Gendered Beliefs among Peers*

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Abstract

We use an incentivized online lab-in-the-field experiment to measure what unemployed youth believe about others' abilities, preferences, and beliefs. Such beliefs may influence how social networks match people with employment and training opportunities through referrals and word-of-mouth information sharing. In particular, if women are systematically believed to be less capable or interested in particular fields, these beliefs have implications for gender-based inequality. The experiment targets applicants to an information technology (IT) career training program, using state-of-the-art elicitation methods to measure their beliefs about the differences between women's and men's general cognitive ability, IT-specific ability, and preferences for IT tasks. We find that participants believe that women have higher general cognitive and IT-specific ability, but believe that men have stronger preferences for IT tasks. We also elicit beliefs about what others believe (second-order beliefs) are the differences in women's and men's general cognitive ability. Both women and men correctly believe women are women-favoring, but men incorrectly believe that men are men-favoring.

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1 Introduction

Beliefs about others play a fundamental role in many economic models of decision-making, providing one mechanism through which disparate outcomes between demographic groups emerge. While much attention focuses on employers (Becker, 1971; Altonji and Pierret, 2001) and teachers (Mechtenberg, 2009; Gershenson et al., 2016; Carlana, 2019) in this regard, peers' beliefs are another potentially important source of unequal outcomes. In school, social networks form in part on the basis of beliefs about others' ability (Carrell et al., 2013; De Giorgi et al., 2022), with consequences for academic performance (Sacerdote, 2011). In the labor market, peer networks are an important conduit through which workers learn about and access jobs (Ioannides and Datcher Loury, 2004), and such referrals may depend on beliefs about potential referees' ability and preferences (Beaman and Magruder, 2012; Beaman et al., 2018). Social networks are sometimes used to target training programs (Fafchamps et al., 2020) and social benefits (Alatas et al., 2012), again leveraging beliefs about peers' characteristics. But beliefs are rarely measured directly, requiring economists to infer them from behavior that may have alternative explanations or to leave them unaddressed altogether.

This paper directly measures beliefs about peers, eliciting the types of gendered beliefs that may generate unequal outcomes between women and men. We study the beliefs of young adults who are not in education, employment, or training—NEETs or, in the Panamanian context studied here, *ninis*—using a structured, incentivized online lab-in-the-field experiment to learn what this population believes about other ninis. To measure these beliefs in an incentive-compatible way, we use a straightforward but state-of-the-art elicitation method that (in expectation) pays participants more when their reported beliefs are more accurate (Hossain and Okui, 2013). Because study participants were in the process of applying to an information technology (IT) training program, we focus specifically on beliefs about gender differences in general cognitive and IT-specific ability, as well as preferences for IT jobs. Such beliefs are relevant for the kinds of network

formation and referral choices that may be important for youth seeking opportunities for training and employment.

We then use an extension of this method to elicit beliefs about *other peoples'* beliefs—*second-order beliefs*. Second-order beliefs could play an important role in the effects of social networks on educational and labor market outcomes. For example, in school or training programs, women may be less likely to join male-dominated groups when they believe men think they have lower ability. And peers may be less likely to refer women to jobs if they believe the men who work there think women are less capable.

We find, perhaps surprisingly, that on average participants believe women have higher cognitive and IT-specific ability. In contrast, participants believe that men have stronger preferences for IT tasks than women. Average first-order beliefs of men and women are directionally the same and gender differences explain little of the variation in beliefs. We validate the IT-related belief measures by showing that they predict responses in an incentivized task in which participants guess whether people with female- or male-sounding names applied to the IT training program when referred.

The second-order belief tasks reveal that, on average, participants correctly believe that women believe women have higher cognitive ability than men. But men's second-order beliefs about their own gender are miscalibrated: they believe that other men believe men have higher cognitive ability than women, although the opposite is true. These miscalibrated beliefs could lead men to act based on incorrect expectations about how other men will react: returning to the prior examples, they could decline to invite a woman to join an all-male study group or to refer them for a male-dominated job opportunity, anticipating a level of discrimination that may not actually exist.

The finding that first-order beliefs about ability in this nini population favor women is unexpected, in light of existing work on gender stereotypes (Bertrand, 2011; Babcock et al., 2017; Beede et al., 2011) and gendered beliefs (Dustan et al., 2022; Koutout, 2022; Reuben et al., 2014). But this result is complementary to Beaman et al. (2018), who find

that paying referrers a fixed fee rather than basing incentives on the job performance of referees did not diminish men's tendency to only refer men. Their finding is consistent with men anticipating higher direct benefits from referring male connections, rather than men believing men are more capable workers. Our approach provides a method for isolating and directly measuring the gendered beliefs that factor into such decisions.

The pattern of beliefs we document has implications for the way that social networks function as gateways to employment and other opportunities. Referrals through networks play a vital role in job-finding, both in high-income and developing countries (Bayer et al., 2008; Diaz, 2012; Ioannides and Datcher Loury, 2004; Osman et al., 2021; Topa, 2011; Wahba and Zenou, 2005). In urban Colombia, similar in some ways to the Panamanian context, Nicodemo and García (2015) show that 74% of workers found their current job through their social networks. Crucially for our study, Caria et al. (2020) find that unemployed job-seekers in urban Ethiopia rely extensively on each other to search for employment, meaning that beliefs about peers can impact referral behavior even among the unemployed.

Beyond the conclusions based on the beliefs data, this paper also makes a methodological and practical contribution. To our knowledge, this study represents the first use of state-of-the-art, incentivized belief elicitation tools in a non-student, developing country context. While incentivizing the elicitation of willingness to pay using the Becker–DeGroot–Marschak (BDM) mechanism is used frequently in developing countries and has been shown to be effective (Burchardi et al., 2021), the incentivization of belief elicitation has been more rare, perhaps because the beliefs being elicited often do not have a high social or cognitive cost to revealing. A notable exception is Chen et al. (2021), which uses the same belief elicitation method we use with college students in China. Our study was implemented asynchronously, with invited participants completing the study entirely on their own smartphones or other internet-connected devices without an enumerator. We found this approach to eliciting high-quality survey data to be both cost-effective

and scalable. We address concerns about participant effort and understanding through both carefully-designed monetary incentives for truthful belief revelation and a short, intuitively-explained experiment that elicits the beliefs of interest and little else. As the analysis shows, patterns in the data seem to contain a great deal of signal, suggesting that both the elicitation technology and the virtual surveying are promising approaches for future research.

Even in controlled laboratory settings, elicitation of beliefs about differences between groups is often indirect, inferring beliefs from actions. For instance, in Aguiar et al. (2009) participants choose whether they prefer to have a dictator allocation from a man or woman. Similarly, Castillo and Petrie (2010) and Fershtman and Gneezy (2001) infer beliefs about different races or ethnicities from contributions in a public goods game and choices in a trust game, respectively. Beliefs have also been elicited directly. Schniter and Shields (2014) directly elicit expectations about the choices of young and old people in a trust game. Albrecht et al. (2013) use a price list to elicit beliefs about gender differences in a spatial reasoning task. Reuben et al. (2014) directly elicit expectations about men's and women's performance on a timed math task, while Dustan et al. (2022) elicit first- and second-order beliefs about gender differences in a math and bargaining task. The present paper extends this line of research to a lab-in-the-field setting.

