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The effect of spokesperson attribution on public health message sharing during the COVID-19 pandemic

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Abstract

It is urgent to understand how to effectively communicate public health messages during the COVID-19 pandemic. Previous work has focused on how to formulate messages in terms of style and content, rather than on who should send them. In particular, little is known about the impact of spokesperson selection on message propagation during times of crisis. We report on the effectiveness of different public figures at promoting social distancing among 12,194 respondents from six countries that were severely affected by the COVID-19 pandemic at the time of data collection. Across countries and demographic strata, immunology expert Dr. Anthony Fauci achieved the highest level of respondents' willingness to reshare a call to social distancing, followed by a government spokesperson. Celebrity spokespersons were least effective. The likelihood of message resharing increased with age and when respondents expressed positive sentiments towards the spokesperson. These results contribute to the development of evidence-based knowledge regarding the effectiveness of prominent official and non-official public figures in communicating public health messaging in times of crisis. Our findings serve as a reminder that scientific experts and governments should not underestimate their power to inform and persuade in times of crisis and underscore the crucial importance of selecting the most effective messenger in propagating messages of lifesaving information during a pandemic.

Introduction

Overcoming public crises may require collective behavior change [1]. Public policy efforts to combat the coronavirus disease 2019 (COVID-19) pandemic focus on social distancing [2], contact tracing [3], and vaccination, all of which can yield the desired results only if they are adopted rapidly by a substantial fraction of the population and sustained for an extended period of time [4]. In order to achieve broad compliance with such measures, communicating with the affected population in a coordinated, effective, and credible way is a key factor [5], and reaching a large audience beyond the initial recipients of a message is paramount. Hence, understanding the factors that result in the most persuasive communication is critical for

policies on sharing data and materials. The funders had no role in study design, data collection and analysis, decision to publish, or preparation of the manuscript.

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public-health officials, not just because the world is currently in the grip of one pandemic that is likely to be prolonged [4], but also because it is not too early to start thinking about contingencies for the next pandemic [6].

A large body of work has investigated the question of *how* to frame public messages in order to maximize their persuasiveness [7, 8], and identified as key characteristics evidence-based information [9], message style and content features [10], emphasizing the benefit to the recipient [11], and aligning with the recipient's moral values [12] and personality [13]. During the 2003 SARS outbreak, best practices and strategies for crisis communication were developed [14], and clarity of speech, openness, and honesty were identified as the most important positive personal characteristics for official spokespersons, while inappropriate demeanor, lack of honesty, poor emotional control, political bias, and bureaucratic style were considered negative characteristics [15].

Beyond the content of a message alone, *who* communicates the message is one of the most important factors in determining its perlocutionary force [16], and the successful serial distribution of warning messages in crisis situations has been linked to a strong first-order exposure [17]. Celebrities in particular have been shown to exert a strong influence on public opinion at large [18, 19], including opinions about health and well-being [20]. Yet, little is known about their effectiveness during times of crisis. Extant research suggests that during *simulated* crises, government officials garner greater support for intervention and interest in the crisis than celebrities [21], and that the public tends to rally around their government during crises [22, 23]. Overall, whereas the problem of choosing the wording of a message (*How* to formulate the message?) has received ample attention, the problem of choosing a spokesperson (*Who* should send the message in order to maximize its effectiveness?) has been largely understudied, especially in times of crisis.

Our work aims to narrow this gap by quantifying the effectiveness of various public figures as advocates for social distancing during the COVID-19 pandemic. In the design of such a study, we necessarily have to consider its placement within the space of *message effectiveness* and *achieved result*, which both are equally important in reaching and convincing a substantial fraction of the population. Possible considerations for message effectiveness are how effective the message is at convincing a recipient to adopt its content (*adoption effectiveness*), as well as how effective it is at reaching a large audience (*redistribution effectiveness*). In our study, we focus on redistribution effectiveness, which we consider a necessary precursor for persuasion on a societal scale, since even the most convincing message has little effect without sufficient distribution. With regard to the achieved result, one may consider the respondents' stated intent on the one hand (*intent to reshare content*), and subsequently observed action on the other (*content resharing*). In our study, we investigate the effectiveness of spokesperson selection on the stated intent to reshare a received public health message as a proxy for actual resharing, since intent has been linked to tangible behavior in comparable settings [24].

We examined the spokesperson effect on the stated intent to reshare across six countries in which the transmission of COVID-19 was rapidly intensifying at the time of research (Brazil, Italy, South Korea, Spain, Switzerland, United States) and across age groups, given evidence for age-related effects on social distancing compliance and risk perception [1, 25]. In addition to the identity of the spokesperson, we also investigated the effect of their likeability, since prior research has demonstrated that likeability moderates the impact of persuasive messages [26]. There is also evidence showing that an individual may perceive the argument as better or stronger and therefore as more persuasive if they like the source of the message, which may indicate a "likeability" heuristic [27]. We leveraged a survey that, at the surface, aimed to gauge respondents' perception of the pandemic and their level of compliance with, as well as support for, social distancing measures. The survey was designed as a randomized controlled trial by

stating that social distancing had been endorsed, among others, by a certain public figure, who thus served as a spokesperson for social distancing. When a respondent opened the survey, the identity of the spokesperson was drawn randomly from a set of four candidates (see *Materials and methods* for details on the survey and the choice of spokespersons): an immunology expert (Dr. Anthony Fauci), two widely known celebrities (actor Tom Hanks and media personality Kim Kardashian), and an elected government official, who was specific to the respondent's country (where possible, we used the head of government if they had previously officially endorsed social distancing). Additionally, there was a control condition where social distancing was introduced without mentioning any spokesperson's endorsement. As the outcome variable, we used the respondent's stated willingness to share the spokesperson's endorsement of social distancing on their own social media (henceforth, "message sharing"). The survey was conducted between March 24 and 30, 2020, with participants recruited mainly via social media ads targeting specific demographic groups (N = 12,194), as detailed in the following.

Materials and methods

Respondents

Data were obtained from 12,575 respondents from six countries in which the transmission of COVID-19 was rapidly intensifying at the time of research: Brazil, Italy, South Korea, Spain, Switzerland, and the United States. We detail selection criteria for respondents under *Data preparation*. The final sample consisted of 12,194 respondents (7,316 females, mean age 37.04 (SD 14.80), range 18–80). S1 Table in S1 File provides characteristics and summary data of the survey overall and by country.

Respondents were mainly recruited through a stratified advertisement campaign on Facebook between March 24 and 30, 2020. The ad consisted of a rendered image of the virus, the sentence "Help us understand how COVID-19 is affecting people's lives in a 3-minute survey", and a link that redirected to one of the five spokesperson-specific survey forms (see SD Appendix in S1 File). Participation in the survey was voluntary and not remunerated. The advertisement budget ($3000) was split evenly across the six countries, targeting residents in their native language. Within each targeted country, the campaign was evenly subdivided across eight strata (male/female, as well as the age groups 18–25, 26–40, 41–60, and 61+) and the five spokesperson conditions. Click-through optimization was used as the campaign goal. Parallel to the advertisement campaign, a multilingual website, which redirected visitors to the survey form for a randomly selected spokesperson in a chosen language, was made available and publicized at EPFL and on Twitter.

Sample representativeness

Since participants were primarily recruited through an advertisement campaign on Facebook, our sample may be subject to sampling bias, as is typically the case for online surveys. To mitigate potential sampling bias effects, we stratified the advertisement campaign by age, gender, and geographic location, and respondents were not remunerated for their participation, as described under *Respondents*. As can be seen from S1 Fig in S1 File, our sample was overrepresented in respondents who are female (60%), young (48.6%), employed/self-employed (59.7%), highly educated (over 14 years of education, 58.5%), and non-urban (living in a village, small town, or town, 61.9%).

Survey design

The study was designed as a randomized controlled trial in which data were collected through an online survey form. Assignment to trial conditions occurred algorithmically and uniformly

at random, and we were blinded to this assignment. For the full content of the English version of the survey, see SA Appendix in S1 File. For each country, the English survey form was translated to the official language(s) by a native speaker. The main outcome measure of the study was the respondents' intention of sharing a message that recommended the practice of social distancing, which we adapted from the definition by Johns Hopkins Medicine [28]. After being shown this message, respondents were asked how likely they were to share this message on their own social media (Q3). The design of the survey was identical for all respondents, with the exception of (i) mentions of the country and government, which were adapted to the respondent's country of residence, and (ii) the identity of the spokesperson shown to support the social distancing message. Spokesperson support was included immediately after the message about social distancing and consisted of a picture of the spokesperson and a statement reading, "Social distancing has been publicly supported, among others, by *[job description and name of the spokesperson]*". Respondents were randomly assigned one of four possible spokespersons or a No Speaker condition, in which the statement was not supported by a spokesperson (assignments to one of the five groups were implemented as A/B tests on Facebook Ads, to ensure that participants only ever saw one survey form). Respondents in one of the four groups that included a spokesperson were also asked whether they liked, disliked, were neutral toward, or did not know the spokesperson (Q10).

The four spokespersons were selected to respectively represent (i) a source of official government instructions on social distancing, (ii) a well-known medical expert with a background related to the outbreak, or an unofficial endorsement by an unaffiliated celebrity that had either (iii) contracted COVID-19 or (iv) been personally unaffected. To avoid spreading misinformation at such a crucial time, we ensured that all spokespersons had previously issued public support of social distancing (see SB Appendix in S1 File). As the government spokesperson, we selected the head of state when we could verify, at the time of the survey, their support of social distancing: Donald Trump (United States), Simonetta Sommaruga (Switzerland), Giuseppe Conte (Italy), Pedro Sánchez (Spain), and Moon Jae-in (South Korea). We were unable to find any evidence of support by the President of Brazil, Jair Bolsonaro, and instead used Luiz Henrique Mandetta, the Minister of Health at the time of research, as the spokesperson. As a medical expert spokesperson, we used Dr. Anthony Fauci, due to his expertise in immunology and infectious diseases and his prominent position in the U.S. (and the highest likelihood of being known worldwide). As celebrity speakers, we selected Tom Hanks (who had contracted COVID-19 prior to the survey and attracted media attention for his endorsement of social distancing) and Kim Kardashian (who had been highly outspoken about social distancing). Both are well-known across age groups and to an international audience, which made them likely to be known by respondents in all six countries, for which we found the selection of comparable local celebrities infeasible. In the selection of images for spokespersons, we ensured that images were of the same high quality, showed no other persons, no confusing or overly colorful background, no national symbols or flags in the background, and that the spokespersons were facing the camera with a neutral facial expression.

To establish a baseline of respondents' views and attitudes, the survey also elicited responses to determine the extent to which respondents were aware of, and showed support for, social distancing (Q4, Q5, and Q6), currently practiced social distancing (Q7), intended to practice social distancing in the future (Q9), and the degree to which they perceived others practicing social distancing (Q8). Furthermore, we elicited participants' worry about the current situation as a whole (Q1) and for the well-being of their fellow citizens (Q12), as well as the perceived spread of the pandemic in their community (Q11). In addition, the following demographic and attitudinal variables were collected: age (Q18), gender (Q17), employment status (Q20), years of education (Q19), household size (Q23), settlement size (village, small town, town, city,

metropolitan area; Q22), general subjective health (Q13), religiosity (Q24), perceived freedom of movement (Q14), satisfaction with their government's efforts to combat COVID-19 (Q15), and perception of their government's concern for public health versus the economy (Q16).

Study in context

The survey was administered during the period of March 24–30, 2020, two weeks after COVID-19 had been declared a pandemic by the WHO on March 11 [29]. From February 22, when Italy first established quarantine zones around twelve severely affected regions in Lombardy, a number of social and physical distancing measures were progressively introduced by the countries in our study (see Fig 1; SC Appendix in S1 File). Advice to keep physical distance at all times and to self-isolate at home when suffering from respiratory problems that could be linked to the virus had been formally issued by the national governments of all six countries at least a few days prior to the start of the survey. With the exception of Brazil, public gatherings had been banned or discouraged in all countries by issuing stay-at-home orders or lockdowns. More drastic measures, including the mandated cancelation of public events and the closure of non-essential businesses (in Italy, Spain, and Switzerland), as well as the closure of schools and universities (also implemented in South Korea in addition to the former three), were enforced only by some of the countries on a national level. In the remaining countries, these measures had also been used by the start of our survey period, but only on a local or state level and without support of the national or federal government. The government-mandated shutdown of non-essential businesses in Spain is the only measure for which the announcement coincided with our survey period. The closure of some or all international borders to non-residents was implemented by all countries with the exception of South Korea, which instead enforced strict quarantine and testing protocols upon arrival. Quarantine zones were only implemented in Italy during the early phase of the outbreak and effectively overridden by the country-wide lockdown on March 9.

Ethical compliance

This research is part of a larger project for which ethical approval has been obtained from the EPFL Human Research Ethics Committee. All survey participants were informed that their

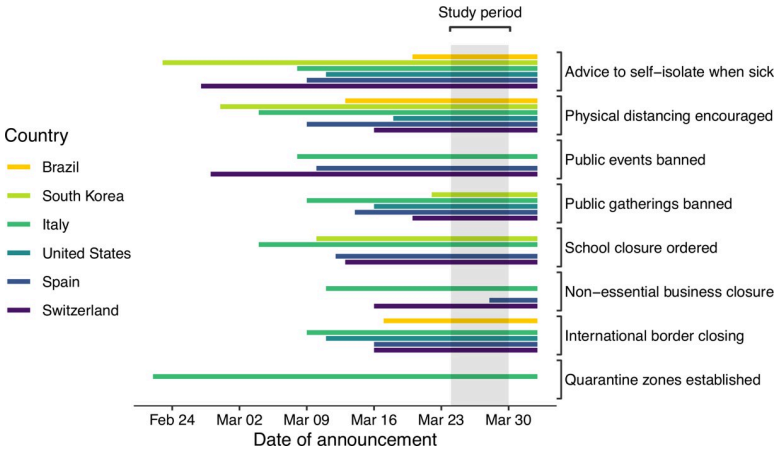

Fig 1. Temporal context of the study. Shown are the dates at which key social distancing measures were announced on a national level by countries in the study. The time frame of data collection (March 24–30, 2020) is highlighted in gray. Empty bars indicate that no action was announced or taken by the national government (for comparability between federal states and unitary states, we only considered announcements by the federal government in federated countries, even though there may have been actions on a local, city, or state level). For a detailed list of these government announcements, see SC Appendix in S1 File.

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responses would be used as part of a research project prior to the submission of the survey, and the submission was regarded as consent.

Data and materials availability

The full data that were generated and analyzed during the study, as well as the computer code that was generated for the study, are available on Github at https://github.com/epfl-dlab/SpokespersonAttributionCOVID.

Data preparation

We intended to collect data from adults between age 18 and 80 to maximize data reliability, which is recommended for online surveys [30]. We therefore excluded 326 respondents whose reported age fell outside this range (Age < 18, $N = 296$; Age > 80, $N = 30$). We also excluded 55 respondents who specified "Other" as their gender. In addition, 118 "household size" entries that equaled zero or had a value greater than 15 were considered invalid, but not removed. The values were imputed with the mean of the valid data entries. In total, we excluded 381 outliers out of 12,575 data points. No participants dropped out of the study, and the analyses were based on the remaining 12,194 respondents.

Age distribution and clustering

Due to the non-unimodal structure of the age distribution of our sample (Hartigans' dip test (D_{5000}) = 0.026, $p < 2.2\text{x}10^{-16}$), we performed a 2-step cluster analysis, using Schwarz' Bayesian criterion, to identify potential subgroups. A 3-cluster solution (see S2 Fig in S1 File) was deemed optimal with a silhouette score of 0.7 (a measure of "cohesion and separation" of clusters), suggesting a good cluster structure [31]. The three age groups were characterized as young ($N = 5931$, range 18–32 years), mid-age ($N = 3618$, range 33–50 years) and old ($N = 2645$, range = 51–80 years). S2 Table in S1 File provides age and gender distributions of the three age groups by country and in the overall sample.

