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Title	A case study of an experiment during the COVID-19 pandemic: online elicitation of subjective beliefs and economic preferences
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Publication date	2021-12-18
Original Citation	Harrison, G., Hofmeyr, A., Kincaid, H., Monroe, B., Ross, D., Schneider, M. and Swarthout, J., (2021) 'A case study of an experiment during the COVID-19 pandemic: online elicitation of subjective beliefs and economic preferences', Journal of the Economic Science Association, 7(2), pp.194-209. doi: 10.1007/s40881-021-00115-7
Type of publication	Article (peer-reviewed)
Link to publisher's version	10.1007/s40881-021-00115-7
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Download date	2026-11-06 09:44:18
Item downloaded from	https://hdl.handle.net/10468/12393

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A Case Study of an Experiment During the COVID-19 Pandemic: Online Elicitation of Subjective Beliefs and Economic Preferences

by

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December 2021

ABSTRACT

We convey our experiences developing and implementing an online experiment to elicit subjective beliefs and economic preferences. The COVID-19 pandemic and associated closures of our laboratories required us to conduct an online experiment in order to collect beliefs and preferences associated with the pandemic in a timely manner. Since we had not previously conducted a similar multi-wave online experiment, we faced design and implementation considerations that are not present when running a typical laboratory experiment. By discussing these details more fully, we hope to contribute to the online experiment methodology literature at a time when many other researchers may be considering conducting an online experiment for the first time. We focus primarily on methodology; in a complementary study we focus on initial research findings.

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1. Motivation

With the onset of the COVID-19 global pandemic during early 2020 and the associated social distancing mandates and guidelines that followed, many have adapted to new routines. Experimental economists who rely on traditional physical laboratories for conducting experiments have faced the reality of shuttered laboratories over intervals of uncertain duration. This situation has led many of us to consider conducting online experiments for the first time. We were keenly motivated to conduct a multi-wave experiment to assess risk preferences, time preferences, and subjective beliefs related to the pandemic as it was unfolding, and the only way to do this was with an online experiment. We provide a detailed case study of our experiences, and review issues and solutions associated with designing and conducting online experiments.

Our online experiment was designed to explore preferences and beliefs during the evolution of the COVID-19 pandemic in South Africa (S.A.) and the United States (U.S.). While the pandemic unfolded, were risk and time preferences unconditionally stable? Did they vary with the progress of the pandemic in some conditional manner, or were they apparently disconnected from its course? Did subjective beliefs about the prevalence and mortality of the pandemic track the actual progress of the pandemic, the projections of widely-publicized epidemiological models, or neither? These are core hypotheses we sought to evaluate with a multi-wave online experiment at monthly intervals between May and November 2020. Subjects were drawn at random from the same populations, with no subject asked to participate twice. Parallel experiments were undertaken in the United States (N = 598) and South Africa (N= 544).

The U.S. results from the experiment are presented in a complementary study by Harrison et al. [2022]. Our objective here is to review the procedures and software we used to implement this online experiment. We provide our software source code for others to use if they find it useful: see https://github.com/bamonroe/Covid19Experiment.

In addition to incentivized elicitation of preferences and beliefs, we administered a

complementary series of non-incentivized survey questions. We incorporated these survey questions in our overall experiment, even though the main focus was on incentivized responses. It was useful for us to have all of the data, experimental choices and survey responses, collected consistently and within the same framework.

We make no attempt here to undertake methodological evaluations of alternative elicitation methods, alternative recruitment methods, or alternative software for running the experiments online. Our objective was to apply four elicitation tasks that we have employed for many years, to address specific questions about the pandemic in a timely manner. We simply did not have time to evaluate alternatives. We used elicitation tools we have had a large hand in establishing in the field, recruitment from a known database of university students, and software that we were already familiar with. Therefore, this is a case study of *successful* methods, not an argument for *best* methods.

2. Software

The primary technical hurdle when running an online experiment is delivering the experiment software over the internet. We used version 3.3.6 of the oTree framework developed by Chen et al. [2016].[1] oTree experiments run natively within any modern browser and on any modern device, valuable features for online experiments, although one always should check the implementation on different browsers and devices.

When conducting an online experiment, consideration should be given to the scalability of

[1] Alternatives exist, of course. For example, Duch et al. [2020] describe zTree Unleashed, a method to run zTree online. This relies on Windows emulation to run a zTree server and all clients on a single Linux server, allowing stateful client-server connections via localhost loopback, and then uses the X Window System to stream bitmaps of each client GUI over HTTPS. The result is that each subject views a zTree client (i.e., a zleaf) within a browser, but the client is actually running on a remote server. Other alternatives are considered by Zhao et al. [2020] and Arechar et al. [2018]. To allow oTree to generate survey questions we used version 0.9.2 of oTreeutils due to Konrad [2019].

the chosen software. Coming from laboratory experiments, one is accustomed to thinking in terms of the number of sessions that must be conducted in support of a given research project, which is often due to the constraint of the number of physical seats within the laboratory. This usually results in running sessions over many days and weeks. An online experiment does not have this constraint, allowing many more subjects to participate simultaneously. This can greatly reduce the amount of time spent collecting data, but only if one has a software approach that effectively scales, and the Django framework on which oTree 3.3.6 was built has a proven track record of extreme scalability.

We deployed our oTree software over the internet by renting an Ubuntu Linux virtual machine at little cost compared to the overall budget of the study,[2] and took advantage of well established open-source software to handle the tasks required to connect computers over the internet. Version 3 of oTree itself is built on the Django web framework,[3] and uses the PostgreSQL database software to manage the data needed to deploy oTree and record subject responses. We connected our oTree instances to the internet at-large by passing HTTPS requests through an Apache web server,[4] which allowed us to deploy multiple instances of oTree on the same virtual machine with different subdomain names. The collective software stack we used, including Linux, Apache, PostgreSQL, and Django, consists entirely of open-source software used globally by millions of users daily, and supported by generous corporate sponsorship to ensure reliability, all free

[2] The monthly cost of renting the machine was roughly equivalent to half the average amount paid to a single subject in our experiment. We used a commercially available machine, based in the United States. Time constraints did not allow us to request access to such machines within a university environment, particularly since our universities were under COVID lockdown. Issues of data privacy also arise in the selection of location and institutional setting of the host machine and researchers must abide by any IRB requirements.

[3] Django is a popular open-source, Python-based web framework used by many well-known, large-scale websites, such as Instagram and Pinterst, to deploy content. For more information see https://www.djangoproject.com/. We used version 3.7 of Python. oTree version 5 has now abandoned the Django framework and instead relies upon the Starlette framework, which appears to be just as scalable. For example, we ran an experiment in June 2021 where we collected data from over 250 people in a single day.

[4] As of December 2020, approximately 35% of all websites on the internet are deployed using an Apache web server; see https://w3techs.com/technologies/history_overview/web_server.

of cost to us as the end users.

All components of this software stack are designed for extreme scalability, which allowed us to conduct experimental sessions with more than 200 simultaneous subjects, and left us with little doubt that we could support several hundred more subjects. By utilizing widely-used and widely-supported open-source software to manage connectivity over the internet, store and retrieve data from databases efficiently, and serve content to our subjects through web browsers, we were able to focus our efforts primarily on the tasks for which we have the greatest comparative expertise: the design of economic experiments.

3. Design Considerations

We are interested in three broad **types of preferences**. One is atemporal risk aversion, measuring aversion to stochastic variability of outcomes at some point in time. Another is time preference, measuring discounting of time-dated, non-stochastic outcomes. And the third is intertemporal risk aversion, measuring aversion to stochastic variability of outcomes over time. Each of these is connected as a matter of theory, so we must have elicitation methods that allow us to jointly estimate time preferences with atemporal risk preferences, and then in turn to estimate intertemporal risk preferences with time preferences and atemporal risk preferences. There are no elicitation methods that allow one to jointly infer all three of these types of preferences with one task.

Our experimental elicitation methods for atemporal risk preferences follows the unordered binary lottery choices popularized by Hey and Orme [1994]. To elicit time preferences we employ the approach of Andersen et al. [2014]. To elicit intertemporal risk preferences, which really involve the conceptual interaction of risk and time preferences, we follow Andersen et al. [2018]. Each of these references provide discussion of previous literature, and evaluations of alternative approaches. Again, our intent here was not to invent any new elicitation mouse-traps, or test the ones we used:

this is a policy application, under time pressure as the pandemic evolved.

We are also interested in eliciting **subjective belief distributions** for individuals with respect to the short-term and longer-term progress of the COVID-19 pandemic. We are specifically interested in beliefs about the levels of infection (prevalence) as well as about the levels of deaths (mortality) of the populations of the United States or South Africa. The short-term horizon is always one month from the day of elicitation. The longer-term horizon was December 1, 2020, implying a varying-length horizon over the waves of the experiment.

A key feature of our elicitation method is that we can make statements about the bias of beliefs as well as the confidence of beliefs. We employ a Quadratic scoring rule to incentivize subjects to report beliefs over various outcomes, as implemented by Harrison et al. [2017]. In effect, we elicit beliefs about histogram bins defined over the possible pandemic outcomes. Subjects could allocate 100 tokens over 10 histogram bins, where each bin was defined by an upper and lower outcome. Details of the procedures for selecting bin intervals are in Harrison et al. [2021]. The upshot is that we had four "frames" for each belief question, randomly assigned to a subject, where each frame had slightly different bin labels to allow us to bracket *a priori* likely beliefs.

None of these elicitation tasks required any subject interaction with other subjects. This allowed us freedom to provide a specific 24-hour window for subjects to respond, facilitating flexible participation around different lock-down schedules and availability. As it happens, oTree allows for synchronous, real-time subject interaction, but this would have required more coordination of subject schedules and raised (potential) issues with intra-session attrition.[5]

[5] Alternatively, we could have implemented asynchronous interaction using the "strategy method" and resolved outcomes at the end of the calendar day.

4. Experiment Procedures

4.1 Recruitment, Samples, & Retention

The procedures to **recruit and contact** student participants vary slightly between our institutions due to the software and institutional infrastructure available. We recruited students from Georgia State University (GSU) and the University of Cape Town (UCT) for the experiment. We already maintained procedures to contact students, and possess a credible reputation amongst them for paying for their participation. This reputation is especially important given the increased social distance involved with purely online activities, and tasks relying upon future payments.

At GSU researchers have access to a recruitment database of current undergraduate students who are interested in taking part in paid research through the Experimental Economics Center (E*x*CEN). When registering in this system, students provide their name, campus ID, email address, and basic demographic information regarding age, gender, and ethnicity. As of May 11, 2020, there was a total of 2,497 active subjects in the recruiter database, which is the pool of participants that were invited to take part in the U.S. portion of the study.

Our researchers at the University of Cape Town (UCT) approach this slightly differently and build a recruitment database from scratch for each project undertaken. This is accomplished by submitting a request to the UCT central administration along with a copy of the study announcement. Once approved, an email with the study announcement is sent to all undergraduate and postgraduate students. The announcement outlines the study, the incentivized nature of the research, and then invites the student to fill out an online questionnaire if they are interested in being considered for participation. The questionnaire captures their name, email address, student number, and similar basic demographic information regarding age, gender, and ethnicity. As of May 11, 2020, there were over 1,700 students at UCT who had confirmed their interest in participating in the study. This is the pool from which we selected participants in the South African portion of the

study.

For both locations **stratified randomization** was performed on the recruitment databases. The demographic variables age, gender, and ethnicity were used to define the multiple strata of interest to create a set of balanced lists from which to recruit. The lists were defined by three across-subject treatments: 3 initial waves of data collection; 3 participant payments on offer ($5, $10, and $15 in the U.S. and R40, R60, and R80 in South Africa);[6] and 2 orders of presenting the health survey and the beliefs task. Thus a total of 18 balanced sample lists (3 waves × 3 participation payments × 2 task orders) were generated for each location and used to recruit participants. These 18 lists were later adopted to serve 6 waves of data collection in total. For each wave six lists were used for recruitment over the six treatments within the wave (3 participation payments × 2 task orders). Additional details of randomization procedures are in Online Appendix G.

Using these recruitment lists, initial **emails inviting** students to sign up to participate in the study were sent about 5 days ahead of the launch date of each wave. The email informs potential participants that they are invited to take part in a study regarding population health risks and health outcomes. It lists the date and time of the study, the anticipated time required for their participation, the amount of the fixed participant payment if they complete all tasks, and explains that they will have 4 additional opportunities to earn extra compensation depending on their decisions.[7] The initial recruitment email concludes with a request for the student to log into their account and confirm participation.[8] Participation was capped at 150 participants per wave (25 participants per treatment) in the U.S. and 120 per wave (20 participants per treatment) in South Africa to accommodate

[6] The purchasing power parity (PPP) for the U.S. dollar and South African rand is currently $1 = R6.8. See https://www.imf.org/external/datamapper/PPPEX@WEO/OEMDC/ADVEC/WEOWORLD/ZAF.

[7] Participants knew the amount of the fixed participation payment but did not know to which task order they were assigned.

[8] For GSU students confirmation of participation was done through the E*x*CEN recruitment system. For UCT students, participation was confirmed through a special instance of UCT's online collaboration and learning environment, *Vula*, which is used to support UCT courses as well as other UCT-related groups and communities.

budgets. Individuals were told that sign-ups to participate were handled on a first-come, first-served basis, and that once quotas were met no further sign-ups were considered. If the quotas were not met and additional capacity remained, then the same recruitment email was sent a second time two days ahead of the wave launch date as a reminder to all non-confirmed individuals to consider participating.

On the evening prior to a wave going live, a list of names and email addresses for all confirmed participants was downloaded, and the session closed from accepting any new registrations. The list of confirmed participants was then matched to a list of unique URLs that contained encrypted wave and treatment information, allowing oTree to correctly display a given subject's participation payment amount, the treatment to which the subject was assigned, and the wave that the subject was in. Since these access URLs are unique to every individual, we used mail merge from Microsoft *Word*, *Excel* and *Outlook* and sent the invitation emails directly to the participant from a university email address about 4 hours before the links became live and provided entry to the study.

In addition to the unique URL, the invitation email contained other pertinent information related to the study: the exact 24-hour window when the study was available; the expected time to complete; instructions on how to log back onto to the study and pick back up where they left off, if necessary; internet browser requirements; an overview of the components of the study; and the payment methods that would be utilized. We provide templates for the emails sent to U.S. subjects in Online Appendix B.

The experimenters **monitored** the number of participants who completed a particular wave throughout the day it took place. In every wave, a reminder was sent at around 3 p.m. to encourage those participants who had yet to complete the study. The encouragement email was another mail merge that provided the unique web link along with brief text reminding the participant that the

study had to be finished within the 24-hour window for them to be eligible for payment.

4.2 Payment

When running an experiment session in a physical laboratory, an experimenter typically pays each subject in cash at the end of the session. This is not possible online and **alternative payment procedures** are needed. Additionally, the temporal aspect of our experiment that involved some future-dated payments required careful consideration of how to remit payments after specific intervals. For example, given the study protocol, it was possible for a participant to be paid over 5 separate transactions that could span up to 7 months from their initial participation.[9] With 598 (544) subjects in the U.S. (S.A.) sample alone and up to 5 potential payments per subject over time, the logistics of making nearly 3,000 (2,700) payments and recording the transactions, as required for filing and reimbursement purposes by our universities, called for an online payment platform to streamline these jobs. Further, online payment processors differ across countries.

We began this project not knowing if our U.S. subjects would be best served with payments via PayPal, Venmo, or a mailed check originating from an online bank, so we provided all three as options in a test run[10] of our protocol ahead of our first wave. While handling these pilot payments, we quickly learned that our subjects do not select a mailed check as an option. Thus we eliminated that option and focused on PayPal and Venmo payments in the U.S. Subjects were able to select their preferred method of payment upon entry into the study, with 54% of the subjects selecting

[9] For example, subject payments for participation and the incentivized atemporal risk task are due within 24 hours of successfully completing the study. The payment dates for the other incentivized tasks vary, over known parameters, after a given session date. Future payments are made between 0 to 98 days after the session date for the time preference task; 7 to 49 days afterwards for the intertemporal risk aversion task; and the belief task paid out either one month after the session date or December 1, 2020.

[10] We invited graduate research assistants and other students already known by the researchers to participate in a trial run of our online protocol, including payments. No test data were retained.

PayPal and 46% Venmo.[11] In contrast, payments to all S.A. subjects were made using the Standard Bank Instant Money service.[12]

Subjects were told in the invitation letter and through the informed consent process that, after completing the study, any payments owed and marked payable on the same day as a session would be verified by authorized research staff and sent within 24 hours of completion; that any task payments marked payable on a future date would be sent on that future date; and if a task payment is dependent on the outcome of a future event, and we only know the true outcome after a specified date in the future, research staff will verify the true outcome and make payment within 14 days of that date passing. Subjects were told that they could revisit the custom web link sent in their invitation to view their payment receipt sheet for each incentivized task decision selected for payment, and the dates associated with them.

When conducting a multi-site study involving multiple currencies, researchers must make decisions regarding exchange rates. The official exchange rate[13] between the two currencies, while variable over the waves of our study, was $1 = R15.14 in December, 2020, and the PPP exchange rate is approximately $1 = R6.80. We opted to take a rough average of the PPP and official exchange rate, and scale our prizes across countries with $1 = R10.

The minimum, mean, and maximum of subject payments over all tasks are $51.19, $121.59, and $231.71 in the U.S., and R460, R1,174, and R2,100 in South Africa, respectively. The median

[11] In 2013, PayPal purchased Venmo and their platforms have been increasingly integrated over the years. This is especially true when using a PayPal Business account with the Payouts module enabled. The module allows one to upload a file containing all the payment information for a particular day and will send payments to multiple subjects at once, directly to their PayPal or Venmo account.

[12] Each of the "big 5" banks in S.A. provide instant money payment options. We chose Standard Bank for the following reasons: it is the largest bank in S.A. (and Africa); instant money can be redeemed at Standard Bank ATMs, numerous stores, and Spar supermarkets, one of the largest and most widespread supermarkets in the country; and it provides a "bulk issuing" facility to make multiple payments at once, which is typically only available to companies, but we could apply to use because one of us is a Standard Bank customer.

[13] See https://wwwrs.resbank.co.za/webindicators/ExchangeRateDetail.aspx?DataItem=EXCX135D.

time spent completing all tasks within a session is 147 minutes.[14] Total subject payments across all waves were $72,711 in the U.S. and R638,656 in S.A, resulting in a grand total across countries of $114,900 for subject payments.

4.3 Experimental Design

We conducted 6 online sessions, which we refer to as **waves**, at roughly one month intervals.[15] Each session was active for 24 hours on the given session date, which meant that a subject completed all experiment tasks during the time span from midnight to midnight local time. Restricting responses to specific dates in this manner allows our *ex post* analysis to better control for effects of emergent news regarding the pandemic. The initial page provided informed consent information and subjects could not progress past this page if they arrived before the experiment start time.

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[14] Pearson's χ^2 test suggests no statistically significant difference in total time on task across our two study locations (p-value = 0.486).

[15] Sessions in both countries were conducted during 2020 on May 29, June 30, July 31, August 31, September 29 and October 29, and referred to as waves 1 through 6. The total number of participants by wave for South Africa are 92, 93, 100, 100, 80, and 79 and for the United States are 112, 130, 117, 99, 81, and 59 for waves 1 through 6, respectively. We had originally planned to have up to 120 in South Africa and 150 in each session in the United States. The recruitment levels for the first 3 waves in the United States are consistent with our experience with in-person recruitment. The lower sample size in wave 6 in the United States is the direct result of massive power outages in the greater Atlanta area due to Tropical Storm Zeta. The small declines in waves 4 and 5 in the United States are probably due to us recruiting from one overall database of potential subjects, and attracting those relatively keen to participate in earlier waves. See Harrison et al. [2022, §4.1] for additional information on the sampling procedure used for the United States waves. The recruitment levels for the first 4 waves in South Africa are consistent with our experience there with in-person recruitment, and the slight drops in the final 2 waves are probably due to the end of the academic year. Our experiments were not longitudinal, so these declines are not due to attrition in the usual sense. Instead we view these slight declines as due to a familiar sample selection effect: unobserved willingness to participate in experiments leads to higher recruitment rates in earlier sessions, leaving only those who are less willing to fill later sessions. This sample selection effect is not unique to online samples. Formal econometric methods for addressing sample selection, and attrition for longitudinal experiments, are demonstrated by Harrison, Lau and Rutström [2009] and Harrison, Lau and Yoo [2020]. These studies also demonstrate that these sampling biases can affect inferences about atemporal risk preferences unless corrected. We followed their procedures for identifying sample selection by varying the non-stochastic participation fee offered to subjects, and one could therefore apply formal econometric corrections to the data we collect. Again, none of these general corrections are specific to our experiments being online.

Since this is an individual choice experiment, each subject was free to arrive, progress, and complete the experiment at her desired pace during the 24-hour active period, but was paid for participation only if all tasks were completed by midnight of the session date. Every page displayed a countdown timer showing the time remaining in the 24-hour time span of a session. Figure 1 summarizes the hour in which subjects completed the study distributed over the 24 hours of the active participation window. The spread of responses between 10 AM and midnight suggests that there is some value in allowing online subjects a wider window for a session than is conventional in physical laboratories. This is particularly true for such a long experiment, spanning many tasks.[16] Of course, the decision to widen the participation window of a session will be influenced by whether subjects participate singly or in groups: the larger the group size, the greater the benefit of coordinating on common start times.

Subjects completed the following **task sequence** after progressing past the initial informed consent page: a welcome page which collected payment details and reiterated basic information previously provided during recruitment; a general demographics questionnaire; an incentivized belief elicitation task focusing on COVID-19 infections and deaths; a health questionnaire and short, validated screens for anxiety and depression;[17] an incentivized atemporal risk preference task; an incentivized time preference task; an incentivized intertemporal risk preference task; and a final earnings summary. Subjects received a non-salient participation payment and also received earnings from a randomly-determined choice from *each* of the four incentivized tasks. We presented a "roadmap" page before each task, which kept each subject apprised of her current progress through the experiment. We provide screen shots of all components of the experiment in Online Appendix

[16] In the physical laboratory we often split tasks over two distinct sessions on separate days, to allow time for all tasks and avoid an unduly long single session.

[17] We swapped the order of the belief elicitation task and the health questionnaire for approximately half of the subjects since these both ask about COVID-19, and it is possible that initial exposure to the questionnaire may affect subsequent responses to the task, or *vice versa*.

C.

We presented **video instructions** to subjects before each task. We had already begun using video instructions for experiments run within the physical laboratory before the pandemic,[18] while also providing printed instructions. Our experience from the laboratory was that most subjects focused on watching and listening to the video instructions instead of reading the printed instructions, so we opted for only video instructions in the present study. We produced the videos with *Camtasia* and *ScreenFlow*, and hosted the videos on Vimeo. We then presented the videos by embedding the Vimeo streaming video player on each instructions page before the task. Additionally, a subject could re-watch instructions during the task as needed. The scripts we used to create the U.S. video instructions are given in Online Appendix D and the videos are all available online.[19]

The **survey questions** were split into two questionnaires presented to the subjects. One set consisted of standard demographic questions while the other set included COVID-19 questions along with anxiety and depression screening questions. There were some country-specific variations in questions. The survey questions are provided in Online Appendix E.

The **beliefs task** elicited responses to eight questions pertaining to COVID-19 infection and mortality counts one month after the session date and on December 1, 2020. The questions refer to the country in which the session was conducted, and separate questions were asked for the overall population, and over-65 population in the U.S. and over-60 population in S.A. For each question the response space was partitioned into 10 ordered bins and a subject reported an allocation of 100

[18] Video instructions provide greater control over the delivery of information to subjects than the common practice of an experimenter standing at the front of the laboratory and presenting or discussing the instructions with the subjects. "Live" presentation of instructions, even if following a script, increases the possibility of extemporaneous speech and other *ad hoc* verbal and nonverbal communication which could bias subject behavior and confound inferences.