2 Experimental Design

This online lab-in-the-field experiment took place within a program evaluation conducted by Innovations for Poverty Action (IPA) on a career training program executed by the non-profit organization Glasswing International and funded by the Inter-American Development Bank (IDB).[1] This section first describes the worker training program context,

[1]The lab experiment complemented a field experiment eliciting referrals to the training program, which did not generate enough referrals to analyze referral behavior. The full experimental design was pre-registered in the AEA RCT Registry (#AEARCTR-0007206).

then outlines the online lab experiment used to elicit beliefs.

2.1 Worker Training Program

The Career Program in Information Technology for Youth in Panama (henceforth "the IT career program")[2] aims to train participants in information technology (IT) support careers. The program targets *ninis*, young adults who are neither working nor studying. In particular, the program recruits only Panamanian youths aged 18 to 22 living in one of two provinces (Panamá Oeste or Chiriquí) who have completed secondary education, but who are neither working nor pursuing a post-secondary education.[3] At the end of the approximately six month-long program, participants are expected to have the skills needed to secure employment in an entry-level job in IT support.[4]

The experiment took place during the selection process for the IT career program. After determining applicants' eligibility, Glasswing notified applicants who passed the screening and gave them information on how to complete the next phase. Approximately one day later, IPA sent invitations to the eligible applicants to participate in a paid online survey.[5] Eligible applicants had approximately one week to complete the online survey. Independently, they had a similar amount of time to complete the next phase of the application. Participation in the experiment was independent of the program selection process.

2.2 Lab Experiment Design

The lab experiment was designed to elicit participants' beliefs about the differences between women's and men's beliefs and characteristics, particularly those that could generate differences in application behavior to IT training programs and jobs. There were three

[2]The original name of the program in Spanish is *Programa de Certificado para Jóvenes en Soporte de Tecnología*.

[3]In the third cohort, Panamá province was added as an eligible province.

[4]The program was originally intended to be delivered in a hybrid format; however, the cohorts we study are online only due to COVID-19.

[5]Glasswing's notification email also informed eligible applicants that they should expect an email about a paid survey from IPA.

main components: first-order belief elicitations about the differences between women's and men's characteristics, second-order belief elicitations about women's and men's first-order beliefs, and a betting task to measure beliefs about differences in women's and men's IT program application decisions. Lastly, we collected demographic characteristics.

We elicited three first-order beliefs and two second-order beliefs, for a total of five beliefs, using the methodological framework established in Dustan et al. (2022). The first-order beliefs were with respect to gender differences in three domains: general cognitive ability, IT-specific ability, and preferences for IT work. The second-order beliefs were with respect to women's and men's first-order beliefs about gender differences in general cognitive ability. One belief out of the five was randomly selected at the end of the survey for payment.

Incentivizing first-order beliefs about these domains requires an objective measure of each. Here we describe the tasks used to construct these measures, noting that they were completed prior to the experimental session by a separate set of participants. The general cognitive ability domain was measured using the number of correct answers on a 12 question version of the Raven's Standard Progressive Matrices. The task was described as a test of mental ability with progressively more difficult questions, "so that most people would correctly answer the first question and few people would correctly answer the last question." Participants were also informed that participants who completed the task in an earlier survey were paid \$0.42 for each correct answer.

The IT-specific ability domain was measured using a 10 question version of the test that applicants to the IT career program complete in a later phase of the application process. The task was described as a test of aptitude for IT support with questions of varying difficulty. Participants were also informed that participants who completed the task in an earlier survey were paid \$0.50 for each correct answer.

Lastly, the preferences for IT work domain was measured using a task that asked par-

ticipants to rank-order a list of subject areas from which to receive a work assignment. The work assignment consisted of an approximately five minute video and three multiple-choice questions. The subject areas that participants ranked were Accounting, Administration, Information Technology Support, Robotics, Sales, and Social Media Advertising. Participants were informed that participants who completed the task in an earlier survey were paid $5 for completing the task, regardless of their ranking of subject areas.

To generate these measures, we solicited a small sample of two women and two men who qualified as eligible for the IT career program to complete the tasks for the general cognitive ability and preferences for IT work domains. Either the ability or the preferences task was randomly selected for payment at the end of the experiment for payment. We solicited another small sample of two women and two men who qualified as eligible for the IT career program to complete the task for the IT-specific ability domain. Participants in both samples were paid a $3 participation fee.

First-order beliefs were measured as follows. First, participants read descriptions of the three tasks.[6] Then, we explained that at the end of the experiment, a computer would select a random woman and a random man who completed the task in an earlier survey of people who were eligible for the IT career program. To elicit participants' first-order beliefs about cognitive ability, we asked them "Who do you believe answered more questions out of the 12 correctly, the randomly selected man or the randomly selected woman, and by how many?" To elicit participants' first-order beliefs about IT-specific ability, we asked them "Who do you believe answered more questions out of the 10 correctly, the randomly selected man or the randomly selected woman, and by how many?" Lastly, to elicit participants' first-order beliefs about preferences for IT support work, we asked them "Who do you believe ranked the Information Technology (IT) Support subject area higher, the randomly selected man or the randomly selected woman, and by how many positions?" The order in which these three beliefs were elicited was randomized. Par-

[6]Participants would have known the eligibility criteria from their application, but we also reminded them in the instructions.

ticipants reported their beliefs using a slider that presented the payment rule for the Binarized Scoring Rule (BSR) (Hossain and Okui, 2013) to elicit a median as sequences of probabilities. Participants placed the slider on the desired response (for example, "I believe the man answered two more questions correctly than the woman"). If the task was selected for payment, the response was translated into a number x (in this example, $x = 2$) and the probability of winning the prize $P(A)$ was determined using the BSR for the median:

$$P(A) = 1 - \frac{|x - \theta|}{\bar{K}},$$

where θ is the true value of the difference for the randomly drawn man and woman, and $\bar{K}$ is the maximum amount by which a participant's guess could be incorrect. Note that when the participant's guess x equals the randomly drawn man-woman difference θ, the payment probability is 1. The larger is $|x - \theta|$, the lower the probability of payment. We truncate the range of responses to be integers in $[-5, 5]$. Under the BSR, truthfully reporting beliefs is a dominant strategy for all expected-utility maximizers and some non-expected utility maximizers (Hossain and Okui, 2013).

In order to incentivize the elicitation of participants' second-order beliefs, we solicited a small sample of two women and three men who qualified as eligible for the IT career program to complete the three first-order belief elicitations tasks. One of those beliefs was selected at random for payment. Participants could earn $5 based on their reported belief and the random draw, plus a $3 participation fee.

To elicit second-order beliefs, we informed participants that people eligible for the IT career program answered the same question they just did when reporting their first-order belief about cognitive ability in an earlier survey. Then, we asked them to guess what a random woman and a random man chose as their guesses, which are their second-order beliefs about women's and men's beliefs. The order in which these two beliefs were elicited was randomized. Like first-order beliefs, participants reported their beliefs using a slider that presented the payment rule for the BSR to elicit a median as sequences of

probabilities.

