ready (see Fig. 2 for a timeline of the project). Creating two survey flows (Study 1 and 3 versus Study 2) kept participant completion time to approximately 20–30 minutes across the entire survey as Study 2 took longer to complete than Study 1 and 3. Data collection for Loss-Gain Framing (Study 1) and Self-Determination (Study 3) ended before Cognitive Reappraisal (Study 2) for which data collection was continued to achieve the *a priori* determined sample size. A timeline for the different PSACR studies onsets and offsets is presented in Fig. 2. After completing the studies, participants were shown a debriefing about the studies that included information about the pandemic and World Health Organization (WHO) recommendations. All translations and materials can be found at <https://osf.io/gvw56/> and at <https://osf.io/s4hj2/>.

Translation. The translation team consisted of one lead coordinator, two assistant coordinators, one language specific coordinator, and translators within each language. The lead coordinator, along with the assistant coordinators, oversaw all languages organizing and connecting information between the study teams, translation teams, and implementation teams. The language coordinator worked with the individual translators for their target language, and approximately 268 individuals helped achieve the translations for this study. The translation process included three stages: forward translation, backward translation, and cultural adjustment. During forward translation, at least two translators worked together to translate each study from English to each target language. Separately, two translators then reversed this process by backward translating from each target language to English. Between these two stages, all inconsistencies were eliminated by discussion between team members. Last, the translated materials were sent to separate individuals for cultural adjustment. Cultural adjustment included wording tweaks for understanding within that culture. For example, several of the educational levels were modified based on the education system in the area that generally spoke the target language (see <https://osf.io/ca3ks> for a review of the translation process).

Study deployment. The study was implemented online using *formr* survey software²³ which enabled complex randomization and study tracking during the life of the project. The study can be reproduced using the Excel files for each language and the overall survey flow **psacr-pool.json** file (<https://osf.io/643aw/>) provided in the **formr** folder in the Open Science Framework (OSF) repository. *formr* software allows a researcher to import a survey flow through .json formatted files, and the exact questions and study design can be imported using Excel or Google Sheets files. Within each language folder, we have provided the consent form, the general survey, the Loss-Gain Framing survey (Study 1), the Cognitive Reappraisal survey (Study 2), the Self-Determination survey (Study 3), and the final WHO and debriefing information. Each language setup uses the same survey flow and therefore can be recreated using the provided .json survey flow and the relevant Excel files.

General survey. The general survey was designed to gather information about the participants' experiences with COVID-19 protocols and restrictions in their lives as well as demographic information. Participants first reported their health behaviors in response to the pandemic by indicating how many times they had left their homes in the past week, the reasons for leaving their home, their mask usage, hand washing, and coughing/sneezing actions. The next section covered COVID-19 restrictions and government responses, including current restrictions, ability to manage restrictions, and trust and satisfaction in government activities. Participants then indicated if they had been tested for COVID-19, were self-isolating for symptoms, their confidence about understanding and preventing COVID-19, and their worry over their physical and emotional well-being. The last section of the general survey covered participant demographics (age, gender, education, geopolitical region, nationality, state of residence for U.S. participants, and type of community), questions about how the participant was recruited into the survey, and questions about their household (number of members, socioeconomic status, and health conditions).

Loss-gain framing (Study 1). In this study, each participant was first presented with an overall description of the task, which was to express their opinions on various recommendations for mitigating COVID-19. Participants were randomized into two framing conditions about the steps one can take to meet COVID-19 guidelines. These two conditions were framed in either a gain perspective ("You have so much to gain by practicing these steps") or a loss perspective ("You have so much to lose by not following these steps"). Within the loss- and gain-framed conditions, the messages were written in three different ways, and participants were randomly assigned which version of the message to view. Participants then rated the likelihood to comply with these recommendations while the instructions were presented on the page. Next, they rated their feelings on government policies related to health, rated their emotions (i.e., anger, anxiety, fear) when considering these policies, and indicated if they wanted to learn more about WHO guidelines. Finally, participants were asked to complete a manipulation check about the information they had read to ensure they had paid attention during the study.