Statistical analyses

First, we measured Spearman's correlation between the study's variables, with Bonferroni correction. The main analyses were performed using *Generalized linear mixed models with robust estimations in SPSS 25*. In a linear regression, we examined the main effect of spokesperson, age group, and country, the 2-way interactions of spokesperson × country and spokesperson × age group, and the 3-way interaction of spokesperson × country × age group on message sharing. The model was fitted while controlling for the following demographic and attitudinal measures by adding them as regression terms: age, gender, employment status, years of education, household size, settlement size, subjective health, perceived fraction of population infected by coronavirus, level of concern about COVID-19, concern for the well-being of others, perception of others' practice of social distancing, religiosity, liberty of movement, satisfaction with government efforts to combat COVID-19, and perception of the government's concern for public health versus the economy. In addition, we controlled for the number of social distancing measures they endorsed (from a list of nine measures, see Q6 in SA Appendix in S1 File), the extent to which respondents supported social distancing, currently practiced social distancing, and intended to practice social distancing in the future. We control for these various attitudinal and demographic variables because studies that investigated responses during the early stages of this pandemic as well as prior pandemics have shown that compliance can be affected by a number of important demographic (e.g., age, gender), attitudinal (e.g.,

perceived health status, attitudes towards public health and government officials) [5, 32], and psychological factors such as risk perception and concern for others [32–34]. While randomization is likely to reduce the impact of controlling for these variables, any randomized control trial with finite size will suffer from some degree of imbalance in residual covariance, and so we follow standard practice and account for this fact by controlling for these attitudinal and demographic variables. We cannot rule out self-selection as a result of the treatment step (participants may be more likely to submit the surveys for some spokespersons than for others).

In addition, to examine if the above effects on message sharing varied by the respondents' sentiments towards the spokespersons (namely, towards Fauci, Government, Hanks and Kardashian), we repeated the same analysis by adding the likeability factor and examined the main effect of spokesperson, country, and likeability, the 2-way interactions of spokesperson × country, country × likeability, spokesperson × likeability, and the 3-way interaction of spokesperson × country × likeability. For this analysis, the outcome measure was the standardized residual of the message sharing scores, adjusted for all demographic and attitudinal measures mentioned above. Moreover, in a separate linear regression, we also computed the standardized residual of the message sharing scores under the no-spokesperson condition, by partialing out all demographic and attitudinal measures mentioned above. This was performed in order to be able to compare the relative effect of the four spokespersons, under the different likeability categories, to the no-spokesperson condition, for which a likeability could not be elicited (see Fig 6A).

All pairwise comparisons were subjected to sequential Bonferroni correction. For the correlation matrix (Fig 2), we applied the more conservative Bonferroni correction. Effect sizes are reported in terms of Cohen's d (in absolute values) and partial eta squared (η_p^2).

Results

First, to estimate if the self-reported declaration of willingness to share the message (henceforth referred to as message sharing) was associated with demographic and attitudinal measures, we calculated bivariate correlations. Spearman's correlations revealed that message sharing was significantly associated with a number of demographic and attitudinal measures (Fig 2, all $p < 3.3\text{x}10^{-4}$, Bonferroni-corrected for multiple testing). Specifically, message sharing was positively associated with support for social distancing ($r = 0.24$), current practice of social distancing ($r = 0.10$), the intention to practice social distancing in the future ($r = 0.18$), and the total number of endorsed social distancing measures ($r = 0.15$) (see also S3 Fig in S1 File, which examines in more detail the pattern of endorsement of nine social distancing measures [see Q6 in SA Appendix in S1 File] by spokesperson and country). It was also positively associated with age ($r = 0.13$), concern for the situation ($r = 0.33$), concern for others ($r = 0.32$), settlement size ($r = 0.09$), and religiosity ($r = 0.23$). It was negatively correlated with the perception that others are practicing social distancing ($r = -0.07$), greater freedom of movement ($r = -0.06$), better subjective health ($r = -0.04$), and the perception that the government prioritizes public health over the economy ($r = -0.10$).

Subsequently, using generalized linear mixed models (GLMMs), we performed linear regression to test if the likelihood of message sharing varies by spokesperson, and whether this variation might be dependent on the respondents' country and age (parametrized in terms of three statistically derived age groups, see S2 Fig and S2 Table in S1 File). These effects were tested in a single model while controlling for all other demographic and attitudinal measures (see *Materials and methods*). Our analysis revealed significant main effects for spokesperson ($p < 0.001$, $d = 0.45$), country ($p < 0.001$, $d = 0.48$), and age group ($p < 0.001$, $d = 0.14$) on message sharing (Fig 3A and 3B). S3 and S4 Tables in S1 File provide model details and all pairwise comparisons and effect sizes.

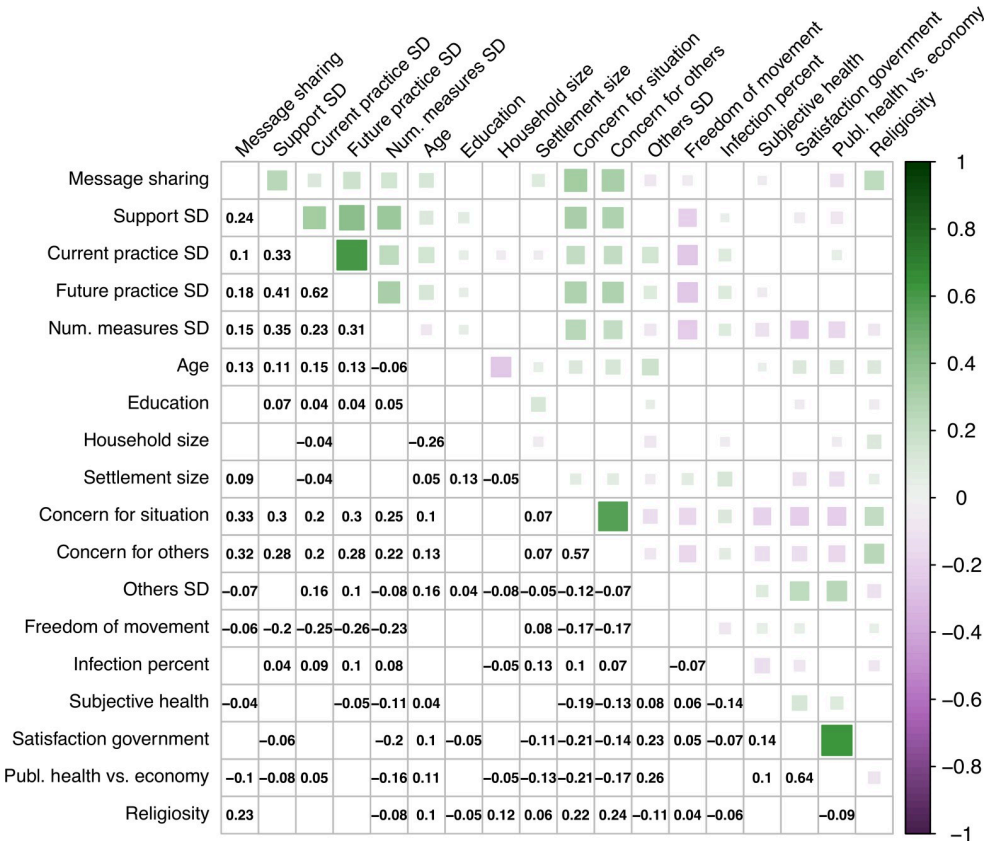

Fig 2. Correlation matrix of all study variables. Significance threshold is Bonferroni-corrected, $p < 3.3\text{x}10^{-4}$. Empty cell = non-significant correlation; SD = Social distancing; Num. = Number.

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Out of all spokesperson conditions, Fauci had the greatest effect on message sharing (Fig 3A and 3B). Specifically, on the 7-point Likert scale, Fauci's effect was on average greater (all $p < 0.05$) by 0.28 points relative to the no-spokesperson condition (95% CI = [0.10, 0.47],

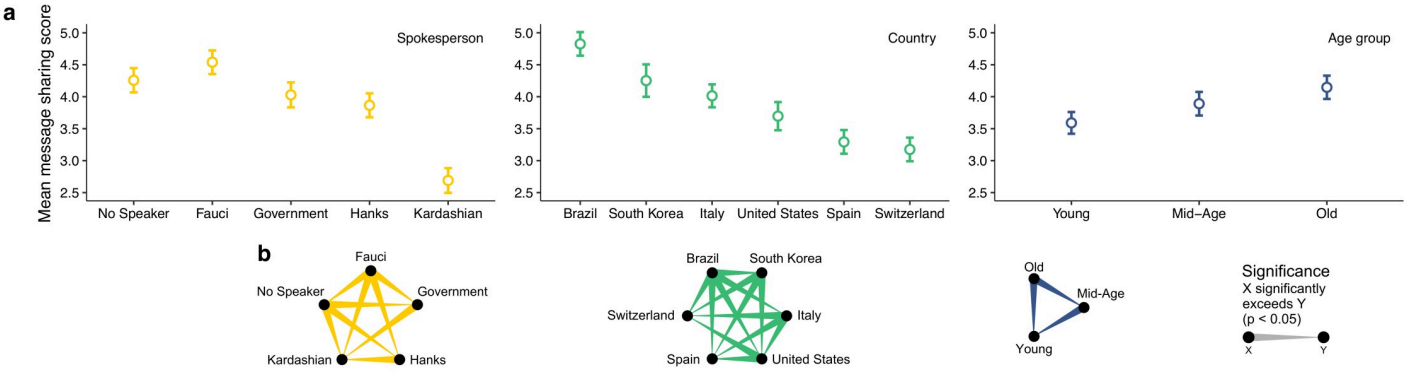

Fig 3. Main effects of spokesperson, country and age group on message sharing. (a) Message sharing score on a 1–7 Likert scale. Error bars represent 95% CIs. **(b)** Corresponding, color-coded significant pairwise comparisons, accounting for multiple comparisons via sequential Bonferroni correction. Only significant comparisons are shown. The results show that the medical spokesperson Dr. Fauci achieved the highest level of respondents' willingness to reshare a call to social distancing, whereas celebrity spokesperson Kim Kardashian was least effective. Celebrity spokesperson Tom Hanks, the Government, and the no-spokesperson conditions took a middle ground. The likelihood of message resharing increased with age and when respondents expressed positive sentiments towards the spokesperson.

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Cohen's $d = 0.07$ standard deviations), by 0.51 points relative to the elected government official (95% CI = [0.30, 0.72], $d = 0.12$), by 0.67 points relative to Hanks (95% CI = [0.46, 0.89], $d = 0.17$), and by 1.85 points relative to Kardashian (95% CI = [1.63, 2.07], $d = 0.45$). Moreover, message sharing of respondents in the no-spokesperson condition was significantly higher (all $p < 0.05$) than those in the Government (mean difference [MD] = 0.23 points, 95% CI = [0.04, 0.42], $d = 0.05$), Hanks (MD = 0.39 points, 95% CI = [0.19, 0.59], $d = 0.10$), and Kardashian (MD = 1.57 points, 95% CI = [1.34, 1.80], $d = 0.38$) conditions. Message sharing of respondents in the Government condition was on par with those in the Hanks condition (MD = 0.16 points, 95% CI = [-0.003, 0.33], $d = 0.04$, $p > 0.05$), but was significantly higher than those in the Kardashian condition by 1.34 points (95% CI = [1.34, 1.80], $d = 0.31$, $p < 0.05$). Finally, message sharing in the Hanks condition was higher than in the Kardashian condition by 1.18 points (95% CI = [0.96, 1.39], $d = 0.28$, $p < 0.05$). Taken together, these results show that Dr. Fauci achieved the highest level of the respondents' willingness to reshare a call to social distancing, the celebrity spokesperson Kim Kardashian achieved the lowest level, and the elected government official, the celebrity spokesperson Tom Hanks, and the no-spokesperson condition took a middle ground.

Among all countries, Brazil had the highest likelihood of message sharing (Fig 3A and 3B), ranging from 0.10 standard deviations above South Korea to 0.40 standard deviations above Switzerland (all $p < 0.05$). As for age (Fig 3A and 3B), older respondents significantly indicated a higher likelihood of message sharing (all $p < 0.05$): old > young ($d = 0.14$); old > mid-age ($d = 0.06$); and mid-age > young ($d = 0.08$).

The spokesperson effect on message sharing was moderated by country ($p < 0.001$, $d = 0.26$, Fig 4A and 4B). The government official was most effective in Brazil ($M = 5.31$,

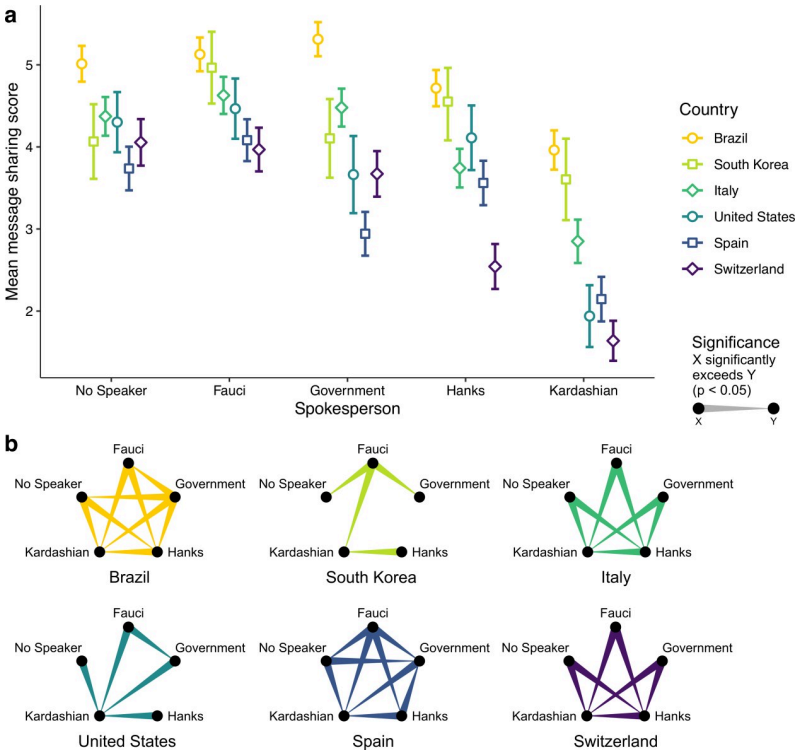

Fig 4. Country-by-spokesperson interaction on message sharing. (a) Message sharing score on a 1–7 Likert scale. Error bars represent 95% CIs. **(b)** Corresponding, color-coded significant pairwise comparisons, accounting for multiple comparisons via sequential Bonferroni correction. Only significant comparisons are shown.

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SE = 0.11, 95% CI = [5.11, 5.52]) and least effective in Spain (M = 2.94, SE = 0.14, 95% CI = [2.68, 3.21]). Fauci was significantly more effective than the elected government official in South Korea (d = 0.05), Spain (d = 0.14), and the United States (d = 0.14), and on par with the government in Italy and Switzerland. Celebrities were generally least effective. S5 Table in S1 File provides all pairwise comparisons and effect sizes, and S4 Fig in S1 File shows the frequency plots of message sharing by country and spokesperson.

In addition, the effect of the spokesperson condition on message sharing was moderated by age group ($p < 0.001$, d = 0.11, Fig 5A and 5B). Fauci was significantly more effective than all other spokespersons across all age groups (d between 0.06 and 0.26), and on par with the no-spokesperson condition among the mid- and old-age groups. S6 Table in S1 File provides all pairwise comparison results and effect sizes, and S5 Fig in S1 File shows the frequency plots of message sharing by spokesperson and age group.

Finally, the 3-way interaction of spokesperson, country, and age group on message sharing, although significant ($p < 0.001$, d = 0.18), did not reveal important deviations from the observations made from the 2-way interactions described above. S6 Fig in S1 File visualizes the 3-way interaction, S7 Table in S1 File provides all pairwise comparison results and effect sizes, and S7 Fig in S1 File shows the frequency plots of message sharing by country and age group.

Evidence suggests that celebrities who are viewed favorably consistently have positive effects on people's opinions, attitudes, and behaviors [18, 19]. Thus, in a separate GLMM, we estimated in a linear regression the extent to which respondents' sentiment towards the spokesperson affected the likelihood of message sharing. Being liked boosted the effect on message sharing for all spokespersons ($p < 0.05$, d = 0.07, S8 Table in S1 File), and particularly for social media personality Kardashian (Fig 6A and 6B). All effects among respondents who liked the spokespersons were significantly higher than the effect of the no-spokesperson condition (note the non-overlapping confidence intervals, Fig 6A). Notably, Fauci retained his status as the most influential spokesperson on message sharing across all likeability levels, namely among those who expressed positive (d = 0.06 to d = 0.20), neutral (d = 0.08 to d = 0.36), and even

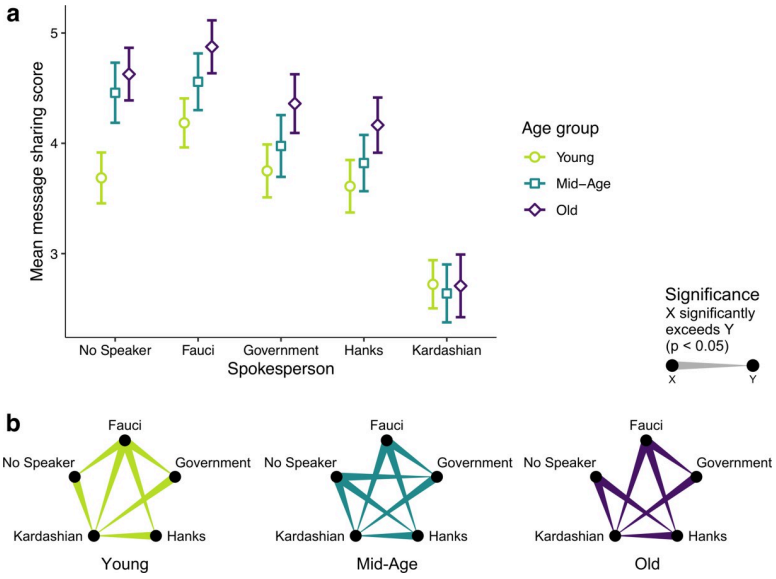

Fig 5. Spokesperson-by-age-group interaction on message sharing. (a) Message sharing score on a 1–7 Likert scale. Error bars represent 95% CIs. **(b)** Corresponding, color-coded significant pairwise comparisons, accounting for multiple comparisons via sequential Bonferroni correction. Only significant comparisons are shown.

