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Estimating Perceptions of the Relative COVID Risk of Different Social-Distancing Behaviors from Respondents' Pairwise Assessments

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## ABSTRACT

How do people compare bundles of social-distancing behaviors? During the COVID pandemic, we showed 676 online respondents in the US, UK, and Israel 30 pairs of brief videos of acquaintances meeting. We asked them to indicate which in each pair depicted greater risk of COVID infection. Their choices imply that on average respondents considered talking 14 minutes longer to be as risky as standing 1 foot closer, being indoors as standing 3 feet closer, and removing a properly worn mask by either party as standing 4–5 feet closer. We explore subpopulations and perceived nonlinear and interacted effects of combined behaviors.

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Although its details varied by country and evolved over time, the COVID-19 pandemic led to a worldwide campaign (by persuasion and mandates) to change our lives. We have been told that we can reduce COVID-infection risk by not touching our faces, covering our coughs, properly washing our hands, disinfecting surfaces, staying at home when we feel ill, and (once available) getting tested frequently and getting vaccinated. The campaign also included guidelines for our private interactions with others: we should replace hugs and handshakes with elbow bumps, stand six feet apart, wear masks (properly), and keep our interactions brief and outdoors. These conversational guidelines were unusual not only in their scale and domain, but in their unusual concreteness. Billions of people were told where and how far apart to be when conversing with others, and whether and how to make physical contact.

There are nonetheless reasons to doubt that this communication provided people with a sharp sense of how important these different precautions are. It is impossible to imagine precise calibrations of the health costs of failing to follow different parts of these guidelines, in terms of decreasing life expectancy; or even "merely" providing the exact probability that a behavior will lead to infection. And as in many other domains, the risks vary massively by the age and health status of individuals. The presence of this variation was well conveyed, but it rendered any effort to convey the level of danger to a "typical" person meaningless. Likewise, advice was given as the experts and officials were racing to understand the dangers of this new virus, and doing so when the virus itself was evolving; precise statements might later backfire if they made changes to guidelines more salient. All said, conveying the absolute risks would therefore be a fanciful task. Even now, and even with a specific person in mind, we doubt experts would venture estimates of the percentage-point increase in risk of infection or dying from one handshake.

By contrast, we assume almost all members of the public who accepted the reality of the pandemic would have a strong sense of expert advice on the direction of risk for any particular aspect of behavior. A long conversation is riskier than a short one, an unmasked one is riskier than a masked one, and an inside one is riskier than outside. While it would be useful to confirm (as we do) what people thought of as good and bad changes in particular

behaviors, it would seem unlikely that we could learn much by eliciting such beliefs.[1]

In between knowing which single behaviors are bad—as most of us do—and having precise beliefs about how bad each behavior is—as none of us does—is having beliefs about the *relative* risk of different behaviors. Although indications of the relative health risk of different activities seem conspicuously absent from most medical communication, we suspected experts may have strong opinions on the relative risks. Quantifying and conveying risks relative to each other may hence be more achievable than precise calibrations. At the same time, it may be more helpful than simply identifying good and bad behavior, because people often face tradeoffs: we cannot always improve particular behaviors in isolation, but rather need to know which of two *bundles* of behaviors puts us at greater risk of contracting COVID. Should we opt for longer work meetings outdoors—or shorter ones indoors? Should we keep greater distance in those meetings but then, to be heard, have to remove our masks when talking—or stand closer with masks always on? Should we go to a crowded indoor mask-enforced space where people queue in long lines—or to an outdoor market, with much shorter lines but unmasked people?

In this paper, we measure what people have come to believe regarding the *relative* dangers of infection of different conversational behaviors. As complicated as many aspects of the disease are, to our understanding the risk of infection is an unusually concrete, objective, essentially one-dimensional outcome variable. It is also of nearly universal relevance and concern to everybody participating in our survey (unlike other proximate health outcomes, such as determinants of raising blood pressure, whose impact is neither concrete nor universally relevant). The likelihood of infection may vary across people a great deal, and the likelihood of illness from contracting the virus varies even more widely, but (without being experts) we are unaware of variation in the *relative* risk of different activities. What's riskier for a young healthy person is also riskier for the elderly or those with exacerbating conditions. Moreover, although advice changed over time, especially early in the pandemic, it is our impression that advice in this domain changed little over the period of our study.[2] And while the delta

[1]There are a few exceptions we can think of: We were a bit curious, for instance, about what people thought about hugs versus handshakes.

[2]Dramatic shifts in understanding of the virus occurred early in the pandemic. Most notable was evolution in beliefs about how "airborne" the virus is, shifting the emphasis from keeping surfaces clean to ridding shared air of the virus.

variant arose between our first and last rounds of survey (the omicron arose well after our last survey), we are also unfamiliar with variation in advice that depended on the Greek alphabet.

To study perceptions, we showed a total of 676 respondents in the US, UK, and Israel between May and September, 2021, a sequence of pairs of 5-second videos played simultaneously, side by side, each showing the same acquaintances meeting and conversing. Respondents were asked to judge, for one of the two people designated, which of the two scenarios in each pair is riskier. From their responses to 30 pairs of such videos, we estimate their perceptions of how risks changed by the features of the conversation. We use videos—rather than written descriptions—for several reasons. It allows us to vary features of situations without suggesting the importance of these features, and to make the salience of those features be as naturalistic as possible. We were curious, for example, not just whether people knew how important it is to cover the nose, when asked, but also whether that is something they attended to in conversations.[3] Of course, witnessing naturalistic situations is still different from participating in them, and we speculate below how our design might have distorted perceptions relative to the case where people participate in conversations. There was one exception to our no-written-descriptions approach. Because we could not replace our 5-second clips with 300- to 3,600-second "clips," in treatments where it is varied, duration is therefore written below each video, as shown in figure 1 on page 7. We also had treatments that did not indicate conversation duration, and others where we provided identical duration for the two videos.[4]

[3]Our design reflects an initial focus on the translation respondents might have had from ubiquitous messaging quantifying the appropriate distance into respondents' objective experience of distance. In our exit questionnaire we asked respondents to estimate the distances in the videos. Although individuals' assessments varied and (per usual) respondents tended to provide round numbers in local units, the median respondent is generally well calibrated. We summarize these findings in appendix A.1.

[4]The closest existing study we found is by Svenson et al. (2020). They ask online US respondents to estimate changes in COVID exposure as a function of interpersonal distance changes. They do not use videos, and their main survey question asks: "Assume that two persons are in a face to face conversation standing **2 feet** away from each other. If they moved away from each other, their Coronavirus exposures would decrease. If they increased the distance **from 2 feet to 4 feet**, what percentage of the airborne viruses reaching a person at **2 feet** will reach a person at **4 feet**? Please, answer with a percentage. Same = 100%, Three quarters = 75%, Half = 50%, One quarter = 25%, One tenth = 10% etc. ...," with a similar question for a decrease in distance and increase in exposure ("Same= 100%, twice = 200%, 5 times = 500%, 10 times = 1,000%, 100 times = 10,000% etc. ..."). They find that relative to their reading of the the existing evidence, their survey respondents underestimate the effects on exposure of moving closer and away from another person. Their question and findings are orthogonal to ours, because they looked at the perceived

We collected four samples from three countries over the course of four months. We began by collecting data from 100 US participants in May 2021, and (after verifying that responses were not pure noise, and making no material modifications except for our randomization of videos into pairs, as explained below) from about 200 in August. To expand our data numerically and geographically we collected samples of about 200 each in the UK in August and in Israel in September. While we discuss below a few seeming differences across the three countries, we find generally similar estimated tradeoffs. We had no ex ante hypotheses we were testing about qualitative features of perceptions—and did not preregister any such hypotheses. Nor can we contrast quantitative perceptions with expert opinion—which we do not know.[5]

Overall (see table 1 on page 14), respondents perceive 14 extra minutes of social interaction to be as risky as standing one foot closer to the other person, and interacting indoors as equivalent to standing 3 feet closer outdoors. Masks loom large to respondents: wearing no mask by one of the interacting parties is perceived as equivalent to standing 4–5 feet closer (9 feet if both are maskless); wearing mask under one's nose as reducing protection by a third; and pulling one's mask down when talking as roughly equivalent to wearing no mask at all. Hugs and handshakes are seen as comparably risky, and as risky as standing 5–7 feet closer during the entire conversation, relative to no physical contact, and almost three to four times riskier than elbow bumps. We were surprised to find that on average respondents believed wearing a mask was as important for self as for the others.