Cognitive reappraisal (Study 2). This study focused on determining if a cognitive reappraisal strategy would change the emotional responses to photos related to COVID-19. First, participants rated their emotions they were feeling "right now." For positive emotions, they indicated how hopeful, loved, peaceful, understood, and cared for they felt. For negative emotions, they indicated how annoyed, sad, angry, stressed, left out, and much

hate they felt. These emotions were randomly presented such that each person saw positive and negative emotion questions interspersed, beginning either with positive (i.e., positive, negative, positive, negative, etc.) or negative. The order of the questions was also randomized across participants.

At this point in the study, participants were randomized into one of four conditions: (1) reflecting: reflecting upon your thoughts and feelings about any situation can lead to different emotional responses; (2) rethinking: different ways of interpreting or thinking about any situation can lead to different emotions; (3) refocusing: finding something good in even the most challenging situations can lead to different emotional responses; and (4) a control condition that suggested participants respond as they naturally would. Participants were provided with instructions on how to implement these appraisals. Consequently, participants had four practice trials where each time they viewed a picture, rated their current affect/mood, and wrote a few sentences about how they implemented the appraisal with respect to the picture.

After completion of the practice trials, participants rated ten COVID-19 related pictures (e.g., person on a stretcher being taken out of an ambulance, grieving/worried relatives, etc.) followed by questions about how positive and negative they felt viewing the pictures. The pictures were selected by lead team of Study 2 by searching major news sources across Asia, Europe, and North America. These pictures were rated by the lead team on sadness/anxiety and whether they should use the pictures. The final selection of pictures received higher-than-average scores (on a 1–7 Likert scale), for both ratings. This section was followed by the original emotion questions presented at the beginning of the study, in the same randomized order as they had been previously seen. These questions were then adjusted to determine anticipated emotions (i.e., to what extent will you feel sad). Participants next answered questions about their positive habits, such as exercising, and negative habits, such as drinking and smoking. Last, participants were given a series of attention check questions to identify inattentive responding, along with a final question about their current emotional state relative to their emotional state at the beginning of the study.

Self-determination (Study 3). This study examined the COVID-19 recommendations for social-distancing across three randomly assigned conditions: (1) an autonomy-supportive message promoting personal agency and reflective choices, (2) a controlling message that was forceful and shaming, and 3) no message about social distancing. Each participant rated their current adherence with social distancing before receiving these messages. After the messages, participants rated their motivations to engage in social distancing, and how the messaging about social distancing made them feel. They then re-rated the original items about their social distancing intentions for the next week (i.e., how often will you see friends in the next week) and the next six months. At the end of the study, participants completed manipulation check items to ensure messages were experienced as supportive vs. pressuring.

Data processing. The complete data processing scripts from the study, along with annotations, can be found at <https://osf.io/gvw56/>. During the data collection phase of the studies, we tracked several indicators such as the current participant counts, timing, and other important factors in the study (e.g., the number of people in each language and group). The code for this tracking is presented in <https://osf.io/uzqdr/>, but those summary data were collected only for monitoring purposes during the study. The following data processing steps were taken on the raw data, and the final output can be found in the **raw_data** folder in the OSF repository. The raw data are stored separately by month in compressed zip files due to their large size and file storage limits. The processing steps included:

- 1) Eliminate duplicate rows. We collected data across multiple servers, and sometimes, the server posted the same participant data twice.
- 2) Creation of unique identifiers for each participant. One language of the study (Swedish) briefly did not include the appropriate code to enable creating unique identifiers. Therefore, these data were matched using other information embedded in the surveys and the unique identifier was filled in for these participants.
- 3) Removal of pilot data. We removed pilot testing responses from the dataset. These responses were identified by the start dates and times for each language separately.
- 4) Participant completion codes (e.g., unique subject identifiers created for reporting completion at the end of the study) were extracted from the raw data for researchers to check if their participants had completed the study.
- 5) Participant personal information (i.e., information that could be used to identify the participant, information for creating completion codes, emails or phone numbers for lottery participants) was excluded before uploading data into the **raw_data** folder.

Next, we transformed the raw data set to facilitate reuse of the data. The code for this stage can be found at <https://osf.io/shd9a/>. The following steps were performed to create a processed dataset, and the output from this data curation can be found in the **processed_data** folder online.