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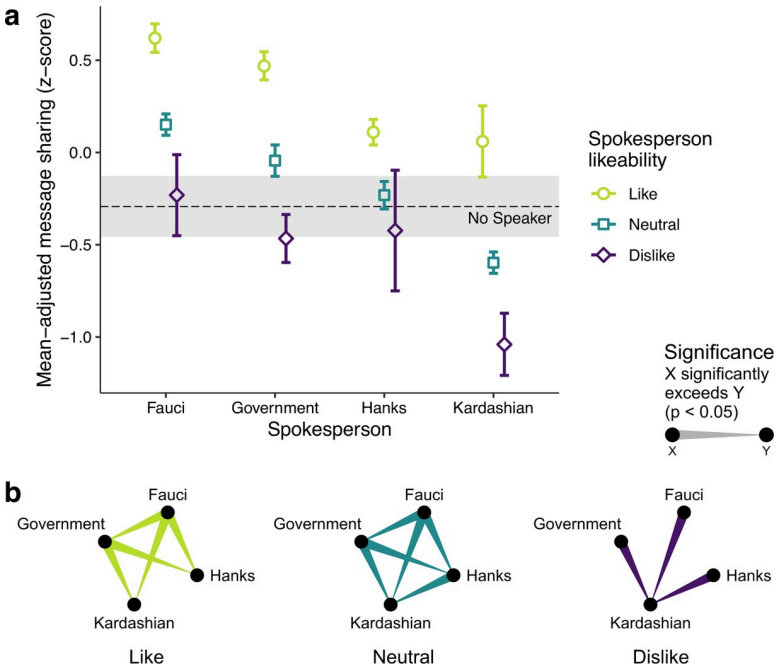

Fig 6. Spokesperson-by-likeability interaction on message sharing. (a) Message sharing score as the standardized residual of the message sharing scores (on a 1–7 Likert scale), adjusted for all demographic and attitudinal measures (see *Materials and methods*: *Statistical analyses*). Error bars represent 95% CIs. The dashed black line (95% CI, gray band) represents the effect for the no-spokesperson condition, for which a likeability could not be elicited. **(b)** Corresponding, color-coded significant pairwise comparisons, accounting for multiple comparisons via sequential Bonferroni correction. Only significant comparisons are shown.

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negative ($d = 0.02$ to $d = 0.12$) sentiments towards the spokespersons, although for the latter his effect was only significantly greater than for Kardashian. S9 Table in S1 File provides the pairwise comparisons and effect sizes for the interaction of spokesperson and likeability. The effect of likeability was evident for respondents in all countries ($p < 0.001$, $d = 0.13$, S8 Fig and S8, S10 Tables in S1 File).

Discussion

Overall, the results revealed large differences between the four spokespersons in terms of their effectiveness as advocates for social distancing. Considering that, in the context of a pandemic, even small effects can translate into saving many lives [35], this constitutes a consequential result. Across demographic strata, the immunology expert Dr. Anthony Fauci achieved the highest level of willingness to reshare a call to social distancing, followed by the elected government official and celebrity actor Tom Hanks. Media personality Kim Kardashian was by far the least effective spokesperson for social distancing, across age groups and countries. Remarkably, while the magnitude of the effect increased for all spokespersons among respondents who expressed favorable sentiments towards them, their relative effect on message sharing was retained (expert > government > celebrities) and persisted across national and cultural boundaries.

Thus, empowering experts during the pandemic could not be more important, particularly when misinformation by high-profile figures can have fatal consequences during the pandemic [36], and especially in its early stages [37]. Even in the presence of a preventive vaccine and effective treatment, efforts to mitigate the outbreak will necessarily continue to rely on abiding

by social and physical distancing rules, which may need to be sustained as late as 2022 [4]. Consequently, enlisting and supporting the most effective spokespersons for public health messaging will be critical in slowing transmission and mobilizing large-scale social distancing interventions. This was recognized as a key factor in the handling of the 2003 SARS outbreak in Toronto [5] and the 2009 H1N1 influenza pandemic [38]. In order to counter misinformation and the undermining of expert advice [36, 37], expert impact can be bolstered if sanctioned by governments, and similarly governments can increase their effectiveness by basing their decisions on the most up-to-date scientific advice and evidence, particularly when decisions need to be made under the uncertain conditions of a pandemic [38].

The results of this study should be considered in the light of its limitations. For example, our study did not measure actual message sharing, but respondents' stated willingness to do so. Evidence suggests, however, that self-reports of intended behavior during the COVID-19 pandemic do in fact reflect real behavior [39] and self-reported intent to share content on social media has been linked to subsequent sharing behavior [24]. Moreover, we tested the effectiveness of four spokespersons only. Future research should extend the study to other spokespersons from different social spheres, such as leaders within the faith sector. Indeed, our data show that religiosity is one of the highest correlates of message sharing ($r = 0.23$, $p = 3.21\text{x}10^{-146}$, Fig 2), and research shows that enlisting religious leaders during the West African Ebola crisis proved critical in slowing transmission through the revision of safe burial practices [40]. Given the sudden, worldwide spread of COVID-19 outside of China in March 2020, one might also argue that Dr. Fauci simply filled a vacuum of trust at the time of the study. While this is almost certainly the case (for some demographics) in the United States, he is by no means an uncontroversial figure. It is also questionable if his rise to prominence can be considered a global phenomenon, yet our findings are consistent across all countries in our study, including those with notably different cultural background, in which Dr. Fauci is likely to be considered "just" an expert (with the possible exception of Brazil, where the minister of health filled a similar opposition role to the government as Dr. Fauci did in the United States). We emphasize that, although the present results clearly show Fauci's prominent role, they do not allow us to draw conclusions regarding the underlying causal mechanisms. To elucidate what specific properties (being a proven expert, holding an MD, being old, being visible on TV, etc.) make some spokespersons more effective than others, future work should repeat our study with a range of nearly-identical, fabricated personas that differ only in carefully selected demographic and biographic attributes.

We also observed a heterogeneous spokesperson effect on message sharing across different segments of the population (Fig 5A). This suggests that multiple spokespersons might be needed to achieve equal effects across the population, a strategy that is also supported by research on social contagion, which suggests that message resharing is likely to increase if encouraged by multiple non-overlapping social circles [41]. Similarly, it is important to remember that the observed effects are merely the result of a single message. The effect of multiple messages from a single spokesperson would be intriguing for future research to explore. With regard to spokesperson likeability, it is worth noting that we elicited spokesperson likeability after the treatment and thus cannot rule out any effects that this stimulus may have had on the likeability ratings. Furthermore, it is conceivable that the spokesperson identity may have influenced participants' decisions to complete the survey or refrain from submitting it. Future studies could address this reverse effect of the stimulus on spokesperson likeability. Such an effect may be further compounded by partisan bias, which has, for example, shaped the reception of, and adherence to, health measures in the United States [42], indicating that the respondent's ideology may play a role in the effectiveness of a spokesperson to successfully deliver the message. Furthermore, it seems likely that the success of promoting specific

message content (e.g., social distancing, vaccination, or the use of a tracing app, for example) may differ for different spokespersons. Finally, as our findings cannot yet speak to long-term effects, future research should replicate these results at different stages of the pandemic to determine if different spokespersons are most effective at different stages of the pandemic.

Our study contributes to the development of evidence-based knowledge regarding the effectiveness of prominent official and non-official public figures in communicating public health messaging during the COVD-19 pandemic. The findings presented here can help governments shape effective strategies for communicating behaviors aimed at mitigating the COVID-19 pandemic, including prospective challenges associated with vaccination and proximity-tracing compliance. Numerous celebrities are advocating for social distancing and, maybe partly in response to a general decline in experts' credibility as perceived by the public [43], governments have started to enlist celebrities as spokespersons [44]. While it is possible that celebrities can bring heightened awareness to health issues [20], especially among their fan base (Fig 6A), this awareness may not be associated with heightened public understanding of related risks and treatment [45]. Our findings thus serve as a reminder to governments and experts not to underestimate their own power to inform and persuade.

Supporting information

S1 File.
(PDF)

Acknowledgments

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Supplementary Materials for

The Effect of Spokesperson Attribution on Public Health Message Sharing During the COVID-19 Pandemic

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This PDF file includes:

Other Supplementary Materials for this manuscript include the following:

Supplementary Text

Table S1. Sample characteristics for the overall sample and by Country[1] (N = 12,194)

Variable	Overall	BR	CH	ES	IT	KR	US
Age[2]	37.04 (14.80)	37.7 (14.66)	38.54 (14.53)	36.4 (14.65)	44.97 (17.08)	41.19 (17.40)	34.98 (13.84)
Gender							
Female	7316	2587	899	1320	1841	246	423
Male	4878	1755	766	812	1080	229	236
Employment							
Student	1807	455	359	289	578	68	58
Employed	5547	1920	983	977	1181	147	339
Self-employed	1731	975	105	173	333	96	49
Unemployed	2180	738	82	519	641	98	102
Retired	929	254	136	174	188	66	111
Education years							
No schooling	235	93	5	44	17	33	43
1-6 years	369	131	42	66	37	14	79
7-13 years	2670	862	322	360	879	95	152
14-16 years	3442	1166	468	552	903	151	202
17-18 years	2269	834	357	388	549	55	86
Over 18 years	3209	1256	471	722	536	127	97
Settlement Size							
Village	1601	178	425	366	540	17	75
Small Town	2592	598	505	487	812	31	159
Town	3348	1224	330	579	955	66	194
City	2812	1260	377	489	397	132	157
Metropolitan	1841	1082	28	211	217	229	74
Household Size[2]	3.14 (1.42)	3.37 (1.54)	2.82 (1.41)	3.05 (1.23)	3.11 (1.30)	2.94 (1.24)	3.08 (1.67)
Likelihood of Message Sharing[1]	4.42 (2.40)	5.28 (2.17)	3.17 (2.27)	3.82 (2.41)	4.31 (2.32)	4.45 (2.32)	4.28 (2.45)
Support of S/PD[2,3]	6.37 (1.21)	6.33 (1.28)	6.58 (0.90)	6.60 (0.97)	6.16 (1.34)	5.96 (1.43)	6.55 (1.04)
Current Practice of S/PD measures[2,3]	6.24 (1.10)	5.94 (1.27)	6.29 (0.93)	6.50 (0.89)	6.54 (0.84)	5.79 (1.29)	6.19 (1.09)
Intention to practice S/PD in the future[2,3]	6.13 (1.24)	5.84 (1.48)	6.20 (0.98)	6.50 (0.90)	6.30 (1.08)	5.67 (1.42)	6.25 (1.10)
Number of supported S/PD[1,2] measures	6.70 (2.37)	6.50 (2.49)	6.61 (1.86)	7.55 (2.05)	6.60 (2.45)	4.82 (2.19)	7.23 (2.18)
Concern Situation[2]	5.81 (1.45)	6.04 (1.44)	4.93 (1.45)	6.06 (1.27)	5.80 (1.35)	5.67 (1.62)	5.89 (1.43)
Concern Others[2]	6.14 (1.28)	6.41 (1.15)	5.49 (1.35)	6.37 (1.09)	5.99 (1.35)	5.68 (1.49)	6.28 (1.20)
Others' Practice S/PD[2,3]	4.12 (1.27)	3.72 (1.29)	4.63 (1.02)	4.41 (1.22)	4.30 (1.17)	4.28 (1.36)	3.67 (1.29)
Liberty of Movement[2]	1.85 (1.58)	2.09 (1.74)	1.90 (1.39)	1.49 (1.38)	1.33 (1.05)	3.14 (1.84)	2.73 (2.01)
Satisfaction from Government[2]	3.84 (2.06)	3.37 (2.09)	4.73 (1.71)	3.20 (2.01)	4.52 (1.78)	4.68 (2.22)	3.22 (2.03)
Government prioritizes Public Health over Economy[2]	3.36 (2.08)	2.37 (1.83)	4.19 (1.80)	3.30 (2.09)	4.32 (1.85)	4.32 (2.11)	3.08 (2.00)
Religiosity[2]	3.79 (2.36)	5.04 (2.20)	2.49 (1.91)	2.74 (2.04)	3.39 (2.14)	3.70 (2.32)	4.10 (2.36)

Variable	Overall	BR	CH	ES	IT	KR	US
General Health							
Very bad	132	51	7	27	37	1	9
Bad	733	211	66	235	144	23	54
Average	3235	1055	266	779	798	156	181
Good	4972	1912	751	681	1220	169	239
Very good	3122	1113	575	410	722	126	176
Infection %							
0-9%	5576	2510	635	781	1064	310	276
10-19%	2125	702	399	374	450	68	132
20-29%	1336	377	242	281	313	34	89
30-39%	1082	301	162	224	310	21	64
40-49%	621	175	80	129	193	14	30
50-59%	529	116	86	107	178	8	34
60-69%	369	65	29	102	165	2	6
70-79%	292	52	25	67	125	7	16
80-89%	170	31	2	44	78	8	7
90-100%	94	13	5	23	45	3	5
Awareness of S/PD							
Yes	11872	4310	1624	2089	2735	463	651
No	322	32	41	43	186	12	8
Attitude to speaker							
No Speaker[4]	2401	844	319	415	562	118	143
Government (*N*=2,612)							
Like	1010	364	147	68	346	40	45
Neutral	1157	373	196	181	226	35	46
Dislike	445	41	22	203	106	25	48
Fauci (*N* = 2293)							
Like	371	158	40	56	56	4	57
Neutral	1912	622	296	362	494	76	62
Dislike	10	7	0	1	2	0	0
Hanks (*N*=2535)							
Like	1173	495	134	152	275	31	86
Neutral	1332	467	184	262	310	66	43
Dislike	30	10	5	7	5	1	2
Kim (*N*= 2,353)							
Like	162	93	8	20	30	3	8
Neutral	1947	733	243	339	479	72	81
Dislike	244	35	71	66	30	4	38

[1] Country Key: BR = Brazil; CH = Switzerland; ES = Spain; IT = Italy; KR = South Korea; US = United States. [2] Mean (SD); [3] S/PD = Social/Physical Distancing; [4] Likeability rating could not be solicited in the 'No Speaker' condition.