The betting task asked participants to bet on the application decisions of people referred to the IT career program. Participants were given a list of 20 pairs of first names that clearly signaled gender.[7] Ten of those pairs were woman/man, five of those pairs were woman/woman, and five of those pairs were man/man. The participant was asked to choose one name out of each pair. For payment, one pair out of the 20 was randomly selected. After the referrals had the opportunity to make their application decisions, the participant was paid $5 if the name they choose out of the randomly selected pair chose to apply. The betting task was randomized to appear either before or after the belief elicitations. The order of the pairs and the order of the names within the pairs were also randomized.

After the belief elicitations and betting task, we informed participants that they would have the future opportunity to refer people to the IT career program and earn $5 for each of their referrals who chose to apply. Participants were then able to un-check a box if they did not want to participate in the referral experiment. Lastly, participants were asked basic demographic questions and given their results. Payment for the selected belief elicitation was made within 24 hours of the participant completing the online survey. Payment for the betting task was made after the close of the application period for referrals. Screenshots of the full experiment in Spanish can be found in Appendix B.

2.3 Practical Considerations for Implementation

We are the first, to our knowledge, to deploy a structured, incentivized economics lab experiment fully online to a specific non-student population in a low- to middle-income country. In this section, we discuss the trade-offs of an online experiment of the type we

[7] These names came from referrals that were made during a pilot referral experiment. To reduce the chance that any names were recognized from the betting task if both the lab experiment participant and the referral joined the IT career program, we did not include atypical names and only showed people names from the province in which they did not live.

conduct in this paper relative to a comparable in-person experiment. Then, we provide practical considerations for implementing such an experiment in low- and middle-income countries.

First, selection into participating is an important consideration for any experiment. Online experiments select on access to technology and the internet, which are often correlated with socioeconomic status and education. In-person experiments also face selection, as documented by Frijters et al. (2015), based on willingness to travel to a site on a set day and time.[8] These days and times often conflict with work and other daily routine activities, so participants may be less likely to be employed or have childcare responsibilities. In addition, participants may have a lower opportunity cost of time since traveling to and participating in an in-person experiment is more time-consuming than an equivalent online experiment.

Second, there are trade-offs to the presence or absence of an enumerator or proctor. One concern with online experiments is that there is no person present to prevent "cheating" in the form of searching online or consulting others for an answer. This concern can often be addressed by choosing questions that are challenging to find online and setting a timer for the response time.

On the other hand, the absence of an enumerator or proctor has some advantages. It increases a participant's anonymity, which could decrease the experimenter demand effect and/or increase willingness to reveal beliefs or preferences inconsistent with social norms (De Quidt et al., 2019; Cilliers et al., 2015). The absence of an enumerator or proctor also eliminates any idiosyncrasies generated by their actions. Explanations of instructions or responses to questions that correlate with participant characteristics or treatment assignment may bias estimates of the associated parameters.[9]

Lastly, online experiments allow participants to participate when and where they pre-

[8]Selection is also based on willingness to participate in an experiment, but that selection is parallel between the two approaches.

[9]This problem is particularly hazardous when randomization is at the session level.

fer. This advantage is partially offset if an online experiment requires synchronicity. The experimenter would need to impose restrictions on participation times similar to those with an in-person experiment: participants would need to arrive online at a specific time or in a narrow time window.

If, after evaluating these trade-offs, an experimenter determines to execute an online experiment in a low- or middle-income country, there are several practical considerations to take into account for implementation. First, participants in these countries are likely to complete the experiment on a mobile phone, so mobile-friendly programming is essential. Similarly, when testing the programming of the experiment, it is important to use old (as well as new) devices since they are more common in low- and middle-income countries.

Another practical consideration for fully online experiments is payment, since it cannot be made in cash. Mobile airtime/money is a viable option in many countries, but other online payment options similar to PayPal or Venmo are also becoming more prevalent. To determine the appropriate method of payment, context is essential to ensure that payment is as close to a cash equivalent as possible.

Lastly, several rounds of piloting are vital, above and beyond the typical piloting requirements for an experiment. Technical glitches do not just affect the success of the experiment; they become ethically problematic by keeping a participant from receiving the money they wanted and invested time into earning. Field piloting in the population of interest helps identify context-specific issues prior to the experiment launch.

2.4 Implementation

This experiment was implemented in two cohorts of applicants to the IT career program, in February and May 2021. Out of 404 eligible applicants, 244 completed the online lab experiment. Table 1 shows the characteristics of those who chose to complete the lab experiment versus those who did not. Importantly, there are essentially no differences between these groups in a broad range of characteristics, indicating that selection into

participation is not an important factor in this study.[10]

Participants completed the approximately 20 minute experiment, which was programmed in oTree (Chen et al., 2016), online and were paid an average of $6.48 out of a possible $8 for participating and for the belief elicitations. Due to low application rates by referrals and random chance, only 4 participants received the $5 reward for the betting task.

Table 2 shows the descriptive statistics for women and men in our sample. There are some differences between women and men, including the proportion who are single, monthly income, and the number of children, so we include controls for these covariates in regression analyses when indicated.

3 Results

We present the results of the belief elicitations in Figure 1, which shows the cumulative distribution functions (CDFs) for each elicited first-order belief, and Figure 2, which shows the CDFs for the second-order beliefs. Negative values indicate reported beliefs in favor of women. The unit of measurement for beliefs (and beliefs about beliefs) about ability is the number of correct questions on the test of cognitive ability or the test of IT ability; for beliefs about preferences, the unit of measurement is the task ranking. To interpret these results, we evaluate three questions.

Question 1 *What do people believe are the differences in women's and men's abilities and preferences?*

Question 2 *What do people believe that women and men believe about the differences in women's and men's cognitive ability?*

Question 3 *Are second-order beliefs about others' beliefs accurate?*

[10]The only statistically significant difference is a three percentage point difference in whether or not the applicant is a Panamanian citizen, which almost all are.

Table 3 shows that *on average* participants believe women have higher ability and men have stronger preferences for IT in a sample of their peers. Column 1 shows that participants believe that women correctly answer more questions on a test of cognitive ability (-0.844, $SE = 0.168$) and a test of IT ability (-0.352, $SE = 0.185$). On the other hand, participants believe that men rank IT tasks higher in their preferences (1.184, $SE = 0.178$).

Result 1 *People believe that women have higher cognitive ability and IT-specific ability, but believe that men have stronger preferences for IT.*

Table 3 also shows that participants are *most likely* to believe that women are higher ability and men have stronger preferences for IT. With respect to ability, more than half (57.0%, $CI = [50.8\%, 63.2\%]$) believe that women correctly answer more cognitive ability questions, and about half (51.2%, $CI = [45.0\%, 57.5\%]$) believe that women correctly answer more IT ability questions. In comparison, 29.5 percent ($CI = [23.8\%, 35.2\%]$) of participants believe that men have higher cognitive ability and 43 percent ($CI = [36.8\%, 49.2\%]$) believe that men have higher IT ability. On the other hand, only 26.2 percent ($CI = [20.7\%, 31.7\%]$) believe that women rank IT tasks higher in their preferences relative to men, while 65.6 percent ($CI = [59.6\%, 71.5\%]$) believe that men rank IT tasks higher. Overall, a large majority of participants believe that gender differences exist (86.5%, $CI = [81.3\%, 90.2\%]$ for cognitive ability, 94.3%, $CI = [90.5\%, 96.6\%]$ for IT ability, and 91.8%, $CI = [87.6\%, 94.7\%]$ for IT preferences).