- 1) The information presented on the screen to the participant was included as a new column matching each item label from the *formr* worksheets. These labels were added as new columns in English and the language the study was displayed in.
- 2) The answer choice from a participant is included in numeric format (e.g., 1 = *Strongly Agree* to 5 = *Strongly Disagree*), and therefore, we included a new column with the original labels of the answer choice for items that had text labels. These labels are in English, even if the study was presented in a different language.
- 3) We created an overall participant file that has relevant information for participants across the entire study. This data file is described below.

- 4) We separated the data from each of the embedded studies (General Survey, Loss Gain, etc. described above) into independent data files, and these files are described below.
- 5) For the Cognitive Reappraisal study, we added a column that identified the exact items shown to participants. The original labels contain markdown and R code that generated the random order of items for each participant. The label column includes that code but can be difficult to interpret. Therefore, we recreated the order seen by each participant and merged that information into the Cognitive Reappraisal study file only.

Exclusion criteria. Each of the three individual studies used different exclusion criteria for their analyses (see technical validation description below). For the dataset described in this manuscript, no exclusion criteria were employed other than data curation described above. Therefore, the dataset includes all answers from any person that opened the survey, regardless of completion times or missing data.

Data Records

In this section, we describe the contents of the **processed_data** folder created from the data processing steps described above. All data is stored on OSF²¹. The **raw_data** folder contains files in a similar structure, which should be interpretable from the descriptions provided below. The main difference in these files is that the processed data include additional columns to disambiguate the information contained in each row.

Global participant data. The overall participant data consist of one participant information file and two dictionary files that detail the hand-coded processing of a free text response. The participant information file (**participants.csv**) is a comma separated text file that contains overall participant information and can be accessed at <https://osf.io/rjgwh/>. The information for each column of the participant file is found in Supplemental Table 1. The file included the geopolitical region from which the participant indicated they had taken the survey, along with the state (only for U.S. participants). This information was a free text response in the original survey. The **country_dictionary.xlsx** (<https://osf.io/8zv42/>) and **state_dictionary.xlsx** (<https://osf.io/5xbce/>) were used to merge geopolitical information from the overall general survey into this file. These files are in Excel format with two tabs. Each text answer was examined by two individuals and coded into geopolitical region codes and U.S. state names. In cases of disagreement, a third person arbitrated that decision. The first tab of each document includes the final chosen answer, and the second tab includes all coder responses for transparency. Supplemental Tables 2 and 3 include the metadata for each column. Figure 3 demonstrates the geopolitical region data and corresponding sample sizes from this processing.

Individual study data. The data are in long format wherein each line represents a single item that was shown to the participant, including submit buttons, notes, and hidden item information. All four data files have the same format (Supplemental Table 4). The general survey data can be found at <https://osf.io/37uca/> (**general_data.csv.zip**), the Loss-Gain Framing study at <https://osf.io/ctsrk/> (**study1_data.csv.zip**), the Cognitive Reappraisal study at <https://osf.io/bec2f/> (**study2_data.csv.zip**), and the Self-Determination study at <https://osf.io/aqkjh/> (**study3_data.csv.zip**). Each file is in comma separated text format, which was then compressed into a zip archive to fit within space limitations for OSF. As noted in Supplemental Table 4, the Cognitive Reappraisal study has one extra column of data due to the specific randomization involved in the study.

Table 1 includes information about completion rates and demographic measures for each study. The number of participants who started the survey is first reported. Each participant started with the general survey indicating a large portion of the participants generally opened the link to the study and then declined to continue (i.e., 73,223 participants opened the link while only 54,952 started the general survey). The number of participants who completed the last item in each section is also reported. In the next row, we present the number of participants who completed most of the items (>95%) on the survey as a secondary measure of the amount of usable data within each area. Depending on the secondary interest variables, more data may be available for each study. The number of languages and geopolitical regions represented in each study are found next in the table and the overall demographics can be found in Fig. 3. The gender breakdown is provided for each study, and most participants identified as female. Last, we provide information for technical validation described below.