Table S2. Demographic overview of the three age groups by country and for the overall sample

Country[1]	**BR**	**CH**	**ES**	**IT**	**KR**	**US**	**Overall**
N							
Young	2358	786	868	1492	149	278	5931
Mid-Age	1253	535	745	814	111	160	3618
Old	731	344	519	615	215	221	2645
Gender (M/F)							
Young	925/1433	373/413	278/590	567/925	57/92	101/177	2301/3630
Mid-Age	518/735	236/299	324/421	302/512	51/60	59/101	1490/2128
Old	312/419	157/187	210/309	211/404	121/94	76/145	1087/1558
Age (Mean & SD)							
Young	24.59 (4.09)	25.28 (3.61)	24.70 (3.51)	24.57 (3.71)	24.03 (4.14)	24.40 (3.92)	24.67 (3.85)
Mid-Age	40.13 (4.99)	40.95 (5.15)	39.87 (4.87)	40.31 (5.13)	41.47 (5.23)	40.69 (5.46)	40.30 (5.06)
Old	59.69 (6.06)	61.00 (7.52)	59.78 (6.19)	59.91 (6.27)	61.28 (6.42)	62.67 (6.75)	60.31 (6.49)

[1] Country Key: BR = Brazil; CH = Switzerland; ES = Spain; IT = Italy; KR = South Korea; US = United States

Table S3. Model summary of message sharing

Source	F	df1	df2	p-value[1]	η_p^2	Cohen's d
Corrected Model	58.931	163	12030	**0.000**	0.444	1.79
Spokesperson	148.899	4	12030	**0.000**	0.047	0.45
Country	136.611	5	12030	**0.000**	0.054	0.48
Age Group	31.253	2	12030	**0.000**	0.005	0.14
Spokesperson x Country	10.664	20	12030	**0.000**	0.017	0.27
Spokesperson x Age Group	4.372	8	12030	**0.000**	0.003	0.11
Spokesperson x Country x Age Group	1.949	50	12030	**0.000**	0.008	0.18
Gender	0.345	1	12030	0.557	0.000	0.01
Employment	0.945	1	12030	0.437	0.000	0.02
Education	3.481	5	12030	**0.004**	0.001	0.08
Household size	0.328	1	12030	0.567	0.000	0.01
City size	0.734	4	12030	0.569	0.000	0.03
Concern for the situation	28.590	6	12030	**0.000**	0.014	0.24
Concern for others	16.712	6	12030	**0.000**	0.008	0.18
Others' practice of SD	0.815	6	12030	0.558	0.000	0.04
Freedom of movement	0.998	6	12030	0.424	0.000	0.04
Infection percent	2.282	9	12030	**0.015**	0.002	0.08
Subjective Health	0.578	4	12030	0.678	0.000	0.03
Satisfaction from government	4.801	6	12030	**0.000**	0.002	0.10
Public health over Economy	4.468	6	12030	**0.000**	0.002	0.09
Religiosity	11.613	6	12030	**0.000**	0.006	0.15
Support of SD	271.469	1	12030	**0.000**	0.022	0.30
Current practice of SD	2.254	1	12030	0.134	0.000	0.03
Future practice of SD	35.782	1	12030	**0.000**	0.003	0.11
Number of SD measures endorsed	41.224	1	12030	**0.000**	0.003	0.12

[1] p-values < 0.05 are highlighted in bold

Table S4. Pairwise comparisons of main effects (Spokesperson, Country, Age group) and effect sizes

Spokesperson Contrast	**MD**	**SE**	**t**	**df**	**Adj. P**	**LCI95**	**UCI95**	**Cohen's d**
Fauci - No speaker	0.282	0.078	3.624	12030	0.000	0.096	0.469	0.07
Fauci - Government	0.511	0.083	6.188	12030	0.001	0.298	0.723	0.12
Fauci - Hanks	0.674	0.079	8.581	12030	0.000	0.459	0.889	0.17
Fauci - Kardashian	1.850	0.080	22.987	12030	0.000	1.633	2.066	0.45
Government - No speaker	-0.229	0.084	-2.713	12030	0.013	-0.418	-0.040	-0.05
Government - Hanks	0.163	0.085	1.924	12030	0.054	-0.003	0.329	0.04
Government - Kardashian	1.339	0.086	15.492	12030	0.000	1.099	1.579	0.31
No speaker - Hanks	0.392	0.080	4.882	12030	0.000	0.191	0.592	0.10
No speaker - Kardashian	1.568	0.082	19.097	12030	0.000	1.337	1.798	0.38
Hanks - Kardashian	1.176	0.083	14.229	12030	0.000	0.958	1.394	0.28
Country Contrast[1]	**MD**	**SE**	**t**	**df**	**Adj. P**	**LCI95**	**UCI95**	**Cohen's d**
BR-CH	1.651	0.077	21.350	12030	0.000	1.424	1.878	0.39
BR-ES	1.533	0.070	22.040	12030	0.000	0.133	1.736	0.40
BR-IT	0.812	0.066	12.272	12030	0.000	0.621	1.004	0.22
BR-KR	0.574	0.110	5.233	12030	0.000	0.279	0.869	0.10
BR-US	1.130	0.095	11.937	12030	0.000	0.859	1.402	0.22
CH-ES	-0.118	0.076	-1.548	12030	0.122	-0.268	0.031	-0.03
CH-IT	-0.839	0.071	-11.876	12030	0.000	-1.039	-0.639	-0.22
CH-KR	-1.077	0.122	-8.853	12030	0.000	-1.418	-0.735	-0.16
CH-US	-0.521	0.106	-4.924	12030	0.000	-0.800	-0.242	-0.09
ES-IT	-0.720	0.067	-10.747	12030	0.000	-0.906	-0.535	-0.20
ES-KR	-0.959	0.120	-8.017	12030	0.000	-1.286	-0.632	-0.15
ES-US	-0.403	0.102	-3.943	12030	0.000	-0.658	-0.148	-0.07
IT-KR	-0.238	0.117	-2.033	12030	0.084	-0.501	0.024	-0.04
IT-US	0.318	0.101	3.153	12030	0.005	0.077	0.559	0.06
KR-US	0.556	0.136	4.096	12030	0.000	0.206	0.906	0.07
Age Group Contrast	**MD**	**SE**	**t**	**df**	**Adj. P**	**LCI95**	**UCI95**	**Cohen's d**
Old-Young	0.556	0.071	7.825	12030	0.000	0.386	0.726	0.14
Old- Mid age	0.257	0.072	3.548	12030	0.000	0.115	0.398	0.06
Mid age - Young	0.299	0.066	4.513	12030	0.000	0.151	0.448	0.08

[1] Country Key: BR = Brazil; CH = Switzerland; ES = Spain; IT = Italy; KR = South Korea; US = United States

Table S5. Pairwise comparisons of the spokesperson × country interaction

Country[1]	Comparison	MD	SE	t	df	Adj. P	LCI95	UCI95	Cohen's d
BR	Fauci - No speaker	0.115	0.087	1.322	12030	0.186	-0.055	0.285	0.02
	Fauci - Government	-0.185	0.081	-2.271	12030	0.046	-0.367	-0.002	-0.04
	Fauci - Hanks	0.412	0.089	4.662	12030	0.000	0.182	0.641	0.09
	Fauci - Kardashian	1.166	0.103	11.304	12030	0.000	0.884	1.448	0.21
	Government - No speaker	0.299	0.085	3.524	12030	0.002	0.087	0.512	0.06
	Government - Hanks	0.596	0.087	6.836	12030	0.000	0.366	0.827	0.12
	Government - Kardashian	1.350	0.102	13.282	12030	0.000	1.068	1.632	0.24
	No speaker - Hanks	0.297	0.093	3.208	12030	0.004	0.075	0.519	0.06
	No speaker - Kardashian	1.051	0.106	9.891	12030	0.000	0.753	1.349	0.18
	Hanks - Kardashian	0.754	0.108	6.979	12030	0.000	0.463	1.045	0.13
CH	Fauci - No speaker	-0.087	0.163	-0.536	12030	0.592	-0.406	0.232	-0.01
	Fauci - Government	0.297	0.160	1.849	12030	0.129	-0.063	0.656	0.03
	Fauci - Hanks	1.425	0.160	8.911	12030	0.000	0.995	1.855	0.16
	Fauci - Kardashian	2.330	0.145	16.105	12030	0.000	1.948	2.712	0.29
	Government - No speaker	-0.384	0.168	-2.289	12030	0.066	-0.785	0.018	-0.04
	Government - Hanks	1.129	0.165	6.841	12030	0.000	0.704	1.554	0.12
	Government - Kardashian	2.033	0.150	13.545	12030	0.000	1.623	2.444	0.25
	No speaker - Hanks	1.512	0.167	9.065	12030	0.000	1.044	1.981	0.17
	No speaker - Kardashian	2.417	0.152	15.855	12030	0.000	1.994	2.840	0.29
	Hanks - Kardashian	0.905	0.149	6.072	12030	0.000	0.533	1.277	0.11
ES	Fauci - No speaker	0.345	0.148	2.326	12030	0.040	0.013	0.677	0.04
	Fauci - Government	1.140	0.149	7.638	12030	0.000	0.739	1.542	0.14
	Fauci - Hanks	0.522	0.152	3.431	12030	0.002	0.158	0.886	0.06
	Fauci - Kardashian	1.936	0.151	12.821	12030	0.000	1.518	2.355	0.23
	Government - No speaker	-0.795	0.154	-5.161	12030	0.000	-1.202	-0.389	-0.09
	Government - Hanks	-0.619	0.158	-3.923	12030	0.000	-1.012	-0.225	-0.07
	Government - Kardashian	0.796	0.157	5.079	12030	0.000	0.392	1.200	0.09
	No speaker - Hanks	0.177	0.157	1.127	12030	0.260	-0.131	0.484	0.02
	No speaker - Kardashian	1.591	0.156	10.211	12030	0.000	1.154	2.029	0.19
	Hanks - Kardashian	1.415	0.159	8.880	12030	0.000	0.979	1.851	0.16
IT	Fauci - No speaker	0.256	0.120	2.138	12030	0.098	-0.031	0.543	0.04
	Fauci - Government	0.149	0.117	1.275	12030	0.405	-0.113	0.410	0.02
	Fauci - Hanks	0.886	0.121	7.340	12030	0.000	0.561	1.211	0.13
	Fauci - Kardashian	1.778	0.136	13.109	12030	0.000	1.407	2.149	0.24
	Government - No speaker	0.107	0.121	0.887	12030	0.405	-0.134	0.349	0.02

Country[1]	Comparison	MD	SE	t	df	Adj. P	LCI95	UCI95	Cohen's d
	Government - Hanks	0.737	0.122	6.050	12030	0.000	0.423	1.052	0.11
	Government - Kardashian	1.629	0.137	11.920	12030	0.000	1.250	2.008	0.22
	No speaker - Hanks	0.630	0.125	5.043	12030	0.000	0.318	0.942	0.09
	No speaker - Kardashian	1.522	0.139	10.926	12030	0.000	1.131	1.913	0.20
	Hanks - Kardashian	0.892	0.140	6.361	12030	0.000	0.522	1.261	0.12
KR	Fauci - No speaker	0.900	0.298	3.022	12030	0.023	0.074	1.726	0.06
	Fauci - Government	0.861	0.308	2.793	12030	0.037	0.031	1.691	0.05
	Fauci - Hanks	0.444	0.293	1.513	12030	0.771	-0.329	1.216	0.03
	Fauci - Kardashian	1.362	0.316	4.310	12030	0.000	0.475	2.248	0.08
	Government - No speaker	0.039	0.315	0.123	12030	0.902	-0.579	0.656	0.00
	Government - Hanks	-0.418	0.310	-1.345	12030	0.771	-1.201	0.366	-0.02
	Government - Kardashian	0.500	0.332	1.509	12030	0.771	-0.372	1.373	0.03
	No speaker - Hanks	-0.456	0.300	-1.520	12030	0.771	-1.248	0.336	-0.03
	No speaker - Kardashian	0.462	0.322	1.432	12030	0.771	-0.370	1.294	0.03
	Hanks - Kardashian	0.918	0.318	2.889	12030	0.031	0.049	1.787	0.05
US	Fauci - No speaker	0.164	0.243	0.676	12030	0.910	-0.372	0.700	0.01
	Fauci - Government	0.803	0.286	2.808	12030	0.030	0.048	1.557	0.05
	Fauci - Hanks	0.354	0.254	1.397	12030	0.515	-0.258	0.967	0.03
	Fauci - Kardashian	2.527	0.245	10.318	12030	0.000	1.848	3.206	0.19
	Government - No speaker	-0.638	0.286	-2.229	12030	0.129	-1.376	0.099	-0.04
	Government - Hanks	-0.448	0.295	-1.520	12030	0.515	-1.185	0.289	-0.03
	Government - Kardashian	1.724	0.288	5.990	12030	0.000	0.950	2.499	0.11
	No speaker - Hanks	0.190	0.254	0.747	12030	0.910	-0.380	0.760	0.01
	No speaker - Kardashian	2.363	0.245	9.639	12030	0.000	1.675	3.051	0.18
	Hanks - Kardashian	2.173	0.256	8.474	12030	0.000	1.472	2.874	0.15

[1] Country Key: BR = Brazil; CH = Switzerland; ES = Spain; IT = Italy; KR = South Korea; US = United States

Table S6. Pairwise comparisons of the spokesperson × age group interaction

Age Group	Comparison	MD	SE	t	df	Adj. P	LCI95	UCI95	Cohen's d
Young	Fauci - No speaker	0.499	0.121	4.113	12030	0.000	0.186	0.811	0.07
	Fauci - Government	0.435	0.127	3.437	12030	0.002	0.119	0.752	0.06
	Fauci - Hanks	0.574	0.127	4.528	12030	0.000	0.240	0.909	0.08
	Fauci - Kardashian	1.463	0.115	12.763	12030	0.000	1.145	1.781	0.23
	Government - No speaker	0.063	0.130	0.448	12030	1.000	-0.216	0.343	0.01
	Government - Hanks	0.139	0.135	1.027	12030	0.913	-0.185	0.462	0.02
	Government - Kardashian	1.028	0.124	8.316	12030	0.000	0.681	1.374	0.15
	No speaker - Hanks	0.076	0.130	0.582	12030	1.000	-0.216	0.367	0.01
	No speaker - Kardashian	0.964	0.118	8.174	12030	0.000	0.642	1.287	0.15
	Hanks - Kardashian	0.889	0.124	7.187	12030	0.000	0.556	1.221	0.13
Mid-Age	Fauci - No speaker	0.100	0.153	0.652	12030	0.646	-0.214	0.413	0.01
	Fauci - Government	0.582	0.158	3.680	12030	0.001	0.187	0.977	0.07
	Fauci - Hanks	0.737	0.147	5.001	12030	0.000	0.348	1.126	0.09
	Fauci - Kardashian	1.919	0.149	12.865	12030	0.000	1.511	2.327	0.23
	Government - No speaker	-0.482	0.163	-2.968	12030	0.009	-0.871	-0.093	-0.05
	Government - Hanks	0.155	0.157	0.988	12030	0.646	-0.197	0.507	0.02
	Government - Kardashian	1.337	0.159	8.401	12030	0.000	0.895	1.778	0.15
	No speaker - Hanks	0.637	0.152	4.205	12030	0.000	0.247	1.028	0.08
	No speaker - Kardashian	1.819	0.154	11.832	12030	0.000	1.388	2.251	0.22
	Hanks - Kardashian	1.182	0.148	7.977	12030	0.000	0.783	1.580	0.15
Old	Fauci - No speaker	0.248	0.129	1.925	12030	0.163	-0.060	0.557	0.04
	Fauci - Government	0.515	0.142	3.621	12030	0.001	0.149	0.881	0.07
	Fauci - Hanks	0.710	0.133	5.331	12030	0.000	0.359	1.062	0.10
	Fauci - Kardashian	2.168	0.151	14.341	12030	0.000	1.754	2.581	0.26
	Government - No speaker	-0.267	0.143	-1.865	12030	0.163	-0.602	0.068	-0.03
	Government - Hanks	0.195	0.147	1.324	12030	0.185	-0.094	0.484	0.02
	Government - Kardashian	1.653	0.163	10.119	12030	0.000	1.200	2.105	0.18
	No speaker - Hanks	0.462	0.134	3.436	12030	0.002	0.126	0.798	0.06
	No speaker - Kardashian	1.919	0.152	12.634	12030	0.000	1.493	2.346	0.23
	Hanks - Kardashian	1.457	0.156	9.356	12030	0.000	1.038	1.877	0.17

Table S7. Pairwise comparisons of the spokesperson × country × age group interaction

Country[1]	Age Group	Comparison	MD	SE	t	df	Adj. P	LCI95	UCI95	Cohen's d
BR	**Young**	Fauci - No speaker	0.442	0.121	3.480	12030	0.002	0.132	0.713	0.06
		Fauci - Government	-0.033	0.111	-0.295	12030	1.000	-0.263	0.197	-0.01
		Fauci - Hanks	0.480	0.115	4.166	12030	0.000	0.183	0.777	0.08
		Fauci - Kardashian	1.382	0.129	10.745	12030	0.000	1.025	1.739	0.20
		Government - No speaker	0.445	0.120	3.809	12030	0.001	0.157	0.754	0.07
		Government - Hanks	0.513	0.113	4.540	12030	0.000	0.215	0.811	0.08
		Government - Kardashian	1.415	0.126	11.188	12030	0.000	1.060	1.770	0.20
		No speaker - Hanks	0.058	0.123	0.469	12030	1.000	-0.219	0.334	0.01
		No speaker - Kardashian	0.960	0.136	7.075	12030	0.000	0.589	1.331	0.13
		Hanks - Kardashian	0.902	0.130	6.925	12030	0.000	0.552	1.252	0.13
	Mid-Age	Fauci - No speaker	-0.154	0.141	-1.097	12030	0.546	-0.470	0.161	-0.02
		Fauci - Government	-0.272	0.138	-1.972	12030	0.146	-0.602	0.058	-0.04
		Fauci - Hanks	0.397	0.153	2.597	12030	0.038	0.015	0.779	0.05
		Fauci - Kardashian	1.289	0.185	6.965	12030	0.000	0.783	1.795	0.13
		Government - No speaker	0.118	0.133	0.884	12030	0.546	-0.164	0.399	0.02
		Government - Hanks	0.669	0.146	4.587	12030	0.000	0.284	1.053	0.08
		Government - Kardashian	1.561	1.790	8.698	12030	0.000	1.057	2.065	0.16
		No speaker - Hanks	0.551	1.490	3.708	12030	0.001	0.168	0.934	0.07
		No speaker - Kardashian	1.443	0.182	7.934	12030	0.000	0.939	1.947	0.14
		Hanks - Kardashian	0.892	0.191	4.679	12030	0.000	0.379	1.405	0.09
	Old	Fauci - No speaker	0.076	0.183	0.418	12030	0.676	-0.282	0.435	0.01
		Fauci - Government	-0.249	0.167	-1.490	12030	0.409	-0.605	0.151	-0.03
		Fauci - Hanks	0.358	0.187	1.918	12030	0.275	-0.123	0.839	0.03
		Fauci - Kardashian	0.826	0.212	3.886	12030	0.001	0.236	1.415	0.07
		Government - No speaker	0.325	0.182	1.792	12030	0.293	-0.128	0.779	0.03
		Government - Hanks	0.607	0.186	3.272	12030	0.007	0.108	1.107	0.06