Since we had no strong hypotheses on how perceptions would vary by country either, we did not design the experiment to disentangle national variation from any time trends in beliefs.[6,7] Nonetheless, we found some differences that seem noteworthy. One difference

exposure effect of distance, while we compare the perceived *relative* effects of distance, time, maskiness, etc.

[5]That said, a few findings seem to us as likely misperceptions. For example, respondents did not perceive being outdoors as dramatically safer than wearing a mask indoors. In a few instances where we think the ranking is clear, we were surprised that our participants saw essentially no difference. In part prompted by such findings, we speculate below how the high salience of certain behaviors—either in the real world or only in our videos—may have affected their perceived risk.

[6]Our guess is that most of the national differences were not due to time trends, but we have no data from our study or externally in support of that hunch. Because the emphasis on the value of being outdoors seemed to increase over time, however, we think this difference could plausibly be based on time trends rather than national differences.

[7]Despite the contentious nature of some aspects of the pandemic, we also had little reason to suspect beliefs about conversational behaviors would vary based on political views of our participants, and did

was in perceptions regarding *how* people wear their masks. Respondents in the US and UK recognized a substantial difference in risk from wearing the mask below the nose versus fully, whereas Israelis thought this difference mattered little. Israelis also seemed to think a person's own mask mattered more than the other person's mask. Finally, being indoors versus outdoors may have loomed larger in the UK (and perhaps in Israel) than in the US.

Our primary intended and implemented estimates treated each of the variables independently. This independence is probably implausible—e.g., presumably the risk from any initial physical contact would not depend on the distance and duration of the conversation, whereas the other factors would. It may, however, be plausible that participants perceived little such interaction, and we indeed present evidence consistent with this possibility. We are also able to estimate *some* perceived interdependencies, as well as the perceived risk of combinations of behaviors. For example (see figure 2 on page 12 and table 2 on page 17), masks are perceived more effective relative to other factors indoors than they are outdoors, and the perceived change in risk from an additional minute of conversation or an additional foot of distance is smaller at longer conversations and longer distances, respectively (i.e., we find perceived decreasing marginal effects of duration and distance).

We hope one use of this article is to edge debates on public health a little closer to more precise communication. To the best of health professionals' knowledge, *is* being indoors as risky as standing 3 feet closer outdoors? *Is* the risk of an extra 10 minutes of conversation smaller when the conversation is already 40 minutes long? *Is* wearing a mask as effective as having the other person wear one? The public constantly makes choices based on such perceptions. It would be good to know what the experts think. Shouldn't authorities find out and communicate it to the public?

not design the study to identify any such differences. We did collect such data, as well as demographic characteristics, after the main part of the survey, and found no striking (or un-striking) patterns. We report several such analyses in the appendix (and summarize them below in section II.4), and our posted data will include all collected variables.

# I Survey Design and Data

## I.1 Relative-Risk Assessments

Respondents complete thirty rounds of relative-risk assessments. Figure 1 provides an example snapshot from one round. Each round consists of a pair of silent videos, appearing on the screen side by side. The two videos play simultaneously, in repeated loops, until the respondent clicks on one of them, moving to the next round.

Figure 1: Example Risk-Assessment Snapshot


**Notes:** Each respondent makes thirty such risk assessments. Three design features are randomized at the respondent level (features shown in the example are underlined): (a) "risk... for the person in red/blue"; (b) "risk... is **higher**/**lower**"; (c) "all videos depict conversations of the same duration" (in the instructions)/"Interaction duration: **... minutes**" (under each video).

Each video depicts the first moments of a social encounter between two people. It starts with the two people entering the scene walking towards each other, and greeting each other. Sometimes they stop at a distance they then maintain, and other times they hug, shake hands, or touch elbows, before repositioning themselves at a certain distance. The rest of the video is a conversation, during which one of the two people may take off the mask when talking, or may cough or sneeze. The scene is cut after five seconds, and the video is replayed.

At the top of the screen, above the two videos, a fixed instruction reads: "Click on the video in which the risk of infection for the person in [red/blue] is [**higher**/**lower**]." Respondents are uniformly split into: (a) being asked about red or blue; (b) being asked about

higher or lower risk; and (c) being told the specific duration of each interaction or being asked to assume that all interactions are of the same duration. For split (c), "specific duration" respondents are shown a caption under each video that reads: "Interaction duration: [**5/10/15/20/30/40/60**] **minutes**" (uniformly randomized at the single-video level); "same duration" respondents are asked, before starting the survey, to assume that "all videos depict conversations of the same duration" (with no captions under the videos).[8] For each respondent, these three randomized design features are held fixed throughout the survey.

## I.2 Videos

Our production team shot 379 videos during a single shooting day, featuring the same two actors, wearing the same clothes and always each appearing on the same side of the scene.[9] Our posted data package will provide full details on our video catalog (by video features). Here we provide a brief summary. The videos differ along several dimensions. First, 32 baseline videos show the following $2 \times 4 \times 2 \times 2$ combinations: the scene is located in- or outdoors; after greeting remotely, the actors position themselves 2, 4, 6, or 8 feet apart; and either person does or does not wear a surgical mask throughout the video. Second, subsets of the baseline videos show the following variations, one per video: in addition to greeting remotely, the encounter starts with a hug, handshake, or elbow (after which the persons reposition themselves at the above distances and continue the encounter as usual); the person in red, blue, or both wear a cotton mask (two different types) rather than a surgical mask; the person in red or blue (but not both) coughs, sneezes, takes the mask off (by pulling it down) when talking, or wears the mask below their nose.[10] The indoors videos are all shot in the same location; outdoors videos use two different locations.

[8] Respondents in the "same duration" treatment are further randomized into two sub-treatments: unspecified same duration and specified same duration (ten and forty percent of all respondents, respectively). In the latter, the instruction prior to starting the survey explicitly specifies the duration of all interactions. Specifically, respondents are asked to assume that "all videos depict conversations of the same duration: [**5/10/15/20/30/40/60**] **minutes**" (uniformly randomized at the respondent level).

[9] Due to COVID-risk considerations, only pairs of domestic-partner actors were auditioned.

[10] In order to avoid unnecessary ambiguity, respondents are never asked to assess the risk of infection for a person who is seen coughing or sneezing.

## I.3 Survey Flow

Prior to making the thirty relative-risk assessments, respondents are provided with detailed instructions, are walked through an example round, are provided (system generated) feedback and clarification regarding their assessment in that round, and are given an opportunity to confirm their choice or to cancel and retry. Importantly, they are asked, and are repeatedly reminded throughout the instructions, to assume that both people are not vaccinated for COVID-19 and, if randomized into "same duration," to also assume that all videos depict conversations of the same duration. They are also asked to consider each video on its own, as if it were the only interaction they saw, ignoring the behavior of the same actors they observed in other videos. After completing the instructions and example, respondents can start the thirty assessment rounds.