[19] Our project page at https://cear.gsu.edu/gwh/covid19/ provides URLs to the video instructions hosted on Vimeo.

tokens over these bins. Each response was incentivized via a QSR that rewarded a minimum of $0 and maximum of $30 depending on response accuracy. Figure 2 shows an example of a beliefs task decision page. Online Appendix F provides the specific parameters for each question.

The **atemporal risk preference task** consisted of 90 pair-wise lottery choices, primarily designed to allow econometric estimation of Expected Utility Theory and Rank-Dependent Utility models *at the individual level*. Figure 3 shows an atemporal risk preference choice with a "Double or Nothing" option, used to test the Reduction of Compound Lotteries axiom. Each lottery pair was drawn randomly, without replacement, from this battery and presented to subjects one at a time. The task used prize magnitudes between $0 and $70, and probabilities which varied in increments of 0.05 between 0 and 1. Parameters for the 90 lottery pairs are provided in Online Appendix F.

The **time preference task** consisted of 20 choice pages with 5 pair-wise choices on each page. Each choice consisted of a smaller, sooner (SS) amount to be paid on an earlier date, and a larger, later (LL) amount to be paid on a later date. On a given choice page the SS and LL delays, along with the SS amount, were held constant, leaving only the LL amount to vary across choices on the page. In turn, all of these values varied across pages. A calendar was presented on each choice page highlighting the current date, and the dates on which the SS and LL rewards would be received. We used three front-end delays (FEDs) to the SS reward: 0, 7, and 14 days. We also used two principals ($25 and $40), four time horizons (7, 14, 42, and 84 days), and LL rewards that increased in increments of $1, up to a maximum of $64, in the task. Figure 4 presents a screenshot of the time preference task. Parameters for this task are provided in Online Appendix F, with each subject receiving a random sample from the full set of parameters.

The **intertemporal risk preference task** consisted of 40 pair-wise choices over intertemporal lotteries that varied payouts over time. Each lottery had two possible outcomes, with each outcome paying an amount at *two* future dates. A calendar was included in the task showing the

current date and the two future dates when payments would be received depending on the realization of the chosen intertemporal lottery. To construct our battery of intertemporal lotteries, we used a 7-day FED to the sooner reward, probabilities that increased in increments of 0.1 between 0.1 and 0.9, two time horizons of 14 days and 42 days between the rewards, and the following two sets of larger and smaller amounts: ($45, $2) and ($26, $1). Each intertemporal lottery pair was drawn at random, without replacement, from this battery and presented to subjects sequentially. Figure 5 shows an example of this task and Online Appendix F provides the parameters used for all intertemporal risk preference questions.

After completing all tasks, a subject arrived at the **final earnings summary**. This summary page recapped all earnings owed to the subject for participating in the experiment, which included the fixed participation payment along with the previously-realized earnings from each of the four incentivized tasks. Additional tabs on this page allowed the subject to view the specifics of each task realization. Generally speaking, a subject received payment on more than one date given the intertemporal structure of several tasks. The final earnings summary clearly conveyed the date on which each payment would be made. The server hosting this experiment was online throughout the timespan of sessions and subsequent payoffs, and subjects were reminded that they could always return to their final earnings summary page, which included no personal identifying information, via their unique participation URL in order to access their payment details.

5. Conclusions

Conducting an online experiment for the first time is challenging, but manageable. As is often characteristic of the dynamics of innovation, we soon discovered some respects in which our proficiency improved. The areas which required the most attention and offered the most scope for new efficiencies were software design, mechanics of recruitment, flowing subjects into the sessions,

and payments.

Although short-term start-up costs of adapting to online experiments are inevitable, there are definite benefits to consider. Aside from the obvious benefit of simply collecting data during a time of laboratory closures, we found it attractive to be able to conduct a session with many more subjects simultaneously participating than is possible in a traditional laboratory. A case in point is our experiment: 1142 subjects participated in the six sessions, yielding an average of 190 subjects per day. This throughput is likely not obtainable in most physical laboratories, and where, in extremis, it is, it is surely not sustainable. Online experiments have the potential to be highly efficient from a data collection perspective.

Another benefit of online experiments is the relative ease of conducting a multi-site, multi-country study. Although any replication of a study protocol will result in some degree of procedural variation and issues of data security, even across locations within a single study, an online protocol using a common software codebase allows researchers to explicitly determine *a priori* which aspects of the protocol will remain constant across locations and which will vary. This is due primarily to the necessity of structuring most procedures of an online experiment in advance, in contrast to procedures in physical laboratories that naturally afford a higher degree of human interaction.

As advocates of laboratory experiments we would be remiss not to acknowledge the greater experimental control provided by the physical laboratory. The extent to which experimental control is lost in online experiments remains an open question for us, and once more laboratories are open again after the pandemic we will likely see an influx of such assessments. The equilibrium solution, we predict, will feature judicious mixtures of face-to-face and online experimentation, but with a higher prevalence of the latter than was the norm before COVID-19 emerged as a mother of invention.

Figure 1: Local Time of Day Session Completed

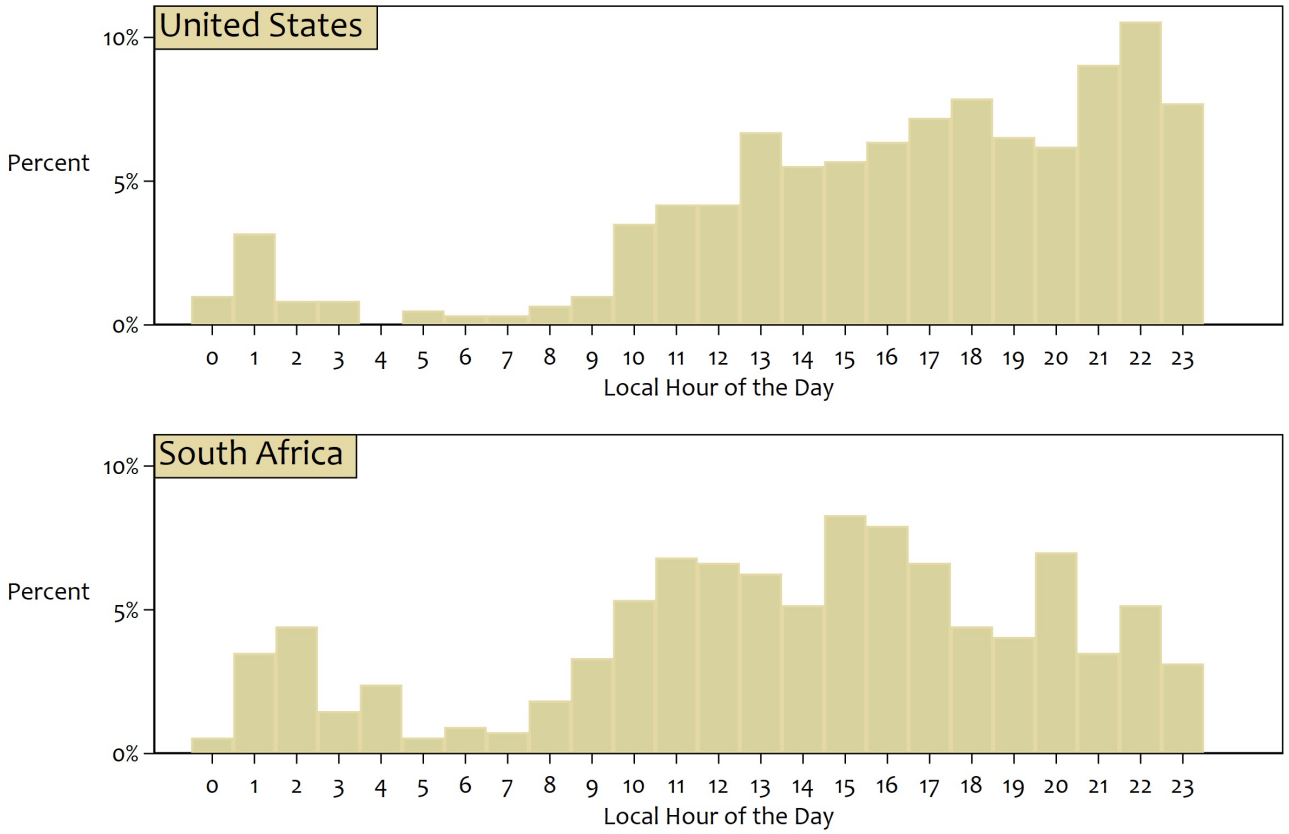
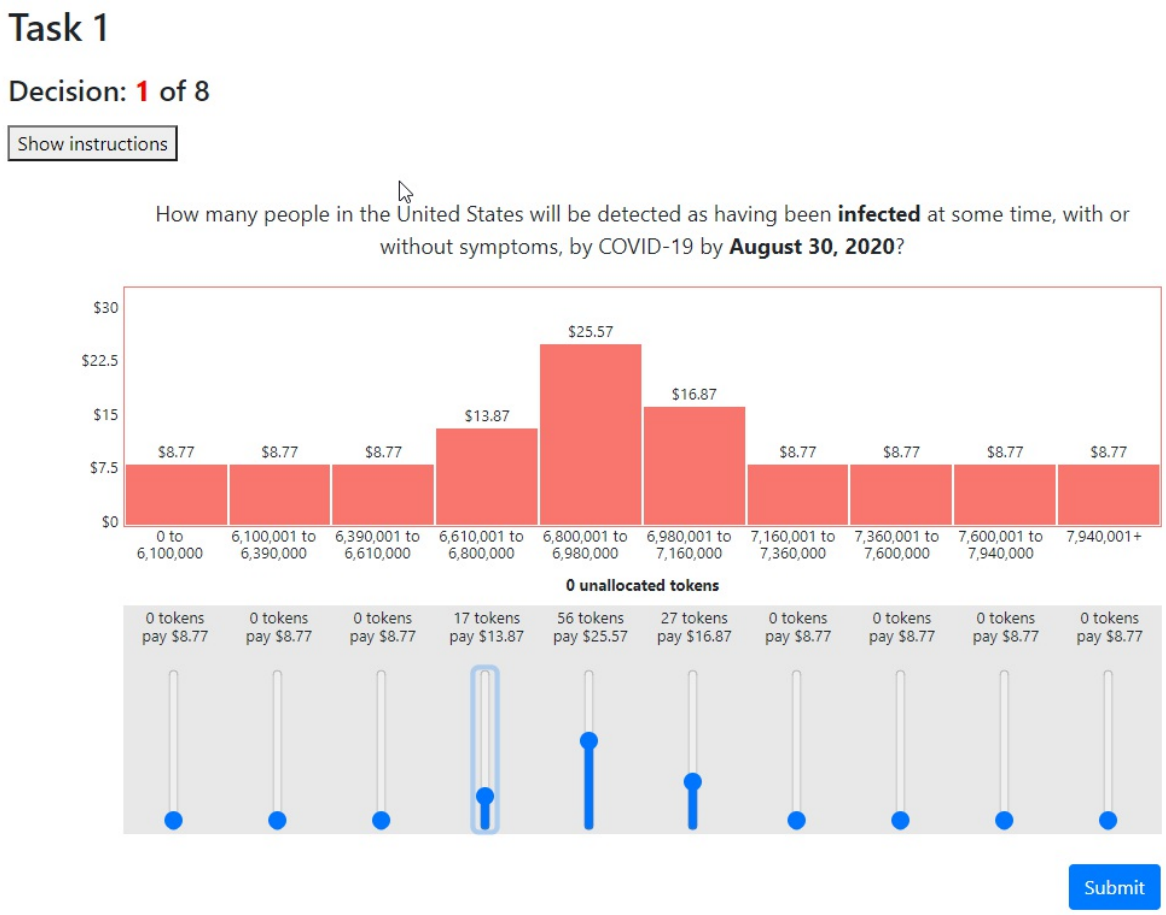


Figure 2: Interface for Belief Elicitation



This example shows a beliefs choice screen with a provisional token allocation. Each bin reports the payoff that will be realized *conditional on the future true value being within the given bin*.

Figure 3: Interface for Atemporal Risk Preference Task

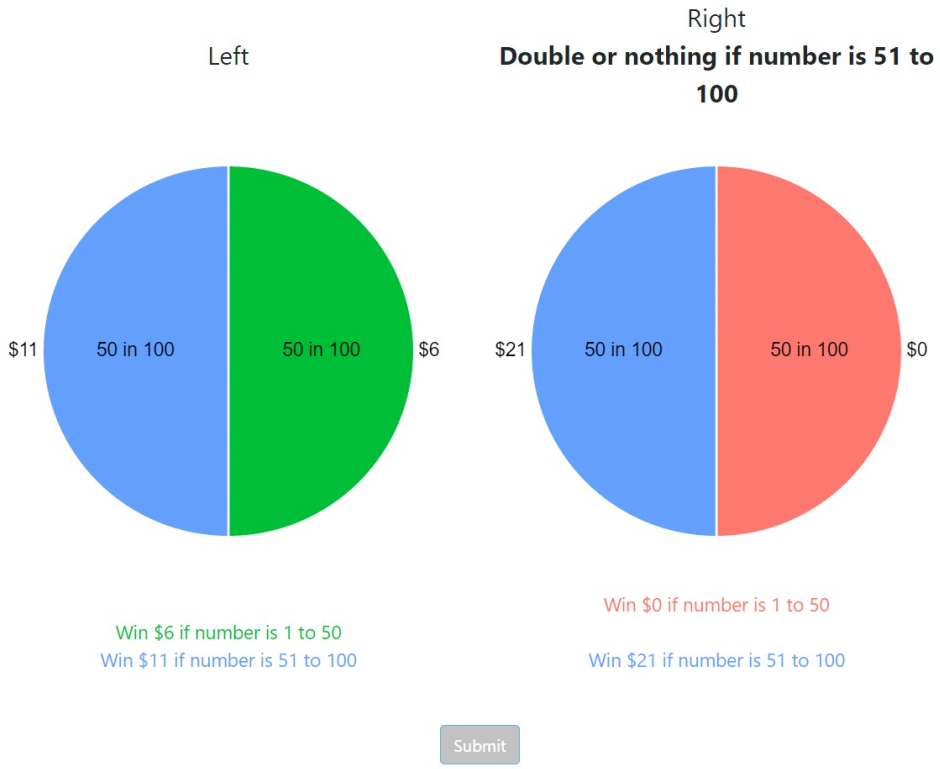
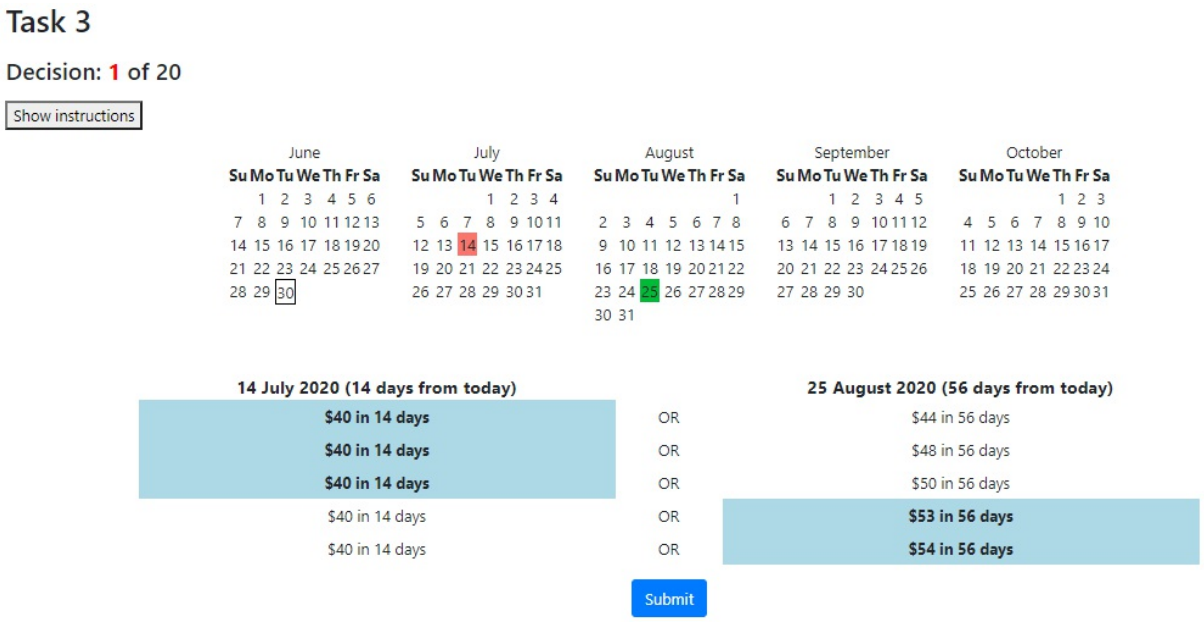


Figure 4: Interface for Time Preference Task



This example shows a time preferences choice screen with SS delay of 14 days, SS amount of $40, and LL delay of 56 days. The LL amount varies across choice rows. Provisional selections of the SS option in the first three rows and LL option in the last two rows have been made, and the subject may change these selections or submit.

Figure 5: Interface for Intertemporal Risk Preference Task



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Online Appendix A: Additional Figures

Figure A1: Raw Data and Smoothed Data for Daily Infections and Deaths in the United States

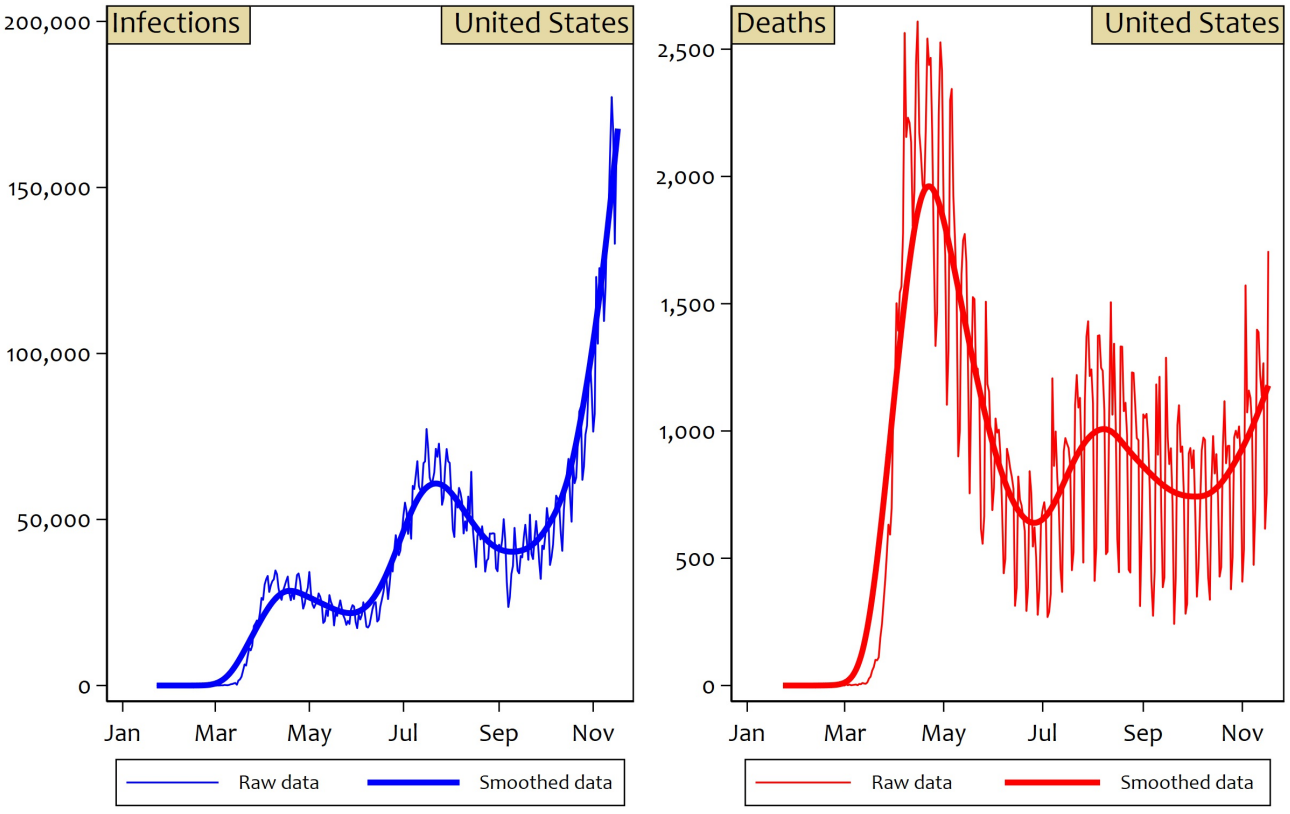
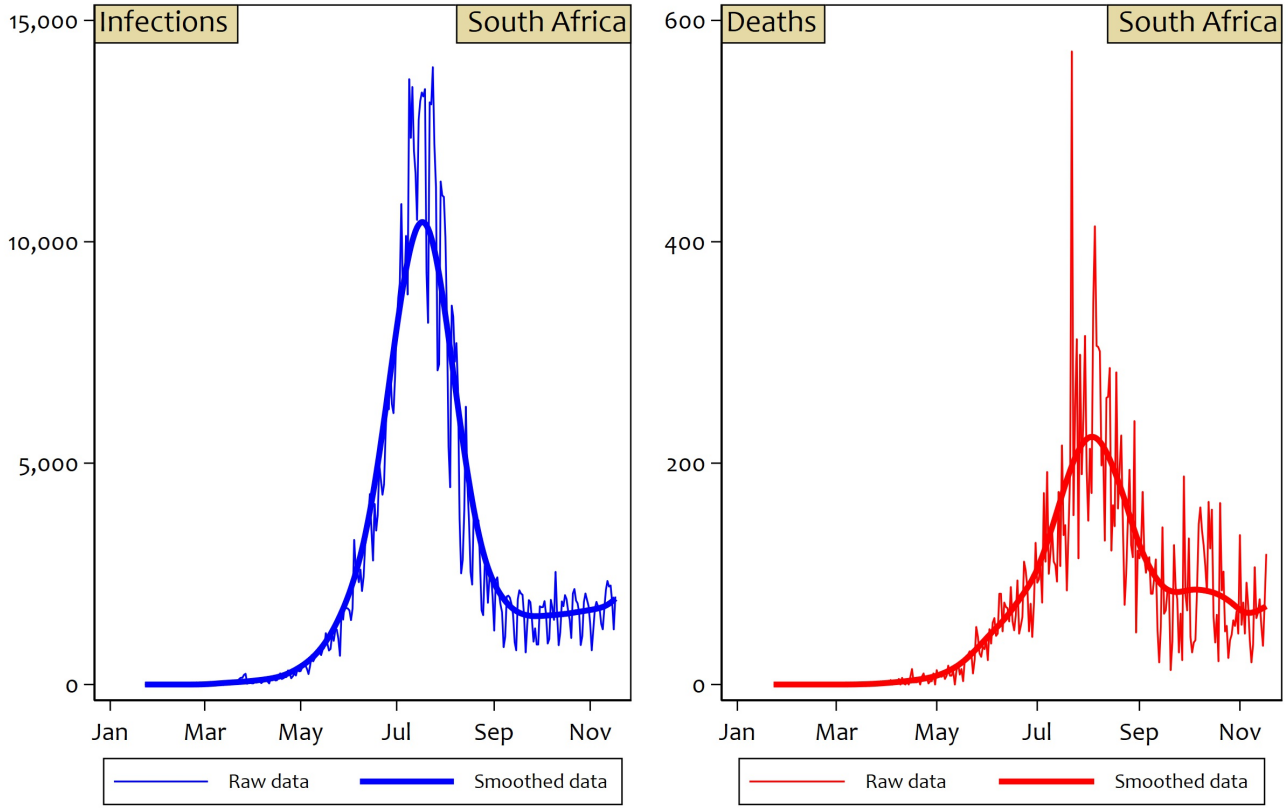


Figure A2: Raw Data and Smoothed Data for Daily Infections and Deaths in South Africa



Online Appendix B: Recruitment Emails

Initial Recruitment Email: USA

You have been invited to the following experiment:

Date: Friday, May 29, 2020

Time: 2 to 3 hours total. Study opens at 12:01 AM and closes at 11:59 PM local Atlanta, Georgia time on May 29, 2020

Location: Online

Hello. You have been randomly selected to take part in a study on beliefs about population health risks and health outcomes. You will be compensated <<$5, $10, $15 depending on assignment>> for successfully completing the study. You will also have 4 additional opportunities to earn extra compensation which will depend on the decisions that you make in the study. Before you make any decisions in these tasks, you will be given instructions that describe each task in greater detail.