Country[1]	Age Group	Comparison	MD	SE	t	df	Adj. P	LCI95	UCI95	Cohen's d
		Government – Kardashian	1.075	0.212	5.077	12030	0.000	0.480	1.669	0.09
		No speaker - Hanks	0.282	0.200	1.410	12030	0.409	-0.186	0.749	0.03
		No speaker - Kardashian	0.749	0.224	3.341	12030	0.007	0.136	1.363	0.06
		Hanks - Kardashian	0.467	0.227	2.056	12030	0.239	-0.132	1.067	0.04
CH	**Young**	Fauci - No speaker	0.000	0.233	0.001	12030	1.000	-0.457	4.570	0.00
		Fauci - Government	0.082	0.216	0.381	12030	1.000	-0.435	0.599	0.01
		Fauci - Hanks	0.829	0.219	3.786	12030	0.001	0.251	1.408	0.07
		Fauci - Kardashian	1.907	0.180	10.615	12030	0.000	1.416	2.398	0.19
		Government - No speaker	-0.082	0.228	-0.360	12030	1.000	-0.560	0.396	-0.01
		Government - Hanks	0.747	0.214	3.495	12030	0.002	0.213	1.281	0.06
		Government - Kardashian	1.825	0.174	10.513	12030	0.000	1.343	2.306	0.19
		No speaker - Hanks	0.829	0.231	3.595	12030	0.002	0.235	1.423	0.07
		No speaker - Kardashian	1.907	0.194	9.812	12030	0.000	1.361	2.452	0.18
		Hanks - Kardashian	1.077	0.177	6.082	12030	0.000	0.601	1.554	0.11
	Mid-Age	Fauci - No speaker	-0.280	0.278	-1.007	12030	0.386	-0.849	0.289	-0.02
		Fauci - Government	0.347	0.266	1.302	12030	0.386	-0.250	0.944	0.02
		Fauci - Hanks	1.651	0.262	6.296	12030	0.000	0.959	2.343	0.11
		Fauci - Kardashian	2.272	0.242	9.380	12030	0.000	1.600	2.943	0.17
		Government - No speaker	-0.627	0.270	-2.319	12030	0.061	-1.274	0.020	-0.04
		Government - Hanks	1.304	0.254	5.130	12030	0.000	0.649	1.958	0.09
		Government - Kardashian	1.925	0.233	8.250	12030	0.000	1.287	2.563	0.15
		No speaker - Hanks	1.931	0.265	7.273	12030	0.000	1.216	2.645	0.13
		No speaker - Kardashian	2.552	0.246	10.387	12030	0.000	1.862	3.241	0.19
		Hanks - Kardashian	0.621	0.228	2.729	12030	0.025	0.052	1.189	0.05
	Old	Fauci - No speaker	0.018	0.327	0.056	12030	0.956	-0.623	0.659	0.00
		Fauci - Government	0.460	0.338	1.363	12030	0.519	-0.348	1.269	0.02
		Fauci - Hanks	1.795	0.337	5.334	12030	0.000	0.890	2.701	0.10

Country[1]	Age Group	Comparison	MD	SE	t	df	Adj. P	LCI95	UCI95	Cohen's d
		Fauci - Kardashian	2.812	0.313	8.993	12030	0.000	1.945	3.679	0.16
		Government - No speaker	-0.442	0.357	-1.238	12030	0.519	-1.268	0.384	-0.02
		Government - Hanks	1.335	0.366	3.647	12030	0.001	0.392	2.278	0.07
		Government - Kardashian	2.351	0.343	6.855	12030	0.000	1.413	3.289	0.12
		No speaker - Hanks	1.777	0.356	4.993	12030	0.000	8.380	2.716	0.09
		No speaker - Kardashian	2.793	0.333	8.397	12030	0.000	1.859	3.727	0.15
		Hanks - Kardashian	1.016	0.342	2.973	12030	0.012	0.162	1.870	0.05
ES	**Young**	Fauci - No speaker	0.114	0.220	0.516	12030	1.000	-0.363	0.590	0.01
		Fauci - Government	0.664	0.229	0.290	12030	0.022	0.061	1.268	0.01
		Fauci - Hanks	0.214	0.241	0.889	12030	1.000	-0.362	0.790	0.02
		Fauci - Kardashian	1.357	0.222	6.107	12030	0.000	0.733	1.981	0.11
		Government - No speaker	-0.551	0.228	-2.416	12030	0.079	-1.138	0.036	-0.04
		Government - Hanks	-0.450	0.248	-1.816	12030	0.278	-0.107	0.169	-0.03
		Government - Kardashian	0.693	0.230	3.012	12030	0.018	0.074	1.312	0.05
		No speaker - Hanks	0.100	0.240	0.419	12030	1.000	-0.409	0.609	0.01
		No speaker - Kardashian	1.244	0.221	5.619	12030	0.000	0.630	1.857	0.10
		Hanks - Kardashian	1.143	0.242	4.733	12030	0.000	-1.857	-0.630	0.09
	Mid-Age	Fauci - No speaker	0.542	0.259	2.093	12030	0.073	-0.039	1.123	0.04
		Fauci - Government	1.612	0.254	6.358	12030	0.000	0.919	2.306	0.12
		Fauci - Hanks	1.012	0.247	4.097	12030	0.000	0.360	1.664	0.07
		Fauci - Kardashian	2.326	0.237	9.828	12030	0.000	1.661	2.990	0.18
		Government - No speaker	-1.070	0.275	-3.891	12030	0.001	-1.779	-0.362	-0.07
		Government - Hanks	-0.600	0.264	-2.276	12030	0.069	-1.232	0.031	-0.04
		Government - Kardashian	0.713	0.254	2.805	12030	0.020	0.078	1.348	0.05
		No speaker - Hanks	0.470	0.269	1.747	12030	0.081	-0.057	0.997	0.03
		No speaker - Kardashian	1.783	0.259	6.873	12030	0.000	1.064	2.503	0.13
		Hanks - Kardashian	1.314	0.247	5.310	12030	0.000	0.648	1.979	0.10

Country[1]	Age Group	Comparison	MD	SE	t	df	Adj. P	LCI95	UCI95	Cohen's d
	Old	Fauci - No speaker	0.379	0.287	1.321	12030	0.559	-0.308	1.066	0.02
		Fauci - Government	1.144	0.289	3.953	12030	0.001	0.365	1.923	0.07
		Fauci - Hanks	0.339	0.298	1.136	12030	0.559	-0.340	1.018	0.02
		Fauci - Kardashian	2.127	0.316	6.722	12030	0.000	1.238	3.015	0.12
		Government - No speaker	-0.765	0.293	-2.608	12030	0.041	-1.511	-0.019	-0.05
		Government - Hanks	-0.805	0.305	-2.641	12030	0.041	-1.590	-0.020	-0.05
		Government - Kardashian	0.983	0.322	3.049	12030	0.014	0.132	1.833	0.06
		No speaker - Hanks	-0.040	0.302	-0.133	12030	0.894	-0.633	0.553	0.00
		No speaker - Kardashian	1.748	0.320	5.465	12030	0.000	0.861	2.634	0.10
		Hanks - Kardashian	1.788	0.331	5.409	12030	0.000	0.884	2.692	0.10
IT	**Young**	Fauci - No speaker	0.329	0.176	1.870	12030	0.123	-0.065	0.723	0.03
		Fauci - Government	-0.080	0.164	-0.489	12030	0.625	-0.402	0.241	-0.01
		Fauci - Hanks	0.765	0.173	4.428	12030	0.000	0.309	1.221	0.08
		Fauci - Kardashian	1.257	0.179	7.006	12030	0.000	0.759	1.754	0.13
		Government - No speaker	0.409	0.165	2.484	12030	0.047	0.004	0.814	0.05
		Government - Hanks	0.845	0.161	5.235	12030	0.000	0.404	1.287	0.10
		Government - Kardashian	1.337	0.168	7.942	12030	0.000	0.864	1.810	0.14
		No speaker - Hanks	0.436	0.173	2.520	12030	0.047	0.004	0.869	0.05
		No speaker - Kardashian	0.928	0.180	5.166	12030	0.000	0.445	1.412	0.09
		Hanks - Kardashian	0.492	0.177	2.780	12030	0.027	0.036	0.947	0.05
	Mid-Age	Fauci - No speaker	0.052	0.225	0.232	12030	1.000	-0.409	0.513	0.00
		Fauci - Government	-0.101	0.205	-0.492	12030	1.000	-0.542	0.340	-0.01
		Fauci - Hanks	1.144	0.224	5.098	12030	0.000	0.552	1.737	0.09
		Fauci - Kardashian	1.883	0.245	7.698	12030	0.000	1.205	2.562	0.14
		Government - No speaker	0.153	0.211	0.725	12030	1.000	-0.352	0.658	0.01
		Government - Hanks	1.245	0.210	5.922	12030	0.000	0.679	1.811	0.11
		Government - Kardashian	1.984	0.231	8.577	12030	0.000	1.334	2.633	0.16

Country[1]	Age Group	Comparison	MD	SE	t	df	Adj. P	LCI95	UCI95	Cohen's d
		No speaker - Hanks	1.092	0.231	4.736	12030	0.000	0.498	1.686	0.09
		No speaker - Kardashian	1.831	0.250	7.315	12030	0.000	1.146	2.515	0.13
		Hanks - Kardashian	0.739	0.249	2.963	12030	0.012	0.116	1.362	0.05
	Old	Fauci - No speaker	0.387	0.218	1.774	12030	0.304	-0.158	0.933	0.03
		Fauci - Government	0.627	0.233	2.696	12030	0.035	0.028	1.226	0.05
		Fauci - Hanks	0.749	0.226	3.314	12030	0.006	0.153	1.346	0.06
		Fauci - Kardashian	2.193	0.271	8.083	12030	0.000	1.431	2.955	0.15
		Government - No speaker	-0.240	0.245	-0.978	12030	0.656	-0.789	0.310	-0.02
		Government - Hanks	0.122	0.252	0.485	12030	0.656	-0.376	0.621	0.01
		Government - Kardashian	1.566	0.293	5.337	12030	0.000	0.764	2.369	0.10
		No speaker - Hanks	0.362	0.239	1.515	12030	0.390	-0.210	0.934	0.03
		No speaker - Kardashian	2.806	0.282	6.399	12030	0.000	1.023	2.589	0.12
		Hanks - Kardashian	1.444	0.288	5.012	12030	0.000	0.669	2.219	0.09
KR	**Young**	Fauci - No speaker	1.823	0.441	4.134	12030	0.000	0.585	3.061	0.08
		Fauci - Government	1.404	0.502	2.795	12030	0.047	0.011	2.796	0.05
		Fauci - Hanks	0.823	0.491	1.675	12030	0.470	-0.443	2.088	0.03
		Fauci - Kardashian	0.918	0.442	2.077	12030	0.302	-0.291	2.126	0.04
		Government - No speaker	0.419	0.529	0.793	12030	1.000	-0.797	1.635	0.01
		Government - Hanks	-0.581	0.572	-1.016	12030	1.000	-2.010	0.848	-0.02
		Government - Kardashian	-0.486	0.529	-0.918	12030	1.000	-1.739	0.767	-0.02
		No speaker - Hanks	-1.000	0.519	-1.928	12030	0.377	-2.396	0.396	-0.04
		No speaker - Kardashian	-0.905	0.472	-1.918	12030	0.377	-2.171	0.361	-0.03
		Hanks - Kardashian	0.095	0.519	0.183	12030	1.000	-0.957	1.147	0.00
	Mid-Age	Fauci - No speaker	0.623	0.656	0.950	12030	1.000	-0.941	2.187	0.02
		Fauci - Government	0.368	0.656	0.950	12030	1.000	-0.933	1.668	0.02
		Fauci - Hanks	-0.021	0.601	-0.034	12030	1.000	-1.206	1.165	0.00
		Fauci - Kardashian	0.921	0.613	1.502	12030	1.000	-0.743	2.586	0.03

Country[1]	Age Group	Comparison	MD	SE	t	df	Adj. P	LCI95	UCI95	Cohen's d
		Government - No speaker	0.256	0.613	0.418	12030	1.000	-1.045	1.556	0.01
		Government - Hanks	-0.388	0.553	-0.702	12030	1.000	-1.635	0.858	-0.01
		Government - Kardashian	0.554	0.566	0.977	12030	1.000	-0.806	1.913	0.02
		No speaker - Hanks	-0.644	0.626	-1.029	12030	1.000	-2.164	0.876	-0.02
		No speaker - Kardashian	0.298	0.639	0.466	12030	1.000	-1.073	1.669	0.01
		Hanks - Kardashian	0.942	0.582	1.619	12030	1.000	-0.691	2.574	0.03
	Old	Fauci - No speaker	0.253	0.417	0.608	12030	1.000	-0.667	1.174	0.01
		Fauci - Government	0.812	0.511	1.590	12030	0.671	-0.536	2.160	0.03
		Fauci - Hanks	0.529	0.414	1.277	12030	1.000	-0.538	1.596	0.02
		Fauci - Kardashian	2.246	0.570	3.939	12030	0.001	0.645	3.846	0.07
		Government - No speaker	-0.559	0.489	-1.144	12030	1.000	-1.778	0.660	-0.02
		Government - Hanks	-0.283	0.511	-1.590	12030	0.671	-2.160	0.536	-0.03
		Government - Kardashian	1.433	0.625	2.294	12030	0.153	-0.248	3.114	0.04
		No speaker - Hanks	0.275	0.388	0.711	12030	1.000	-0.600	1.151	0.01
		No speaker - Kardashian	1.992	0.551	3.614	12030	0.003	0.463	3.521	0.07
		Hanks - Kardashian	1.717	0.550	3.122	12030	0.014	0.213	3.221	0.06
US	**Young**	Fauci - No speaker	0.305	0.431	0.708	12030	1.000	-0.668	1.278	0.01
		Fauci - Government	0.576	0.432	1.334	12030	1.000	-0.563	1.715	0.02
		Fauci - Hanks	0.334	4.330	0.773	12030	1.000	-0.657	1.326	0.01
		Fauci - Kardashian	1.957	0.382	5.121	12030	0.000	0.884	3.030	0.09
		Government - No speaker	-0.271	0.426	-0.636	12030	1.000	-1.217	0.676	-0.01
		Government - Hanks	-0.241	0.427	-0.565	12030	1.000	-1.176	0.694	-0.01
		Government - Kardashian	1.381	0.376	3.669	12030	0.002	0.368	2.394	0.07
		No speaker - Hanks	0.029	0.426	0.069	12030	1.000	-0.816	0.875	0.00
		No speaker - Kardashian	1.652	0.375	4.404	12030	0.000	0.612	2.692	0.08
		Hanks - Kardashian	1.623	0.337	4.305	12030	0.000	0.592	2.653	0.08
	Mid-Age	Fauci - No speaker	-0.186	0.442	-0.421	12030	1.000	-1.125	0.753	-0.01