To ease respondents in, and as an attention check, the first four rounds consist of (randomly selected) "easy" video pairs: using the anticipated (and observed) near-universal agreement on what is safer or less safe on each dimension, the encounter in one video is strictly riskier than that in the other video. In one pair, for example, the two videos are identical except for the distance. The remainder twenty six assessment rounds consist of "non-easy" pairs, all involving tradeoffs (US May sample); or any pairs, that may or may not involve tradeoffs (all other samples).[11]

After completing the thirty rounds, respondents (a) estimate interaction distances (in feet or meters, both from memory and in real time; see appendix A.1); (b) restate interaction duration (only from memory and only in the "specified same duration" treatment; see footnote 8); and (c) list sources that informed their understanding of COVID and ways to reduce infection risk, including specific media outlets and governmental resources. They then proceed to an exit questionnaire, asking them about (d) past infection, symptoms, and severity (separately regarding self, family, relatives, and friends); (e) social distancing behavior regarding mask wearing, keeping distance, and hugging (self); (f) vaccination uptake/intentions, and their timing (self); (g) perceptions regarding being high risk (self, family), concerns regarding getting infected (self, others), opinion about the local COVID

[11] Across all respondents and first-four rounds, the strictly riskier video is indeed indicated as riskier 90.6 percent of the time. To the extent that these rounds serve as attention check, our respondents seem attentive.

situation and whether they, family, or friends work in healthcare; and (h) personal demographics and political views. Our posted data package will provide screenshots, full survey text, and details about sample-specific modifications and adjustments. The survey was programmed on Otree (Chen, Schonger and Wickens, 2016).

### I.4 Data

Respondents in the US and UK were recruited using Prolific (`https://www.prolific.co`), and in Israel using Sekernet (`https://sekernet.co.il`). Median respondent age was around 30 in each US and UK sample, and 43 in Israel; overall 50 percent of respondents were female, with share 47–52 percent in each sample; the median survey-completion time is 15–18 minutes in all four samples. Appendix table A.1 panel A reports the exact statistics, as well as respondents' reported infection and vaccination status; its panel B reports official local daily infection and death rates during each of the four survey samples.

Pooled across the four samples (total $N = 676$) and all rounds ($N = 30$), our main data consist of 20,280 pairwise relative-risk assessments.[12]

## II Results

### II.1 Semi-parametric Relative-Risk Estimates

Figure 2 shows the impact on relative-risk assessment of each of sixteen combinations of features: location (in/outdoors) × distance (2/4/6/8 feet) × full-mask wearing (none/both actors). By estimating the effect of each individual combination, rather than of its underlying features, we avoid imposing assumptions regarding how effects vary with distance or regarding how location, distance, and mask wearing interact. Each of the sixteen points on the graph shows the estimated difference in probability that respondents assess the relevant combination as riskier compared with the combination at the bottom right: outdoors, 8-feet apart, both wearing full masks. That combination is considered the safest (both by common wisdom and, as the figure shows, by our respondents). Its value of 0 (by construction) means

[12]Respondents went back to watch the previous pair of videos in 102 of those 20,280 assessment rounds, and reversed their previous assessment when doing so in 53 of those 102 times.

that when both videos in a pair include this combination of features, respondents assess the one on the left as riskier with a 50-percent chance.

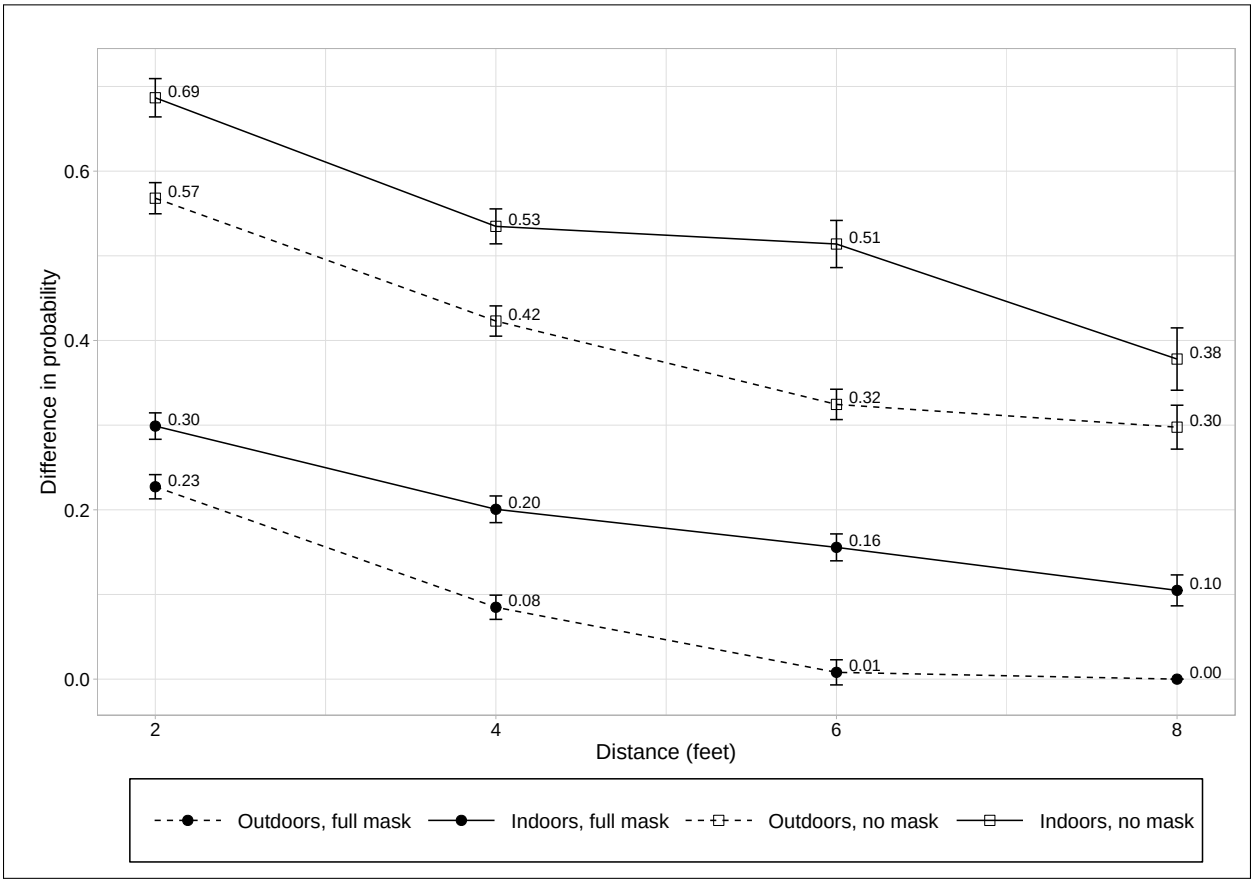
The estimates reported in the figure are the average marginal effects (and their SEs) from a logit regression based on the assessments made in the 13,689 cases where neither video involves partial mask wearing. The dependent variable is 1 if the video on the left is assessed riskier and 0 otherwise. The main independent variables represent feature-combination differences between the videos in a pair. To construct them, first, each single video is coded as a vector of indicator variables (0/1)—an indicator for each feature combination; second, each pairwise assessment—the unit of observation—is coded as a vector of differences ($-1/0/+1$) between the left- and right-video vectors. To make the graph readable, it only reports estimates from the above 16 coefficients; however, the regression has 31 such difference variables as main regressors, based on 31 0/1 indicators at the video level for the main 32 feature combinations that include the sixteen above plus the sixteen where one of the actors fully wears a mask while the other wears none (omitted category: the "safest" combination above).[13] In addition the these 31 main regressors—the nonparametric part of the specification—the regression also controls for any differences (across the videos in a pair) in duration and in these five extra features: cough, sneeze, hug, handshake, and elbow. (Hence, it is a semi-parametric specification.)