Your participation in the study will take approximately 2 to 3 hours of your time to complete. You may do this all in one sitting or at different intervals over the 24-hour period that the study is open (in this instance: Friday, May 29, 2020 from 12:01 AM to 11:59 PM). However you choose, the study must be completed within this time frame to be considered eligible for payment.

This is an online study, thus you will need internet access and a connected device (preferably a desktop, laptop, or tablet with a larger screen) running a current internet browser such as Google Chrome, Microsoft Edge, Mozilla Firefox, or Opera.

If you are interested in participating, please login to your account on the Experiment Recruiter to confirm your participation:

http://excen.gsu.edu/recruiter

While you may login to the Recruiter and Accept or Decline this invitation at your earliest convenience, subjects will be confirmed on a first-come, first-served basis.

If you successfully confirm participation through the Recruiter, the research team will then email you an invitation that contains a customized web-link that you will use to access the study. These emails will be sent out around 10:00 PM on Thursday, May 28 to the email address saved on the Recruiter with the subject line "GSU Study Invitation: Population Health Risks and Health Outcomes." That email will provide a brief overview of the study as well.

Thank you.
Research Study Team

Reminder to Confirmed Participants: USA

This is a reminder that you are signed up for an online study which will be active on Friday, May 29, 2020 beginning at 12:01 AM and ending at 11:59 PM local Atlanta, Georgia time.

Emails containing your customized web link to participate will be sent out around 10:00 PM on Thursday, May 28 to your email address saved on the ExCEN Recruiter. The subject line of that email is 'GSU Study Invitation: Population Health Risks and Health Outcomes | Friday, May 29, 2020.'

Your email will come from Mark Schneider (mschneider@gsu.edu), an investigator on the study. If you do not see it in your regular inbox, please check your spam/junk folder.

Customized Invitation Letter: USA

Dear "FirstName" "LastName":

Thank you for your interest in the study! Your customized web link to participate is shown below. It will be active for use on Friday, May 29, 2020 beginning at 12:01 AM and ending at 11:59 PM local Atlanta, Georgia time:

"Customised_Web_Link"

Do not share this link with any other individual. It is uniquely generated for your participation.

Some housekeeping items:

- Your participation in the study will take approximately 2 to 3 hours of your time to complete. You may do this all in one sitting or at different intervals over the 24-hour period that the study is open (in this instance: Friday, May 29, 2020 from 12:01 AM to 11:59 PM). However you choose, the study must be completed within this time frame to be considered eligible for payment.
- Within this 24-hour period, you can access the study and pick back up where you left off by clicking on your customized web-link. You may revisit that link any time after completing the study to view a copy of your receipt.
- This study is best viewed on a device with a larger display screen (laptop, desktop, tablet) using one of the following internet browsers: Google Chrome, Microsoft Edge, Mozilla Firefox, or Opera. You can change devices at any time during the study. Once logged on to a new device you can pick back up where you left off by clicking the customized web-link above on that new device.
- You will earn a participation payment of $"Showupfee" for successfully completing the study.
- There are 2 questionnaires and 4 task components in the study.
- In addition to the participation payment for completing the study, each task has the potential for additional earnings either today or in the future. The amount of additional earnings depends on your responses, chance, and actualized outcomes.
- Before you make any decisions in these tasks, you will be given instructions that describe each task in greater detail.
- If you take a break, we suggest that it would be best if you take them between tasks rather than during a single task.
- Upon entry into the study you will be presented with an informed consent. You will read through that document and either consent into the study or not.
- The study must be completed within the time frame indicated above to be considered eligible for payment. Payments will be sent via Venmo or PayPal. You will choose a primary and an optional secondary method from those options to receive any amounts owed upon entry into the study. If there is trouble with the first method, we will try the backup. We will only use this information for payment purposes only.
-

No time extensions will be granted. If you have other study related questions, you can write to Dr. Mark Schneider, study co-investigator, at mschneider@gsu.edu.

We thank you in advance for your participation in this study.

Research Study Team

Encouragement to Complete Email: USA

Hello "FirstName":

Thank you for signing up for the GSU research project on beliefs about population health and health outcomes.

Recall that you need to finish the study by 11:59PM tonight (Friday, May 29, 2020) to be eligible for payment.

Here is your customized web link again, in case you need it:

"Customised_Web_Link"

As per the note on the final payment page, any payments marked payable as of today will be made within 24 hours of successfully completing the study by the deadline. Specifically, I will make payment tomorrow afternoon.

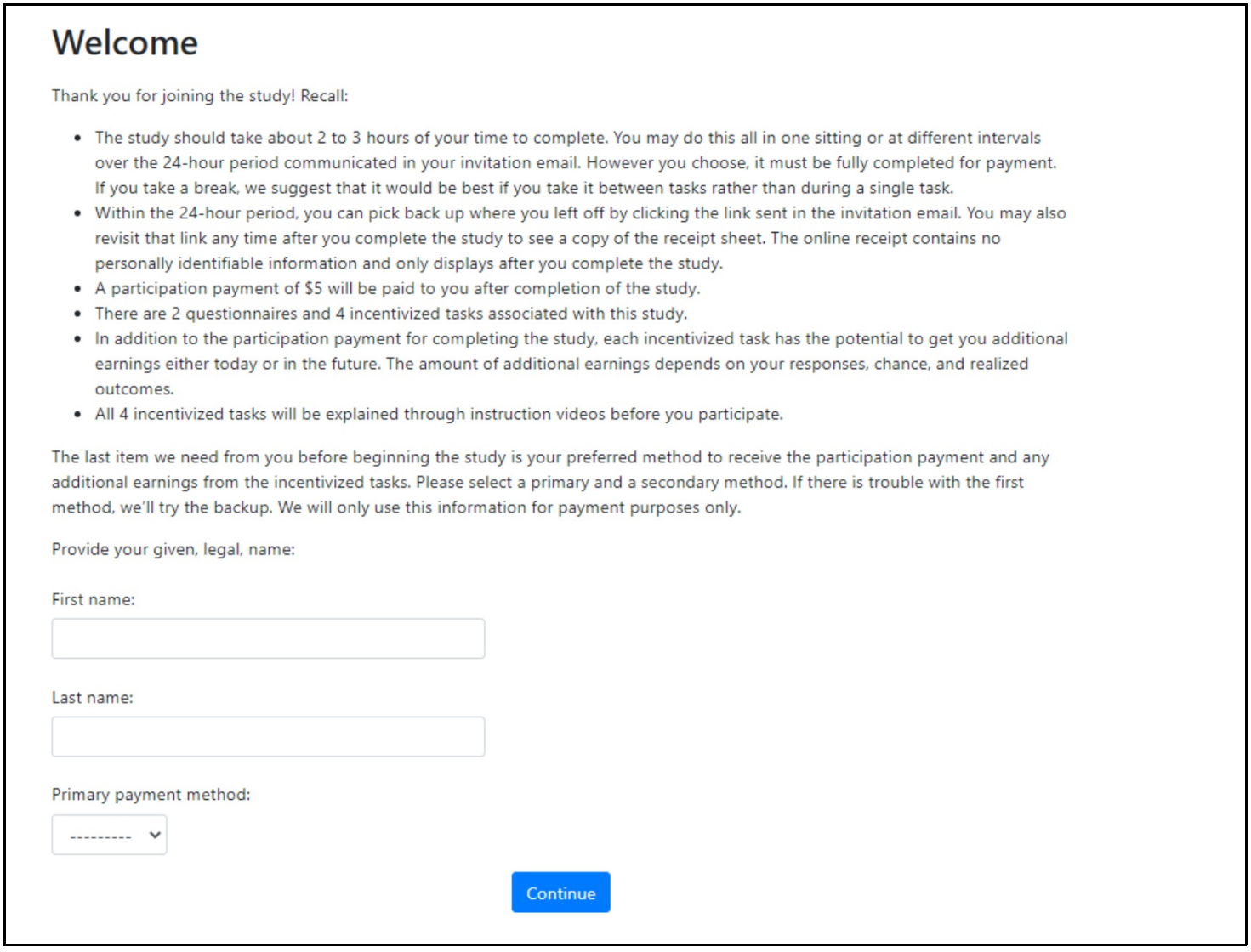
If you have already finished the study, you can ignore this email.

All the best,
Mark Schneider, PhD

Center for the Economic Analysis of Risk
Georgia State University
mschneider@gsu.edu

Online Appendix C: Software Screen Shots

All screen shots provided in this appendix are taken from the first USA session on May 29, 2020. The top left of every screen displayed a countdown timer with the time remaining in hh:mm:ss format and the top right of every screen displayed each subject's unique code. We exclude those two elements from the screen shots below due to cropping the otherwise-empty left and right margins in an effort to enlarge and make more readable the primary content. Screenshots are presented below in the same order as in the experiment.



Study Road Map

Welcome to the study. The table below lists the order of questionnaires and components of the study you will complete today. As you finish each component, the status of that component will update to Complete. Instructions for the tasks will be provided before starting each task. If you are disconnected from a task, use the web link provided in your invitation email to pick back up where you left off.

You have until 11:59 PM in Atlanta, Georgia on Friday, May 29, 2020 to complete all tasks.

Click the **Next** button below to continue.

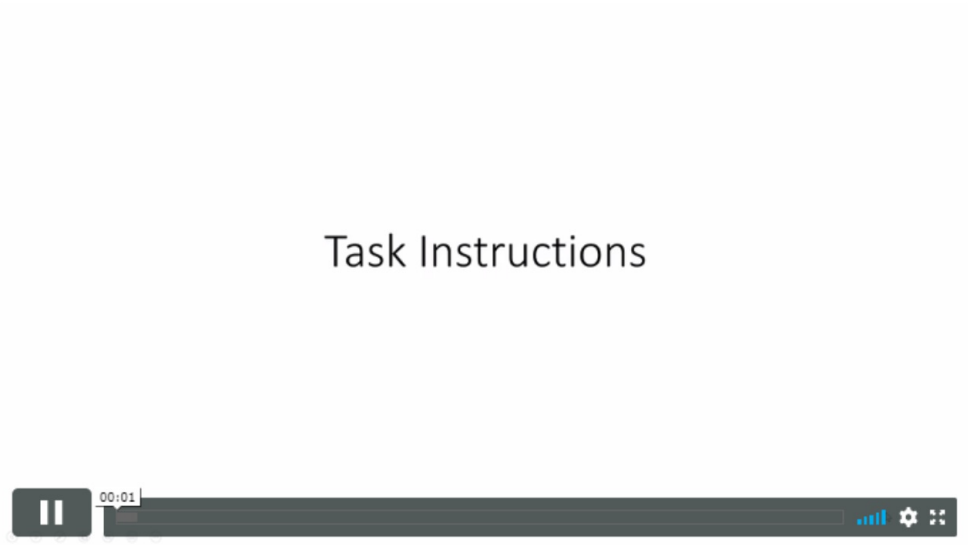
Order	Status
Survey Questions	Incomplete
Task 1	Incomplete
Health Questionnaire	Incomplete
Task 2	Incomplete
Task 3	Incomplete
Task 4	Incomplete
Final Earnings After Completion	Incomplete

Next

Task 1 Instructions

Please turn up your volume and click the play button in the video below to watch instructions for the task. When the video is finished, click the Next button below to continue.

Next



Task 1

Overview

- Today you will be asked 8 questions about COVID-19 related events occurring in the future.
- When you have completed all questions, one will be randomly chosen for payment and shown to you.
- Within 14 days of the future date displayed in the selected question, the research team will verify what the outcome is and pay you based on your token allocation.
- The research team will verify future outcomes in levels, not percentages, using information from the US Centers for Disease Control and Prevention (US CDC).
- For question payment, we will treat the correct answer as the first public report after June 30 or December 1, depending on the date in the question.
- Note this task is best viewed on a device with a larger display screen (laptop, desktop, tablet) using one of the following internet browsers: Google Chrome, Microsoft Edge, Mozilla Firefox, or Opera. If you want to change devices, please do so now. Once logged on to the new device you can pick back up where you left off by clicking the link sent in the invitation email.

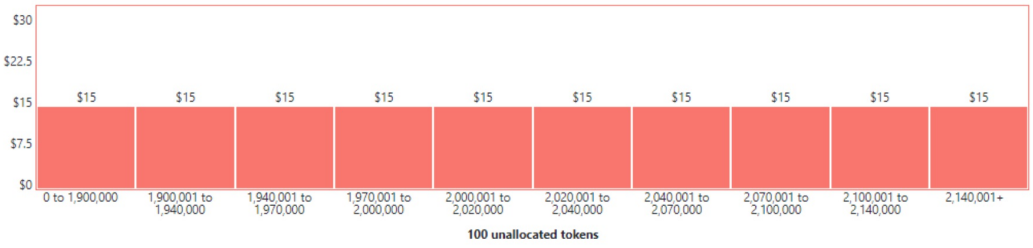
Next

Task 1

Decision: 1 of 8

Show instructions

How many people in the United States will be detected as having been **infected** at some time, with or without symptoms, by COVID-19 by **June 30, 2020**?



100 unallocated tokens



You must allocate all tokens.

Submit

Task 1

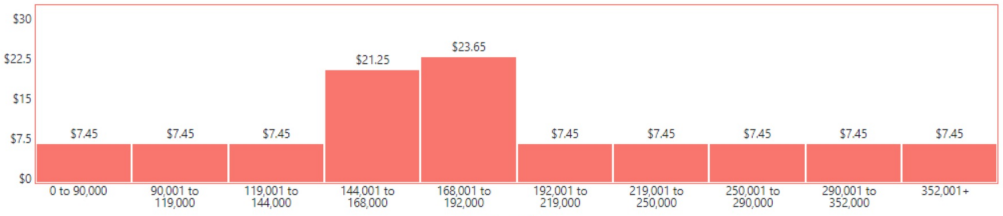
Question 8 was randomly selected for payment.

Your token allocation is displayed below.
You will be paid within 14 days of December 1, 2020 according to your token allocation.
We will verify the correct answer to this question using the first public report provided by the US Centers for Disease Control and Prevention (US CDC) after the date in the question.

Click the Next button below to continue.

Next

How many people **65 years of age and older** in the United States will have **died** because of COVID-19 by **December 1, 2020**?



0 unallocated tokens



Show Percentages

Health Questionnaire

You will now complete a questionnaire on health risks and health outcomes. Click the Next button below to continue.

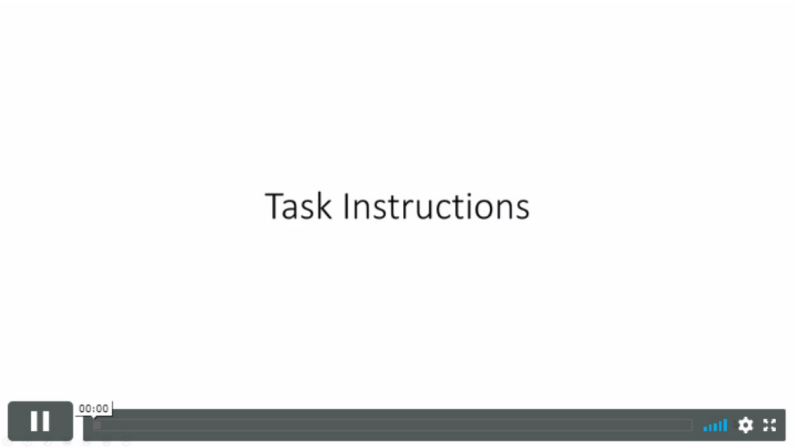
Order	Status
Survey Questions	Complete
Task 1	Complete
Health Questionnaire	Incomplete
Task 2	Incomplete
Task 3	Incomplete
Task 4	Incomplete
Final Earnings After Completion	Incomplete

Next

Task 2 Instructions

Please turn up your volume and click the play button in the video below to watch instructions for the task. When the video is finished, click the Next button below to continue.

Next

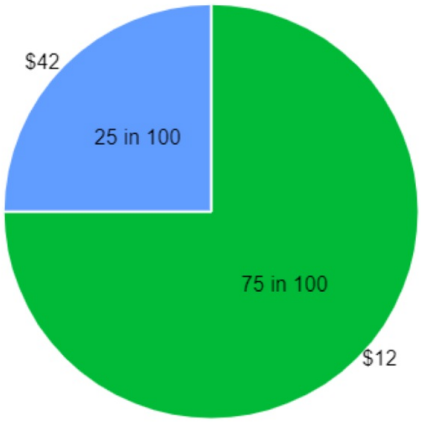


Task 2

Decision: 5 of 90

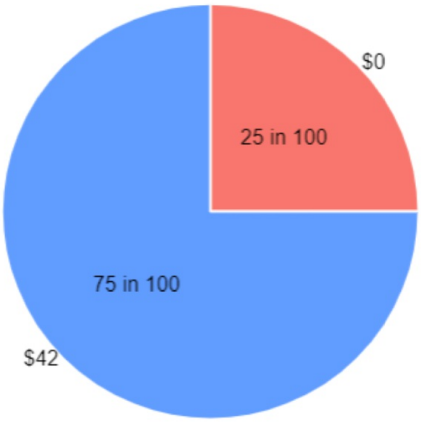
Show instructions

Left



Win $12 if number is 1 to 75
Win $42 if number is 76 to 100

Right



Win $0 if number is 1 to 25
Win $42 if number is 26 to 100

Submit

Payment for Task 2

Decision screen 24 was randomly selected for payment.

Your choice is displayed below.

You chose Right.

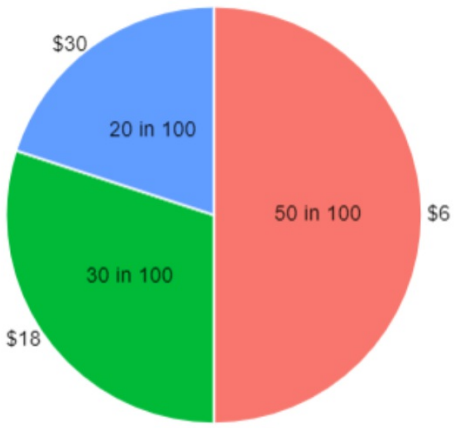
The random number chosen out of 100 is 31.

Based on your choice and the random number drawn, your earnings for this task are: $6

Click the Next button below to continue.

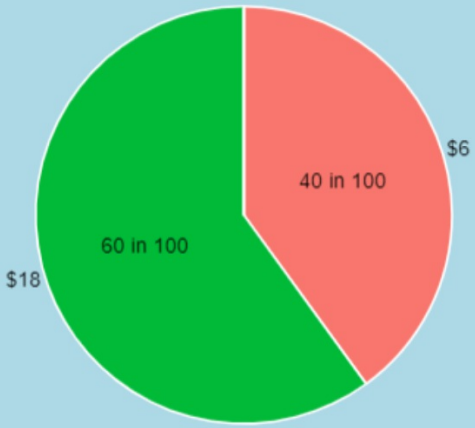
Next

Left



Win $6 if number is 1 to 50
Win $18 if number is 51 to 80
Win $30 if number is 81 to 100

Right



Win $6 if number is 1 to 40
Win $18 if number is 41 to 100

Task 3

You will now complete Task 3. Click the Next button below to continue.

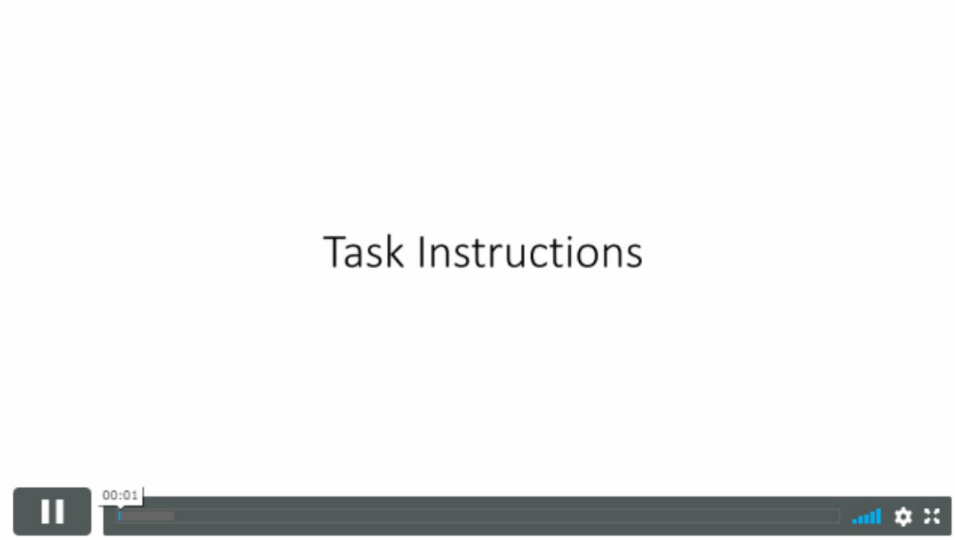
Order	Status
Survey Questions	Complete
Task 1	Complete
Health Questionnaire	Complete
Task 2	Complete
Task 3	Incomplete
Task 4	Incomplete
Final Earnings After Completion	Incomplete

Next

Task 3 Instructions

Please turn up your volume and click the play button in the video below to watch instructions for the task. When the video is finished, click the Next button below to continue.

Next



Task 3

Decision: 8 of 20

Show instructions



May						
Su	Mo	Tu	We	Th	Fr	Sa
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

June						
Su	Mo	Tu	We	Th	Fr	Sa
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

July						
Su	Mo	Tu	We	Th	Fr	Sa
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

August						
Su	Mo	Tu	We	Th	Fr	Sa
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

September						
Su	Mo	Tu	We	Th	Fr	Sa
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

29 May 2020 (Today)		**5 June 2020 (7 days from today)**
$25 today	OR	$26 in 7 days
$25 today	OR	$27 in 7 days
$25 today	OR	$28 in 7 days
$25 today	OR	$29 in 7 days
$25 today	OR	$30 in 7 days

Submit

You must make a choice on each of the rows above.

Payment for Task 3

Decision screen 15 and row 4 were randomly selected for payment.

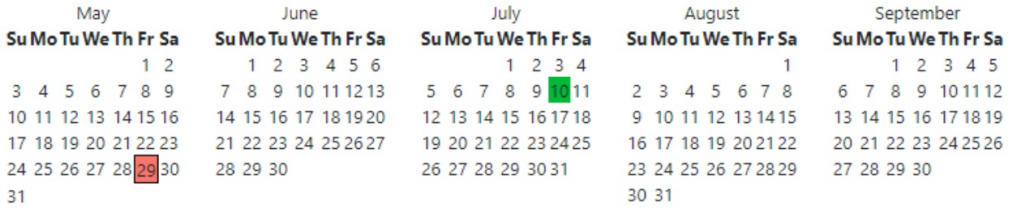
Your choice is displayed below

You chose the Right option.

Based on the random row drawn and your choice, your earnings are $49 in 42 days.

Click the Next button below to continue.