Country[1]	Age Group	Comparison	MD	SE	t	df	Adj. P	LCI95	UCI95	Cohen's d
		Fauci - Government	1.537	0.601	2.556	12030	**0.064**	-0.050	3.124	0.05
		Fauci - Hanks	0.239	0.463	0.515	12030	1.000	-0.765	1.243	0.01
		Fauci - Kardashian	2.822	0.467	6.044	12030	0.000	1.527	4.117	0.11
		Government - No speaker	-1.723	0.603	-2.859	12030	0.030	-3.345	-0.102	-0.05
		Government - Hanks	-1.298	0.618	-2.099	12030	0.179	-2.892	0.295	-0.04
		Government - Kardashian	1.285	0.622	2.065	12030	0.179	-0.300	2.869	0.04
		No speaker - Hanks	0.425	0.465	0.914	12030	1.000	-0.689	1.539	0.02
		No speaker - Kardashian	3.008	0.468	6.422	12030	0.000	1.693	4.323	0.12
		Hanks - Kardashian	2.583	0.490	5.269	12030	0.000	1.242	3.924	0.10
	Old	Fauci - No speaker	0.374	0.388	0.964	12030	1.000	-0.554	1.302	0.02
		Fauci - Government	0.295	0.433	0.681	12030	1.000	-0.677	1.268	0.01
		Fauci - Hanks	0.490	0.422	1.161	12030	1.000	-0.623	1.602	0.02
		Fauci - Kardashian	2.802	0.420	6.668	12030	0.000	1.622	3.983	0.12
		Government - No speaker	0.079	0.439	0.180	12030	1.000	-0.809	0.967	0.00
		Government - Hanks	0.195	0.469	0.415	12030	1.000	-0.801	1.190	0.01
		Government - Kardashian	2.507	0.467	5.365	12030	0.000	1.229	3.785	0.10
		No speaker - Hanks	0.116	4.280	0.270	12030	1.000	-0.766	0.998	0.00
		No speaker - Kardashian	2.428	0.426	5.697	12030	0.000	1.246	3.611	0.10
		Hanks - Kardashian	2.313	0.458	5.055	12030	0.000	1.082	3.544	0.09

[1] Country Key: BR = Brazil; CH = Switzerland; ES = Spain; IT = Italy; KR = South Korea; US = United States

Table S8. Model summary of the effect of sentiment towards spokesperson on message sharing

Source	F	df1	df2	p-value[1]	η_p^2	Cohen's d
Corrected Model	73.151	67	9,724	**0.000**	0.335	1.42
Spokesperson	46.745	3	9,724	**0.000**	0.014	0.24
Country	15.385	5	9,724	**0.000**	0.008	0.18
Attitude (towards Spokesperson)	132.648	2	9,724	**0.000**	0.027	0.33
Spokesperson × Country	2.436	15	9,724	**0.001**	0.004	0.12
Spokesperson × Attitude	2.200	6	9,724	**0.040**	0.001	0.07
Country × Attitude	4.140	10	9,724	**0.000**	0.004	0.13
Spokesperson × Attitude × Country	1.454	27	9,724	0.060	0.004	0.13

[1] p-values < 0.05 are highlighted in bold

Table S9. Pairwise comparisons of the spokesperson × likeability interaction

Attitude	Comparison	MD	SE	t	df	Adj. P	LCI95	UCI95	Cohen's d
Like	Fauci - Government	0.151	0.055	2.733	9724	0.013	0.027	0.274	0.055
	Fauci - Hanks	0.510	0.053	9.680	9724	0.000	0.371	0.649	0.196
	Fauci - Kardashian	0.560	0.106	5.278	9724	0.000	0.295	0.925	0.107
	Government - Hanks	0.359	0.053	6.835	9724	0.000	0.224	0.494	0.139
	Government - Kardashian	0.409	0.106	3.859	9724	0.000	0.155	0.663	0.078
	Hanks - Kardashian	0.050	0.105	0.477	9724	0.633	-0.155	0.255	0.010
Neutral	Fauci - Government	0.195	0.052	3.723	9724	0.000	0.078	0.313	0.076
	Fauci - Hanks	0.383	0.048	7.916	9724	0.000	0.262	0.503	0.161
	Fauci - Kardashian	0.748	0.042	17.894	9724	0.000	0.640	0.856	0.363
	Government - Hanks	0.187	0.058	3.254	9724	0.001	0.074	0.300	0.066
	Government - Kardashian	0.553	0.052	10.584	9724	0.000	0.415	0.691	0.215
	Hanks - Kardashian	0.365	0.048	7.595	9724	0.000	0.250	0.481	0.154
Dislike	Fauci - Government	0.235	0.130	1.804	9724	0.214	-0.077	0.547	0.037
	Fauci - Hanks	0.191	0.201	0.953	9724	0.681	-0.259	0.642	0.019
	Fauci - Kardashian	0.809	0.141	5.727	9724	0.000	0.436	1.181	0.116
	Government - Hanks	-0.043	0.179	-0.242	9724	0.809	-0.395	0.308	-0.005
	Government - Kardashian	0.574	0.109	5.291	9724	0.000	0.294	0.854	0.107
	Hanks - Kardashian	0.617	0.188	3.290	9724	0.004	0.149	1.086	0.067

Table S10. Pairwise comparisons of the country[1] × likeability interaction

Attitude	Comparison	MD	SE	t	df	Adj. P	LCI95	UCI95	Cohen's d
Like	BR-CH	0.397	0.088	4.492	9724	0.000	0.137	0.656	0.091
	BR-ES	0.210	0.077	2.722	9724	0.065	-0.007	0.427	0.055
	BR-IT	0.032	0.062	0.524	9724	1.000	-0.106	0.170	0.011
	BR-KR	-0.139	0.098	-1.417	9724	0.626	-0.383	0.106	-0.029
	BR-US	0.233	0.086	2.710	9724	0.000	-0.656	-0.137	0.055
	CH-ES	-0.186	0.111	-1.681	9724	0.557	-0.479	0.106	-0.034
	CH-IT	-0.364	0.100	-3.625	9724	0.004	-0.655	-0.074	-0.074
	CH-KR	-0.535	0.126	-4.249	9724	0.000	-0.902	-0.168	-0.086
	CH-US	-0.163	0.117	-1.397	9724	0.626	-0.454	0.127	-0.028
	ES-IT	-0.178	0.091	-1.958	9724	0.352	-0.423	0.067	-0.040
	ES-KR	-0.349	0.118	-2.945	9724	0.360	-0.685	-0.013	-0.060
	ES-US	0.023	0.109	0.209	9724	1.000	-0.199	0.245	0.004
	IT-KR	-0.171	0.109	-1.568	9724	0.584	-0.451	0.110	-0.032
	IT-US	0.201	0.098	2.039	9724	0.332	-0.069	0.470	0.041
	KR-US	0.372	0.124	2.988	9724	0.034	0.015	0.729	0.061
Neutral	BR-CH	0.486	0.034	14.274	9724	0.000	0.386	0.586	0.290
	BR-ES	0.411	0.037	11.131	9724	0.000	0.304	0.519	0.226
	BR-IT	0.169	0.032	5.345	9724	0.000	0.080	0.258	0.108
	BR-KR	0.126	0.067	1.863	9724	0.313	-0.048	0.300	0.038
	BR-US	0.413	0.069	6.030	9724	0.000	0.217	0.610	0.122
	CH-ES	-0.074	0.043	-1.735	9724	0.331	-0.181	0.033	-0.035
	CH-IT	-0.317	0.038	-8.273	9724	0.000	-0.427	-0.206	-0.168
	CH-KR	-0.360	0.071	-5.081	9724	0.000	-0.557	-0.163	-0.103
	CH-US	-0.072	0.072	-1.006	9724	0.944	-0.244	0.100	-0.020
	ES-IT	-0.242	0.041	-5.926	9724	0.000	-0.359	-0.126	-0.120
	ES-KR	-0.286	0.072	-3.952	9724	0.001	-0.484	-0.088	-0.080
	ES-US	0.002	0.073	0.027	9724	1.000	-0.142	0.146	0.001
	IT-KR	-0.043	0.070	-0.622	9724	1.000	-0.200	0.113	-0.013
	IT-US	0.244	0.071	3.453	9724	0.004	0.054	0.435	0.070
	KR-US	0.288	0.093	3.109	9724	0.011	0.044	0.532	0.063
Dislike	BR-CH	0.560	0.170	3.297	9724	0.012	0.073	1.047	0.067
	BR-ES	0.613	0.147	4.171	9724	0.000	0.185	1.042	0.085
	BR-IT	0.653	0.172	3.789	9724	0.002	0.155	1.152	0.077
	BR-KR	1.037	0.198	5.227	9724	0.000	0.454	1.619	0.106
	BR-US	0.596	0.281	2.123	9724	0.304	-0.183	1.374	0.043
	CH-ES	0.053	0.149	0.357	9724	1.000	-0.260	0.367	0.007
	CH-IT	0.093	0.174	0.535	9724	1.000	-0.367	0.554	0.011
	CH-KR	0.477	0.200	2.381	9724	0.190	-0.091	1.045	0.048
	CH-US	0.036	0.282	0.126	9724	1.000	-0.530	0.601	0.003

Attitude	Comparison	MD	SE	t	df	Adj. P	LCI95	UCI95	Cohen's d
	ES-IT	0.040	0.152	0.262	9724	1.000	-0.274	0.354	0.005
	ES-KR	0.423	0.181	2.336	9724	0.195	-0.085	0.932	0.047
	ES-US	-0.018	0.268	-0.066	9724	1.000	-0.551	0.515	-0.001
	IT-KR	0.383	0.202	1.894	9724	0.466	-0.170	0.937	0.038
	IT-US	-0.058	0.283	-0.204	9724	1.000	-0.634	0.519	-0.004
	KR-US	-0.441	0.300	-1.471	9724	0.989	-1.248	0.366	-0.030

[1] Country Key: BR = Brazil; CH = Switzerland; ES = Spain; IT = Italy; KR = South Korea; US = United States

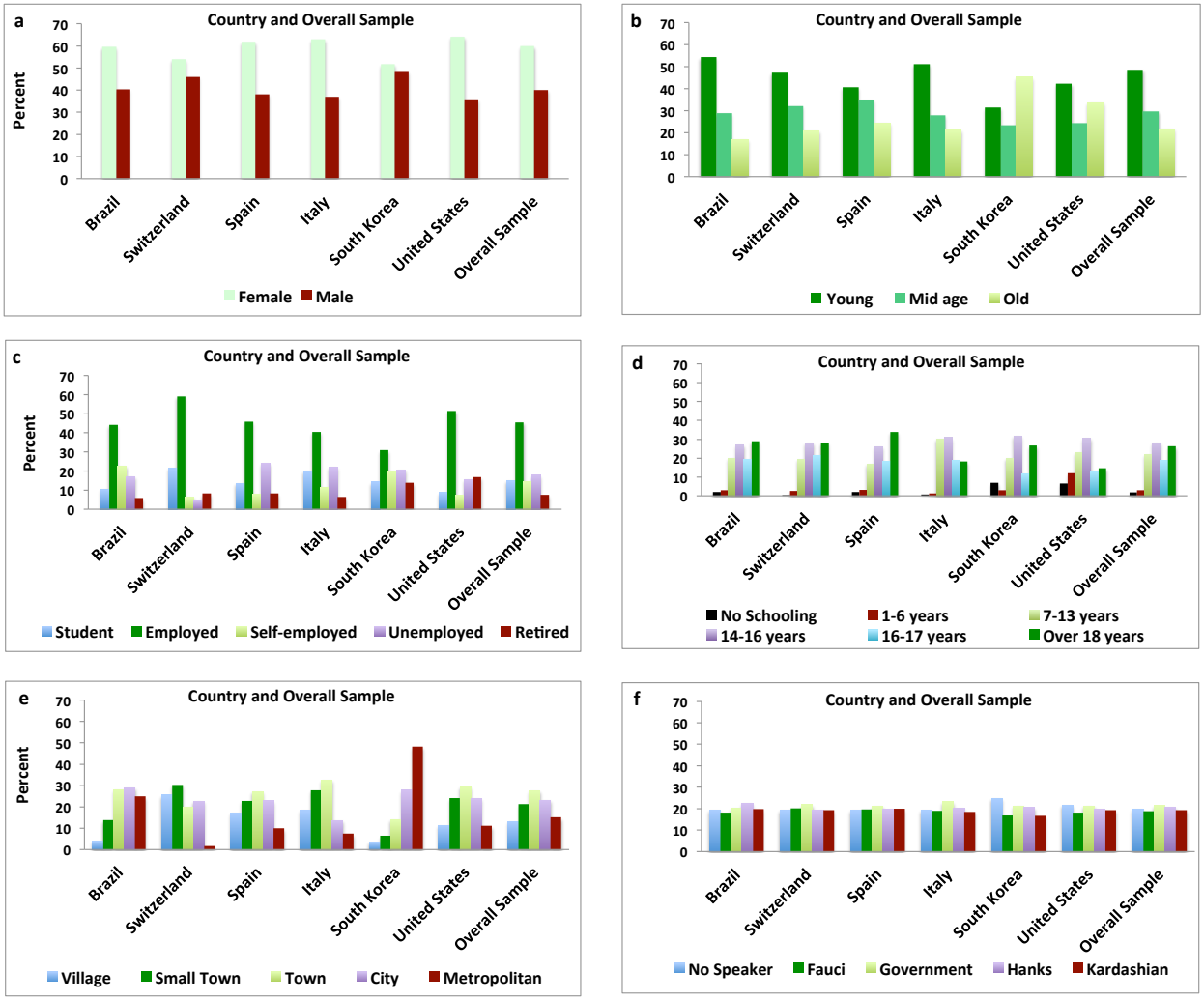

Fig. S1. Sample characteristics by country and overall sample in terms of (**a**) gender, (**b**) age group, (**c**) employment, (**d**) education, (**e**) settlement size, and (**f**) spokesperson distribution.

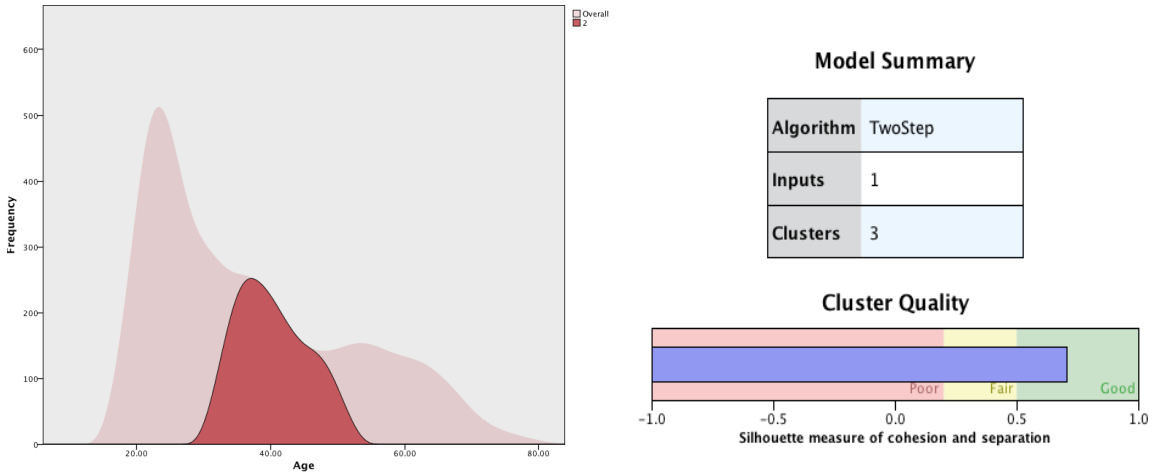

Fig. S2. Two-step cluster analysis of age. Left panel displays the density plot of age, highlighting in burgundy, the mid-age group. Right panel displays the silhouette measure of cluster quality.

Endorsement of social and physical distancing measures

We surveyed nine measures: (i) Self-isolation / staying at home, (ii) Quarantine zones that no-one can enter or leave, (iii) Closing international borders, (iv) Not meeting friends and family, (v) Keeping physical distance (2m / 6ft) at all times, (vi) Closing schools, universities, daycares and non-essential businesses, (vii) Shutting down flights and public transportation, (viii) Canceling events and public gatherings, and (ix) Not going to your place of work. Response reliability to the nine measures was good (Cronbach's $\alpha = 0.81$).

At the spokesperson level (Fig. S3), respondents indicated the highest overall endorsement of physical and social distancing measures under the Fauci condition (Mean = 74.5%, 95% CI = 73.9% — 75.2%), and the lowest under the No speaker condition (Mean = 71.6%, 95% CI = 70.9% — 72.2%). At the country level, respondents from South Korea indicated the lowest overall endorsement (Mean = 53.6%, 95% CI = 48.8% — 58.4%), and respondents from Spain indicated the highest overall endorsement (Mean = 83.9%, 95% CI = 80% — 87.4%). With respect to individual measures, quarantine zones, transportation, not going to the workplace, not meeting friends and family, and closing borders received lower levels of endorsement (range 55% [quarantine zones] – 70% [closing borders]). On the other hand, self isolation, physical distance, closing businesses and canceling events received higher levels of endorsement (range 80% [physical distancing] – 89% [canceling events]).