The figure shows, first, that all three features matter: socializing indoors (solid lines) is assessed riskier than socializing outdoors (dashed lines); socializing with both persons maskless (hollow squares) is assessed riskier than with both fully masked (filled circles); and socializing at closer distances is increasingly riskier. The riskiest baseline combination at the top left—indoors, no masks, 2 feet apart—is 69 percent likelier to be assessed riskier than the safest combination at the bottom right—outdoors, full masks, 8 feet apart—suggesting that in a direct pairwise comparison, it is assessed riskier almost 85 percent of the time.

Second, interactions across the three features appear modest: the four lines move roughly together. Specifically, the vertical gap between the no-mask in- and outdoors lines (the top two lines) is not dramatically larger than its counterpart gap between the two full-mask

[13] Appendix figure A.1, a busier version of figure 2, reports all 32 feature-combination estimates. It conveys a similar picture.

Figure 2: Risk Assessments: Location, Distance, and Mask Wearing




**Notes:** Source: authors' online surveys during 2021 on convenience samples in the US, UK, and Israel. Average marginal effects (and SEs) from logit regression. Observations: $N = 13,689$ relative-risk assessments where masks are either worn in full or not at all. Dependent variable: 1 if left video is assessed riskier; 0 otherwise. Independent variables: 31 main difference variables for the 32 baseline-feature combinations (2 in/outdoors $\times$ 4 distances $\times$ 2 blue mask full/none $\times$ 2 red mask full/none; omitted combination: outside, 8 feet apart, blue and red full masks), and controls for differences in duration and in 5 extra features (cough, sneeze, hug, handshake, elbow). The 31 main independent variables: 1 if feature combination or extra feature appears only in left video, $-1$ if only in right video, 0 if both/none. The figure shows the estimated effects on the 16 of the 32 baseline-feature combinations where either both blue and red wear full masks or none does (omitted combination coefficient = 0); see appendix figure A.1 for all 32 effects. Each depicted coefficient represents the estimated difference in probability that its combination is indicated as riskier when compared with the omitted combination (outside, 8 feet apart, full masks).

lines (the bottom two lines), meaning that the perceived effects of masks inside are not much larger than outside. Similarly, these two gaps are only somewhat larger at longer distances (6–8 feet) than at shorter ones (2–4 feet), meaning that the perceived effects of being in- versus outdoors vary only modestly with distance. Finally, the top two (no-mask) lines are only modestly closer to the bottom two (full-mask) lines at longer than at shorter distances, suggesting that the perceived effects of masks decline only modestly with distance.

Third, the perceived effect of distance is only somewhat nonlinear: while the lines clearly slope downwards more steeply at closer than at longer distances, none of the four lines is very far from linear.

This general absence of strong nonlinearities and interactions motivates the analysis in the rest of this paper. It suggests, first, that a simple linear-regression model is a convenient way to organize our main findings. It also suggests that distance could serve as a convenient numeraire, allowing us to discuss the assessed-risk effects of changes in location, mask wearing, and other features in terms of the (average) change in distance, measured in feet, that would lead to an equivalent effect. We return to investigating nonlinearities and interactions in section II.3.

## II.2 Average Tradeoff Estimates

Table 1 reports our main results. Each column is based on a single logit regression. Each pair of videos is an observation. The dependent variable is 1 if left video is indicated as riskier and 0 otherwise. The independent variables are twelve $1/0/-1$ variables indicating differences in features across the videos in a pair—coded 1 if a feature is present in the left but not right video, $-1$ if it is present in the right but not left video, and 0 if there is no difference across the videos—and two variables indicating distance differences (in feet) and duration differences (in minutes). Panel A reports the estimated coefficient on distance. In panel B, the estimated coefficients are normalized into distance equivalents (in feet) by dividing them by the distance coefficient.

The leftmost column pools all four samples and rounds. The Distance coefficient in panel A, $-0.040$ (SE 0.001), means that on average—over the entire set of respondents and video pairs—and holding all else constant, an additional foot of distance increases the probability

Table 1: Relative-Risk Perceptions, by Sample

| | Pooled | US May | US Aug | UK Aug | Israel Sep |
|---|---|---|---|---|---|
| A. Regression coefficient | | | | | |
| Distance (feet) | −0.040 | −0.040 | −0.038 | −0.042 | −0.039 |
| | (0.001) | (0.002) | (0.002) | (0.002) | (0.002) |
| B. Ratio of coefficient to Distance coefficient | | | | | |
| Distance (feet; used as numeraire) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Duration (minutes×10) | −0.69 | −0.71 | −0.53 | −0.84 | −0.67 |
| | (0.05) | (0.14) | (0.10) | (0.08) | (0.09) |
| Indoors | −3.02 | −2.15 | −1.69 | −4.22 | −3.39 |
| | (0.13) | (0.31) | (0.24) | (0.25) | (0.23) |
| Self wears mask: fully | 4.53 | 4.21 | 4.66 | 3.51 | 5.56 |
| | (0.16) | (0.40) | (0.34) | (0.24) | (0.31) |
| under nose | 2.92 | 2.53 | 1.89 | 1.61 | 5.28 |
| | (0.24) | (0.64) | (0.50) | (0.40) | (0.46) |
| fully but removed when talking | 0.15 | −0.38 | −0.59 | −0.49 | 1.69 |
| | (0.26) | (0.67) | (0.57) | (0.44) | (0.45) |
| Other wears mask: fully | 4.27 | 4.95 | 4.20 | 3.80 | 4.44 |
| | (0.15) | (0.42) | (0.32) | (0.25) | (0.28) |
| under nose | 2.89 | 3.23 | 2.70 | 2.02 | 3.88 |
| | (0.23) | (0.61) | (0.47) | (0.37) | (0.42) |
| fully but removed when talking | −0.33 | 0.47 | −1.30 | −0.17 | 0.02 |
| | (0.27) | (0.77) | (0.62) | (0.43) | (0.47) |
| Other: coughs | −2.95 | −2.96 | −3.30 | −3.18 | −2.37 |
| | (0.22) | (0.62) | (0.46) | (0.38) | (0.37) |
| sneezes | −4.36 | −4.89 | −4.37 | −5.27 | −3.25 |
| | (0.23) | (0.64) | (0.48) | (0.44) | (0.38) |
| Greeting: hug | −7.42 | −7.07 | −6.16 | −7.99 | −8.14 |
| | (0.27) | (0.70) | (0.52) | (0.47) | (0.51) |
| handshake | −5.40 | −5.54 | −4.57 | −5.78 | −5.73 |
| | (0.25) | (0.63) | (0.50) | (0.43) | (0.46) |
| elbow | −1.98 | −1.14 | −1.39 | −2.68 | −2.11 |
| | (0.21) | (0.54) | (0.44) | (0.37) | (0.38) |
| Observations | 20,280 | 3,000 | 5,460 | 5,820 | 6,000 |
| Respondents | 676 | 100 | 182 | 194 | 200 |

**Notes:** Source: authors' online surveys during 2021 on convenience samples in the US, UK, and Israel. Each column's estimates are from a single logit regression, based on only that column's sample. Dependent variable: response to pairwise assessment (across two videos): "Click on the video in which the risk of infection for the person in [red/blue] is [**higher**/**lower**]" (depending on treatment); coded 1 if left (right) video is clicked on in **higher** (**lower**) treatment; 0 otherwise. Independent variables: differences in features of social interaction (across the videos in a video pair); features are dichotomous (0/1), except for Distance and Duration. Self/Other: coded by [red/blue] treatment. Standard errors, clustered at the respondent level, are in parentheses.

that a video is chosen as riskier by 4 percent. This can be seen for instance in figure 2: the likelihood that a participant chooses a video as riskier is about 24 percentage points higher when that video shows a two-foot distance than when it shows an eight-foot distance.