Next



May						
Su	**Mo**	**Tu**	**We**	**Th**	**Fr**	**Sa**
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

June						
Su	**Mo**	**Tu**	**We**	**Th**	**Fr**	**Sa**
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

July						
Su	**Mo**	**Tu**	**We**	**Th**	**Fr**	**Sa**
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

August						
Su	**Mo**	**Tu**	**We**	**Th**	**Fr**	**Sa**
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

September						
Su	**Mo**	**Tu**	**We**	**Th**	**Fr**	**Sa**
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

29 May 2020 (Today)		**10 July 2020 (42 days from today)**
$40 today	OR	$42 in 42 days
$40 today	OR	$43 in 42 days
$40 today	OR	$46 in 42 days
$40 today	OR	**$49 in 42 days**
$40 today	OR	**$54 in 42 days**

Task 4

You will now complete Task 4. Click the Next button below to continue.

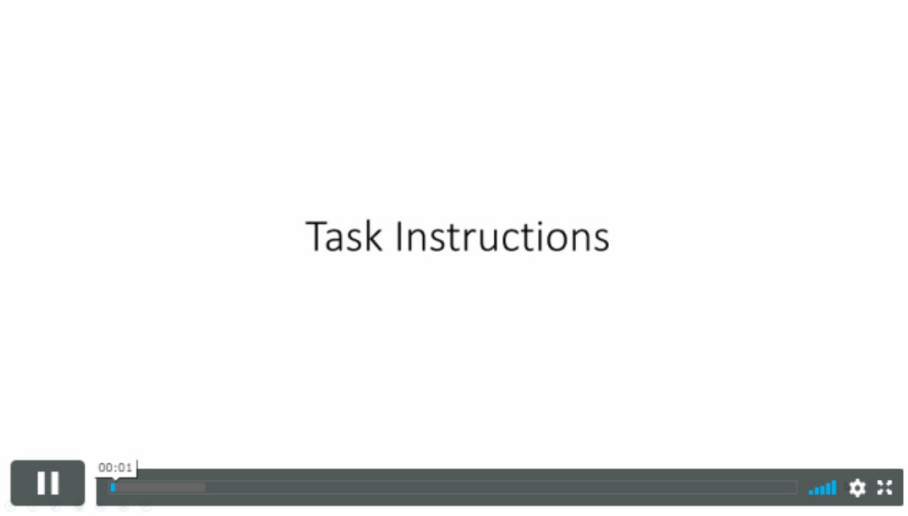
Order	Status
Survey Questions	Complete
Task 1	Complete
Health Questionnaire	Complete
Task 2	Complete
Task 3	Complete
Task 4	Incomplete
Final Earnings After Completion	Incomplete

Next

Task 4 Instructions

Please turn up your volume and click the play button in the video below to watch instructions for the task. When the video is finished, click the Next button below to continue.

Next



Task 4

Decision: 1 of 40

Show instructions

May						
Su	Mo	Tu	We	Th	Fr	Sa
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

June						
Su	Mo	Tu	We	Th	Fr	Sa
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

July						
Su	Mo	Tu	We	Th	Fr	Sa
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

August						
Su	Mo	Tu	We	Th	Fr	Sa
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

September						
Su	Mo	Tu	We	Th	Fr	Sa
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

1 to 3  4 to 10	30% chance of $45 in 7 days AND $2 in 49 days 70% chance of $2 in 7 days AND $45 in 49 days
1 to 3  4 to 10	30% chance of $45 in 7 days AND $45 in 49 days 70% chance of $2 in 7 days AND $2 in 49 days

Submit

Task 4

Decision: 1 of 40

Show instructions

May

Su	Mo	Tu	We	Th	Fr	Sa
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

June

Su	Mo	Tu	We	Th	Fr	Sa
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

July

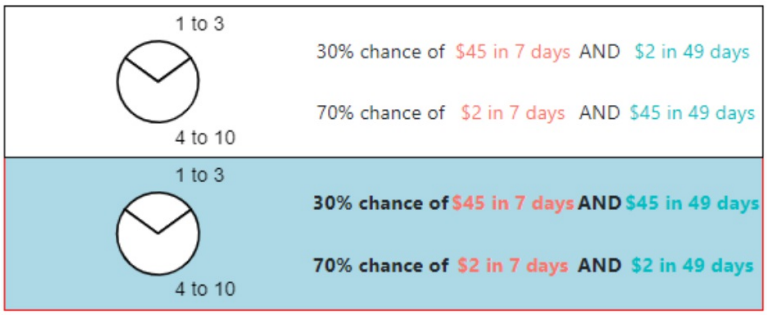
Su	Mo	Tu	We	Th	Fr	Sa
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

August

Su	Mo	Tu	We	Th	Fr	Sa
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

September

Su	Mo	Tu	We	Th	Fr	Sa
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			



Submit

Payment for Task 4

Decision screen 1 was chosen for payment.

You selected the Bottom option.

The number 1 was chosen out of 10.

You will be paid $45 in 7 days AND $45 in 49 days.

Click the Next button below to continue.

Next

May

Su	Mo	Tu	We	Th	Fr	Sa
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

June

Su	Mo	Tu	We	Th	Fr	Sa
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

July

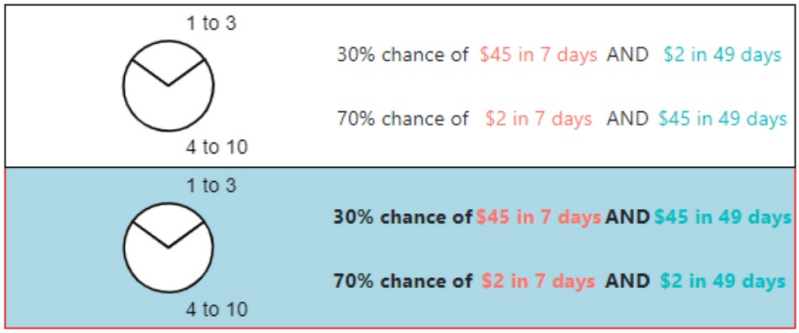
Su	Mo	Tu	We	Th	Fr	Sa
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

August

Su	Mo	Tu	We	Th	Fr	Sa
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

September

Su	Mo	Tu	We	Th	Fr	Sa
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			



Payment Information

You successfully finished the study on time, and will be paid as detailed below.

Final Payment | Task 1 | Task 2 | Task 3 | Task 4

Session Date: 29 May 2020

The study is now complete. Any payments marked as payable today will be verified by research staff and sent within 24 hours. Once you have looked at your payment information you can close this browser window. You can always return to view this information by clicking on the custom web link sent in your invitation email.

For participating in this experiment, you will be paid $5 today.

For Task 1 you will be paid based on the correct answer to the question within 14 days of December 1, 2020.
For Task 2 you will be paid $6 on 29 May 2020.
For Task 3 you will be paid $49 on 10 July 2020.
For Task 4 you will be paid $45 on 05 June 2020 AND $45 on 17 July 2020.

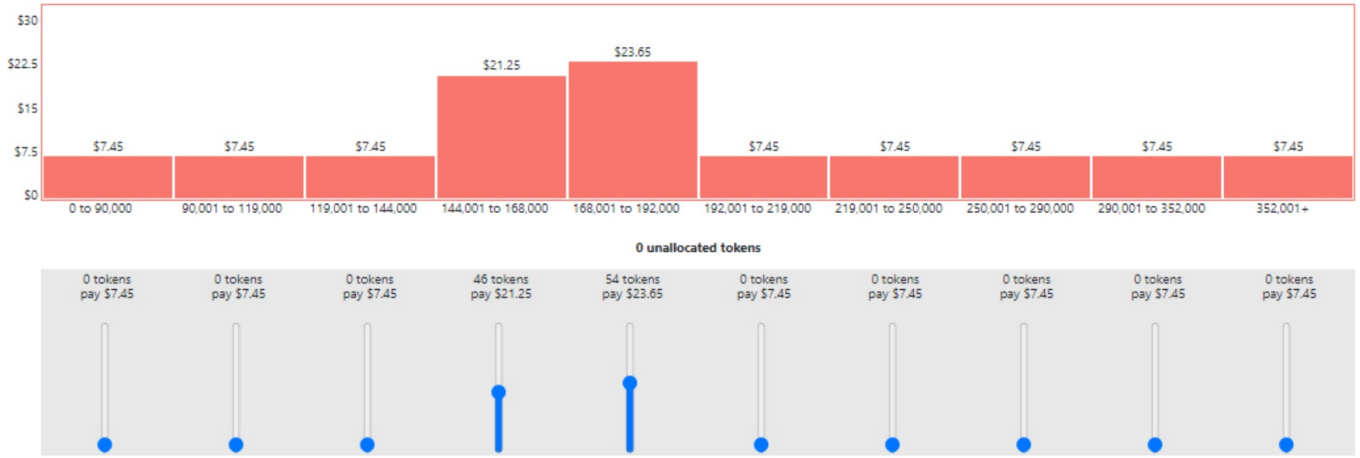
Payment Information

You successfully finished the study on time, and will be paid as detailed below.

Final Payment | Task 1 | Task 2 | Task 3 | Task 4

Question 8 was randomly selected for payment.
Your token allocation is displayed below.
You will be paid within 14 days of December 1, 2020 according to your token allocation.
We will verify the correct answer to this question using the first public report provided by the US Centers for Disease Control and Prevention (US CDC) after the date in the question.

How many people **65 years of age and older** in the United States will have **died** because of COVID-19 by **December 1, 2020**?



Show Percentages

Payment Information

You successfully finished the study on time, and will be paid as detailed below.

Final Payment | Task 1 | Task 2 | Task 3 | Task 4

Decision screen 24 was randomly selected for payment.

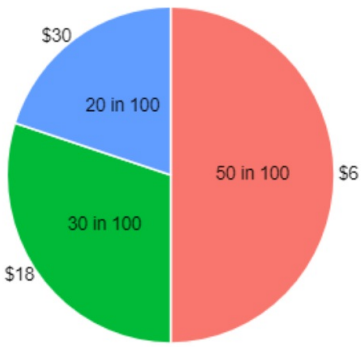
Your choice is displayed below.

You chose Right.

The random number chosen out of 100 is 31.

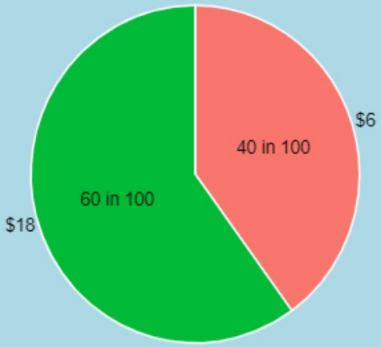
Based on your choice and the random number drawn, your earnings for this task are: $6

Left



Win $6 if number is 1 to 50
Win $18 if number is 51 to 80
Win $30 if number is 81 to 100

Right



Win $6 if number is 1 to 40
Win $18 if number is 41 to 100

Payment Information

You successfully finished the study on time, and will be paid as detailed below.

Final Payment | Task 1 | Task 2 | Task 3 | Task 4

Decision screen 15 and row 4 were randomly selected for payment.
Your choice is displayed below
You chose the Right option.
Based on the random row drawn and your choice, your earnings are $49 in 42 days.

May

Su	Mo	Tu	We	Th	Fr	Sa
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

June

Su	Mo	Tu	We	Th	Fr	Sa
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

July

Su	Mo	Tu	We	Th	Fr	Sa
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

August

Su	Mo	Tu	We	Th	Fr	Sa
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

September

Su	Mo	Tu	We	Th	Fr	Sa
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

29 May 2020 (Today)		**10 July 2020 (42 days from today)**
$40 today	OR	$42 in 42 days
$40 today	OR	$43 in 42 days
$40 today	OR	$46 in 42 days
$40 today	OR	**$49 in 42 days**
$40 today	OR	**$54 in 42 days**

Payment Information

You successfully finished the study on time, and will be paid as detailed below.

Final Payment | Task 1 | Task 2 | Task 3 | Task 4

Decision screen 1 was chosen for payment.
You selected the Bottom option.
The number 1 was chosen out of 10.
You will be paid $45 on 05 June 2020 AND $45 on 17 July 2020.

May

Su	Mo	Tu	We	Th	Fr	Sa
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

June

Su	Mo	Tu	We	Th	Fr	Sa
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

July

Su	Mo	Tu	We	Th	Fr	Sa
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

August

Su	Mo	Tu	We	Th	Fr	Sa
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

September

Su	Mo	Tu	We	Th	Fr	Sa
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			



30% chance of $45 in 7 days AND $2 in 49 days

70% chance of $2 in 7 days AND $45 in 49 days



30% chance of $45 in 7 days AND $45 in 49 days

70% chance of $2 in 7 days AND $2 in 49 days

Online Appendix D: Instructions

What follows are the scripts used to create the video instructions. The video instructions followed these scripts as closely as possible, although subjects were presented only with the video version of the instructions and not the printed scripts below.

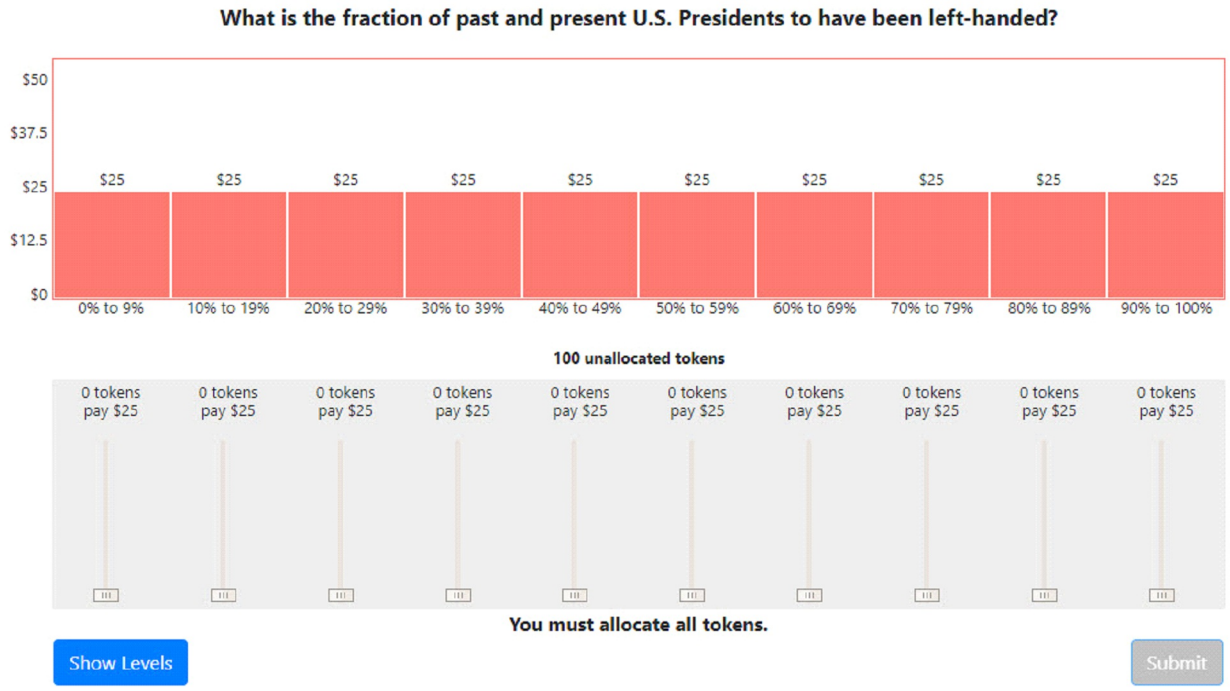
Beliefs Task Instructions

Task Overview

This is a task where you will be paid according to how accurate your beliefs are about certain things. You will be presented with some questions and asked to place bets on your beliefs about the answer to each question. You will be rewarded for your answer to one of these questions, so you should think carefully about your answer to each question. The question that is chosen for payment will be determined after you have made all decisions, and that process is described shortly.

Screenshot 1

To illustrate, consider the following question: What is the fraction of past and present U.S. Presidents to have been left-handed? In order to express your beliefs, you will be shown a screen on the computer like the one shown here:



You have 10 sliders to adjust, shown at the bottom of the screen, and you have 100 tokens to allocate across the sliders. Each slider allows you to allocate tokens to reflect your belief about the answer to this question. You must allocate all 100 tokens, and we always start with 0 tokens allocated to each slider. As you allocate tokens, by adjusting sliders, the payoffs displayed on the screen will change. Your earnings are based on the payoffs that are displayed after you have allocated all 100 tokens.

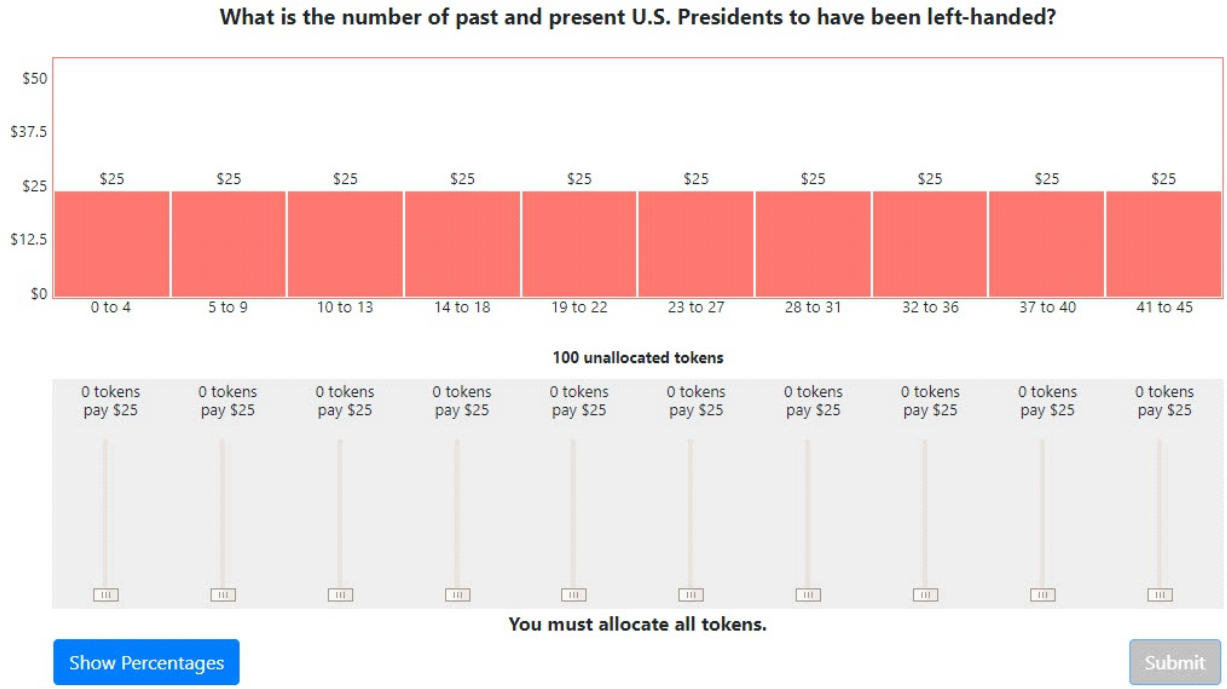
Where you position each slider depends on your beliefs about the correct answer to the question. Note that the bars above each slider correspond to that particular slider. In our example, the tokens you allocate to each bar will naturally reflect your beliefs about the fraction of U.S. Presidents that have been left-handed.

The first bar corresponds to your belief that the fraction of left-handed U.S. Presidents is 0% to 9%. The second bar corresponds to your belief that the fraction of left-handed U.S. Presidents is 10% to 19%. The third bar corresponds to your belief that the fraction is 20% to 29%, and so on. Each bar shows the amount of money you could earn if the true number of left-handed U.S. Presidents is in the interval (for example, 20% to 29%) shown under the bar.

Below the sliders, you can see a "Show Levels" button. If you click this button, the text below the bars will change to show you the levels, 0 to 4, 5 to 9, and so on, that correspond to the percentages, 0% to 9%, 10% to 19%, and so on, you can see in this image.

Screenshot 2

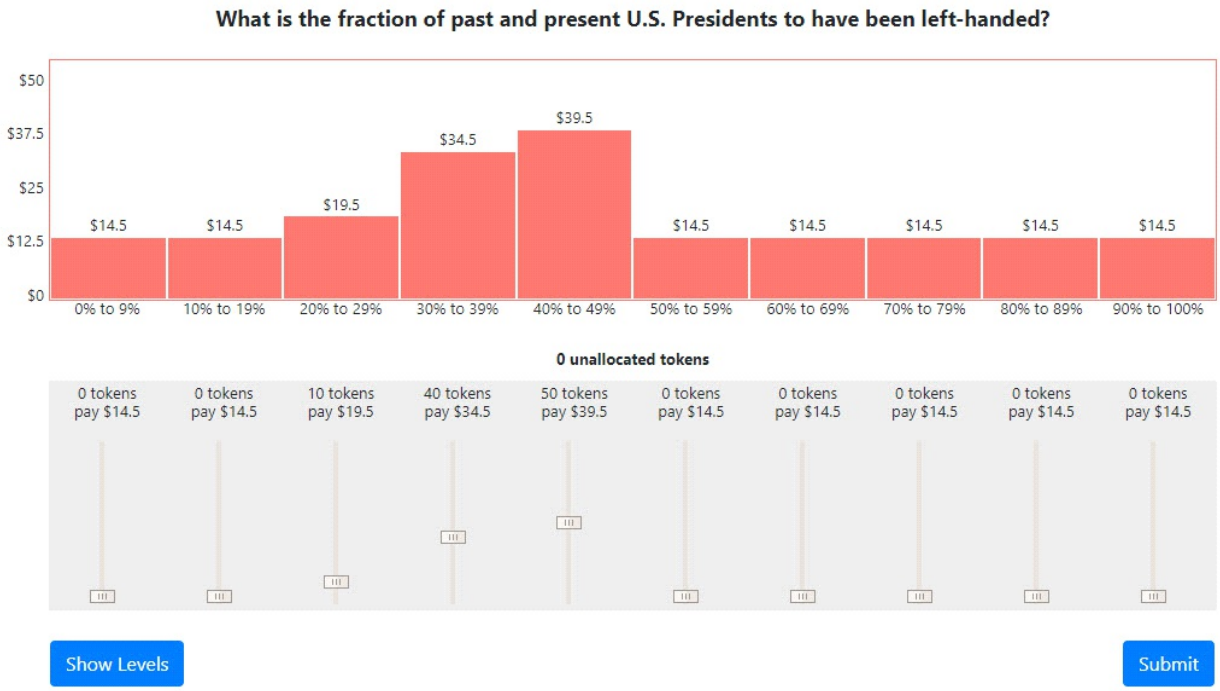
Here is what the display will look like if you click the "Show Levels" button:



You can click the "Show Percentages" button to return to seeing percentages, 0% to 9%, 10% to 19%, and so on, rather than levels, 0 to 4, 5 to 9, and so on. Some people may prefer to see percentages while others prefer levels. The choice of how to display the text below the bars, in levels or percentages, is yours and you can toggle between them by clicking the "Show Levels" and "Show Percentages" buttons.

Screenshot 3

To illustrate how you use these sliders, suppose you think there is a fairly good chance that the true answer is just under 50%. In other words, that the fraction of U.S. Presidents that are left-handed is under 50%. Then you might allocate 50 tokens with the slider for 40% to 49%, as shown here. So you can see that if indeed the true number is 40% to 49% you would now earn more money as you allocate more tokens with this slider. So if you do indeed believe that there is a higher chance of the number being 40% to 49%, you would have increased your expected earnings. In this example, if the true number is 40% to 49% you would earn $39.50, and you would earn less than $39.50 if the true number instead falls into any other range. Suppose you think there is also some chance that it is less than 40%, and could be 39% or less. Then you might allocate the rest of your tokens as shown here.