Table 4 shows that participants hold relatively nuanced beliefs. Each panel displays the relationship between two of the three first-order beliefs by reporting the proportion of participants who hold each cell's combination of ternary beliefs. The diagonals of each table show the proportion of participants who favor the same gender (or neither) for both beliefs. Summing over those diagonals reveals that less than half of participants hold the same beliefs *directionally* for gendered outcomes over two different domains. For example, in Panel A, while 57% of participants believe that women have higher cognitive ability, those participants are split evenly on whether they believe that women also have

higher ability in IT. Only 12.3% of participants believe that men perform better on both cognitive and IT ability dimensions. Panel B also shows significant variation in beliefs across cognitive ability and IT preferences. Similarly, in Panel C, while 65% of participants believe that men have stronger preferences for IT tasks, those participants are split evenly on whether they believe that men also have higher ability in IT. Only 30.3% of participants believe that men are both more capable on the IT ability task and prefer IT tasks more than women. So, there is within-participant heterogeneity in beliefs about distinct, but related domains.

When we turn to beliefs about other people's beliefs to answer question 2, the final two rows of Table 3 show that participants believe their peers' beliefs favor their own gender. On average participants believe women believe that women have higher cognitive ability (-1.123, $SE = 0.170$), but believe men believe that men have higher cognitive ability (0.816, $SE = 0.178$). In addition, participants are most likely to believe that women's beliefs favor women (64.3%, $CI = [58.3\%, 70.4\%]$) and that men's beliefs favor men (60.7%, $CI = [54.5\%, 66.8\%]$).

We can also evaluate how individuals believe that women's and men's beliefs differ by comparing each participant's second-order belief about women to their second-order belief about men. Figure 3 illustrates this by plotting the CDF of the difference in second-order beliefs about men and about women. Only 18.0% of people hold the same second-order beliefs about women and men ($CI = [13.7\%, 24.4\%]$). Most believe that men's first-order beliefs favor men more than women's do (59.8%, $CI = [53.5\%, 65.8\%]$). Only 22.1% believe that women's first-order beliefs favor men more than men's do ($CI = [17.3\%, 27.8\%]$).

Result 2 *People believe that others believe there are gender differences in cognitive ability. People are much more likely to believe that these beliefs are man-favoring than the opposite.*

To answer question 3 about whether second-order beliefs are well-calibrated, we compare participants' second-order beliefs about women to the sample median of women's

first-order beliefs and their second-order beliefs about men to the sample median of men's first-order beliefs. Recall from Section 2 that we incentivize participants to report their belief about the median population difference between women and men; however, we do not observe the population difference, only the sample difference. We implement a bootstrapping procedure to account for sampling error and evaluate the accuracy of second-order beliefs, reporting the mean prediction errors and confidence intervals in Table 5. We cannot reject that, on average, participants' second-order beliefs about women are well-calibrated. But second-order beliefs about men are miscalibrated: participants believe the median man reports a cognitive score difference 1.82 points higher than the median that is actually observed in the first-order beliefs data ($CI = [0.56, 2.86]$).

Result 3 *People incorrectly believe that men's beliefs about cognitive ability favor men. There is no evidence that beliefs about women's beliefs are miscalibrated.*

3.1 Gender Differences in Beliefs

We next consider whether women and men differ in their beliefs about gender differences in abilities, preferences, and beliefs. Table 6 shows that women and men have, directionally, similar mean cardinal beliefs about gender differences in abilities and preferences, although women's beliefs favor women more than men's beliefs do. On average, women believe the difference is 0.68 ($SE = 0.333$) larger in favor of women in cognitive ability and 0.35 ($SE = 0.370$) larger in favor of women in IT ability. Similarly, while women's and men's beliefs about IT preferences both favor men, women believe the difference is 0.70 ($SE = 0.360$) *smaller* in favor of men.

While the size of the difference between the average woman's and average man's beliefs is meaningful (26.0% of a standard deviation for cognitive ability, 11.9% for IT ability, and 25.2% for IT preferences), gender explains little of the overall variation in first-order beliefs. The CDFs in Appendix Figure A.1 show considerable within-gender heterogeneity in beliefs for both women and men, with the median woman corresponding to the

44^{th}, 50^{th}, and 58^{th} percentile in men for cognitive ability, IT ability, and IT preferences, respectively. Moreover, the R-squared values in univariate regressions of each belief on gender show that only $0.4 - 1.7\%$ of variation in first-order beliefs is explained by the gender of the respondent (see Appendix Table A.1).

Gender-specific second-order belief CDFs are in Appendix Figure A.2. All genders believe that women's first-order beliefs about cognitive ability favor women. The beliefs about men's first-order beliefs present an interesting contrast. While women believe that men's first-order beliefs are close to neutral, men believe that other men strongly favor their own gender. The gender difference in second-order beliefs is large (1.13 points, $SE = 0.355$). Men's second-order beliefs about other men's beliefs are miscalibrated: on average, their second-order beliefs differ from the sample median of men's first-order beliefs by 2.33 points (CI = [1.01, 3.38]).

3.2 Correlation with beliefs about gendered behavior

Our last set of results considers whether the elicited beliefs correlate with beliefs about activities that occur outside the lab. While the beliefs we elicit are not consistent with participants responding randomly (leading to a uniform distribution of beliefs) or inattentively (leading to bunching of beliefs at neutrality or endpoints), we probe the validity of the elicitations by examining their relationship with behavior in the betting task.

We elicited beliefs that related to interest in, and aptitude for, IT careers. These gendered beliefs should then be predictive of the rate at which participants bet on men to apply to the IT career program program, where the application decision has high stakes for the potential applicant. We test this hypothesis by first combining the IT-related beliefs into a summary index of IT affinity, following Anderson (2008). Then, we regress the proportion of men chosen out of the ten mixed-gender pairs on the IT affinity index.

The results in Table 7 show that, with and without controls, the IT affinity index is positively correlated with the proportion of men on which the participant bets. Figure 4

shows a binned scatterplot of this relationship with a linear fit. The more the participant's beliefs regarding IT affinity favor men, the more likely they are to bet on men to apply. A one standard deviation increase in the index predicts an increase of approximately 3 percentage points in the proportion of bets made on men, compared to the sample average of 55%. This coefficient is stable when controlling for participant gender in column 2, indicating that within-gender variation in beliefs about IT affinity predicts beliefs about gendered application behavior. This relationship is robust to adding participant covariates in column 3.

4 Discussion

In this paper, we measure first- and second-order beliefs about the differences between women and men ninis applying for a career training program in IT in Panama. Participants of all genders believe that women are higher ability, both in general and in the IT-specific domain, but believe that men have stronger preferences for IT work. Second-order beliefs reveal that our sample's beliefs about women's beliefs are well calibrated; however, men believe that other men are much more men-favoring in their beliefs about general cognitive ability than we observe in the data.