Moving to panel B, the Duration row, −0.69 (0.05), means that on average, respondents consider an additional ten minutes of interaction to be as risky as standing roughly 0.7 feet closer. The next row shows that being in- rather than outdoors is on average perceived equivalent to standing 3 feet closer outside.[14] Next, fully wearing a mask or (three rows below it) having the other person fully wear a mask is perceived equivalent to being 4.5 and 4.3 feet farther, respectively, while wearing a mask (by self or other person) under one's nose is perceived equivalent to being only 2.9 feet farther, and pulling it down when talking is perceived roughly as risky as not wearing it at all.

The extra features at the lower rows all loom large. In increasing order: elbow bumps, the other person's coughs, the other person's sneezes, handshakes, and hugs are perceived equivalent to standing 2–7.4 feet closer. Representing a downside of our methodology, we suspect that these estimates may overstate naturalistically occurring perceptions: a quick hug is difficult to ignore in a repeatedly replayed 5-second clip, but may hardly be remembered—perhaps rightly so—in an imagined full-length video depicting an entire 30-minute interaction. Given that as a group, these features may appear disproportionately salient in our videos, we think that comparisons among themselves may be more meaningful than comparisons with other features. Thus, sneezes are perceived roughly 1.5 times riskier than coughs; hugs and handshakes are perceived roughly 3.7 and 2.7 times riskier than elbow bumps.

The four sample-specific columns are generally similar. The Distance coefficient in panel A is particularly stable and, given the reported standard errors in panel B, many of the (mostly small) cross-column differences could simply reflect sampling variation. This general similarity in perceived-risk tradeoffs across the samples is notable given that the samples differ not only in respondent populations, but also in other features, including survey timing and local COVID conditions. Of the few possible exceptions, we mention two that stand out. First, being indoors rather than outdoors may be perceived equivalent to roughly twice

[14] As an indoors-outdoors falsification test, we also run a specification with two separate indicator variables for the two outdoors locations where videos were shot. We find essentially identical Indoors estimates: −2.97 (0.15) and −3.05 (0.14) feet.

as many feet of closeness in the UK sample as in the US samples (with the Israel sample somewhere in between). Second, wearing a mask under one's nose—apparently a common practice in Israel throughout the pandemic—is perceived there roughly as risk-reducing as wearing a mask in full; in contrast, in the US and UK samples it is perceived as substantially less risk-reducing.

## II.3 Interactions and Nonlinearities

Table 2 reproduces the pooled column in table 1 for three data splits: by location (in- vs. outdoors), duration (30–60 vs. 5–20 minutes), and distance (2–4 vs. 6–8 feet). Each column is based solely on assessment rounds where both videos satisfy the condition in the column's title. For example, the first and second columns are each based on a regression that includes only rounds where both videos are shot indoors, and outdoors, respectively. (Since in such rounds the indoors indicator does not vary, the "Indoors" cells are empty.)

These two location columns do not differ much, in panel A, on the importance of distance; and are pretty similar, in panel B, on the negative effects of duration and the different greetings. However, both the protective effects of masks and the risky effects of coughs and sneezes are consistently larger indoors.

The two duration columns again do not differ much, in panel A, on the importance of distance. In panel B, while essentially everything tends to matter slightly more, in terms of distance, in shorter- than in longer-duration conversations, the most dramatic difference is in the marginal effect of duration itself. In longer conversations, a normalized duration coefficient of $-0.53$ (0.13) suggests that standing 1 foot closer is equivalent to talking almost 19 additional minutes. But in shorter conversations every minute matters much more: the coefficient almost quadruples to $-1.93$ (0.32), suggesting that 1 foot closer is equivalent to only slightly more than 5 minutes longer.

Finally, consistent with figure 2, the two distance columns show that the effect of distance is nonlinear too. In panel A, the average effect of an extra foot of distance in the 2–4-foot range is more than twice its effect in the 6–8-foot range ($-0.062$ vs. $-0.027$). As a result, while many of the other effects are similar in shorter and longer distances in absolute terms, once converted to feet they become more than twice larger in the longer distances—not

Table 2: Relative-Risk Perceptions, by Location, Duration, and Distance

| | Location | | Duration (minutes) | | Distance (feet) | |
|---|---|---|---|---|---|---|
| | Indoors | Outdoors | 30–60 | 5–20 | 2–4 | 6–8 |
| A. Regression coefficient | | | | | | |
| Distance (feet) | −0.040 | −0.045 | −0.042 | −0.039 | −0.062 | −0.027 |
| | (0.002) | (0.001) | (0.002) | (0.001) | (0.003) | (0.005) |
| B. Ratio of coefficient to Distance coefficient | | | | | | |
| Distance (feet) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Duration (minutes×10) | −0.78 | −0.75 | −0.53 | −1.93 | −0.48 | −1.16 |
| | (0.12) | (0.07) | (0.13) | (0.32) | (0.06) | (0.27) |
| Indoors | | | −2.73 | −3.00 | −1.76 | −6.60 |
| | | | (0.22) | (0.21) | (0.14) | (1.29) |
| Self wears mask: fully | 5.46 | 3.85 | 4.00 | 4.86 | 3.32 | 6.90 |
| | (0.41) | (0.21) | (0.27) | (0.26) | (0.22) | (1.35) |
| under nose | 4.24 | 2.65 | 2.91 | 3.25 | 2.40 | 4.12 |
| | (0.56) | (0.35) | (0.43) | (0.39) | (0.27) | (1.07) |
| only when not talking | 1.12 | 0.03 | 0.06 | −0.01 | 0.05 | 1.88 |
| | (0.61) | (0.36) | (0.49) | (0.41) | (0.30) | (0.98) |
| Other wears mask: fully | 4.97 | 3.82 | 3.88 | 4.48 | 3.11 | 7.23 |
| | (0.39) | (0.21) | (0.26) | (0.25) | (0.20) | (1.42) |
| under nose | 3.54 | 2.30 | 2.42 | 3.01 | 2.13 | 4.28 |
| | (0.52) | (0.32) | (0.39) | (0.36) | (0.26) | (1.06) |
| only when not talking | 0.39 | −0.12 | 0.00 | −0.02 | −0.71 | 1.81 |
| | (0.60) | (0.41) | (0.48) | (0.45) | (0.31) | (1.00) |
| Other: coughs | −3.18 | −2.65 | −2.60 | −3.41 | −2.18 | −4.77 |
| | (0.52) | (0.31) | (0.38) | (0.37) | (0.25) | (1.17) |
| sneezes | −5.21 | −4.00 | −4.06 | −5.02 | −3.16 | −6.91 |
| | (0.57) | (0.33) | (0.41) | (0.40) | (0.30) | (1.53) |
| Greeting: hug | −7.11 | −7.28 | −7.59 | −7.67 | −4.22 | −13.42 |
| | (0.69) | (0.37) | (0.49) | (0.44) | (0.31) | (2.60) |
| handshake | −5.42 | −5.13 | −5.10 | −5.82 | −2.93 | −12.48 |
| | (0.61) | (0.33) | (0.44) | (0.41) | (0.26) | (2.41) |
| elbow | −1.93 | −2.30 | −1.52 | −2.23 | −1.08 | −6.04 |
| | (0.49) | (0.29) | (0.38) | (0.34) | (0.22) | (1.40) |
| Observations | 3,488 | 7,249 | 5,727 | 8,107 | 7,064 | 3,607 |
| Respondents | 672 | 676 | 451 | 483 | 676 | 676 |