Technical Validation

As participants entered the survey, they were randomized into one of two combinations of studies (Cognitive Reappraisal only or Loss-Gain Framing and Self-Determination combined). Within each of these studies, the experimental group manipulations were randomly assigned. Last, when noted above, study items were randomly ordered. The participants were blind to their conditions within the study. The technical programmers and study lead investigators had knowledge of the study conditions, but these were not known to most of the data collection teams. Samples were recruited from participant pools, paid participant websites, and social media. Research teams had no control over the allocation of participants to conditions. Samples were tracked through an online Shiny app (i.e., an R statistical software that creates online interactive applications²⁴) that displayed the total number of participants, separated by language and condition, to ensure appropriate randomization during the study deployment.

As shown in Table 1, the timing of the study completion may be used to ensure data quality by excluding participants who completed the study too quickly (as defined by a secondary analysis team). Each individual study also included manipulation checks to determine participant attentiveness. In the Loss-Gain Framing study, each participant was asked to indicate which framing message they had seen, and the number of participants indicated in Table 1 represents those who chose the correct answer based on their group assignment.

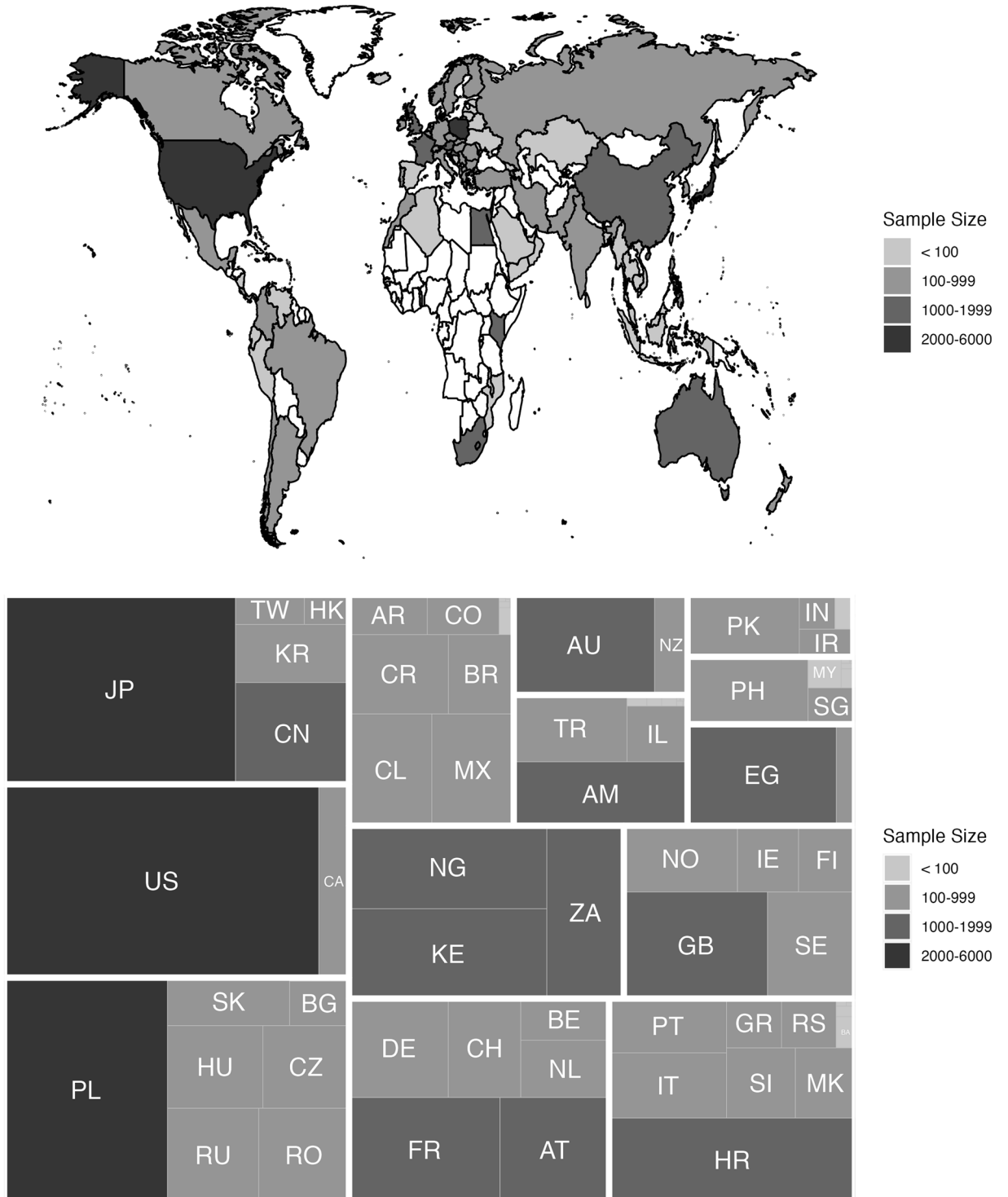


Fig. 3 The top panel includes a map of the countries/geopolitical locations from which data was collected for the PSACR project with corresponding sample size. The bottom panel includes a treemap of sample size by geopolitical region, and these values are grouped by UN subregion: Eastern Europe, Northern America, Eastern Asia, Western Europe, Southern Europe, Sub-Saharan Africa, Northern Europe, Latin American and the Caribbean, Western Asia, Australia and New Zealand, South-Eastern Asia, and Southern Asia (listed here largest to smallest). Cell size depicts relative sample size for each sub-region to the whole sample and within groups relative sample size.

The Cognitive-Reappraisal study had two manipulation check questions: participants had to pick a picture they had not previously seen and had to indicate the instructions they had been given to appraise those pictures. The values in Table 1 represent those who answered both questions correctly.

	General Study	Loss-Gain Framing Study 1	Cognitive Reappraisal Study 2	Self-Determination Study 3
Number Started Survey	54952	17682	27979	20033 ^a