The beliefs we elicit suggest that, if ninis' beliefs are representative of decision-makers' beliefs in the labor market, discrimination against women based on perceived ability is unlikely to be a driver of unequal outcomes, and is more more likely based on beliefs about differences in women's and men's preferences. Moreover, our results are inconsistent with the hypothesis that women's beliefs about discrimination against them based on ability deters women from IT work. On the other hand, if our observation—that women believe women's beliefs favor women more than men's beliefs do—persists in other domains, the relatively low number of women in IT could be driven by women seeking careers in fields with more women decision-makers.

There are important caveats to the interpretations above. First, our evidence is purely descriptive. It does not provide causal evidence for relationships between beliefs and job search, referral behavior, or other actions in the labor market. Second, our sample is particularly selected for its relevance to the IT program we study, and should not be taken as representative either of Panamanian beliefs or more generally.

At the same time, our study provides proof of concept that high-quality data collection using structured and incentivized methods can be implemented in developing country contexts with populations like ninis, who struggle to find employment and typically do not have post-secondary education. Our results indicate that our sample had few problems understanding instructions for state-of-the-art belief elicitation procedures, including higher-order belief elicitations. Participants did not require access to physical labs or personal computers since a large majority of our sample completed the experiment on their mobile phones, with almost no reported technical difficulties. The low cost of this data collection method, particularly in comparison to using enumerators, combined with its accessibility to populations comfortable with smart phones recommend the use of such methods in future work. Integrating high-quality elicitation of beliefs, preferences, expectations, and other primitives into randomized controlled trials would generate new insight into mechanisms driving behavior and extend the external validity of program evaluations of comprehensive interventions.

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Figures and Tables

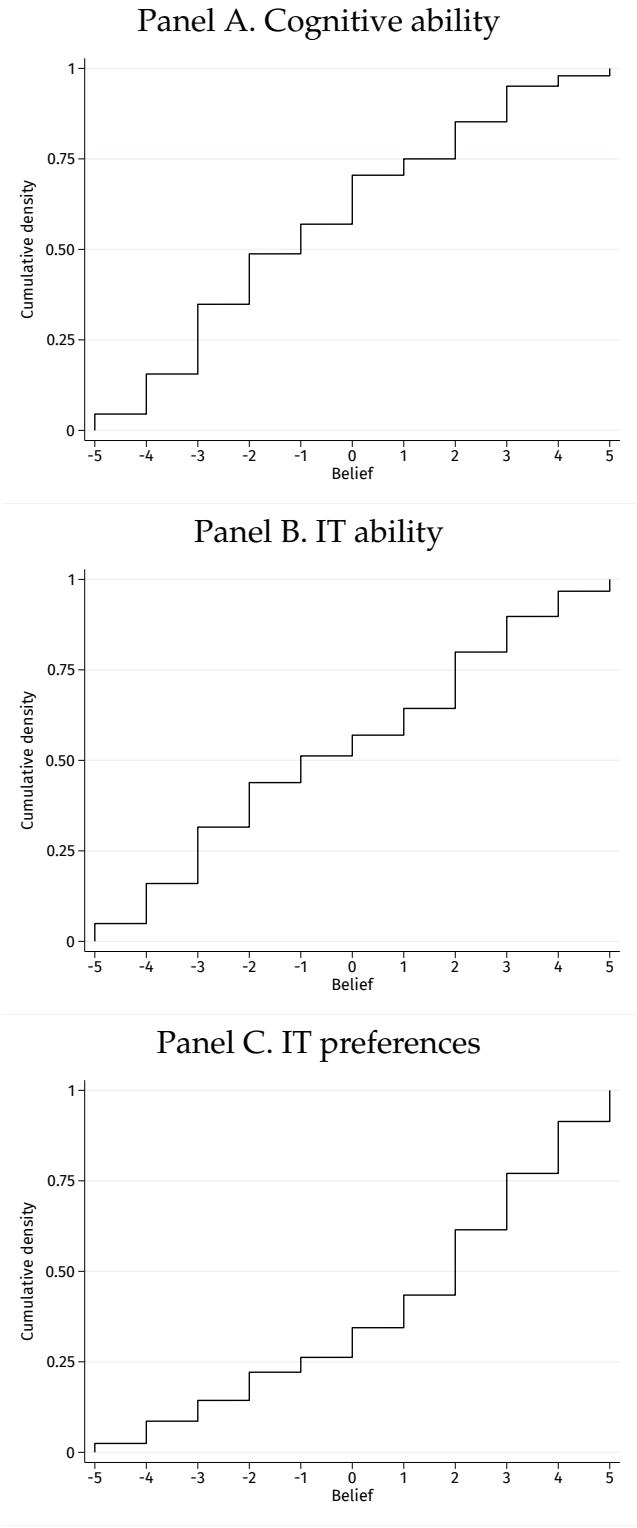


Figure 1: Cumulative densities of first-order beliefs about gender differences

Note: Panel titles indicate the outcome to which the first-order belief corresponds. The horizontal axis is the reported belief about the difference between a randomly drawn man and a randomly drawn woman in the corresponding task. Negative values correspond to woman-favoring beliefs; positive values correspond to man-favoring beliefs. For Panels A and B, the unit of measurement is the number of questions answered correctly on the cognitive and IT tests, respectively. For Panel C, the unit of measurement is ranked preference for the IT task compared to non-IT tasks, where higher values correspond to higher preference for the IT task.

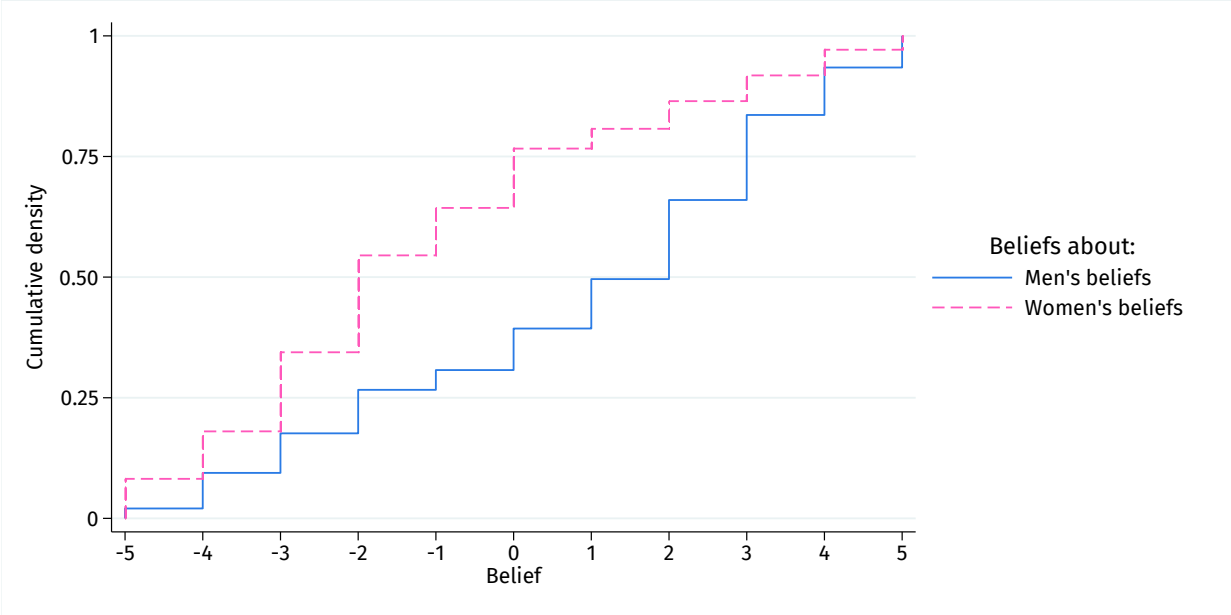


Figure 2: Cumulative densities of second-order beliefs about gender differences in cognitive ability