**Notes:** Source: authors' online surveys during 2021 on convenience samples in the US, UK, and Israel (pooled). Each column's estimates are from a single logit regression, based on only that column's subsample, which consists of all pairwise assessments in which *both* videos are within the indicated location/duration/distance range. Dependent variable: response to pairwise assessment (across two videos): "Click on the video in which the risk of infection for the person in [red/blue] is [**higher**/**lower**]" (depending on treatment); coded 1 if left (right) video is clicked on in **higher** (**lower**) treatment; 0 otherwise. Independent variables: differences in features of social interaction (across the videos in a video pair); features are dichotomous (0/1), except for Distance and Duration. Self/Other: coded by [red/blue] treatment. Standard errors, clustered at the respondent level, are in parentheses.

because they matter more, but because a foot matters less. That said, some effects in the 6–8-feet column are conspicuously larger than twice their 2–4-feet counterparts, including indoors, hugs, handshakes, and elbow bumps. We did not expect this difference, which could also result from our video methodology: it is possible that in a longer distance conversation, a zero-distance greeting looms larger because it is more salient and it takes up more time of the 5-seconds video.

### II.4 Robustness and Heterogeneity

Appendix tables A.2–A.4 reproduce the pooled column in table 1 for seventeen additional subsamples. The estimates appear generally similar to each other, with no particularly noteworthy exceptions. The subsamples include: (a) data splits by our three 50-50 between-subject randomizations (table A.2): risk is for the person in red vs. blue, risk is **higher** vs. **lower**, and interactions are "same duration" vs. "Interaction duration: **... minutes**";[15] (b) only certain assessment rounds (table A.3): excluding all rounds that include extra features or "zero-distance" features (hugs, handshakes, or elbow bumps), excluding the first four ("easy") rounds, or splitting the remaining rounds into ("early") rounds 5–17 and ("late") rounds 18–30; and (c) data cuts by respondent characteristics (table A.4): gender, political-party affiliation (in the US samples only), and vaccination status (at least one dose).

Our detailed exit survey allows for many additional splits. We hope that researchers with specific hypotheses of interest will explore them using our data, which will be made publicly available upon acceptance for publication.

## III Discussion

As an overarching goal, we hope to contribute to an understanding of modes of health communication in general and, in the future, to investigate some worries we have about such communication in other important domains. In particular, we are intrigued by the dearth of communication about tradeoffs which, as economists, we believe is crucial for helping people

[15] We further split the same-duration sample into unspecified- vs. specified-same-duration subsamples (see footnote 8), and again find no systematic differences.

make sound choices. To the extent that experts believe that the perceived risk tradeoffs we see in our data are wrong, and to the extent that correcting them would actually improve outcomes—an admittedly big behavioral assumption—our results may indicate a colossal health-risk communications failure that could be costing many lives all around the world.

Our pairwise-assessment methodology—a video adaptation of pairwise-choice methods routinely used by empirical economists—could be applied to other health-risk domains. Potential domains include weight loss, cardiac health, and dental health. Like the COVID domain, in these domains we are also asked by the experts to change our behavior in order to reduce health risk. And in these domains too, we cannot always—or simply do not always want to—improve particular behaviors in isolation, but would rather like to know which of two *bundles* of behaviors is better for us. How should we trade off low-carb food items versus low-fat ones versus low-calorie ones versus exercising more? What is better for our hearts: using the stairs at home four times a week, or keeping using the elevator but spending time at the gym on weekends? And what is better for our teeth: replacing one soda a week with a glass of fruit juice, or brushing 10 times a week rather than 8?

By investigating perceptions regarding such tradeoffs, we hope that future research, and the findings in this paper, will help focus health-risk communications on relative risks—potentially helping people make healthier choices.

# References

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# A Appendix

## A.1 Distance Assessments

A strength of our video-based survey design is that respondents make relative-risk assessments without having to translate distances described in words (using specific units, e.g., "six feet") into visual distances on the (videotaped) ground, nor translate such visuals into words. But the question of distance literacy is of importance to policymakers and others, who typically use words to communicate social-distancing recommendations. We explore it in our exit survey. We find that the median respondent is generally distance literate, but individuals' assessments vary. In addition, respondents tend to round numbers, using local units.

Appendix table A.1 panel C reports median distance estimates, by sample and pooled. Respondents are first asked (from memory) what was the average, minimum, and maximum distance in the thirty video pairs they had watched. Correct answers should be, respectively, 4.5 feet (on average), 2 feet, and 8 feet, if respondents only refer to distances during videotaped conversations; if they also consider distance during hugs, handshakes, and elbow bumps in videos that have these extra features, then average distance is lower and minimum distance could be 0 feet. Median responses (elicited in metes in the UK and Israel, then converted to feet) are, respectively, 5, 1.6, and 8.2 feet—rather close to said 4.5, 2, and 8 feet. However, responses are mostly given in round numbers, using local units: in both the UK and Israel, median assessments are 2, 0.5, and 3 meters, which convert to 6.6, 1.6, and 9.8 feet, respectively.

Respondents are then shown six randomly selected videos and are asked to assess (in real time) the distance in each of the six. The respective median responses are: for 2-feet videos with and without zero-distance extra features, 2 feet (with) and 1.6 feet (without); for 4-feet videos, 3.3 and 4; for 6-feet videos, 4.9 and 6; and for 8-feet videos, 6.3 (with zero-distance features) and 7 feet (without). As expected, looking at the full distributions of responses, videos that include a zero-distance extra feature tend to have large modes at zero, while videos without them have almost no zero responses. Also, as above, most responses are round numbers in local units, which tilts the medians for original responses in meters.