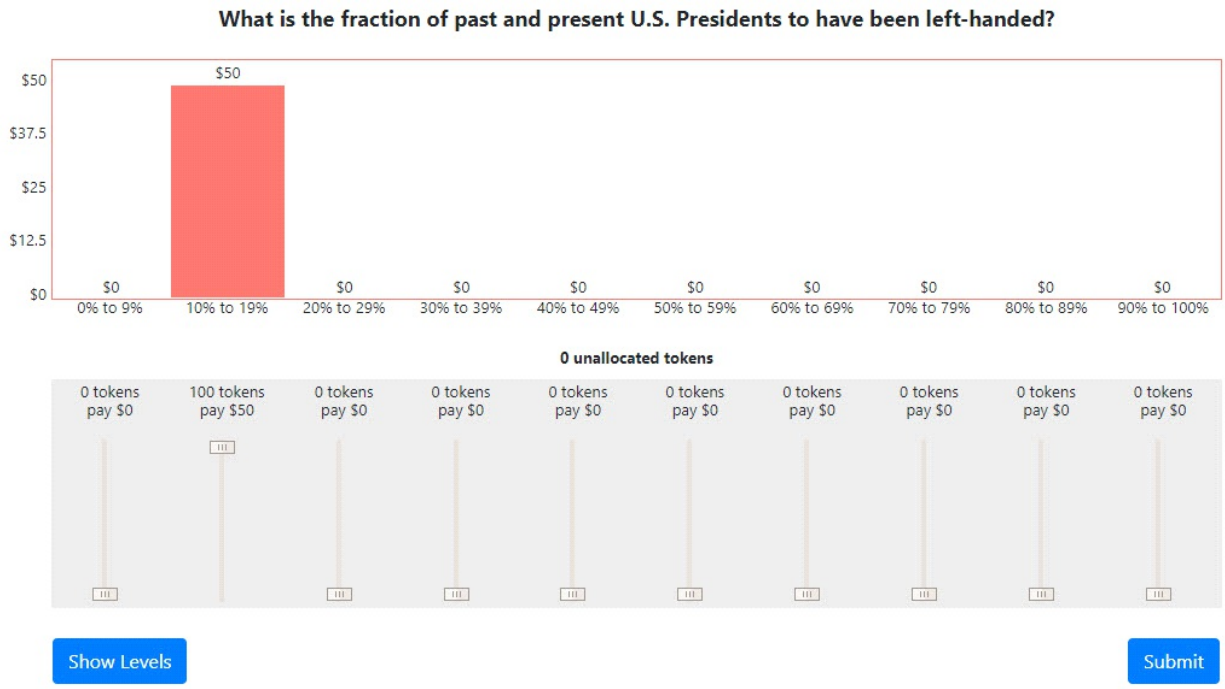


So here we show someone that allocated 50 tokens with the slider for 40% to 49%, 40 tokens with the slider for 30% to 39%, and 10 tokens with the slider for 20% to 29%. You can adjust this allocation as much as you want to best reflect your personal beliefs.

Your earnings depend on your reported beliefs and, of course, the true answer. In this case the true answer is that there are 8 left-handed U.S Presidents out of 45, so the true fraction is 17.8%, and we would round that to 18%. So if you had reported these beliefs, you would have earned $14.50.

Screenshot 4

What if you had put all of your eggs in the true basket, and allocated 100 tokens with the slider for 10% to 19%? Then you would have faced the earnings outcomes shown here.



Note the "good news" and "bad news" here. If you are absolutely certain that you know the true answer to the question, you can earn the maximum payoff, shown here as $50. But if you are wrong, and the actual number had been 20%, then you would have earned nothing.

So it is up to you to balance the strength of your personal beliefs with the risk of them being wrong.

Summary

There are two important points for you to keep in mind when placing your bets:

- Your belief about the chances of each outcome is a personal judgement that depends on information you have about the different events. Some people might be experts on a certain issue, and others might not be very knowledgeable about it. Your personal beliefs will naturally reflect your knowledge.
- Your choices might also depend on your willingness to take risks or to gamble. There is no right choice for everyone. For example, in a horse race you might want to bet on the longshot since it will bring you more money if it wins. On the other hand, you might want to bet on the favorite since it is more likely to win something.

For each question, your choice will depend on two things: your judgment about how likely it is that each outcome will occur, and how much you like to gamble or take risks.

We used a trivia question about U.S. Presidents just for illustration. You will not be asked any trivia questions today.

When you are happy with your token allocation, you should click on the **Submit** button to confirm your choices and advance to the next question. Since there is a chance that any of the questions could be selected for payment, you should approach each question as if it is the one you will be paid for.

Task Earnings

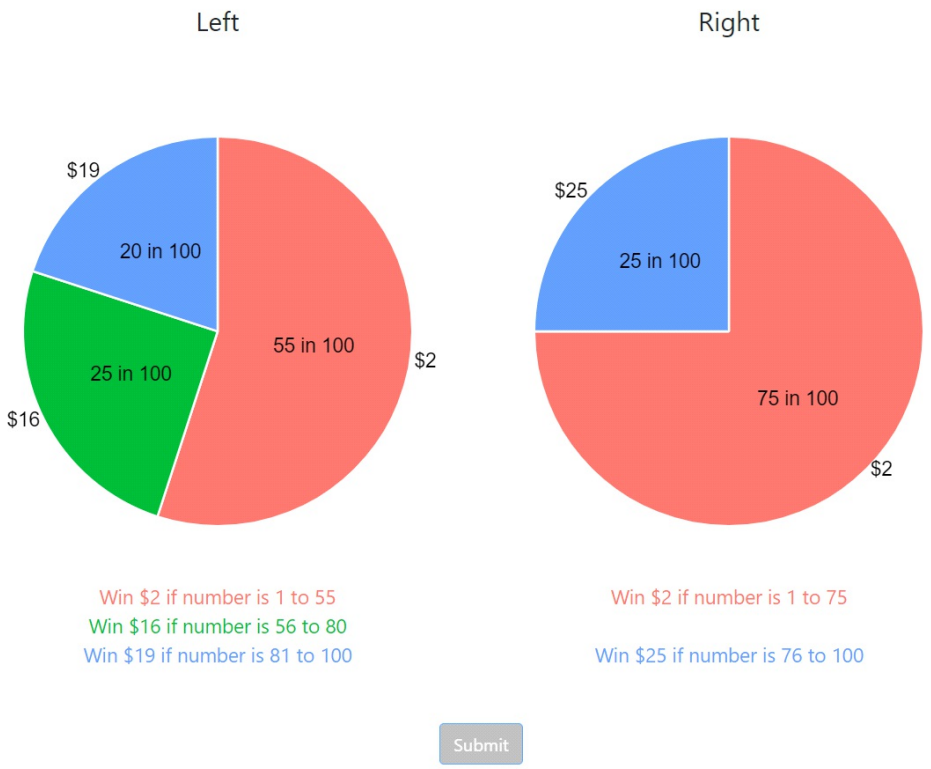
Once you are finished with the task, the computer will randomly select one of the questions that you just completed. The decision screen selected will be shown back to you and the computer will record your potential earnings on the basis of your token allocation for the selected question. Because each question is asking about events on future dates, we will only know the true outcome after that date in the question has passed. Once we have verified the true outcome, we will send you any additional earnings generated from this task within 14 days of the future date passing. The true outcome will be based on levels that are reported, not percentages. When it is appropriate, you will have the option to review the percentages implied by these levels by clicking on the "Show Percentages" button.

Recall that when you complete the study, you may revisit the custom web link sent in your invitation to view a payment receipt sheet for the incentivized task decisions selected for payment and the dates associated with them. Payments will be made via the primary or secondary method you indicated when you entered the study.

Atemporal Risk Task Instructions

This is a task where you will choose between prospects with varying prizes and chances of winning. On each computer screen you will be presented with a pair of prospects and you will need to choose one of them. There are 90 pairs of prospects in this task. For each pair of prospects, you should choose the prospect you prefer to play. You will actually get the chance to play **one** of the prospects you choose, and you will be paid according to the outcome of that prospect, so you should think carefully about which prospect you prefer.

Here is an example of what the computer display of such a pair of prospects might look like.



The outcome of the prospects will be determined by the computer drawing a random number from 1 and 100. Each number from 1 to 100 is equally likely to occur.

In the example, the prospect on the Left pays $2 with a 55 in 100 (or 55%) chance, $16 with a 25 in 100 (or 25%) chance and $19 with a 20 in 100 (20%) chance. So if the random number drawn is between 1 and 55 you will be paid $2, if the number is between 56 and 80 you will be paid $16, and if the number is between 81 and 100 you will be paid $19. The pink color in the pie chart corresponds to 55% of the area and illustrates the chances that the number drawn will be between 1 and 55 and your earnings will be $2. The green area in the pie chart corresponds to 25% of the area and illustrates the chances that the number drawn will be between 56 and 80 and your earnings will be $16. The blue area in the pie chart corresponds to 20% of the

area and illustrates the chances that the number drawn will be between 81 and 100 and your earnings will be $19.

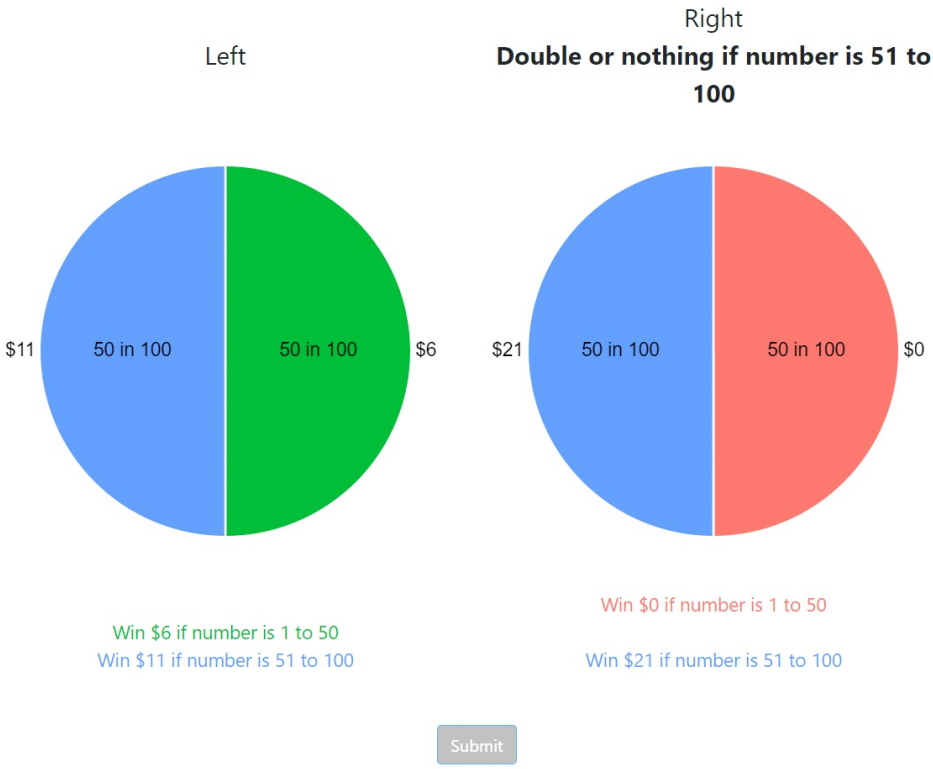
Now look at the prospect on the Right in the example. It pays $2 with a 75 in 100 (75%) chance, and $25 with a 25 in 100 (or 25%) chance. So if the random number drawn is between 1 and 75 you will be paid $2, and if the number is between 76 and 100 you will be paid $25. The pink color in the pie chart corresponds to 75% of the area and illustrates the chances that the number drawn will be between 1 and 75 and your earnings will be $2. The blue area in the pie chart corresponds to 25% of the area and illustrates the chances that the number drawn will be between 76 and 100 and your earnings will be $25.

Each pair of prospects is shown on a separate screen on the computer. On each screen, you should indicate which prospect you prefer to play by clicking on that prospect. The prospect you select will be highlighted in blue. If you want to change your choice, just click the other prospect. When you are happy with your choice, click the **Submit** button.

You could also get a pair of prospects in which one of the prospects will give you the chance to play "Double or Nothing." For instance, the prospect on the Right in this screen image pays "Double or Nothing" if the randomly drawn number is 51 to 100. The right pie chart indicates that there is a 1 in 50 (or 50%) chance that you get $0. So if the randomly drawn number is between 1 and 50 you will be paid $0. However, if the number is between 51 and 100, the computer will toss a fair coin to determine if you get double the amount listed next to the blue area of the pie chart ($21). If the virtual coin comes up Heads you get $42, otherwise you get nothing. The prizes listed for a particular prospect refer to the amounts **before** any "Double or Nothing" coin toss.

For instance, suppose you picked the prospect on the Left in this example. If the random number drawn was 37, you would get $6; if it was 93, you would get $11.

If you picked the prospect on the Right and the random number drawn was 37, you would get $0; if instead it was 93, the computer would toss a virtual coin to determine if you get "Double or Nothing." If the virtual coin comes up Heads then you get $42. However, if it comes up Tails you get nothing from your chosen prospect.



It is also possible that you will be given a prospect in which there is a "Double or Nothing" option no matter what random number is drawn. This screen image illustrates this possibility. The prospect on the Right in the example pays "Double or Nothing" for any number that is randomly drawn by the computer. So if you select the prospect on the Right and the computer selects a number between 1 and 50 the computer will toss a virtual coin to see whether you get $0 or $12 (double $6). If the random number selected is between 51 and 100 the computer will toss a virtual coin to see whether you get $0 or $42 (double $21).



When you are finished with the task, you will be paid for one of your choices. The computer will first randomly select one of the 90 choices you made. The decision screen selected will be shown back to you. Next the computer will randomly select a number from 1 to 100, where each number is equally likely to be drawn. That number will then determine your payment for this task. If that decision screen happens to involve a "Double or Nothing," the computer will then toss a fair coin to determine your payment.

Therefore, your earnings for this task are determined by four things:

- by which prospect you select, the Left or the Right, for each of these 90 pairs;
- by which prospect pair is randomly chosen to be played out in the set of 90 such pairs;
- by the outcome of that prospect when the computer randomly selects a number from 1 to 100; and
- by the outcome of a virtual coin toss if the chosen prospect outcome is of the "Double or Nothing" type.

Which prospects you prefer is a matter of personal taste. Please make your choices by thinking carefully about each prospect.

After successful completion of the study, payments for participation and any additional earnings from this task and the other tasks will be determined and paid at the appropriate date. Payments will be made via the primary or secondary method you indicated when you entered the study.

Discounting Task Instructions

Task Overview

In this task you will choose between different amounts of money available at different times. You will need to make 100 choices in total. For each choice you will decide between a smaller amount of money which is available sooner and a larger amount of money which is available later. One of your 100 choices will be selected at random for payment and you will receive the amount of money you chose at the appropriate date.

All of these choices will be made on a computer.

Screenshot 1

Here is an example of what the computer display might look like:



For the purpose of explaining this task, assume for the moment that today is 4 May 2020. At the top of the display is a calendar showing you today's date in a black box (4 May 2020). This date is also highlighted in pink and a future date is highlighted in green (18 May 2020). Below the calendar are two columns: a column on the left with amounts of money available at an earlier date (today) and a column on the right with amounts of money available at a later date (in 14 days from today). You need to make 5 choices on this screen. Each choice appears on a different row.

In the first row, you need to choose between receiving $30 today or $31 in 14 days from today. Note that $30 is the smaller of the two amounts but it is available today. $31 is the larger of the two amounts but it is only available after 14 days. Suppose that you prefer $30 today over $31 in 14 days from today. To choose $30 today just click this amount in the first row of the left column.

Suppose instead that you prefer $31 in 14 days rather than $30 today. To choose $31 in 14 days just click this amount in the first row of the right column.

Once you have made your choice on the first row you can move on to the other rows on the screen. You need to make 5 choices on the screen before you can move on to the next set of 5 choices on a new screen. Once you have made all of your choices on the screen you can click the **Submit** button to move on to the next screen.

You will need to make 100 choices in total across 20 screens. The dollar amounts change on each row of each screen. In addition, the times for delivery of the dollar amounts change across screens. For example, on this screen, you had to choose between an amount of money available today and an amount of money available in 14 days. On a different screen, you may need to choose between an amount of money available in 7 days and another amount of money available in 21 days. So please pay careful attention when making your choices.

Task Earnings
When you are finished with the task, you will be paid for one of your choices. The computer will first randomly select one of the 20 decision screens that you just completed. The decision screen selected will be shown back to you. Next the computer will randomly select a number from 1 to 5, where each number is equally likely to be drawn. The number drawn will determine the row that is selected. You will be paid for the choice that you made on that row on the date listed for that choice.

Screenshot 2
For example, if this screen was the one selected for payment, and the randomly drawn number was 3, we would look at the third row to determine your payment. If you chose $30 today, you will be paid $30 within 24 hours of finishing the study. If you chose $33 in 14 days then you will be paid $33 in 14 days.

Note that the option you prefer on each row is a matter of personal taste. Please make your choices by thinking carefully about each option. Since there is a chance that any of your 100 choices could be selected for payment, you should approach each choice as if it is the one that you will be paid for.

After successful completion of the study, payments for participation and any additional earnings from this task and the other tasks will be determined and paid at the appropriate date. Payments will be made via the primary or secondary method you indicated when you entered the study.

Intertemporal Risk Task Instructions

Task Overview

In this task you will make a number of choices between two options that you can think of as the TOP and BOTTOM options.

You will need to make 40 choices in total across 40 screens. On each screen, you should choose the option you prefer.

The outcome of each option will be determined by the draw of a random number from 1 to 10. Each number from 1 to 10 is equally likely to occur.

Screenshot 1

An example of a choice that you will need to make is shown here.



In the example, the TOP option pays $30 in 7 days AND $3 in 21 days if the number is 1 or 2. It pays $3 in 7 days AND $30 in 21 days if the number is 3 to 10.

The BOTTOM option pays $30 in 7 days AND $30 in 21 days if the number is 1 or 2. It pays $3 in 7 days AND $3 in 21 days if the number is 3 to 10.

Task Earnings
When you are finished with the task, you will be paid for one of your choices. The computer will first randomly select one of the 40 choices you made. The decision screen selected will be shown back to you. Next the computer will randomly select a number from 1 to 10, where each number is equally likely to be drawn. That number will then determine your payment for this task.

Screenshot 2
If this example is selected for payment and you chose the TOP option, and if the randomly selected number is 8, then you will be paid $3 in 7 days AND $30 in 21 days.

By contrast, if this example is selected for payment and you chose the BOTTOM option, and if the randomly selected number is 5, then you will be paid $3 in 7 days AND $3 in 21 days.

Note that the option you prefer is a matter of personal taste. Please make your choices by thinking carefully about each option. Since there is a chance that any of your 40 choices could be selected for payment, you should approach each choice as if it is the one you will be paid for.

After successful completion of the study, payments for participation and any additional earnings from this task and the other tasks will be determined and paid at the appropriate date. Payments will be made via the primary or secondary method you indicated when you entered the study.

Online Appendix E: Survey Questions

A. Demographics Survey

General Page

age
What is your current age?
[selected from dropdown]
DROP DOWN SELECTION VALUES (18…80)

gender
Which of the following gender groups do you identify with?
[select one]
Female
Male
Other
Prefer not to Answer

location
Where are you currently taking part this survey? That is, what CITY and STATE/PROVINCE are you currently in?
[User text input]

relationship
What relationship status describes you currently?
[select one]
Single and never married
In a relationship, but not married
Married
Separated, divorced, or widowed
Other

income_last_month
In the last month, what was your total income from all sources?
[User text input]

income_day_received
On what day do you typically receive your income each month?
[User text input]

expenditure_daily
How much do you typically spend each day using cash and your debit card?
[User text input]

financial_situation
What is your current (TODAY's) financial situation on the following scale?
[select one]
Very broke
Broke
Neither broke nor in good shape
In good shape

In very good shape

USA Page

usa_race
Which of the following categories best describes you?
[select one]
White or Caucasian
Black or African American
African
Asian-American
Asian
Hispanic-American
Hispanic
Mixed-Race / Multiracial
Native Hawaiian or Other Pacific Islander
Other

usa_race_other
please specify (optional)

usa_major
What is your major?
[select all that apply]
Accounting
Biological Sciences
Economics
Math, Computer Sciences, or Physical Sciences
Finance
Social Sciences or History
Business Administration, other than Accounting, Economics, or Finance
Humanities
Education
Psychology
Engineering
Health Professions
Public Affairs or Social Services
Does Not Apply
Other

usa_major_other
please specify (optional)

usa_class_standing
What is your class standing?
[select one]
Freshman
Sophomore
Junior
Senior
Masters
Doctoral

Does not apply

usa_class_standing_other
please specify (optional)

usa_expected_education
What is the highest level of education you expect to complete?
[select one]
Associate's degree
Bachelor's degree
Master's degree
Doctoral degree
First professional degree

usa_father_education
What was the highest level of education that your father (or male guardian) completed?
[select one]
Less than High School
GED or High School Equivalency
High School
Vocational or Trade School
College or University
Don't know
Not applicable

usa_mother_education
What was the highest level of education that your mother (or female guardian) completed?
[select one]
Less than High School
GED or High School Equivalency
High School
Vocational or Trade School
College or University
Don't know
Not applicable

usa_reported_gpa
On a 4-point scale, what is your current GPA if you are doing a Bachelor's degree, or what was it when you did a Bachelor's degree? This GPA should refer to all of your coursework, not just the current year.
[select one]
Between 3.75 and 4.0 GPA (mostly A's)
Between 3.25 and 3.74 GPA (about half A's and half B's)
Between 2.75 and 3.24 GPA (mostly B's)
Between 2.25 and 2.74 GPA (about half B's and half C's)
Between 1.75 and 2.24 GPA (mostly C's)
Between 1.25 and 1.74 GPA (about half C's and half D's)
Less than 1.25 GPA (mostly D's or below)
Have not taken courses for which grades are given

usa_reside
Where do you live now? That is, where do you stay most often?
[select one]

Your own place (apartment, house, condo, etc.)
Parent or Guardian's home
Another's home (non-parental relative's or non-related adult's home)
Group living arrangement (dormitory, barracks, group home, etc.)
Homeless (no regular place to stay)
Other

usa_reside_other
please specify (optional)

SA Page

rsa_race
In what population group do you classify yourself?
[select one]
Black / African
Coloured
Indian
White
Prefer not to answer
Other

rsa_race_other
please specify (optional)

rsa_home_type
Which of the following best describes your home?
[select one]
Stand Alone House
Town House / Semi Detached House
Flat in Block of Flats
Traditional Dwelling / Hut
House / Room in Back Yard
Shack in Back Yard
Informal Dwelling / Shack Not in Back Yard
Tent / Caravan

rsa_household_members
How many people live in your household? Include yourself, your spouse, and any dependents. Do not include your parents or roommates unless you claim them as dependents (regardless of your living situation, always include yourself as "1")
DROP DOWN SELECTION VALUES (1…15+)

USA Page

usa_household_members
How many people live in your household? Include yourself, your spouse, and any dependents. Do not include your parents or roommates unless you claim them as dependents (regardless of your living situation, always include yourself as "1")
DROP DOWN SELECTION VALUES (1…15+)

usa_household_income
Please select the category below that best describes the total amount of INCOME earned last year by the people in YOUR HOUSEHOLD (as "household" is defined in the previous question). Consider all forms of income, including: salaries, tips, interest and dividend payments, scholarship support, student loans, parental support, social security, alimony, child support, and others.
[select one]
$15,000 or under
$15,001 - $25,000
$25,001 - $35,000
$35,001 - $50,000
$50,001 - $65,000
$65,001 - $80,000
$80,001 - $100,000
$100,001 - $150,000
Over $150,000
Don't know
Prefer to not answer

usa_parent_income
Please select the category below that best describes the total amount of INCOME earned last year by YOUR PARENTS / GUARDIANS. Again, consider all forms of income, including: salaries, tips, interest and dividend payments, scholarship support, student loans, parental support, social security, alimony, child support, and others.
[select one]
$15,000 or under
$15,001 - $25,000
$25,001 - $35,000
$35,001 - $50,000
$50,001 - $65,000
$65,001 - $80,000
$80,001 - $100,000
$100,001 - $150,000
Over $150,000
Don't know
Prefer to not answer

usa_religious_beliefs
How would you characterize your religious beliefs? Please select the option that best describes your beliefs.
[select one]
Atheism
Buddhism
Christianity - Baptist
Christianity - Catholic
Christianity - Lutheran