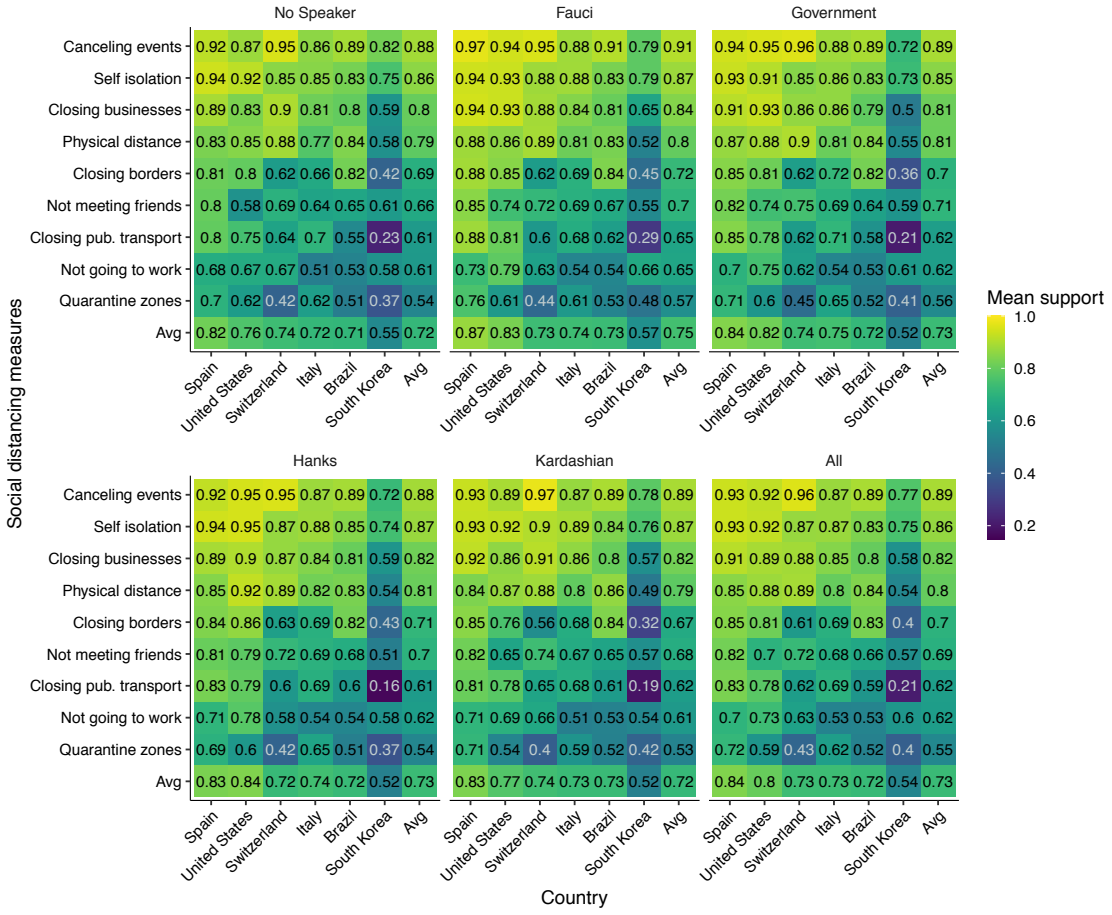

Fig. S3. Endorsement of individual distancing measures. Heatmap of mean endorsement of nine social/physical distancing measures by spokesperson and country, and for the overall sample.

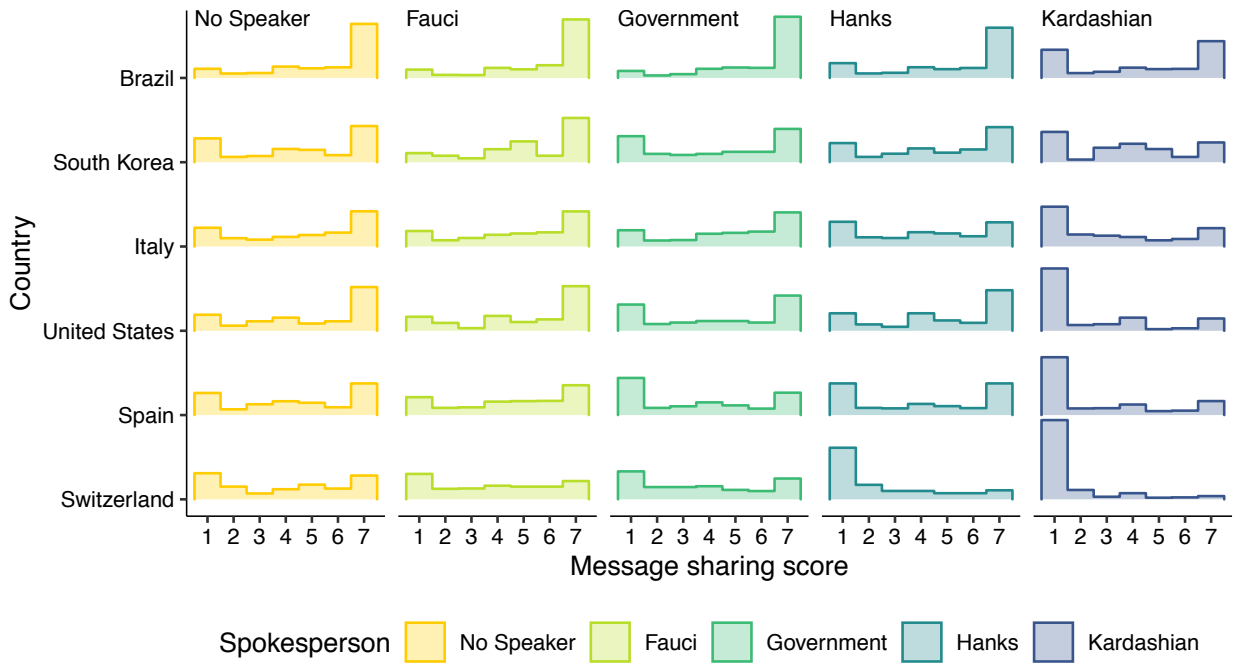

Fig. S4. Frequency of message sharing by country and spokesperson as a ridge frequency plot

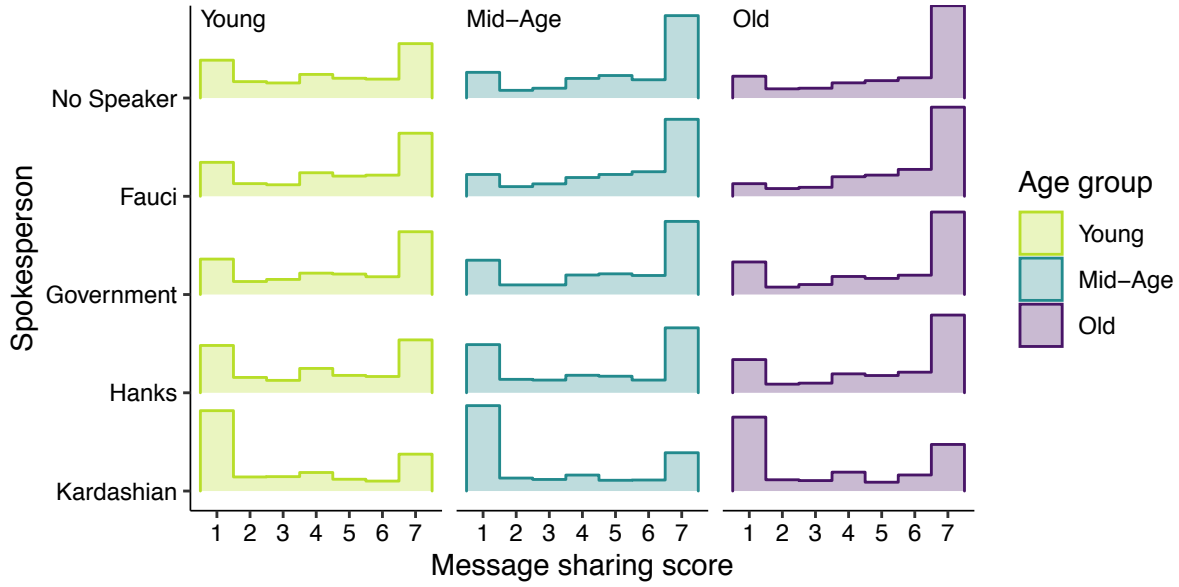

Fig. S5. Frequency of message sharing by spokesperson and age group as a ridge frequency plot

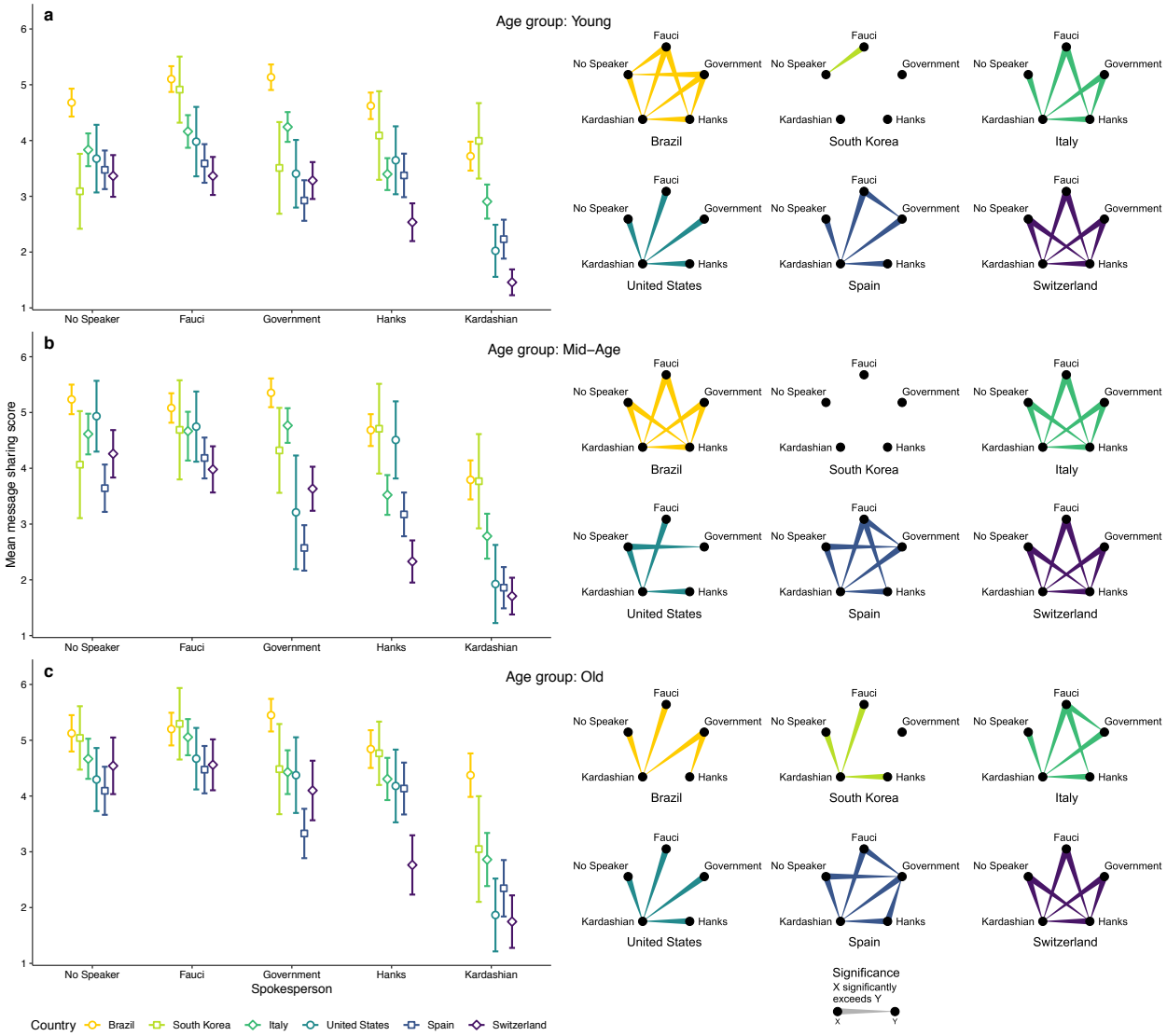

Fig. S6. Three-way interaction of spokesperson × country × age group. Panels **a-c** visualize the interaction of spokesperson x country among the young, mid-age and older respondents, with corresponding spokesperson pairwise comparisons within each country, corrected for multiple comparisons. Only significant comparisons surviving correction are shown. Error bars represent 95% CIs.

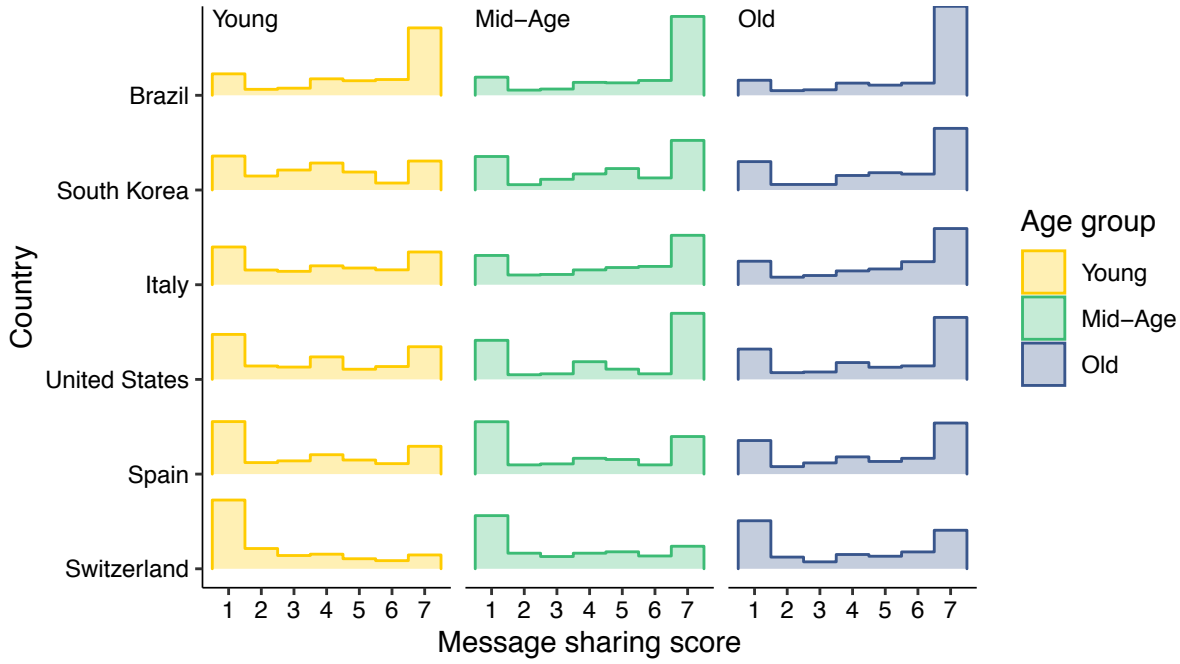

Fig. S7. Frequency of message sharing by country and age group as a ridge frequency plot

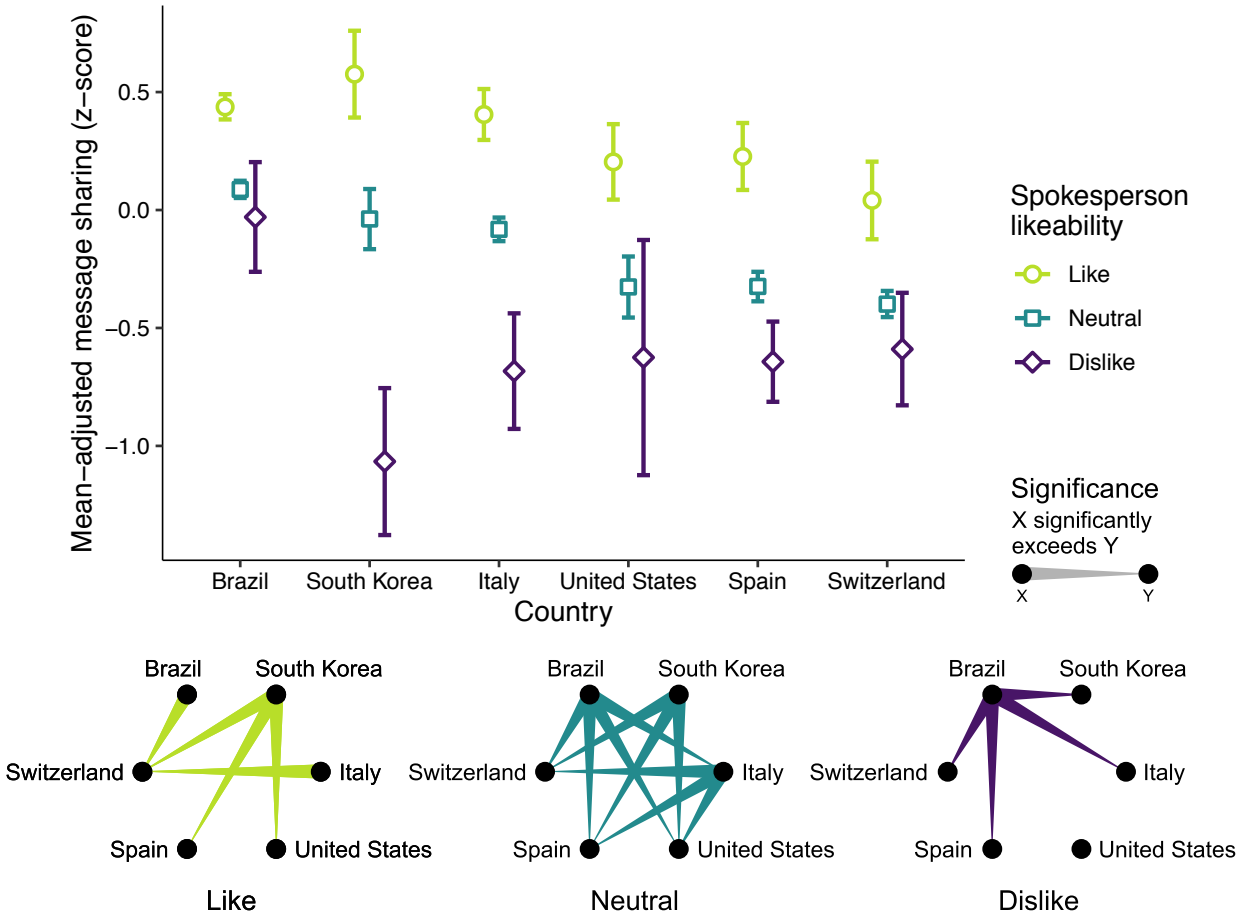

Fig. S8. Interaction of country × likeability. Pairwise comparisons of country for each sentiment category (Like, Neutral, Dislike) show only significant comparisons that survived correction for multiple testing. Error bars represent 95% CIs.