Table A.1: Summary Statistics and Distance Estimates

| | US May | US Aug | UK Aug | Israel Sep | Pooled |
|---|---|---|---|---|---|
| A. Respondent statistics | | | | | |
| Age (median) | 31 | 27.50 | 29 | 43 | 33 |
| Woman (percent)[a] | 47 | 54 | 47 | 52 | 50 |
| Infected (at some point; percent) | 10 | 15 | 15 | 13 | 14 |
| Vaccinated (at least one dose; percent) | 63 | 81 | 82 | 84 | 80 |
| Total survey duration (minutes; median) | 15[b] | 18 | 15 | 16 | 16 |
| B. Country COVID statistics (during survey)[c] | | | | | |
| Data-collection dates (all in 2021) | May 18 | Aug 17 | Aug 17 | Sep 5–9 | |
| New daily cases per 1M | 82 | 457 | 392 | 651 | |
| New daily deaths per 1M | 2.3 | 3.1 | 2.5 | 5.6 | |
| C. Distance estimates (feet; median) | | | | | |
| From memory, over all videos: average | 5 | 4 | 6.6 | 6.6 | 5 |
| minimum | 1 | 2 | 1.6 | 1.6 | 1.6 |
| maximum | 8 | 7 | 9.8 | 9.8 | 8.2 |
| In real time: 2 feet, no zero distance[d] | 2 | 2 | 1.6 | 1.6 | 1.6 |
| with zero distance | | 2 | 1.6 | 1.6 | 2 |
| 4 feet, no zero distance | 4 | 4 | 4.9 | 4.9 | 4 |
| with zero distance | | 3 | 4.1 | 3.3 | 3.3 |
| 6 feet, no zero distance | 5.5 | 5 | 6.6 | 6.6 | 6 |
| with zero distance | | 4.5 | 6.2 | 4.1 | 4.9 |
| 8 feet, no zero distance | 7 | 6 | 9.8 | 6.6 | 7.0 |
| with zero distance | | 5 | 6.6 | 6.6 | 6.3 |
| Respondents | 100 | 182 | 194 | 200 | 676 |

**Notes:** Distance estimates are entered by respondents in feet in the US and in meters in the UK and Israel; in the table they are always converted to feet. (Recall, 1.6 feet $\approx$ 0.5 meters, 3.3 feet $\approx$ 1 meter, 4.9 feet $\approx$ 1.5 meters, 6.6 feet $\approx$ 2 meters, and 9.8 feet $\approx$ 3 meters.)

[a] Overall, 1.6 percent reported "Non-Binary" or "Other."

[b] Based on only 21 respondents in the US May sample, due to a programming error (fixed in later samples).

[c] Source: `https://ourworldindata.org`; refers to (last) day of data collection.

[d] No hug, handshake, or elbow bump. In the US May survey, distance-estimate questions did not include videos with these extra features.

Table A.2: Relative-Risk Perceptions, by Treatment

| | Person in | | Risk is | | Interaction duration | |
|---|---|---|---|---|---|---|
| | Red | Blue | Higher | Lower | Same | Captioned |
| A. Regression coefficient | | | | | | |
| Distance (feet) | −0.039 | −0.041 | −0.043 | −0.037 | −0.042 | −0.038 |
| | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) |
| B. Ratio of coefficient to Distance coefficient | | | | | | |
| Distance (feet; used as numeraire) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Duration (minutes×10) | −0.71 | −0.66 | −0.51 | −0.92 | | |
| | (0.07) | (0.07) | (0.06) | (0.08) | | |
| Indoors | −3.13 | −2.89 | −2.59 | −3.52 | −2.62 | −3.50 |
| | (0.19) | (0.17) | (0.16) | (0.21) | (0.16) | (0.21) |
| Self wears mask: fully | 4.41 | 4.64 | 4.46 | 4.63 | 4.53 | 4.50 |
| | (0.23) | (0.22) | (0.20) | (0.25) | (0.20) | (0.24) |
| under nose | 2.32 | 3.50 | 3.15 | 2.61 | 3.19 | 2.55 |
| | (0.35) | (0.33) | (0.30) | (0.39) | (0.31) | (0.37) |
| only when not talking | 0.42 | −0.10 | 0.20 | 0.05 | 0.31 | −0.25 |
| | (0.36) | (0.38) | (0.33) | (0.41) | (0.33) | (0.41) |
| Other wears mask: fully | 4.57 | 3.96 | 4.03 | 4.56 | 4.30 | 4.24 |
| | (0.22) | (0.21) | (0.19) | (0.25) | (0.20) | (0.24) |
| under nose | 3.42 | 2.35 | 2.74 | 3.14 | 2.87 | 3.00 |
| | (0.34) | (0.30) | (0.28) | (0.36) | (0.29) | (0.35) |
| only when not talking | −1.12 | 0.37 | −0.35 | −0.32 | 0.12 | −0.78 |
| | (0.41) | (0.36) | (0.34) | (0.44) | (0.34) | (0.44) |
| Other: coughs | −3.45 | −2.34 | −3.01 | −2.89 | −2.72 | −3.11 |
| | (0.32) | (0.31) | (0.28) | (0.34) | (0.28) | (0.34) |
| sneezes | −4.45 | −4.21 | −4.06 | −4.73 | −4.19 | −4.46 |
| | (0.34) | (0.32) | (0.29) | (0.38) | (0.30) | (0.36) |
| Greeting: hug | −7.55 | −7.25 | −6.98 | −7.94 | −7.83 | −6.80 |
| | (0.39) | (0.37) | (0.34) | (0.44) | (0.36) | (0.40) |
| handshake | −5.75 | −5.02 | −4.94 | −5.97 | −5.42 | −5.32 |
| | (0.36) | (0.34) | (0.31) | (0.40) | (0.31) | (0.38) |
| elbow | −1.26 | −2.62 | −1.93 | −2.05 | −2.18 | −1.70 |
| | (0.30) | (0.29) | (0.27) | (0.33) | (0.27) | (0.32) |
| Observations | 10,170 | 10,110 | 10,350 | 9,930 | 10,560 | 9,720 |
| Respondents | 339 | 337 | 345 | 331 | 352 | 324 |

**Notes:** See table 1's notes.

Table A.3: Relative-Risk Perceptions, by Round Features

| | No extra features | No 0-dist. features | Rounds 5–30 | Rounds 5–17 | Rounds 18–30 |
|---|---|---|---|---|---|
| A. Regression coefficient | | | | | |
| Distance (feet) | −0.054 | −0.050 | −0.039 | −0.038 | −0.040 |
| | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) |
| B. Ratio of coefficient to Distance coefficient | | | | | |
| Distance (feet; used as numeraire) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Duration (minutes×10) | −0.60 | −0.57 | −0.70 | −0.74 | −0.66 |
| | (0.06) | (0.05) | (0.05) | (0.08) | (0.07) |
| Indoors | −2.86 | −2.82 | −3.05 | −2.98 | −3.12 |
| | (0.15) | (0.13) | (0.14) | (0.20) | (0.19) |
| Self wears mask: fully | 4.21 | 4.09 | 4.66 | 4.76 | 4.58 |
| | (0.19) | (0.16) | (0.17) | (0.25) | (0.24) |
| under nose | 2.88 | 2.80 | 3.02 | 3.10 | 2.97 |
| | (0.25) | (0.23) | (0.26) | (0.38) | (0.35) |
| only when not talking | 0.36 | 0.33 | 0.24 | −0.09 | 0.56 |
| | (0.29) | (0.26) | (0.28) | (0.40) | (0.38) |
| Other wears mask: fully | 3.90 | 4.04 | 4.37 | 4.54 | 4.23 |
| | (0.19) | (0.16) | (0.17) | (0.25) | (0.23) |
| under nose | 2.72 | 2.86 | 3.08 | 3.37 | 2.83 |
| | (0.23) | (0.22) | (0.24) | (0.36) | (0.33) |
| only when not talking | 0.27 | 0.16 | −0.29 | −0.02 | −0.56 |
| | (0.29) | (0.27) | (0.29) | (0.41) | (0.40) |
| Other: coughs | | −2.20 | −2.99 | −2.89 | −3.07 |
| | | (0.21) | (0.24) | (0.34) | (0.33) |
| sneezes | | −3.35 | −4.43 | −4.22 | −4.62 |
| | | (0.22) | (0.25) | (0.36) | (0.35) |
| Greeting: hug | | | −7.74 | −8.04 | −7.48 |
| | | | (0.29) | (0.44) | (0.39) |
| handshake | | | −5.61 | −6.18 | −5.07 |
| | | | (0.26) | (0.40) | (0.35) |
| elbow | | | −2.01 | −2.21 | −1.83 |
| | | | (0.22) | (0.33) | (0.31) |
| Observations | 7,221 | 11,183 | 17,576 | 8,788 | 8,788 |
| Respondents | 676 | 676 | 676 | 676 | 676 |