Christianity - Methodist
Christianity - Other
Hinduism
Islam
Judaism
Nonreligious or Agnostic
Prefer to not answer
Other

religious_beliefs_other
please specify (optional)

General Page

employment
What is your current employment status?
[select one]
Employed - Full Time (Fixed Salary Per Month)
Employed - Informal Sector / Part Time (Non-Fixed Salary Per Month)
Unemployed and currently looking for work
Unemployed and NOT currently looking for work
Home Duties
Full-Time Student
Retired
Self Employed
Unable to work

hyp_risk
How do you see yourself: are you a person who is fully prepared to take risks or do your try to avoid taking risks? Please select an option on the scale, where 0 means "not at all willing to take risks" and 10 means "very willing to take risks".
[bipolar matrix with 11 response spaces]
0 - Not at All Willing to Take Risks
1
2
3
4
5
6
7
8
9
10 - Very Willing to Take Risks

General Page

rate_
Please read through the following list of statements. For each statement, tick the box that best describes you.
[Responses Are: “Rarely/Never”, “Occasionally”, “Often”, “Almost Always”]
[select one per item]
I plan tasks carefully
I do things without thinking

I make up my mind quickly (I decide what to do quickly)
I am happy-go-lucky (I am easy going. I am carefree)
I don't "pay attention"
I have "racing" thoughts (I have quickly changing thoughts that I can't stop or control)
I plan trips well ahead of time (trips doesn't only mean holidays, or long-distance journeys)
I am self-controlled
I concentrate easily
I save regularly
I "squirm" at speeches or meetings (I have trouble keeping still at speeches or meetings)
I think carefully about things
I plan for job security (I think about what I need to do to make sure I am employed or have an income in the future)
I say things without thinking
I like to think about complex problems
I decide to change jobs (this means leaving a job, not losing it)
I act "on impulse"
I get easily bored when solving thought problems (I get easily bored when working on games of thought like riddles and number games)
I act on the spur of the moment (I act without thinking)
I am a steady thinker (I can think about one thing without getting distracted)
I decide to change where I live
I buy things on impulse
I can only think about one problem at a time
I change hobbies (hobbies include sports and other recreational activities)
I spend or buy more on credit than I earn
I have outside thoughts when thinking (I have distracting or unintended thoughts when I'm trying to think about something else)
I am more interested in the present than the future (I am more concerned about the present than the future)
I am restless at talks or in church
I like puzzles (I like games and tasks that require thinking about one thing for some time)
I plan for the future

B. Health Questionnaire

General Page

covid_cause
COVID-19 is caused by:
[select one]
Bacterial infection
Insect bite
Viral infection
Animals
I don't know

covid_spread
COVID-19 is spread by direct contact with the virus from:
[Select all that apply]
Infected persons coughing or sneezing
By being in a public gathering where there is an infected person
Virus-contaminated surfaces
Touching your face after you have been in contact with an infected person
I don't know

covid_incubation
What is the average length of time between a person's becoming infected with COVID-19 and experiencing symptoms (taking into account that some people become infected and never show symptoms)?
[select one]
Immediately
After 1-2 days
After 2-14 days
After 15-20 days
I don't know

covid_symptoms
Which of the following best describes the symptoms of COVID-19?
[Select all that apply]
Body pain
Sweating
Shortness of breath
Headaches
Cough
Running nose
Sneezing
Red-itchy eyes
Fever
Diarrhea
I don't know

covid_prevention
Prevention of COVID-19 infection is best achieved by:
[Select all that apply]
Covering your mouth with a flexed elbow when coughing
Using gloves

Using face mask
Washing your hands regularly with soap for 20 seconds
I don't know

covid_behaviors
Have you been doing any of the following during the past week as a result of the COVID-19 emergency?
[Select all that apply]
Covering coughs or sneezes with a tissue or flexed elbow
Wearing hand gloves
Using face mask
Using hand sanitizer
Washing my hands more frequently
Staying in my house and decreasing my social interaction
Self-isolating
I haven't taken any precautions yet
Other

covid_behaviors_other
please specify (optional)

USA Page

usa_covid_personal_risk
How do you rate your PERSONAL RISK of contracting COVID-19?
[select one]
Very high risk
High risk
Moderate risk
Low risk
Very low risk

usa_covid_personal_risk_factors
Why do you believe that you are at the PERSONAL LEVEL of risk you indicated above?
[Select all that apply]
I am in a young age group
I have underlying medical conditions
I wash my hands regularly
I smoke
I work in a high-risk environment (hospital, police station, essential services)
My home environment places me at risk
I am self-isolating
I am using gloves
I am in a high-risk age group
I am generally healthy
I use a face mask
I don't know
Other

usa_covid_personal_risk_factors_other
please specify (optional)

usa_covid_personal_risk_

Do you feel the level of risk in contracting COVID-19 for each of the following is HIGHER or LOWER than your PERSONAL LEVEL of risk indicated above?
[Responses Are: “HIGHER than my personal risk”, “About the SAME as my personal risk”, “LESS than my personal risk”]
[select one per item]
The World
The United States
My State
My Neighborhood
My Family

usa_experts_confidence
On the 7-point scale below, where 1 means "not at all" and 7 means "completely", how confident are you that the estimates of COVID-19 cases and deaths published on a rolling basis by the US Center for Disease Control (CDC) tend to accurately reflect reality?
1 – Not at all
2
3
4
5
6
7 – Completely

usa_covid_information
Where do you get most of your information on COVID-19?
[select all that apply]
Local television
ABC
CBS
NBC
PBS
FOX News
CNN
MSNBC
i24 News
NEWSMAX
Late-Night Comedy (Daily Show, Tonight Show, John Oliver etc.)
Spanish-language tv
Non-partisan radio
Conservative talk radio
Liberal talk radio
US Newspapers (print or online)
International Newspapers (includes The Economist)
Social media
News websites or mobile apps
Government sources
Spouse or children
Personal doctor
Friends
Family
Scientific journals
I don't know

Other

usa_information_confidence
On the 7-point scale below, where 1 means "very low" and 7 means "very high", what level of confidence do you have in the general accuracy of reporting about COVID-19 you get from the information source that you consult most often when you want to find about the current course of the disease?
1 – Very low
2
3
4
5
6
7 – Very high

usa_covid_information_other
please specify (optional)

usa_covid_one_month
When thinking about COVID-19 here in the United States, which of the following do you think is most likely to happen over the next month?
[select one]
We will be over the worst of it - things will begin to improve
The situation will remain largely the same as it is now
The worst is yet to come - things will start to get worse
I don't know

usa_covid_peak_atlanta
Will the Atlanta metropolitan area reach its peak rate of COVID-19 infection before or after the United States reaches its peak rate?
[select one]
Before
At the same time
After
I don't know

SA Page

rsa_covid_personal_risk
How do you rate your PERSONAL RISK of contracting COVID-19?
[select one]
Very high risk
High risk
Moderate risk
Low risk
Very low risk

rsa_covid_personal_risk_factors
Why do you believe that you are at the PERSONAL LEVEL of risk you indicated above?
[Select all that apply]
I am in a young age group
I have underlying medical conditions

I wash my hands regularly
I smoke
I work in a high-risk environment (hospital, police station, essential services)
My home environment places me at risk
I am self-isolating
I am using gloves
I am in a high-risk age group
I am generally healthy
I use a face mask
I don't know
Other

rsa_covid_personal_risk_factors
_other
please specify (optional)

rsa_covid_personal_risk_
Do you feel the level of risk in contracting COVID-19 for each of the following is HIGHER or LOWER than your PERSONAL LEVEL of risk indicated above?
[Responses Are: “HIGHER than my personal risk”, “About the SAME as my personal risk”, “LESS than my personal risk”]
[select one per item]
The World
South Africa
My Province
My Neighborhood
My Family

rsa_experts_confidence
On the 7-point scale below, where 1 means "not at all" and 7 means "completely", how confident are you that the estimates of COVID-19 cases and deaths published on a rolling basis by the South African Department of Health tend to accurately reflect reality?
1 – Not at all
2
3
4
5
6
7 – Completely

rsa_covid_information
Where do you get most of your information on COVID-19?
[select all that apply]
Local television
Satellite television: South African stations
Satellite television: International stations (CNN, Al Jazeera, etc.)
Radio
South African newspapers (print or online)
International newspapers (includes the economist)
Social media
News websites or mobile apps
Government sources

Spouse or children
Personal doctor
Friends
Family
Scientific journals
I don't know
Other

rsa_information_confidence
On the 7-point scale below, where 1 means "very low" and 7 means "very high", what level of confidence do you have in the general accuracy of reporting about COVID-19 you get from the information source that you consult most often when you want to find about the current course of the disease?
1 – Very low
2
3
4
5
6
7 – Very high

rsa_covid_information_other
please specify (optional)

rsa_covid_one_month
When thinking about COVID-19 here in South Africa, which of the following do you think is most likely to happen over the next month?
[select one]
We will be over the worst of it - things will begin to improve
The situation will remain largely the same as it is now
The worst is yet to come - things will start to get worse
I don't know

rsa_covid_peak_capetown
Will the Cape Town metropolitan area reach its peak rate of COVID-19 infection before or after South Africa reaches its peak rate?
[select one]
Before
At the same time
After
I don't know

General Page

covid_media_exaggerated
I believe the threat from COVID-19 is exaggerated in the media on which I mainly rely for news:
[select one]
Strongly agree
Agree
Neutral
Disagree
Strongly disagree

covid_meida_overload
I feel there is far too much information in the media on which I mainly rely for news, and I can't keep up with it all:
[select one]
Strongly agree
Agree
Neutral
Disagree
Strongly disagree

covid_duration
This whole COVID-19 crisis will be over in the next:
[select one]
Few days
Few weeks
Few months
Will last at least 12 months
I don't know

covid_medication
Is there currently a medication to treat COVID-19?
[select one]
Yes
No
I don't know

covid_cure
Is there currently a cure for COVID-19?
[select one]
Yes
No
I don't know

covid_vaccine
Governments and pharmaceutical companies will develop a vaccine within:
[select one]
The next 6 months
Within one year
Within 18 months
After the next 12 to 18 months
I don't know

covid_diminish_income
If you are required to stay quarantined at home, does this affect your income?
[select one]
Yes, a lot
Yes, a little
No

covid_test_positive
Do you personally know anyone who has tested positive for COVID-19?
[select one]

Yes
No

covid_test_positive_relationship
If you do know someone that tested positive for COVID-19, what is your relationship to those individuals?
[select all that apply]
Not applicable
Family
Friend
Neighbor
People at work
Child
Partner

covid_test_self
Have you been tested for COVID-19?
[select one]
Yes
No

covid_exposed_actions
If you do start showing symptoms and you suspect you may have been exposed to COVID-19, what would be your immediate course of action?
[Select all that apply]
Isolate myself
Call the COVID-19 hotline
Contact my personal doctor
Go to the hospital emergency department
Post the news to my social media
Alert my employer
Treat it like I would any flu
I don't know
Other

covid_exposed_actions_other
please specify (optional)

covid_int_travel_30days
Have you traveled out of the country in the last 30 days?
[select one]
Yes
No

General Page

anxiety_
Over the last 2 weeks, how often have you been bothered by the following problems?
[Responses are: “Not At All”, “Several Days”, “More Than Half the Days”, “Most of the Days”] [select one per item]
Feeling nervous, anxious, or on edge
Not being able to stop or control worrying
Worrying too much about different things

Trouble relaxing
Being so restless that it's hard to sit still
Becoming easily annoyed or irritable
Feeling afraid as if something awful might happen

anxiety_difficulty
If you checked off any of problems above, how difficult have these problems made it for you to do your work, take care of things at home, or get along with other people?
[select one]
I did not check off any problems above
Not difficult at all
Somewhat difficult
Very difficult
Extremely difficult

General Page

depression_
Over the last 2 weeks, how often have you been bothered by any of the following problems?
[Responses are: "Not At All", "Several Days", "More Than Half the Days", "Most of the Days"] [select one per item]
Little interest or pleasure in doing things
Feeling down, depressed, or hopeless
Trouble falling or staying asleep, or sleeping too much
Feeling tired or having little energy
Poor appetite or overeating
Feeling bad about yourself or that you are a failure or have let yourself or your family down
Trouble concentrating on things, such as reading the newspaper or watching television
Moving or speaking so slowly that other people could have noticed. Or the opposite being so fidgety or restless that you have been moving around a lot more than usual
Thoughts that you would be better off dead, or of hurting yourself

depression_difficulty
If you checked off any problems above, how difficult have these problems made it for you to do your work, take care of things at home, or get along with other people?
[select one]
I did not check off any problems above
Not difficult at all
Somewhat difficult
Very difficult
Extremely difficult

Online Appendix F: Task Parameters

A. Beliefs Task

NOTE: Each line in this section is too long fit well so each line is wrapped and a blank line separates each individual line.

```
bin1  bin2  bin3  bin4  bin5  bin6  bin7  bin8  bin9  bin10      bin_button
      alt1  alt2  alt3  alt4  alt5  alt6  alt7  alt8  alt9  alt10      alt_b
utton      gid   qid   tokens     alpha      delta      currency   pay_b
y     text  alt_text

0 to 6,100,000   6,100,001 to 6,390,000     6,390,001 to 6,610,000
      6,610,001 to 6,800,000     6,800,001 to 6,980,000     6,980,001
to 7,160,000     7,160,001 to 7,360,000     7,360,001 to 7,600,000
      7,600,001 to 7,940,000     7,940,001+            0% to 1.86%
      1.86% to 1.95%   1.95% to 2.02%   2.02% to 2.07%   2.07% to 2.13%
      2.13% to 2.18%   2.18% to 2.24%   2.24% to 2.32%   2.32% to 2.42%
      2.42% to 100%    Show Levels      g1_usa     g1q0  100   15    15
      $     within 14 days of August 30, 2020     How many people in
the United States will be detected as having been <b>infected</b> at
some time, with or without symptoms, by COVID-19 by <b>August 30,
2020</b>?       What percentage of people in the United States will be
detected as having been <b>infected</b> at some time, with or without
symptoms, by COVID-19 by <b>August 30, 2020</b>?

0 to 5,600,000   5,600,001 to 5,870,000     5,870,001 to 6,080,000
      6,080,001 to 6,250,000     6,250,001 to 6,420,000     6,420,001
to 6,590,000     6,590,001 to 6,780,000     6,780,001 to 7,000,000
      7,000,001 to 7,320,000     7,320,001+            0% to 1.71%
      1.71% to 1.79%   1.79% to 1.85%   1.85% to 1.91%   1.91% to 1.96%
      1.96% to 2.01%   2.01% to 2.07%   2.07% to 2.13%   2.13% to 2.23%
      2.23% to 100%    Show Levels      g1_usa     g1q1  100   15    15
      $     within 14 days of August 30, 2020     How many people in
the United States will be detected as having been <b>infected</b> at
some time, with or without symptoms, by COVID-19 by <b>August 30,
2020</b>?       What percentage of people in the United States will be
detected as having been <b>infected</b> at some time, with or without
symptoms, by COVID-19 by <b>August 30, 2020</b>?

0 to 6,600,000   6,600,001 to 6,880,000     6,880,001 to 7,080,000
      7,080,001 to 7,260,000     7,260,001 to 7,420,000     7,420,001
to 7,590,000     7,590,001 to 7,780,000     7,780,001 to 8,000,000
      8,000,001 to 8,310,000     8,310,001+            0% to 2.01%
      2.01% to 2.1%    2.1% to 2.16%    2.16% to 2.21%   2.21% to 2.26%
      2.26% to 2.31%   2.31% to 2.37%   2.37% to 2.44%   2.44% to 2.53%
      2.53% to 100%    Show Levels      g1_usa     g1q2  100   15    15
      $     within 14 days of August 30, 2020     How many people in
the United States will be detected as having been <b>infected</b> at
some time, with or without symptoms, by COVID-19 by <b>August 30,
2020</b>?       What percentage of people in the United States will be
detected as having been <b>infected</b> at some time, with or without
symptoms, by COVID-19 by <b>August 30, 2020</b>?

0 to 7,000,000   7,000,001 to 7,300,000     7,300,001 to 7,510,000
```

7,510,001 to 7,700,000 7,700,001 to 7,880,000 7,880,001 to 8,070,000 8,070,001 to 8,260,000 8,260,001 to 8,500,000 8,500,001 to 8,830,000 8,830,001+ 0% to 2.13% 2.13% to 2.23% 2.23% to 2.29% 2.29% to 2.35% 2.35% to 2.4% 2.4% to 2.46% 2.46% to 2.52% 2.52% to 2.59% 2.59% to 2.69% 2.69% to 100% Show Levels g1_usa g1q3 100 15 15 $ within 14 days of August 30, 2020 How many people in the United States will be detected as having been infected at some time, with or without symptoms, by COVID-19 by August 30, 2020? What percentage of people in the United States will be detected as having been infected at some time, with or without symptoms, by COVID-19 by August 30, 2020?

0 to 793,000 793,001 to 831,000 831,001 to 859,000 859,001 to 884,000 884,001 to 907,000 907,001 to 931,000 931,001 to 957,000 957,001 to 988,000 988,001 to 1,030,000 1,030,001+ 0% to 1.86% 1.86% to 1.95% 1.95% to 2.01% 2.01% to 2.07% 2.07% to 2.13% 2.13% to 2.18% 2.18% to 2.24% 2.24% to 2.32% 2.32% to 2.42% 2.42% to 100% Show Levels g2_usa g2q0 100 15 15 $ within 14 days of August 30, 2020 How many people 65 years of age and older in the United States will be detected as having been infected at some time, with or without symptoms, by COVID-19 by August 30, 2020? What percentage of people 65 years of age and older in the United States will be detected as having been infected at some time, with or without symptoms, by COVID-19 by August 30, 2020?

0 to 728,000 728,001 to 764,000 764,001 to 790,000 790,001 to 813,000 813,001 to 835,000 835,001 to 857,000 857,001 to 881,000 881,001 to 910,000 910,001 to 951,000 951,001+ 0% to 1.71% 1.71% to 1.79% 1.79% to 1.85% 1.85% to 1.91% 1.91% to 1.96% 1.96% to 2.01% 2.01% to 2.07% 2.07% to 2.13% 2.13% to 2.23% 2.23% to 100% Show Levels g2_usa g2q1 100 15 15 $ within 14 days of August 30, 2020 How many people 65 years of age and older in the United States will be detected as having been infected at some time, with or without symptoms, by COVID-19 by August 30, 2020? What percentage of people 65 years of age and older in the United States will be detected as having been infected at some time, with or without symptoms, by COVID-19 by August 30, 2020?

0 to 858,000 858,001 to 894,000 894,001 to 920,000 920,001 to 943,000 943,001 to 965,000 965,001 to 987,000 987,001 to 1,010,000 1,010,001 to 1,040,000 1,040,001 to 1,080,000 1,080,001+ 0% to 2.01% 2.01% to 2.1% 2.1% to 2.16% 2.16% to 2.21% 2.21% to 2.26% 2.26% to 2.31% 2.31% to 2.37% 2.37% to 2.44% 2.44% to 2.53% 2.53% to 100% Show Levels g2_usa g2q2 100 15 15 $ within 14 days of August 30, 2020 How many people 65 years of age and older in the United States will be detected as having been infected at some time, with or without symptoms, by COVID-19 by August 30, 2020? What percentage of people 65 years of age and older in the United States will be detected as having been infected at some time, with or without symptoms, by COVID-19 by August 30, 2020?

0 to 910,000 910,001 to 948,000 948,001 to 977,000 977,001 to 1,000,000 1,000,001 to 1,020,000 1,020,001 to 1,050,000 1,050,001 to 1,070,000 1,070,001 to 1,100,000 1,100,001 to 1,150,000 1,150,001+ 0% to 2.13% 2.13% to 2.22% 2.22% to 2.29% 2.29% to 2.35% 2.35% to 2.39% 2.39% to 2.46% 2.46% to 2.51% 2.51% to 2.58% 2.58% to 2.7% 2.7% to 100% Show Levels g2_usa g2q3 100 15 15 $ within 14 days of August 30, 2020 How many people 65 years of age and older in the United States will be detected as having been infected at some time, with or without symptoms, by COVID-19 by August 30, 2020? What percentage of people 65 years of age and older in the United States will be detected as having been infected at some time, with or without symptoms, by COVID-19 by August 30, 2020?

0 to 160,000 160,001 to 172,000 172,001 to 181,000 181,001 to 189,000 189,001 to 196,000 196,001 to 204,000 204,001 to 213,000 213,001 to 223,000 223,001 to 238,000 238,001+ 0% to 0.05% 0.05% to 0.05% 0.05% to 0.06% 0.06% to 0.06% 0.06% to 0.06% 0.06% to 0.06% 0.06% to 0.07% 0.07% to 0.07% 0.07% to 100% Show Levels g3_usa g3q0 100 15 15 $ within 14 days of August 30, 2020 How many people in the United States will have died because of COVID-19 by August 30, 2020? What percentage of people in the United States will have died because of COVID-19 by August 30, 2020?

0 to 156,000 156,001 to 168,000 168,001 to 177,000 177,001 to 185,000 185,001 to 193,000 193,001 to 201,000 201,001 to 209,000 209,001 to 220,000 220,001 to 235,000 235,001+ 0% to 0.05% 0.05% to 0.05% 0.05% to 0.05% 0.05% to 0.06% 0.06% to 0.06% 0.06% to 0.06% 0.06% to 0.06% 0.06% to 0.07% 0.07% to 0.07% 0.07% to 100% Show Levels g3_usa g3q1 100 15 15 $ within 14 days of August 30, 2020 How many people in the United States will have died because of COVID-19 by August 30, 2020? What percentage of people in the United States will have died because of COVID-19 by August 30, 2020?

0 to 165,000 165,001 to 177,000 177,001 to 186,000 186,001 to 194,000 194,001 to 201,000 201,001 to 209,000 209,001 to 218,000 218,001 to 228,000 228,001 to 243,000 243,001+ 0% to 0.05% 0.05% to 0.05% 0.05% to 0.06% 0.06% to 0.06% 0.06% to 0.06% 0.06% to 0.06% 0.06% to 0.07% 0.07% to 0.07% 0.07% to 0.07% 0.07% to 100% Show Levels g3_usa g3q2 100 15 15 $ within 14 days of August 30, 2020 How many people in the United States will have died because of COVID-19 by August 30, 2020? What percentage of people in the United States will have died because of COVID-19 by August 30, 2020?

0 to 170,000 170,001 to 183,000 183,001 to 193,000 193,001 to 202,000 202,001 to 210,000 210,001 to 219,000 219,001 to 229,000 229,001 to 240,000 240,001 to 257,000 257,001+

0% to 0.05% 0.05% to 0.06% 0.06% to 0.06% 0.06% to 0.06%
0.06% to 0.06% 0.06% to 0.07% 0.07% to 0.07% 0.07% to 0.07%
0.07% to 0.08% 0.08% to 100% Show Levels g3_usa g3q3
100 15 15 $ within 14 days of August 30, 2020 How many people in the United States will have died because of COVID-19 by August 30, 2020? What percentage of people in the United States will have died because of COVID-19 by August 30, 2020?

0 to 120,000 120,001 to 134,000 134,001 to 146,000 146,001 to 156,000 156,001 to 165,000 165,001 to 176,000 176,001 to 187,000 187,001 to 201,000 201,001 to 221,000 221,001+
0% to 0.28% 0.28% to 0.31% 0.31% to 0.34% 0.34% to 0.37%
0.37% to 0.39% 0.39% to 0.41% 0.41% to 0.44% 0.44% to 0.47%
0.47% to 0.52% 0.52% to 100% Show Levels g4_usa g4q0
100 15 15 $ within 14 days of August 30, 2020 How many people 65 years of age and older in the United States will have died because of COVID-19 by August 30, 2020? What percentage of people 65 years of age and older in the United States will have died because of COVID-19 by August 30, 2020?