Note: The horizontal axis is the reported second-order belief about a randomly drawn man's or woman's belief about the difference between a randomly drawn man and a randomly drawn woman in the cognitive ability task. Negative values correspond to second-order beliefs that the indicated gender holds woman-favoring beliefs; positive values correspond to second-order beliefs that the indicated gender holds man-favoring beliefs. The unit of measurement is the number of questions answered correctly on the cognitive ability task.

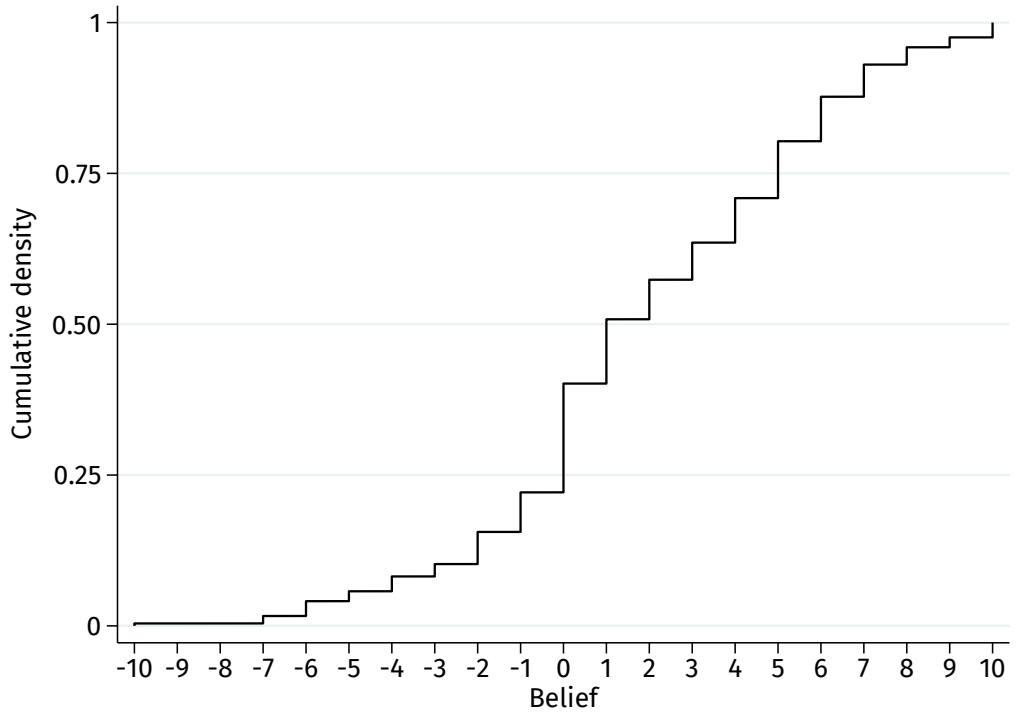


Figure 3: Difference in Second-order Beliefs about Men versus about Women's Cognitive Ability

Note: The horizontal axis is the within-participant difference in reported second-order beliefs about men's vs. women's belief about the difference between a randomly drawn man and a randomly drawn woman in the cognitive ability task. Negative values correspond to the participant reporting that women have more male-favoring beliefs than men. Positive values correspond to the participant reporting that men have more male-favoring beliefs than women. The unit of measurement is the number of questions answered correctly on the cognitive ability task.

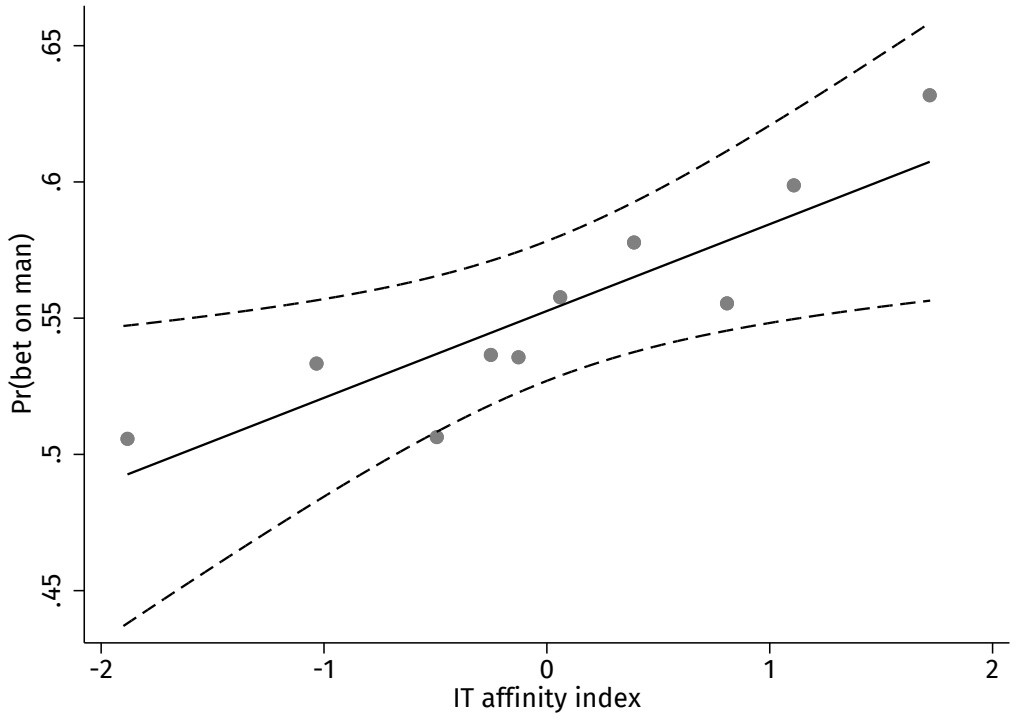


Figure 4: Relationship between beliefs and probability of betting for a man in betting task

Note: Vertical axis is the proportion of bets placed on men in the betting task. Horizontal axis is the IT affinity index, which combines first-order beliefs in IT ability and preferences. Dots are a binscatter plot. Solid is a linear fit, with 95% confidence interval represented by the dashed lines.