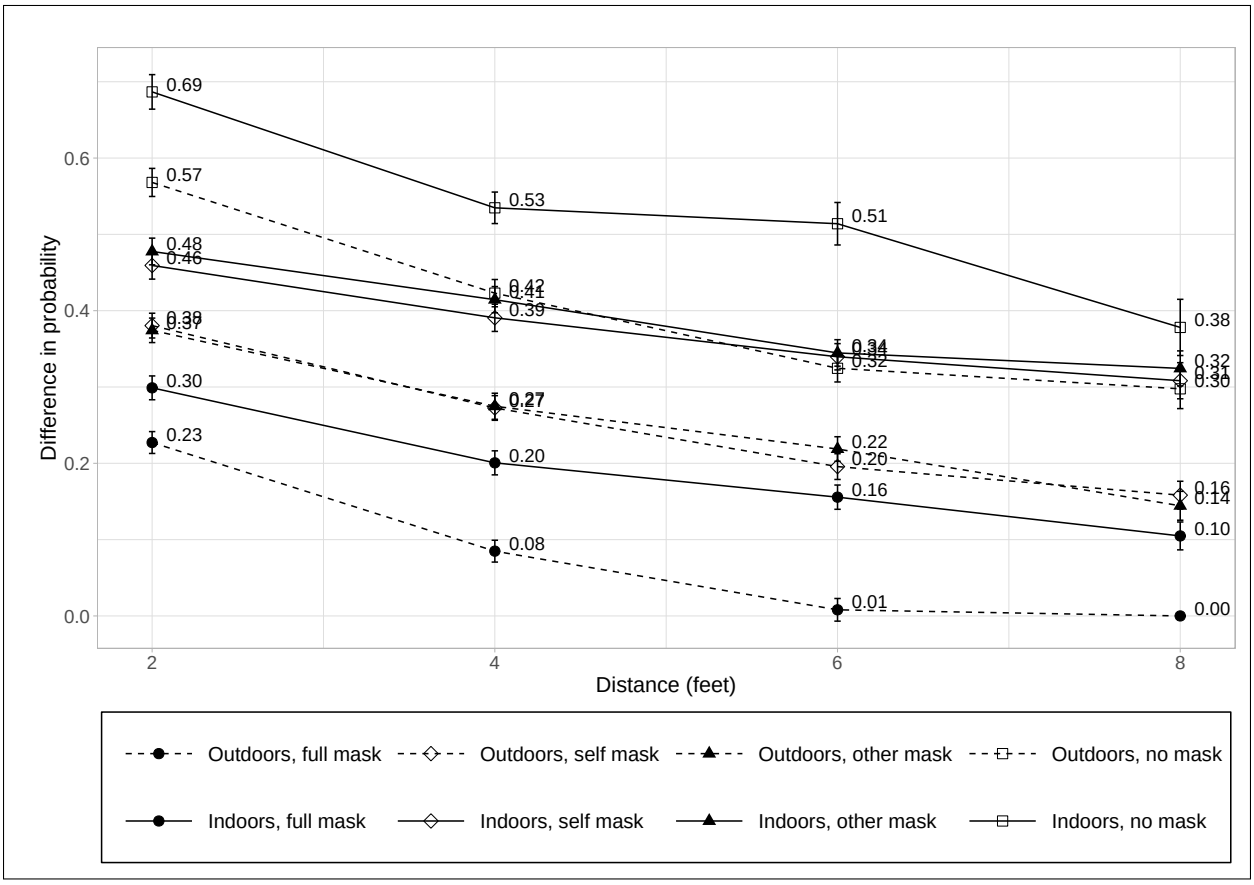
**Notes:** See table 1's notes.

Table A.4: Relative-Risk Perceptions, by Respondent Characteristics

| | Gender | | US Political affiliat. | | Vaccinated | |
|---|---|---|---|---|---|---|
| | Female | Male | Democ. | Repub. | Yes | No |
| A. Regression coefficient | | | | | | |
| Distance (feet) | −0.040 | −0.040 | −0.036 | −0.042 | −0.040 | −0.040 |
| | (0.001) | (0.001) | (0.002) | (0.005) | (0.001) | (0.002) |
| B. Ratio of coefficient to Distance coefficient | | | | | | |
| Distance (feet; used as numeraire) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Duration (minutes×10) | −0.75 | −0.60 | −0.49 | −0.84 | −0.66 | −0.79 |
| | (0.06) | (0.08) | (0.11) | (0.26) | (0.05) | (0.12) |
| Indoors | −3.45 | −2.53 | −1.72 | −2.89 | −3.20 | −2.24 |
| | (0.18) | (0.18) | (0.26) | (0.61) | (0.15) | (0.26) |
| Self wears mask: fully | 5.17 | 3.83 | 4.58 | 4.36 | 4.56 | 4.47 |
| | (0.23) | (0.22) | (0.36) | (0.72) | (0.18) | (0.35) |
| under nose | 2.96 | 2.92 | 2.29 | 2.95 | 3.03 | 2.51 |
| | (0.32) | (0.37) | (0.56) | (1.03) | (0.27) | (0.52) |
| only when not talking | 0.24 | 0.03 | −0.89 | −0.74 | 0.41 | −0.91 |
| | (0.35) | (0.40) | (0.62) | (1.31) | (0.28) | (0.64) |
| Other wears mask: fully | 4.69 | 3.82 | 4.50 | 4.03 | 4.43 | 3.64 |
| | (0.22) | (0.22) | (0.36) | (0.69) | (0.17) | (0.32) |
| under nose | 3.19 | 2.72 | 3.02 | 2.63 | 2.94 | 2.76 |
| | (0.31) | (0.34) | (0.55) | (0.95) | (0.25) | (0.49) |
| only when not talking | −0.55 | −0.17 | −0.65 | −0.49 | −0.27 | −0.56 |
| | (0.36) | (0.41) | (0.71) | (1.33) | (0.30) | (0.65) |
| Other: coughs | −3.06 | −2.82 | −3.14 | −2.03 | −2.97 | −2.88 |
| | (0.30) | (0.33) | (0.52) | (1.00) | (0.25) | (0.48) |
| sneezes | −4.63 | −4.11 | −4.25 | −5.87 | −4.17 | −5.15 |
| | (0.31) | (0.35) | (0.53) | (1.24) | (0.26) | (0.54) |
| Greeting: hug | −7.62 | −7.30 | −6.57 | −6.33 | −7.28 | −7.89 |
| | (0.37) | (0.41) | (0.58) | (1.23) | (0.30) | (0.61) |
| handshake | −5.63 | −5.21 | −4.98 | −4.26 | −5.59 | −4.82 |
| | (0.34) | (0.36) | (0.55) | (1.15) | (0.28) | (0.51) |
| elbow | −1.78 | −2.17 | −0.87 | −2.17 | −1.89 | −2.22 |
| | (0.28) | (0.32) | (0.47) | (0.97) | (0.24) | (0.48) |
| Observations | 10,200 | 9,750 | 5,250 | 870 | 16,140 | 4,110 |
| Respondents | 340 | 325 | 175 | 29 | 538 | 137 |

**Notes:** See table 1's notes.

Figure A.1: Risk Assessments: Location, Distance, and Mask Wearing




**Notes:** See figure 2's notes.