0 to 117,000 117,001 to 131,000 131,001 to 143,000 143,001 to 153,000 153,001 to 162,000 162,001 to 173,000 173,001 to 184,000 184,001 to 198,000 198,001 to 218,000 218,001+
0% to 0.27% 0.27% to 0.31% 0.31% to 0.34% 0.34% to 0.36%
0.36% to 0.38% 0.38% to 0.41% 0.41% to 0.43% 0.43% to 0.46%
0.46% to 0.51% 0.51% to 100% Show Levels g4_usa g4q1
100 15 15 $ within 14 days of August 30, 2020 How many people 65 years of age and older in the United States will have died because of COVID-19 by August 30, 2020? What percentage of people 65 years of age and older in the United States will have died because of COVID-19 by August 30, 2020?

0 to 124,000 124,001 to 138,000 138,001 to 150,000 150,001 to 160,000 160,001 to 170,000 170,001 to 180,000 180,001 to 191,000 191,001 to 205,000 205,001 to 226,000 226,001+
0% to 0.29% 0.29% to 0.32% 0.32% to 0.35% 0.35% to 0.38%
0.38% to 0.4% 0.4% to 0.42% 0.42% to 0.45% 0.45% to 0.48%
0.48% to 0.53% 0.53% to 100% Show Levels g4_usa g4q2
100 15 15 $ within 14 days of August 30, 2020 How many people 65 years of age and older in the United States will have died because of COVID-19 by August 30, 2020? What percentage of people 65 years of age and older in the United States will have died because of COVID-19 by August 30, 2020?

0 to 127,000 127,001 to 143,000 143,001 to 156,000 156,001 to 166,000 166,001 to 177,000 177,001 to 188,000 188,001 to 201,000 201,001 to 216,000 216,001 to 238,000 238,001+
0% to 0.3% 0.3% to 0.34% 0.34% to 0.37% 0.37% to 0.39%
0.39% to 0.42% 0.42% to 0.44% 0.44% to 0.47% 0.47% to 0.51%
0.51% to 0.56% 0.56% to 100% Show Levels g4_usa g4q3

100 15 15 $ within 14 days of August 30, 2020 How many people 65 years of age and older in the United States will have died because of COVID-19 by August 30, 2020? What percentage of people 65 years of age and older in the United States will have died because of COVID-19 by August 30, 2020?

0 to 11,150,000 11,150,001 to 15,830,000 15,830,001 to 19,930,000 19,930,001 to 23,940,000 23,940,001 to 28,120,000 28,120,001 to 32,720,000 32,720,001 to 38,100,000 38,100,001 to 45,000,000 45,000,001 to 55,580,000 55,580,001+ Show Percentages 0% to 3.4% 3.4% to 4.83% 4.83% to 6.08% 6.08% to 7.3% 7.3% to 8.57% 8.57% to 9.98% 9.98% to 11.62% 11.62% to 13.72% 13.72% to 16.95% 16.95% to 100% Show Levels g5_usa g5q0 100 15 15 $ within 14 days of December 1, 2020 How many people in the United States will be detected as having been infected at some time, with or without symptoms, by COVID-19 by December 1, 2020? What percentage of people in the United States will be detected as having been infected at some time, with or without symptoms, by COVID-19 by December 1, 2020?

0 to 9,000,000 9,000,001 to 11,480,000 11,480,001 to 13,530,000 13,530,001 to 15,460,000 15,460,001 to 17,410,000 17,410,001 to 19,520,000 19,520,001 to 21,940,000 21,940,001 to 25,000,000 25,000,001 to 29,640,000 29,640,001+ Show Percentages 0% to 2.74% 2.74% to 3.5% 3.5% to 4.12% 4.13% to 4.71% 4.71% to 5.31% 5.31% to 5.95% 5.95% to 6.69% 6.69% to 7.62% 7.62% to 9.04% 9.04% to 100% Show Levels g5_usa g5q1 100 15 15 $ within 14 days of December 1, 2020 How many people in the United States will be detected as having been infected at some time, with or without symptoms, by COVID-19 by December 1, 2020? What percentage of people in the United States will be detected as having been infected at some time, with or without symptoms, by COVID-19 by December 1, 2020?

0 to 13,000,000 13,000,001 to 18,220,000 18,220,001 to 22,760,000 22,760,001 to 27,160,000 27,160,001 to 31,730,000 31,730,001 to 36,740,000 36,740,001 to 42,570,000 42,570,001 to 50,000,000 50,000,001 to 61,340,000 61,340,001+ Show Percentages 0% to 3.96% 3.96% to 5.55% 5.55% to 6.94% 6.94% to 8.28% 8.28% to 9.67% 9.67% to 11.2% 11.2% to 12.98% 12.98% to 15.24% 15.24% to 18.7% 18.7% to 100% Show Levels g5_usa g5q2 100 15 15 $ within 14 days of December 1, 2020 How many people in the United States will be detected as having been infected at some time, with or without symptoms, by COVID-19 by December 1, 2020? What percentage of people in the United States will be detected as having been infected at some time, with or without symptoms, by COVID-19 by December 1, 2020?

0 to 14,500,000 14,500,001 to 20,800,000 20,800,001 to 26,340,000 26,340,001 to 31,760,000 31,760,001 to 37,400,000 37,400,001 to 43,580,000 43,580,001 to 50,800,000 50,800,001 to 60,000,000 60,000,001 to 73,990,000 73,990,001+ Show Percentages

0% to 4.42% 4.42% to 6.34% 6.34% to 8.03% 8.03% to 9.68% 9.68% to 11.4% 11.4% to 13.29% 13.29% to 15.49% 15.49% to 18.29% 18.29% to 22.56% 22.56% to 100% Show Levels g5_usa g5q3 100 15 15 $ within 14 days of December 1, 2020 How many people in the United States will be detected as having been infected at some time, with or without symptoms, by COVID-19 by December 1, 2020? What percentage of people in the United States will be detected as having been infected at some time, with or without symptoms, by COVID-19 by December 1, 2020?

0 to 1,450,000 1,450,001 to 2,060,000 2,060,001 to 2,590,000 2,590,001 to 3,110,000 3,110,001 to 3,660,000 3,660,001 to 4,250,000 4,250,001 to 4,950,000 4,950,001 to 5,850,000 5,850,001 to 7,230,000 7,230,001+ Show Percentages 0% to 3.4% 3.4% to 4.83% 4.83% to 6.07% 6.07% to 7.29% 7.29% to 8.58% 8.58% to 9.97% 9.97% to 11.61% 11.61% to 13.72% 13.72% to 16.96% 16.96% to 100% Show Levels g6_usa g6q0 100 15 15 $ within 14 days of December 1, 2020 How many people 65 years of age and older in the United States will be detected as having been infected at some time, with or without symptoms, by COVID-19 by December 1, 2020? What percentage of people 65 years of age and older in the United States will be detected as having been infected at some time, with or without symptoms, by COVID-19 by December 1, 2020?

0 to 1,170,000 1,170,001 to 1,490,000 1,490,001 to 1,760,000 1,760,001 to 2,010,000 2,010,001 to 2,260,000 2,260,001 to 2,540,000 2,540,001 to 2,850,000 2,850,001 to 3,250,000 3,250,001 to 3,850,000 3,850,001+ Show Percentages 0% to 2.74% 2.74% to 3.49% 3.49% to 4.13% 4.13% to 4.71% 4.71% to 5.3% 5.3% to 5.96% 5.96% to 6.68% 6.68% to 7.62% 7.62% to 9.03% 9.03% to 100% Show Levels g6_usa g6q1 100 15 15 $ within 14 days of December 1, 2020 How many people 65 years of age and older in the United States will be detected as having been infected at some time, with or without symptoms, by COVID-19 by December 1, 2020? What percentage of people 65 years of age and older in the United States will be detected as having been infected at some time, with or without symptoms, by COVID-19 by December 1, 2020?

0 to 1,690,000 1,690,001 to 2,370,000 2,370,001 to 2,960,000 2,960,001 to 3,530,000 3,530,001 to 4,130,000 4,130,001 to 4,780,000 4,780,001 to 5,530,000 5,530,001 to 6,500,000 6,500,001 to 7,970,000 7,970,001+ Show Percentages 0% to 3.96% 3.96% to 5.56% 5.56% to 6.94% 6.94% to 8.28% 8.28% to 9.69% 9.69% to 11.21% 11.21% to 12.97% 12.97% to 15.24% 15.24% to 18.69% 18.69% to 100% Show Levels g6_usa g6q2 100 15 15 $ within 14 days of December 1, 2020 How many people 65 years of age and older in the United States will be detected as having been infected at some time, with or without symptoms, by COVID-19 by December 1, 2020? What percentage of people 65 years of age and older in the

United States will be detected as having been infected at some time, with or without symptoms, by COVID-19 by December 1, 2020?

0 to 1,890,000 1,890,001 to 2,700,000 2,700,001 to 3,420,000 3,420,001 to 4,130,000 4,130,001 to 4,860,000 4,860,001 to 5,670,000 5,670,001 to 6,600,000 6,600,001 to 7,800,000 7,800,001 to 9,620,000 9,620,001+ Show Percentages 0% to 4.43% 4.43% to 6.33% 6.33% to 8.02% 8.02% to 9.69% 9.69% to 11.4% 11.4% to 13.3% 13.3% to 15.48% 15.48% to 18.29% 18.29% to 22.56% 22.56% to 100% Show Levels g6_usa g6q3 100 15 15 $ within 14 days of December 1, 2020

How many people 65 years of age and older in the United States will be detected as having been infected at some time, with or without symptoms, by COVID-19 by December 1, 2020?

What percentage of people 65 years of age and older in the United States will be detected as having been infected at some time, with or without symptoms, by COVID-19 by December 1, 2020?

0 to 220,000 220,001 to 249,000 249,001 to 272,000 272,001 to 292,000 292,001 to 312,000 312,001 to 333,000 333,001 to 356,000 356,001 to 385,000 385,001 to 427,000 427,001+ Show Percentages 0% to 0.07% 0.07% to 0.08% 0.08% to 0.08% 0.08% to 0.09% 0.09% to 0.1% 0.1% to 0.1% 0.1% to 0.11% 0.11% to 0.12% 0.12% to 0.13% 0.13% to 100% Show Levels g7_usa g7q0 100 15 15 $ within 14 days of December 1, 2020

How many people in the United States will have died because of COVID-19 by December 1, 2020? What percentage of people in the United States will have died because of COVID-19 by December 1, 2020?

0 to 200,000 200,001 to 220,000 220,001 to 236,000 236,001 to 249,000 249,001 to 263,000 263,001 to 276,000 276,001 to 291,000 291,001 to 310,000 310,001 to 337,000 337,001+ Show Percentages 0% to 0.06% 0.06% to 0.07% 0.07% to 0.07% 0.07% to 0.08% 0.08% to 0.08% 0.08% to 0.08% 0.08% to 0.09% 0.09% to 0.09% 0.09% to 0.1% 0.1% to 100% Show Levels g7_usa g7q1 100 15 15 $ within 14 days of December 1, 2020

How many people in the United States will have died because of COVID-19 by December 1, 2020? What percentage of people in the United States will have died because of COVID-19 by December 1, 2020?

0 to 250,000 250,001 to 277,000 277,001 to 298,000 298,001 to 317,000 317,001 to 335,000 335,001 to 354,000 354,001 to 375,000 375,001 to 400,000 400,001 to 437,000 437,001+ Show Percentages 0% to 0.08% 0.08% to 0.08% 0.08% to 0.09% 0.09% to 0.1% 0.1% to 0.1% 0.1% to 0.11% 0.11% to 0.11% 0.11% to 0.12% 0.12% to 0.13% 0.13% to 100% Show Levels g7_usa g7q2 100 15 15 $ within 14 days of December 1, 2020

How many people in the United States will have died because of COVID-19 by December 1, 2020? What percentage of people in the United States will have died because of COVID-19

by December 1, 2020?

0 to 300,000 300,001 to 328,000 328,001 to 349,000 349,001 to 368,000 368,001 to 386,000 386,001 to 404,000 404,001 to 425,000 425,001 to 450,000 450,001 to 486,000 486,001+ Show Percentages 0% to 0.09% 0.09% to 0.1% 0.1% to 0.11% 0.11% to 0.11% 0.11% to 0.12% 0.12% to 0.12% 0.12% to 0.13% 0.13% to 0.14% 0.14% to 0.15% 0.15% to 100% Show Levels g7_usa

g7q3 100 15 15 $ within 14 days of December 1, 2020

How many people in the United States will have died because of COVID-19 by December 1, 2020? What percentage of people in the United States will have died because of COVID-19 by December 1, 2020?

0 to 165,000 165,001 to 195,000 195,001 to 220,000 220,001 to 242,000 242,001 to 264,000 264,001 to 287,000 287,001 to 314,000 314,001 to 346,000 346,001 to 396,000 396,001+ Show Percentages 0% to 0.39% 0.39% to 0.46% 0.46% to 0.52% 0.52% to 0.57% 0.57% to 0.62% 0.62% to 0.67% 0.67% to 0.74% 0.74% to 0.81% 0.81% to 0.93% 0.93% to 100% Show Levels g8_usa

g8q0 100 15 15 $ within 14 days of December 1, 2020

How many people 65 years of age and older in the United States will have died because of COVID-19 by December 1, 2020? What percentage of people 65 years of age and older in the United States will have died because of COVID-19 by December 1, 2020?

0 to 150,000 150,001 to 172,000 172,001 to 190,000 190,001 to 206,000 206,001 to 221,000 221,001 to 238,000 238,001 to 256,000 256,001 to 279,000 279,001 to 313,000 313,001+ Show Percentages 0% to 0.35% 0.35% to 0.4% 0.4% to 0.45% 0.45% to 0.48% 0.48% to 0.52% 0.52% to 0.56% 0.56% to 0.6% 0.6% to 0.65% 0.65% to 0.73% 0.73% to 100% Show Levels g8_usa

g8q1 100 15 15 $ within 14 days of December 1, 2020

How many people 65 years of age and older in the United States will have died because of COVID-19 by December 1, 2020? What percentage of people 65 years of age and older in the United States will have died because of COVID-19 by December 1, 2020?

0 to 187,000 187,001 to 217,000 217,001 to 241,000 241,001 to 262,000 262,001 to 283,000 283,001 to 305,000 305,001 to 329,000 329,001 to 360,000 360,001 to 405,000 405,001+ Show Percentages 0% to 0.44% 0.44% to 0.51% 0.51% to 0.57% 0.57% to 0.61% 0.61% to 0.66% 0.66% to 0.72% 0.72% to 0.77% 0.77% to 0.84% 0.84% to 0.95% 0.95% to 100% Show Levels g8_usa

g8q2 100 15 15 $ within 14 days of December 1, 2020

How many people 65 years of age and older in the United States will have died because of COVID-19 by December 1, 2020? What percentage of people 65 years of age and older in the United States will have died because of COVID-19 by December 1, 2020?

0 to 225,000 225,001 to 257,000 257,001 to 281,000 281,001 to

303,000 303,001 to 325,000 325,001 to 348,000 348,001 to 374,000 374,001 to 405,000 405,001 to 451,000 451,001+ Show Percentages 0% to 0.53% 0.53% to 0.6% 0.6% to 0.66% 0.66% to 0.71% 0.71% to 0.76% 0.76% to 0.82% 0.82% to 0.88% 0.88% to 0.95% 0.95% to 1.06% 1.06% to 100% Show Levels g8_usa

g8q3 100 15 15 $ within 14 days of December 1, 2020

How many people 65 years of age and older in the United States will have died because of COVID-19 by December 1, 2020? What percentage of people 65 years of age and older in the United States will have died because of COVID-19 by December 1, 2020?

B. Atemporal risk

Pair	pA0	pA1	pA2	A0	A1	A2	pB0	pB1	pB2	B0	B1	B2	DoN_Condition
1	0.50	0.50	0.00	$0.00	$6.00	$12.00	0.50	0.50	0.00	$0.00	$6.00	$12.00	B1
2	0.00	1.00	0.00	$0.00	$6.00	$12.00	0.50	0.50	0.00	$0.00	$6.00	$12.00	B1
3	0.00	1.00	0.00	$0.00	$6.00	$21.00	0.00	0.50	0.50	$0.00	$3.00	$10.50	B
4	0.25	0.75	0.00	$0.00	$6.00	$42.00	0.00	1.00	0.00	$0.00	$21.00	$42.00	B
5	0.00	1.00	0.00	$0.00	$6.00	$42.00	0.00	1.00	0.00	$0.00	$21.00	$42.00	B
6	0.00	1.00	0.00	$0.00	$12.00	$21.00	0.00	0.50	0.50	$0.00	$6.00	$21.00	B1
7	0.00	0.50	0.50	$0.00	$12.00	$42.00	0.00	0.50	0.50	$0.00	$21.00	$42.00	B1
8	0.00	1.00	0.00	$0.00	$21.00	$42.00	0.00	0.50	0.50	$0.00	$21.00	$42.00	B1
9	0.00	0.50	0.50	$0.00	$12.00	$21.00	0.50	0.00	0.50	$0.00	$12.00	$42.00	A2
10	0.00	0.75	0.25	$0.00	$21.00	$42.00	0.00	1.00	0.00	$0.00	$21.00	$42.00	B
11	0.00	1.00	0.00	$0.00	$12.00	$42.00	0.00	0.50	0.50	$0.00	$12.00	$21.00	B2
12	0.00	0.75	0.25	$0.00	$21.00	$42.00	0.00	0.50	0.50	$0.00	$21.00	$42.00	B1
13	0.25	0.75	0.00	$0.00	$6.00	$21.00	0.50	0.50	0.00	$0.00	$10.50	$21.00	B1
14	0.00	0.75	0.25	$0.00	$12.00	$21.00	0.00	0.50	0.50	$0.00	$10.50	$21.00	B1
15	0.00	0.75	0.25	$0.00	$12.00	$42.00	0.00	0.50	0.50	$0.00	$21.00	$42.00	B1
16	0.50	0.50	0.00	$0.00	$6.00	$12.00	0.75	0.00	0.25	$0.00	$6.00	$12.00	
17	0.00	1.00	0.00	$0.00	$6.00	$12.00	0.75	0.00	0.25	$0.00	$6.00	$12.00	
18	0.00	1.00	0.00	$0.00	$6.00	$21.00	0.50	0.25	0.25	$0.00	$6.00	$21.00	
19	0.25	0.75	0.00	$0.00	$6.00	$42.00	0.50	0.00	0.50	$0.00	$6.00	$42.00	
20	0.00	1.00	0.00	$0.00	$6.00	$42.00	0.50	0.00	0.50	$0.00	$6.00	$42.00	
21	0.00	1.00	0.00	$0.00	$12.00	$21.00	0.25	0.25	0.50	$0.00	$12.00	$21.00	
22	0.00	0.50	0.50	$0.00	$12.00	$42.00	0.25	0.00	0.75	$0.00	$12.00	$42.00	
23	0.00	1.00	0.00	$0.00	$21.00	$42.00	0.25	0.00	0.75	$0.00	$21.00	$42.00	
24	0.25	0.50	0.25	$0.00	$12.00	$42.00	0.50	0.00	0.50	$0.00	$12.00	$42.00	
25	0.00	0.75	0.25	$0.00	$21.00	$42.00	0.50	0.00	0.50	$0.00	$21.00	$42.00	
26	0.00	1.00	0.00	$0.00	$12.00	$42.00	0.25	0.50	0.25	$0.00	$12.00	$42.00	
27	0.00	0.75	0.25	$0.00	$21.00	$42.00	0.25	0.00	0.75	$0.00	$21.00	$42.00	
28	0.25	0.75	0.00	$0.00	$6.00	$21.00	0.75	0.00	0.25	$0.00	$6.00	$21.00	
29	0.00	0.75	0.25	$0.00	$12.00	$21.00	0.25	0.00	0.75	$0.00	$12.00	$21.00	
30	0.00	0.75	0.25	$0.00	$12.00	$42.00	0.25	0.00	0.75	$0.00	$12.00	$42.00	
31	0.55	0.25	0.20	$3.00	$32.00	$38.00	0.55	0.25	0.20	$3.00	$24.00	$49.00	
32	0.55	0.25	0.20	$19.00	$32.00	$38.00	0.55	0.25	0.20	$19.00	$24.00	$49.00	
33	0.55	0.25	0.20	$35.00	$32.00	$38.00	0.55	0.25	0.20	$35.00	$24.00	$49.00	
34	0.55	0.25	0.20	$51.00	$32.00	$38.00	0.55	0.25	0.20	$51.00	$24.00	$49.00	
35	0.65	0.20	0.15	$3.00	$19.00	$30.00	0.65	0.20	0.15	$3.00	$16.00	$32.00	
36	0.65	0.20	0.15	$14.00	$19.00	$30.00	0.65	0.20	0.15	$14.00	$16.00	$32.00	
37	0.65	0.20	0.15	$24.00	$19.00	$30.00	0.65	0.20	0.15	$24.00	$16.00	$32.00	
38	0.65	0.20	0.15	$35.00	$19.00	$30.00	0.65	0.20	0.15	$35.00	$16.00	$32.00	
39	0.40	0.40	0.20	$3.00	$14.00	$32.00	0.40	0.40	0.20	$3.00	$8.00	$41.00	
40	0.40	0.40	0.20	$16.00	$14.00	$32.00	0.40	0.40	0.20	$16.00	$8.00	$41.00	
41	0.40	0.40	0.20	$30.00	$14.00	$32.00	0.40	0.40	0.20	$30.00	$8.00	$41.00	
42	0.40	0.40	0.20	$43.00	$14.00	$32.00	0.40	0.40	0.20	$43.00	$8.00	$41.00	
43	0.70	0.10	0.20	$14.00	$30.00	$57.00	0.70	0.10	0.20	$14.00	$19.00	$68.00	
44	0.70	0.10	0.20	$32.00	$30.00	$57.00	0.70	0.10	0.20	$32.00	$19.00	$68.00	
45	0.70	0.10	0.20	$51.00	$30.00	$57.00	0.70	0.10	0.20	$51.00	$19.00	$68.00	
46	0.70	0.10	0.20	$70.00	$30.00	$57.00	0.70	0.10	0.20	$70.00	$19.00	$68.00	
47	0.50	0.10	0.40	$0.00	$11.00	$11.00	0.50	0.10	0.40	$0.00	$0.00	$16.00	
48	0.50	0.10	0.40	$11.00	$11.00	$11.00	0.50	0.10	0.40	$11.00	$0.00	$16.00	
49	0.50	0.10	0.40	$22.00	$11.00	$11.00	0.50	0.10	0.40	$22.00	$0.00	$16.00	