Appendix A: Study survey*

If you have 2-3 minutes, we would greatly appreciate it if you could take this short survey to tell us how the spread of coronavirus disease (COVID-19) is affecting your life. We are a university research lab trying to better understand how people are dealing with the crisis. Your input matters!

This survey is anonymous.

Q1	How worried are you about the COVID-19 situation in <country> right now?	(1) I am not worried (7) I am extremely worried
Q2	Please share your opinion about the response of the <country adj.> government and of the <country adj.> population to COVID-19.	Text input

In an effort to avoid spreading COVID-19, a commonly given instruction is to practice SOCIAL DISTANCING, that is, to deliberately stay away from other people by at least 2 meters (6 feet).

Examples of social distancing are
- canceling sports events, cruises, festivals and other gatherings,
- working from home instead of at the office,
- closing schools and universities or switching to online classes,
- visiting loved ones by electronic devices instead of in person,
- canceling or postponing conferences and large meetings.

<image of speaker / no image>

Social distancing has been publicly supported, among others, by <speaker>.

Q3	How likely is it that you would share this message by <speaker> on your own social media?	(1) Very unlikely (7) Very likely
Q4	Were you aware of the instruction to practice social distancing?	Yes / No
Q5	To what degree do you support social distancing as a valid measure in the current situation?	(1) I don't support it (7) I fully support it
Q6	Given the current situation, which measures of social distancing do you find appropriate? (Please select all that apply)	* Self-isolation / staying at home * Quarantine zones that no-one can enter or leave * Closing international borders * Not meeting friends and family * Keeping physical distance (2m / 6ft) at all times * Closing schools, universities, daycares and non-essential businesses * Shutting down flights and public transportation * Canceling events and

		public gatherings * Not going to your place of work
Q7	To what degree are you currently practicing social distancing?	(1) Not at all (7) All the time
Q8	To what degree do you think others are currently practicing social distancing?	(1) Not at all (7) All the time
Q9	To what degree do you see yourself practicing social distancing in the weeks to come?	(1) Not at all (7) All the time
Q10	How do you feel about <speaker>?	* I like <speaker> * I neither like nor dislike <speaker> * I dislike <speaker> * (I don't know <speaker>)
Q11	What is your personal estimate of the percentage of people in your place of residence (city/town/village) who are actually already infected by coronavirus? (Give your best personal guess of the percentage of *actually* infected people (tested + untested), not the official statistics of people who tested positive.)	0-9% 10-19% ... 90-100%
Q12	How concerned are you for the well-being of your fellow citizens at the current time?	(1) Not at all (7) Very concerned
Q13	How would you rate your overall health in the last 30 days?	Very good Good Average Bad Very bad

Considering the current situation in <country>, please state the level to which you agree with the following statements.

Q14	"I feel free to move around and travel wherever I need to in order to go about my daily life, to attend appointments or to visit family or friends."	(1) Disagree strongly (7) Agree strongly
Q15	"I am satisfied with the <country adj.> government's effort and preparedness to fight COVID-19."	(1) Disagree strongly (7) Agree strongly
Q16	"I think the <country adj.> government cares more about public health than about the economy."	(1) Disagree strongly (7) Agree strongly

Please share some details about yourself.

Q17	Gender	Female / Male / Other
Q18	Age	Numerical input

Q19	How many years (full-time equivalent) have you been in formal education? Include all primary and secondary schooling, university and other post-secondary education, and full-time vocational training, but do not include repeated years. If you are currently in education, count the number of years you have completed so far.	I have no formal schooling 1-6 years 7-13 years 14-16 years 17-18 years More than 18 years
Q20	What is your current employment status?	Student Employed Self-employed Unemployed Retired
Q21	What is your current country of residence?	Text input
Q22	Which of the following best describes the area in which you live?	* Village / rural area (fewer than 3,000 people) * Small town (3,000 to 15,000 people) * Town (15,000 to 100,000 people) * City (100,000 to 1,000,000 people) * Metropolitan area (over 1,000,000 people)
Q23	How many people live in your household or shared apartment (including you)?	Numerical input
Q24	How important is religion in your daily life?	(1) Not important at all (7) Very important

* The survey was administered in the following countries and languages: Brazil (Portuguese), Italy (Italian), Spain (Spanish), South Korea (Korean), Switzerland (French, German, Italian), and United States (English). All localized versions were translated from this English original by native speakers.

Appendix B: Web Sources for Spokesperson statements of support

For all spokespersons, we ensured their public and outspoken support of social distancing measures prior to their inclusion in the survey. The following is a list of Web sources of these statements.

Country	Spokesperson	Source
US	Donald Trump, President	https://twitter.com/realDonaldTrump/status/1238824050924883968
CH	Simonetta Sommaruga, President of the Swiss Confederation	https://twitter.com/s_sommaruga/status/1241265194392793088
IT	Giuseppe Conte, Prime Minister	https://twitter.com/GiuseppeConteIT/status/1237863027254243333
ES	Pedro Sánchez, Prime Minister	https://www.nytimes.com/2020/03/15/world/europe/spain-coronavirus.html
BR	Luiz Henrique Mandetta, Minister of Health*	https://twitter.com/minsaude/status/1240753287491727361
KR	Moon Jae-in, President	https://twitter.com/TheBlueHouseENG/status/1239742815141105665
Celebrity	Tom Hanks	https://twitter.com/tomhanks/status/1241919151829954566
Celebrity	Kim Kardashian	https://twitter.com/KimKardashian/status/1242202609420730374
Expert	Anthony Fauci	https://www.today.com/video/dr-anthony-fauci-social-distancing-will-likely-continue-for-at-least-several-weeks-81011269698

*The President of Brazil, Jair Bolsonaro, did not issue public support of social distancing. In his place, we included Minister Luiz Henrique Mandetta as the Brazilian government official, who was the Minister of Health at the time of the survey.

Appendix C: Timeline of government issuance of key social distancing measures

To establish timelines of implemented measures for all countries in which we distributed the survey, we collected official government announcements for nation-wide action, or news articles reporting on these announcements in cases where we could not locate the formal announcements.

Country	Measure	Description	Date Announced	Source
Brazil	Advice to self-isolate when sick	Patients with respiratory symptoms and their family members are required to self-quarantine for 14 days	2020-03-20	https://www.saude.gov.br/noticias/agencia-saude/46568-ministerio-da-saude-declara-transmissao-comunitaria-nacional
	Physical distancing encouraged	The population is advised to avoid crowding	2020-03-13	https://www.saude.gov.br/noticias/agencia-saude/46540-saude-anuncia-orientacoes-para-evitar-a-disseminacao-do-coronavirus
	Public events banned	Not implemented*		
	Public gatherings banned	Not implemented*		
	School closure ordered	Not implemented*		
	Non-essential business closure	Not implemented*		
	International border closing	The border to Venezuela is closed except for cargo	2020-03-17	https://www.reuters.com/article/us-health-coronavirus-brazil-venezuela-idUSKBN2143ZS
	Quarantine zones established	Not implemented		
Italy	Advice to self-isolate when sick	Advice to self-isolate with fever and respiratory symptoms	2020-03-08	http://www.salute.gov.it/portale/nuovocoronavirus/dettaglioNotizieNuovoCoronavirus.jsp?id=4175
	Physical distancing encouraged	Citizens are advised to keep at least 1m distance at all times	2020-03-04	http://www.salute.gov.it/portale/nuovocoronavirus/dettaglio

				NotizieNuovoCoronavirus.jsp?id=4156
	Public events banned	Public events are canceled country-wide	2020-03-08	http://www.salute.gov.it/portale/nuovocoronavirus/dettaglioNotizieNuovoCoronavirus.jsp?id=4175
	Public gatherings banned	Citizens are advised to stay at home unless for work- or health-related reasons. Gatherings are banned both outdoors and indoors	2020-03-09	http://www.salute.gov.it/portale/nuovocoronavirus/dettaglioNotizieNuovoCoronavirus.jsp?id=4184
	School closure ordered	Schools and universities are closed	2020-03-04	http://www.salute.gov.it/portale/nuovocoronavirus/dettaglioNotizieNuovoCoronavirus.jsp?id=4154
	Non-essential business closure	Commercial activity with the exception of basic necessities and pharmacies is ceased	2020-03-11	http://www.salute.gov.it/portale/nuovocoronavirus/dettaglioNotizieNuovoCoronavirus.jsp?id=4212
	International border closing	All travel within the country and entering the country is restricted	2020-03-09	http://www.salute.gov.it/portale/nuovocoronavirus/dettaglioNotizieNuovoCoronavirus.jsp?id=4184
	Quarantine zones established	Local quarantine zones around 12 towns in Lombardy and Veneto are established	2020-02-22	https://www.lastampa.it/milano/2020/02/23/news/coronavirus-nessun-blindato-nella-zona-rossa-del-lodigiano-ma-vigilanza-diffusa-dei-carabinieri-e-unita-mobile-coi-medici-dell-arma-1.38506501
Korea	Advice to self-isolate when sick	Citizens are advised to stay at home if they have respiratory symptoms	2020-02-23	https://www.mohw.go.kr/eng/nw/nw0101vw.jsp?PAR_MENU_ID=1007&MENU_ID=100701&page=3&CONT_SEQ=353124

	Physical distancing encouraged	Population is advised to practice social distancing	2020-02-29	https://www.cdc.go.kr/board/board.es?mid=a30402000000&bid=0030&act=view&list_no=366406
	Public events banned	Not implemented*		
	Public gatherings banned	Citizens are advised to stay at home as much as possible and minimize all interpersonal contact	2020-03-22	https://www.cdc.go.kr/board/board.es?mid=a30402000000&bid=0030&act=view&list_no=366627&tag=&nPage=1
	School closure ordered	Reopening of schools and kindergartens for the new semester is postponed	2020-03-10	https://www.mohw.go.kr/eng/nw/nw0101vw.jsp?PAR_MENU_ID=1007&MENU_ID=100701&page=1&CONT_SEQ=353522
	Non-essential business closure	Not implemented*		
	International border closing	Not implemented		
	Quarantine zones established	Not implemented		
Spain	Advice to self-isolate when sick	Citizens with respiratory symptoms and fever are advised to stay at home	2020-03-09	https://www.mscbs.gob.es/gabinete/notasPrensa.do?id=4806
	Physical distancing encouraged	Working remotely and keeping distance is encouraged	2020-03-09	https://www.mscbs.gob.es/gabinete/notasPrensa.do?id=4806
	Public events banned	Public events with over 1000 participants are canceled in the most severely affected areas	2020-03-10	https://www.mscbs.gob.es/gabinete/notasPrensa.do?id=4807
	Public gatherings banned	Nationwide lockdown is put into effect	2020-03-14	https://www.lamoncloa.gob.es/lang/en/presidente/news/Paginas/2020/20200313

				_emergency.aspx
	School closure ordered	Nationwide closure of schools	2020-03-12	https://elpais.com/sociedad/2020-03-12/suspendidas-las-clases-en-todos-los-centros-educativos-de-euskadi.html
	Non-essential business closure	Workers in non-essential sectors are ordered to stay at home	2020-03-28	https://www.lamoncloa.gob.es/lang/en/presidente/news/Paginas/2020/20200328non-essential-act.aspx
	International border closing	Borders are closed, except for residents and cargo	2020-03-16	http://www.interior.gob.es/es/web/interior/noticias/detalle/-/journal_content/56_INSTANCE_1YSSI3xiWuPH/10180/11634808/
	Quarantine zones established	Not implemented		
Switzerland	Advice to self-isolate when sick	Advice to self-isolate at home with fever or cough.	2020-02-27	https://www.bag.admin.ch/bag/de/home/das-bag/aktuell/medienmitteilungen.msg-id-78273.html
	Physical distancing encouraged	The population is advised to avoid all unnecessary contact	2020-03-16	https://www.bag.admin.ch/bag/de/home/das-bag/aktuell/medienmitteilungen.msg-id-78454.html
	Public events banned	Public events over 1000 participants are banned. Smaller events require municipal approval. This limit was reduced to 100 participants on 2020-03-13	2020-02-28	https://www.bag.admin.ch/bag/de/home/das-bag/aktuell/medienmitteilungen.msg-id-78289.html
	Public gatherings banned	Gatherings of more than 5 persons are banned	2020-03-20	https://www.bag.admin.ch/bag/de/home/das-

				bag/aktuell/medienmitteilungen.msg-id-78513.html
	School closure ordered	In-person teaching at schools and universities is suspended	2020-03-13	https://www.bag.admin.ch/bag/de/home/das-bag/aktuell/medienmitteilungen.msg-id-78437.html
	Non-essential business closure	Closure of all non-essential businesses	2020-03-16	https://www.bag.admin.ch/bag/de/home/das-bag/aktuell/medienmitteilungen.msg-id-78454.html
	International border closing	Closure of borders for everyone except residents, cargo, and transitory travel	2020-03-16	https://www.bag.admin.ch/bag/de/home/das-bag/aktuell/medienmitteilungen.msg-id-78454.html
	Quarantine zones established	Not implemented		
US	Advice to self-isolate when sick	Citizens are advised to stay at home if they are sick or not feeling well	2020-03-11	https://www.whitehouse.gov/briefings-statements/remarks-president-trump-address-nation/
	Physical distancing encouraged	Citizens are advised to keep physical distance	2020-03-18	https://twitter.com/CDCgov/status/1240057093526339593
	Public events banned	Not implemented*		
	Public gatherings banned	Citizens are advised to avoid groups of more than 10 persons	2020-03-16	https://www.whitehouse.gov/briefings-statements/remarks-president-trump-vice-president-pence-members-coronavirus-task-force-press-briefing-3/
	School closure ordered	Not implemented*		

	Non-essential business closure	Not implemented*		
	International border closing	Travel to and from Europe is suspended.	2020-03-11	https://www.whitehouse.gov/briefings-statements/remarks-president-trump-address-nation/
	Quarantine zones established	Not implemented		

* No action was announced or taken by the national (federal) government, but there were responses to this effect on a local, city, or state level

Appendix D: Facebook Advertisement

We include one possible example layout for the Facebook advertising campaign that we used to publicize the survey. Advertisements in all languages used the same image and translations of the English texts in the screenshot below. LEARN MORE redirected respondents to a survey form for their language (with a randomized spokesperson). Note that the actual layout that a respondent would have seen is one of dozens of possible options that depend on the used Facebook platform, browser, system, and window size.