Table 1: Descriptive statistics conditional on being eligible, by whether the participant completed the experiment

	(1) Full Sample	(2) Non-Completers	(3) Completers	(4) Difference (C−NC)
Man	0.530	0.512	0.541	0.028
				(0.051)
Indigenous	0.062	0.075	0.053	-0.022
				(0.025)
Afrodescendant	0.141	0.150	0.135	-0.015
				(0.036)
Ethnic Minority	0.203	0.225	0.189	-0.036
				(0.042)
Education:				
Some college or higher	0.042	0.050	0.037	-0.013
				(0.021)
Secondary Education	0.946	0.938	0.951	0.013
				(0.024)
Primary Education	0.002	0.006	0.000	-0.006
				(0.006)
Other Education	0.010	0.006	0.012	0.006
				(0.009)
Province:				
Panamá Oeste	0.408	0.381	0.426	0.045
				(0.050)
Chiriquí	0.295	0.281	0.303	0.022
				(0.046)
Panamá	0.292	0.331	0.266	-0.065
				(0.047)
Other	0.005	0.006	0.004	-0.002
				(0.007)
Panamanian Citizen	0.970	0.950	0.984	0.034
				(0.019)
Has Children	0.101	0.106	0.098	-0.008
				(0.031)
Number of Children (if > 0)	1.146	1.118	1.167	0.049
				(0.112)

	(1) Full Sample	(2) Non-Completers	(3) Completers	(4) Difference (C−NC)
Main Activity:				
Working	0.020	0.019	0.021	0.002
				(0.014)
Studying	0.052	0.063	0.045	-0.017
				(0.023)
Household Chores	0.665	0.675	0.658	-0.017
				(0.048)
Taking care of children	0.082	0.081	0.082	0.001
				(0.028)
Taking care of elderly	0.000	0.000	0.000	0.000
Other	0.169	0.156	0.177	0.021
				(0.038)
Has Internet Connection	0.945	0.935	0.950	0.015
				(0.037)
PC/Laptop Ownership				
Shared	0.438	0.386	0.471	0.085
				(0.059)
Only User	0.563	0.614	0.529	-0.085
				(0.059)
Household size	4.416	4.357	4.463	0.106
				(0.224)
Number of Rooms	4.585	4.661	4.545	-0.116
				(0.301)
Household Utility Access Index	0.863	0.877	0.855	-0.022
				(0.019)
Household Asset Index	0.561	0.577	0.550	-0.027
				(0.020)
N	404	160	244	

Note: Sample means correspond to all eligible IT program applicants invited to participate in the experiment. Standard errors for comparisons in means between women and men in parentheses.

Table 2: Descriptive statistics of participants, by gender

	(1) Full Sample	(2) Women	(3) Men	(4) Difference (W−M)
Ethnic minority	0.385	0.405	0.368	0.037
				(0.063)
Some college or higher	0.189	0.180	0.195	-0.015
				(0.050)
Mother's education:				
Some college or higher	0.398	0.333	0.451	-0.118
				(0.062)
Secondary education	0.406	0.441	0.376	0.066
				(0.063)
Less than secondary education	0.172	0.207	0.143	0.064
				(0.049)
Do not know	0.025	0.018	0.030	-0.012
				(0.020)
Father's education:				
Some college or higher	0.332	0.297	0.361	-0.064
				(0.060)
Secondary education	0.344	0.369	0.323	0.046
				(0.061)
Less than secondary education	0.197	0.207	0.188	0.019
				(0.051)
Do not know	0.127	0.126	0.128	-0.002
				(0.043)
Single	0.889	0.811	0.955	-0.144
				(0.041)
Monthly income (USD)	411.89	368.92	447.74	-78.83
				(43.25)
Lives with parents	0.705	0.685	0.722	-0.037
				(0.059)
Number of children	0.14	0.23	0.06	0.17
				(0.06)
Completed experiment on mobile device	0.803	0.847	0.767	0.080
				(0.050)
Average payout (USD)	6.50	6.51	6.50	-0.02
				(0.30)
N	244	111	133	

Note: Sample means correspond to all participants completing the lab experiment. Standard errors for comparisons in means between women and men in parentheses.

Table 3: Mean cardinal and ternary first- and second-order beliefs

		Proportions		
	(1)	(2)	(3)	(4)
Beliefs	Mean	Woman-favoring	Neutral	Man-favoring
First-order beliefs, cognitive ability	-0.844	0.570	0.135	0.295
	(0.168)	[0.508, 0.632]	[0.092, 0.178]	[0.238, 0.352]
First-order beliefs, IT ability	-0.352	0.512	0.057	0.430
	(0.185)	[0.450, 0.575]	[0.028, 0.087]	[0.368, 0.492]
First-order beliefs, IT preferences	1.184	0.262	0.082	0.656
	(0.178)	[0.207, 0.317]	[0.048, 0.116]	[0.596, 0.715]
Second-order beliefs, women's ability	-1.123	0.643	0.123	0.234
	(0.170)	[0.583, 0.704]	[0.082, 0.164]	[0.181, 0.287]
Second-order beliefs, men's ability	0.816	0.307	0.086	0.607
	(0.178)	[0.249, 0.365]	[0.051, 0.121]	[0.545, 0.668]

Note: Columns report the mean (standard error in parentheses below) and proportions of the outcome ternarized by women-favoring (negative values), neutral (zero), and men-favoring (positive values). 95% confidence intervals are shown in brackets.

Table 4: Proportion of participants, by combination of first-order beliefs

Panel A: Cognitive ability and IT ability

		IT ability			
		Favor women	Neutral	Favor men	Total
Cognitive ability	Favor women	0.283	0.012	0.275	0.570
	Neutral	0.066	0.037	0.033	0.135
	Favor men	0.164	0.008	0.123	0.295
	Total	0.512	0.057	0.430	1.000

Panel B: Cognitive ability and IT preferences

		IT preference			
		Favor women	Neutral	Favor men	Total
Cognitive ability	Favor women	0.143	0.029	0.398	0.570
	Neutral	0.029	0.033	0.074	0.135
	Favor men	0.090	0.020	0.184	0.295
	Total	0.262	0.082	0.656	1.000

Panel C: IT preferences and IT ability

		IT ability			
		Favor women	Neutral	Favor men	Total
IT preferences	Favor women	0.152	0.012	0.098	0.262
	Neutral	0.041	0.012	0.029	0.082
	Favor men	0.320	0.033	0.303	0.656
	Total	0.512	0.057	0.430	1.000

Note: Each cell contains the proportion of participants in the full sample of 244 who hold the respective first-order belief in the column and respective first-order belief in the row. The cells in each panel are mutually exclusive. Row and column totals are reported in the respective margins.

Table 5: Average inaccuracy of second-order beliefs about cognitive ability

	Beliefs about:	
	(1)	(2)
	Men	Women
Second-order belief −	1.82	0.88
median first-order belief	[0.56, 2.86]	[-0.27, 1.23]
Observations	133	111

Note: Point estimates are mean inaccuracy of second-order beliefs compared to the median first-order belief of the gender in the column header. Bootstrapped 95% confidence intervals in square brackets.