50	0.50	0.10	0.40	$32.00	$11.00	$11.00	0.50	0.10	0.40	$32.00	$0.00	$16.00
51	0.50	0.10	0.40	$11.00	$22.00	$22.00	0.50	0.10	0.40	$11.00	$11.00	$27.00
52	0.50	0.10	0.40	$22.00	$22.00	$22.00	0.50	0.10	0.40	$22.00	$11.00	$27.00
53	0.50	0.10	0.40	$32.00	$22.00	$22.00	0.50	0.10	0.40	$32.00	$11.00	$27.00
54	0.50	0.10	0.40	$43.00	$22.00	$22.00	0.50	0.10	0.40	$43.00	$11.00	$27.00
55	0.30	0.00	0.70	$6.00	$18.00	$30.00	0.15	0.25	0.60	$6.00	$18.00	$30.00
56	0.30	0.00	0.70	$6.00	$18.00	$30.00	0.00	0.50	0.50	$6.00	$18.00	$30.00
57	0.15	0.25	0.60	$6.00	$18.00	$30.00	0.00	0.50	0.50	$6.00	$18.00	$30.00
58	0.15	0.75	0.10	$6.00	$18.00	$30.00	0.00	1.00	0.00	$6.00	$18.00	$30.00
59	0.60	0.00	0.40	$6.00	$18.00	$30.00	0.00	1.00	0.00	$6.00	$18.00	$30.00
60	0.60	0.00	0.40	$6.00	$18.00	$30.00	0.15	0.75	0.10	$6.00	$18.00	$30.00
61	0.50	0.00	0.50	$6.00	$18.00	$30.00	0.10	0.80	0.10	$6.00	$18.00	$30.00
62	0.50	0.00	0.50	$6.00	$18.00	$30.00	0.00	1.00	0.00	$6.00	$18.00	$30.00
63	0.10	0.80	0.10	$6.00	$18.00	$30.00	0.00	1.00	0.00	$6.00	$18.00	$30.00
64	0.70	0.00	0.30	$6.00	$18.00	$30.00	0.50	0.40	0.10	$6.00	$18.00	$30.00
65	0.70	0.00	0.30	$6.00	$18.00	$30.00	0.40	0.60	0.00	$6.00	$18.00	$30.00
66	0.50	0.40	0.10	$6.00	$18.00	$30.00	0.40	0.60	0.00	$6.00	$18.00	$30.00
67	0.40	0.00	0.60	$6.00	$18.00	$30.00	0.10	0.75	0.15	$6.00	$18.00	$30.00
68	0.40	0.00	0.60	$6.00	$18.00	$30.00	0.00	1.00	0.00	$6.00	$18.00	$30.00
69	0.10	0.75	0.15	$6.00	$18.00	$30.00	0.00	1.00	0.00	$6.00	$18.00	$30.00
70	0.70	0.00	0.30	$6.00	$18.00	$30.00	0.60	0.25	0.15	$6.00	$18.00	$30.00
71	0.70	0.00	0.30	$6.00	$18.00	$30.00	0.50	0.50	0.00	$6.00	$18.00	$30.00
72	0.60	0.25	0.15	$6.00	$18.00	$30.00	0.50	0.50	0.00	$6.00	$18.00	$30.00
73	0.40	0.00	0.60	$6.00	$18.00	$30.00	0.20	0.60	0.20	$6.00	$18.00	$30.00
74	0.40	0.00	0.60	$6.00	$18.00	$30.00	0.10	0.90	0.00	$6.00	$18.00	$30.00
75	0.20	0.60	0.20	$6.00	$18.00	$30.00	0.10	0.90	0.00	$6.00	$18.00	$30.00
76	0.60	0.00	0.40	$6.00	$18.00	$30.00	0.50	0.30	0.20	$6.00	$18.00	$30.00
77	0.60	0.00	0.40	$6.00	$18.00	$30.00	0.40	0.60	0.00	$6.00	$18.00	$30.00
78	0.50	0.30	0.20	$6.00	$18.00	$30.00	0.40	0.60	0.00	$6.00	$18.00	$30.00
79	0.25	0.00	0.75	$6.00	$18.00	$30.00	0.10	0.60	0.30	$6.00	$18.00	$30.00
80	0.25	0.00	0.75	$6.00	$18.00	$30.00	0.00	1.00	0.00	$6.00	$18.00	$30.00
81	0.10	0.60	0.30	$6.00	$18.00	$30.00	0.00	1.00	0.00	$6.00	$18.00	$30.00
82	0.50	0.20	0.30	$6.00	$18.00	$30.00	0.40	0.60	0.00	$6.00	$18.00	$30.00
83	0.55	0.00	0.45	$6.00	$18.00	$30.00	0.40	0.60	0.00	$6.00	$18.00	$30.00
84	0.55	0.00	0.45	$6.00	$18.00	$30.00	0.50	0.20	0.30	$6.00	$18.00	$30.00
85	1.00	0.00	0.00	$12.00	$0.00	$0.00	0.50	0.50	0.00	$6.00	$19.00	$0.00
86	1.00	0.00	0.00	$6.00	$0.00	$0.00	0.50	0.50	0.00	$3.00	$10.00	$0.00
87	1.00	0.00	0.00	$32.00	$0.00	$0.00	0.50	0.50	0.00	$26.00	$39.00	$0.00
88	1.00	0.00	0.00	$34.00	$0.00	$0.00	0.50	0.50	0.00	$31.00	$38.00	$0.00
89	1.00	0.00	0.00	$52.00	$0.00	$0.00	0.50	0.50	0.00	$46.00	$59.00	$0.00
90	1.00	0.00	0.00	$54.00	$0.00	$0.00	0.50	0.50	0.00	$51.00	$58.00	$0.00

C. Time Preferences

pair_id	SS_amount	LL_amount	SS_delay	LL_delay	currency	block_id
d_0FED_1	25	26	0	7	$1	
d_0FED_2	25	27	0	7	$1	
d_0FED_3	25	28	0	7	$1	
d_0FED_4	25	29	0	7	$1	
d_0FED_5	25	30	0	7	$1	
d_0FED_6	25	26	0	14	$2	
d_0FED_7	25	27	0	14	$2	
d_0FED_8	25	28	0	14	$2	
d_0FED_9	25	29	0	14	$2	
d_0FED_10	25	30	0	14	$2	
d_0FED_11	25	31	0	14	$2	
d_0FED_12	25	32	0	14	$2	
d_0FED_13	25	33	0	14	$2	
d_0FED_14	25	34	0	14	$2	
d_0FED_15	25	26	0	42	$3	
d_0FED_16	25	27	0	42	$3	
d_0FED_17	25	28	0	42	$3	
d_0FED_18	25	29	0	42	$3	
d_0FED_19	25	30	0	42	$3	
d_0FED_20	25	31	0	42	$3	
d_0FED_21	25	32	0	42	$3	
d_0FED_22	25	33	0	42	$3	
d_0FED_23	25	34	0	42	$3	
d_0FED_24	25	35	0	42	$3	
d_0FED_25	25	36	0	42	$3	
d_0FED_26	25	37	0	42	$3	
d_0FED_27	25	38	0	42	$3	
d_0FED_28	25	39	0	42	$3	
d_0FED_29	25	26	0	84	$4	
d_0FED_30	25	27	0	84	$4	
d_0FED_31	25	28	0	84	$4	
d_0FED_32	25	29	0	84	$4	
d_0FED_33	25	30	0	84	$4	
d_0FED_34	25	31	0	84	$4	
d_0FED_35	25	32	0	84	$4	
d_0FED_36	25	33	0	84	$4	
d_0FED_37	25	34	0	84	$4	
d_0FED_38	25	35	0	84	$4	
d_0FED_39	25	36	0	84	$4	
d_0FED_40	25	37	0	84	$4	
d_0FED_41	25	38	0	84	$4	
d_0FED_42	25	39	0	84	$4	

d_7FED_1	25	26	7	14	$5
d_7FED_2	25	27	7	14	$5
d_7FED_3	25	28	7	14	$5
d_7FED_4	25	29	7	14	$5
d_7FED_5	25	30	7	14	$5
d_7FED_6	25	26	7	21	$6
d_7FED_7	25	27	7	21	$6
d_7FED_8	25	28	7	21	$6
d_7FED_9	25	29	7	21	$6
d_7FED_10	25	30	7	21	$6
d_7FED_11	25	31	7	21	$6
d_7FED_12	25	32	7	21	$6
d_7FED_13	25	33	7	21	$6
d_7FED_14	25	34	7	21	$6
d_7FED_15	25	26	7	49	$7
d_7FED_16	25	27	7	49	$7
d_7FED_17	25	28	7	49	$7
d_7FED_18	25	29	7	49	$7
d_7FED_19	25	30	7	49	$7
d_7FED_20	25	31	7	49	$7
d_7FED_21	25	32	7	49	$7
d_7FED_22	25	33	7	49	$7
d_7FED_23	25	34	7	49	$7
d_7FED_24	25	35	7	49	$7
d_7FED_25	25	36	7	49	$7
d_7FED_26	25	37	7	49	$7
d_7FED_27	25	38	7	49	$7
d_7FED_28	25	39	7	49	$7
d_7FED_29	25	26	7	91	$8
d_7FED_30	25	27	7	91	$8
d_7FED_31	25	28	7	91	$8
d_7FED_32	25	29	7	91	$8
d_7FED_33	25	30	7	91	$8
d_7FED_34	25	31	7	91	$8
d_7FED_35	25	32	7	91	$8
d_7FED_36	25	33	7	91	$8
d_7FED_37	25	34	7	91	$8
d_7FED_38	25	35	7	91	$8
d_7FED_39	25	36	7	91	$8
d_7FED_40	25	37	7	91	$8
d_7FED_41	25	38	7	91	$8
d_7FED_42	25	39	7	91	$8
d_14FED_1	25	26	14	21	$9
d_14FED_2	25	27	14	21	$9

d_14FED_3	25	28	14	21	$9
d_14FED_4	25	29	14	21	$9
d_14FED_5	25	30	14	21	$9
d_14FED_6	25	26	14	28	$10
d_14FED_7	25	27	14	28	$10
d_14FED_8	25	28	14	28	$10
d_14FED_9	25	29	14	28	$10
d_14FED_10	25	30	14	28	$10
d_14FED_11	25	31	14	28	$10
d_14FED_12	25	32	14	28	$10
d_14FED_13	25	33	14	28	$10
d_14FED_14	25	34	14	28	$10
d_14FED_15	25	26	14	56	$11
d_14FED_16	25	27	14	56	$11
d_14FED_17	25	28	14	56	$11
d_14FED_18	25	29	14	56	$11
d_14FED_19	25	30	14	56	$11
d_14FED_20	25	31	14	56	$11
d_14FED_21	25	32	14	56	$11
d_14FED_22	25	33	14	56	$11
d_14FED_23	25	34	14	56	$11
d_14FED_24	25	35	14	56	$11
d_14FED_25	25	36	14	56	$11
d_14FED_26	25	37	14	56	$11
d_14FED_27	25	38	14	56	$11
d_14FED_28	25	39	14	56	$11
d_14FED_29	25	26	14	98	$12
d_14FED_30	25	27	14	98	$12
d_14FED_31	25	28	14	98	$12
d_14FED_32	25	29	14	98	$12
d_14FED_33	25	30	14	98	$12
d_14FED_34	25	31	14	98	$12
d_14FED_35	25	32	14	98	$12
d_14FED_36	25	33	14	98	$12
d_14FED_37	25	34	14	98	$12
d_14FED_38	25	35	14	98	$12
d_14FED_39	25	36	14	98	$12
d_14FED_40	25	37	14	98	$12
d_14FED_41	25	38	14	98	$12
d_14FED_42	25	39	14	98	$12
d_0FED_43	40	41	0	7	$13
d_0FED_44	40	42	0	7	$13
d_0FED_45	40	43	0	7	$13
d_0FED_46	40	44	0	7	$13

d_OFED_47	40	45	0	7	$13
d_OFED_48	40	46	0	7	$13
d_OFED_49	40	47	0	7	$13
d_OFED_50	40	48	0	7	$13
d_OFED_51	40	41	0	14	$14
d_OFED_52	40	42	0	14	$14
d_OFED_53	40	43	0	14	$14
d_OFED_54	40	44	0	14	$14
d_OFED_55	40	45	0	14	$14
d_OFED_56	40	46	0	14	$14
d_OFED_57	40	47	0	14	$14
d_OFED_58	40	48	0	14	$14
d_OFED_59	40	49	0	14	$14
d_OFED_60	40	50	0	14	$14
d_OFED_61	40	51	0	14	$14
d_OFED_62	40	52	0	14	$14
d_OFED_63	40	53	0	14	$14
d_OFED_64	40	54	0	14	$14
d_OFED_65	40	41	0	42	$15
d_OFED_66	40	42	0	42	$15
d_OFED_67	40	43	0	42	$15
d_OFED_68	40	44	0	42	$15
d_OFED_69	40	45	0	42	$15
d_OFED_70	40	46	0	42	$15
d_OFED_71	40	47	0	42	$15
d_OFED_72	40	48	0	42	$15
d_OFED_73	40	49	0	42	$15
d_OFED_74	40	50	0	42	$15
d_OFED_75	40	51	0	42	$15
d_OFED_76	40	52	0	42	$15
d_OFED_77	40	53	0	42	$15
d_OFED_78	40	54	0	42	$15
d_OFED_79	40	41	0	84	$16
d_OFED_80	40	42	0	84	$16
d_OFED_81	40	43	0	84	$16
d_OFED_82	40	44	0	84	$16
d_OFED_83	40	45	0	84	$16
d_OFED_84	40	46	0	84	$16
d_OFED_85	40	47	0	84	$16
d_OFED_86	40	48	0	84	$16
d_OFED_87	40	49	0	84	$16
d_OFED_88	40	50	0	84	$16
d_OFED_89	40	51	0	84	$16
d_OFED_90	40	52	0	84	$16

d_0FED_91	40	53	0	84	$16
d_0FED_92	40	54	0	84	$16
d_0FED_93	40	55	0	84	$16
d_0FED_94	40	56	0	84	$16
d_0FED_95	40	57	0	84	$16
d_0FED_96	40	58	0	84	$16
d_0FED_97	40	59	0	84	$16
d_0FED_98	40	60	0	84	$16
d_0FED_99	40	61	0	84	$16
d_0FED_100	40	62	0	84	$16
d_0FED_101	40	63	0	84	$16
d_0FED_102	40	64	0	84	$16
d_7FED_43	40	41	7	14	$17
d_7FED_44	40	42	7	14	$17
d_7FED_45	40	43	7	14	$17
d_7FED_46	40	44	7	14	$17
d_7FED_47	40	45	7	14	$17
d_7FED_48	40	46	7	14	$17
d_7FED_49	40	47	7	14	$17
d_7FED_50	40	48	7	14	$17
d_7FED_51	40	41	7	21	$18
d_7FED_52	40	42	7	21	$18
d_7FED_53	40	43	7	21	$18
d_7FED_54	40	44	7	21	$18
d_7FED_55	40	45	7	21	$18
d_7FED_56	40	46	7	21	$18
d_7FED_57	40	47	7	21	$18
d_7FED_58	40	48	7	21	$18
d_7FED_59	40	49	7	21	$18
d_7FED_60	40	50	7	21	$18
d_7FED_61	40	51	7	21	$18
d_7FED_62	40	52	7	21	$18
d_7FED_63	40	53	7	21	$18
d_7FED_64	40	54	7	21	$18
d_7FED_65	40	41	7	49	$19
d_7FED_66	40	42	7	49	$19
d_7FED_67	40	43	7	49	$19
d_7FED_68	40	44	7	49	$19
d_7FED_69	40	45	7	49	$19
d_7FED_70	40	46	7	49	$19
d_7FED_71	40	47	7	49	$19
d_7FED_72	40	48	7	49	$19
d_7FED_73	40	49	7	49	$19
d_7FED_74	40	50	7	49	$19

d_7FED_75	40	51	7	49	$19
d_7FED_76	40	52	7	49	$19
d_7FED_77	40	53	7	49	$19
d_7FED_78	40	54	7	49	$19
d_7FED_79	40	41	7	91	$20
d_7FED_80	40	42	7	91	$20
d_7FED_81	40	43	7	91	$20
d_7FED_82	40	44	7	91	$20
d_7FED_83	40	45	7	91	$20
d_7FED_84	40	46	7	91	$20
d_7FED_85	40	47	7	91	$20
d_7FED_86	40	48	7	91	$20
d_7FED_87	40	49	7	91	$20
d_7FED_88	40	50	7	91	$20
d_7FED_89	40	51	7	91	$20
d_7FED_90	40	52	7	91	$20
d_7FED_91	40	53	7	91	$20
d_7FED_92	40	54	7	91	$20
d_7FED_93	40	55	7	91	$20
d_7FED_94	40	56	7	91	$20
d_7FED_95	40	57	7	91	$20
d_7FED_96	40	58	7	91	$20
d_7FED_97	40	59	7	91	$20
d_7FED_98	40	60	7	91	$20
d_7FED_99	40	61	7	91	$20
d_7FED_100	40	62	7	91	$20
d_7FED_101	40	63	7	91	$20
d_7FED_102	40	64	7	91	$20
d_14FED_43	40	41	14	21	$21
d_14FED_44	40	42	14	21	$21
d_14FED_45	40	43	14	21	$21
d_14FED_46	40	44	14	21	$21
d_14FED_47	40	45	14	21	$21
d_14FED_48	40	46	14	21	$21
d_14FED_49	40	47	14	21	$21
d_14FED_50	40	48	14	21	$21
d_14FED_51	40	41	14	28	$22
d_14FED_52	40	42	14	28	$22
d_14FED_53	40	43	14	28	$22
d_14FED_54	40	44	14	28	$22
d_14FED_55	40	45	14	28	$22
d_14FED_56	40	46	14	28	$22
d_14FED_57	40	47	14	28	$22
d_14FED_58	40	48	14	28	$22

d_14FED_59	40	49	14	28	$22
d_14FED_60	40	50	14	28	$22
d_14FED_61	40	51	14	28	$22
d_14FED_62	40	52	14	28	$22
d_14FED_63	40	53	14	28	$22
d_14FED_64	40	54	14	28	$22
d_14FED_65	40	41	14	56	$23
d_14FED_66	40	42	14	56	$23
d_14FED_67	40	43	14	56	$23
d_14FED_68	40	44	14	56	$23
d_14FED_69	40	45	14	56	$23
d_14FED_70	40	46	14	56	$23
d_14FED_71	40	47	14	56	$23
d_14FED_72	40	48	14	56	$23
d_14FED_73	40	49	14	56	$23
d_14FED_74	40	50	14	56	$23
d_14FED_75	40	51	14	56	$23
d_14FED_76	40	52	14	56	$23
d_14FED_77	40	53	14	56	$23
d_14FED_78	40	54	14	56	$23
d_14FED_79	40	41	14	98	$24
d_14FED_80	40	42	14	98	$24
d_14FED_81	40	43	14	98	$24
d_14FED_82	40	44	14	98	$24
d_14FED_83	40	45	14	98	$24
d_14FED_84	40	46	14	98	$24
d_14FED_85	40	47	14	98	$24
d_14FED_86	40	48	14	98	$24
d_14FED_87	40	49	14	98	$24
d_14FED_88	40	50	14	98	$24
d_14FED_89	40	51	14	98	$24
d_14FED_90	40	52	14	98	$24
d_14FED_91	40	53	14	98	$24
d_14FED_92	40	54	14	98	$24
d_14FED_93	40	55	14	98	$24
d_14FED_94	40	56	14	98	$24
d_14FED_95	40	57	14	98	$24
d_14FED_96	40	58	14	98	$24
d_14FED_97	40	59	14	98	$24
d_14FED_98	40	60	14	98	$24
d_14FED_99	40	61	14	98	$24
d_14FED_100	40	62	14	98	$24
d_14FED_101	40	63	14	98	$24
d_14FED_102	40	64	14	98	$24

D. Intertemporal Risk

pair_id	SS	LL	SA1	SA0	p0	p1	LA1	SB0	LB0	LA0	SB1	LB1	currency
CA1	7	21	2	45	0.1	0.9	45	45	45	2	2	2	$
CA2	7	21	2	45	0.2	0.8	45	45	45	2	2	2	$
CA3	7	21	2	45	0.3	0.7	45	45	45	2	2	2	$
CA4	7	21	2	45	0.4	0.6	45	45	45	2	2	2	$
CA5	7	21	2	45	0.5	0.5	45	45	45	2	2	2	$
CA6	7	21	2	45	0.6	0.4	45	45	45	2	2	2	$
CA7	7	21	2	45	0.7	0.3	45	45	45	2	2	2	$
CA8	7	21	2	45	0.8	0.2	45	45	45	2	2	2	$
CA9	7	21	2	45	0.9	0.1	45	45	45	2	2	2	$
CA10	7	21	2	45	0.7	0.3	45	45	45	2	2	2	$
CA11	7	21	1	26	0.1	0.9	26	26	26	1	1	1	$
CA12	7	21	1	26	0.2	0.8	26	26	26	1	1	1	$
CA13	7	21	1	26	0.3	0.7	26	26	26	1	1	1	$
CA14	7	21	1	26	0.4	0.6	26	26	26	1	1	1	$
CA15	7	21	1	26	0.5	0.5	26	26	26	1	1	1	$
CA16	7	21	1	26	0.6	0.4	26	26	26	1	1	1	$
CA17	7	21	1	26	0.7	0.3	26	26	26	1	1	1	$
CA18	7	21	1	26	0.8	0.2	26	26	26	1	1	1	$
CA19	7	21	1	26	0.9	0.1	26	26	26	1	1	1	$
CA20	7	21	1	26	0.8	0.2	26	26	26	1	1	1	$
CA21	7	49	2	45	0.1	0.9	45	45	45	2	2	2	$
CA22	7	49	2	45	0.2	0.8	45	45	45	2	2	2	$
CA23	7	49	2	45	0.3	0.7	45	45	45	2	2	2	$
CA24	7	49	2	45	0.4	0.6	45	45	45	2	2	2	$
CA25	7	49	2	45	0.5	0.5	45	45	45	2	2	2	$
CA26	7	49	2	45	0.6	0.4	45	45	45	2	2	2	$
CA27	7	49	2	45	0.7	0.3	45	45	45	2	2	2	$
CA28	7	49	2	45	0.8	0.2	45	45	45	2	2	2	$
CA29	7	49	2	45	0.9	0.1	45	45	45	2	2	2	$
CA30	7	49	2	45	0.6	0.4	45	45	45	2	2	2	$
CA31	7	49	1	26	0.1	0.9	26	26	26	1	1	1	$
CA32	7	49	1	26	0.2	0.8	26	26	26	1	1	1	$
CA33	7	49	1	26	0.3	0.7	26	26	26	1	1	1	$
CA34	7	49	1	26	0.4	0.6	26	26	26	1	1	1	$
CA35	7	49	1	26	0.5	0.5	26	26	26	1	1	1	$
CA36	7	49	1	26	0.6	0.4	26	26	26	1	1	1	$
CA37	7	49	1	26	0.7	0.3	26	26	26	1	1	1	$
CA38	7	49	1	26	0.8	0.2	26	26	26	1	1	1	$
CA39	7	49	1	26	0.9	0.1	26	26	26	1	1	1	$
CA40	7	49	1	26	0.7	0.3	26	26	26	1	1	1	$

Online Appendix G: Additional Notes on Procedures

We had two ways of presenting the health survey and the beliefs task Both the health survey and beliefs task asked health-related questions, so we control for order effects with this treatment. The two variations on task order presented to subjects consisted of either Task 1 (Beliefs) first and then the Health Survey, or the Health Survey first and then Task 1 (Beliefs); all other tasks came after.

After the initial 3 waves of data collection, the project team procured additional funding to conduct another 3 waves of data collection: hence 6 waves altogether. In the U.S. it was decided to use the existing balanced sample lists, excluding people who registered for participation in wave 1, 2 or 3. Thus the remaining individuals who did not register to participate in, for example, wave 1, treatment 1, with $5 participation payment were recruited to participate in wave 4, treatment 1, with $5 participation payment.

Although similar, the sampling methodology in South Africa was slightly different to the U.S., and therefore deserves mention. Of the 1,706 students who signed up for the study, we used stratified random sampling (with age, gender, and race or ethnicity defining the strata) to select 450 students for the first 3 waves × 3 participation payments × 2 task order treatments. Given the stratified nature of our sampling, these 450 students were not statistically different (in terms of age, gender, and ethnicity) to the population of 1,706 students, nor were there any statistically significant differences between the different wave × participation payment × task order treatments. After securing additional funding for 3 more waves of data collection, we used stratified random sampling on the remaining population of 1,256 (1,709 - 450) students to select another 450 students for the final 3 waves. These additional 450 students were not statistically different to the population as whole, nor the first sample of 450 students, and, again, there were no statistically significant differences between the 450 students allocated to the various wave × participation payment × task

order treatments.