Number Completed Last Item	48434 ^b	16775 ^c	21425	18806
Number Completed Most Items	48182	16799	21447 ^d	18999
Number Languages	44	44	43	44
Number Geopolitical Regions	110	89	89	90
Gender				
Female	30226	10300	13543	11602
Male	17277	6185	7575	6864
Prefer Not to Say/Other	557	187	219	223
Missing	374	103	88	117
<i>M</i> Minutes Completion	7.51	4.19	20.41	6.37
<i>SD</i> Minutes Completion	5.27	4.03	10.71	4.94
Manipulation Check Passed	NA	12049	13859 ^d	NA

Table 1. Completion and Demographic Information. *Note.* All items starting with Number Languages are calculated based on participants who completed the last item in the study. ^aThe published version of this study added a secondary dataset collected by the lead authors. That data is not included in our publication or these sample sizes. ^bWhen more participants complete the last item versus all items, this generally occurred because participants skipped many items or pages of the survey. ^cWhen more participants complete most items versus the last time, this generally occurred when people left the survey early or skipped the last page (either on purpose or because they clicked Continue twice too quickly). ^dThis study used two exclusions: participants had to answer at least one manipulation check item correctly (here, we present the number who answered both correctly), and they had to complete at least 50% of the study items (here, we present people who completed most items).

The Self-Determination study did not use a manipulation check with a “correct” answer, but rather examined if their manipulation changed the responses to questions presented at the end of the study (1 *Strongly Disagree* to 7 *Strongly Agree*). The autonomy group ($M = 4.11$, $SD = 1.70$) rated the instructions as providing more choices than the controlling message group ($M = 3.57$, $SD = 2.01$, $d = 0.29$) and the no message group ($M = 3.75$, $SD = 1.82$, $d = 0.20$), while the controlling message group rated the messages lower than the no message group ($d = 0.10$). A second question asked participants to rate the messages seen as trying to pressure people. The controlling messages group rated the item the highest ($M = 3.30$, $SD = 2.07$) in comparison to the autonomy message group ($M = 2.62$, $SD = 1.91$, $d = 0.34$) and the no message group ($M = 2.88$, $SD = 1.96$, $d = 0.21$). The no message group rated this item as higher than the autonomy group, $d = 0.14$. While these effect sizes are small, they indicate a pattern of responses that support participants’ responding to the manipulations presented for their group.

Code availability

All code can be found at <https://osf.io/gvw56/>.

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