Table 6: Mean cardinal first- and second-order beliefs, by participant gender

	(1)	(2)	(3)
Beliefs	Man	Woman	Difference
First-order beliefs, cognitive ability	-0.534	-1.216	0.682
	(0.235)	(0.235)	(0.333)
First-order beliefs, IT ability	-0.195	-0.541	0.345
	(0.260)	(0.263)	(0.370)
First-order beliefs, IT preferences	1.504	0.802	0.702
	(0.226)	(0.280)	(0.360)
Second-order beliefs, women's ability	-0.925	-1.360	0.436
	(0.246)	(0.231)	(0.337)
Second-order beliefs, men's ability	1.331	0.198	1.133
	(0.223)	(0.277)	(0.355)

Note: Columns 1 and 2 report gender-specific mean cardinal beliefs about the indicated characteristic. Column 3 reports the difference in means. Standard errors in parentheses.

Table 7: Correlation between first-order beliefs about IT affinity and the probability of betting for a man in the betting task

	(1)	(2)	(3)
IT affinity index	0.0319	0.0337	0.0371
	(0.0128)	(0.0129)	(0.0133)
Man		-0.0302	-0.0368
		(0.0264)	(0.0270)
Observations	243	243	243
R^2	0.024	0.030	0.082
Mean dep. variable	0.553	0.553	0.553
Additional covariates	No	No	Yes

Dependent variable is the proportion of bets placed on men in the betting task. The IT affinity index combines first-order beliefs in IT ability and preferences. The additional covariates in column 3 include ethnicity, program cohort, highest completed education level, parental education, marital status, number of children, monthly income, and whether the participant lives with their parents. Robust standard errors in parentheses.

Appendices

A Additional figures and tables

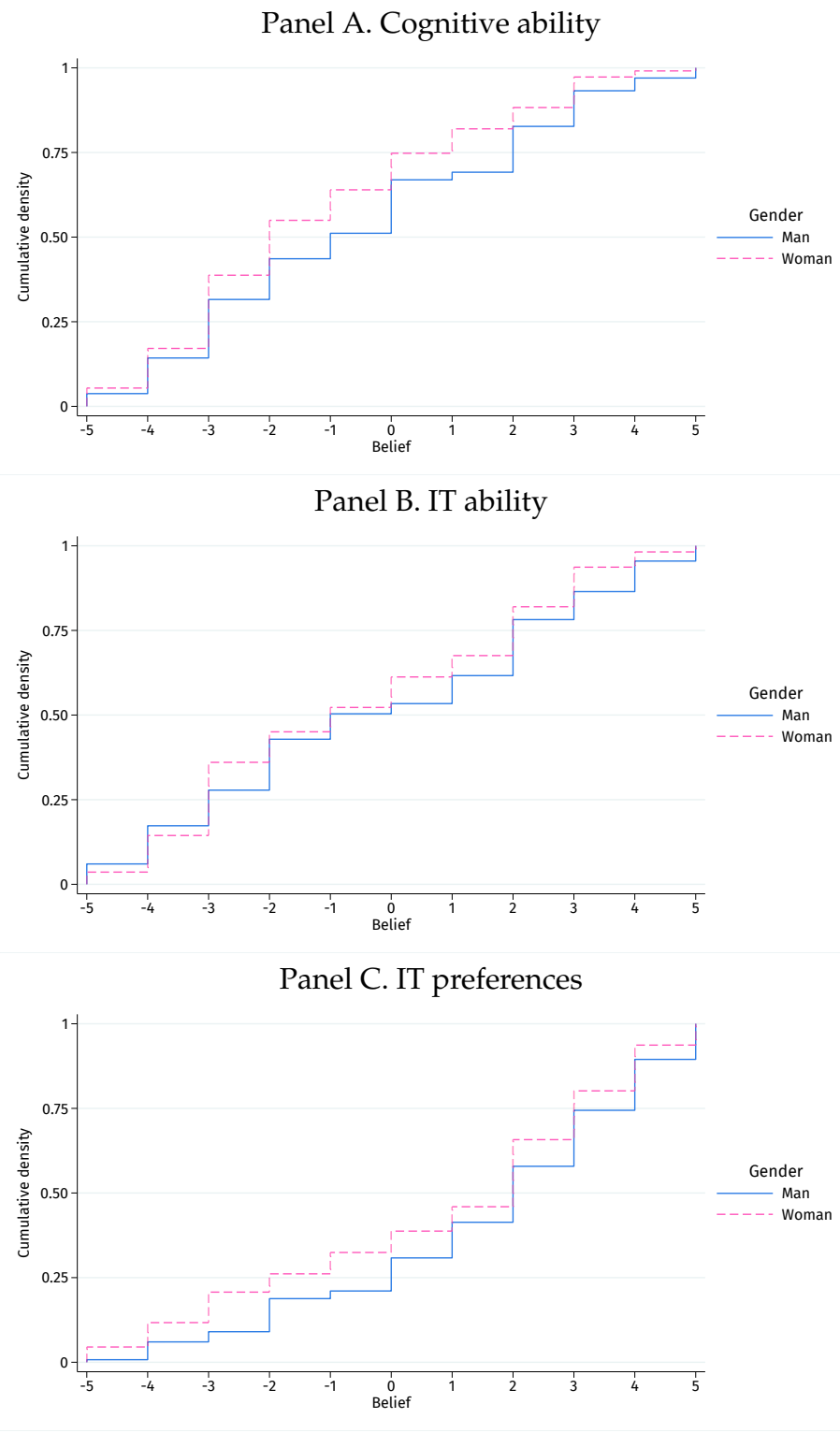
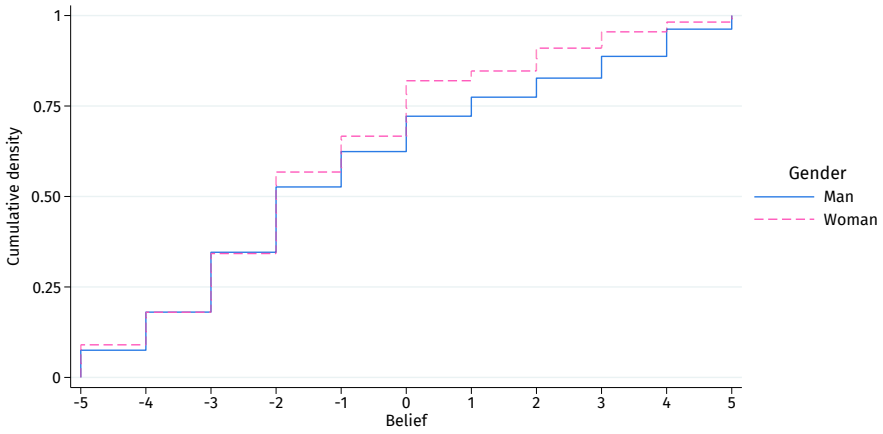


Figure A.1: Cumulative densities of first-order beliefs about gender differences, by gender of respondent

Note: Panel titles indicate the outcome to which the first-order belief corresponds. The horizontal axis is the reported belief about the difference between a randomly drawn man and a randomly drawn woman in the corresponding task. Negative values correspond to woman-favoring beliefs; positive values correspond to man-favoring beliefs. For Panels A and B, the unit of measurement is the number of questions answered correctly on the cognitive and IT tests, respectively. For Panel C, the unit of measurement is ranked preference for the IT task compared to non-IT tasks, where higher values correspond to higher preference for the IT task.

Panel A. Second-order beliefs about men, cognitive ability



Panel B. Second-order beliefs about women, cognitive ability

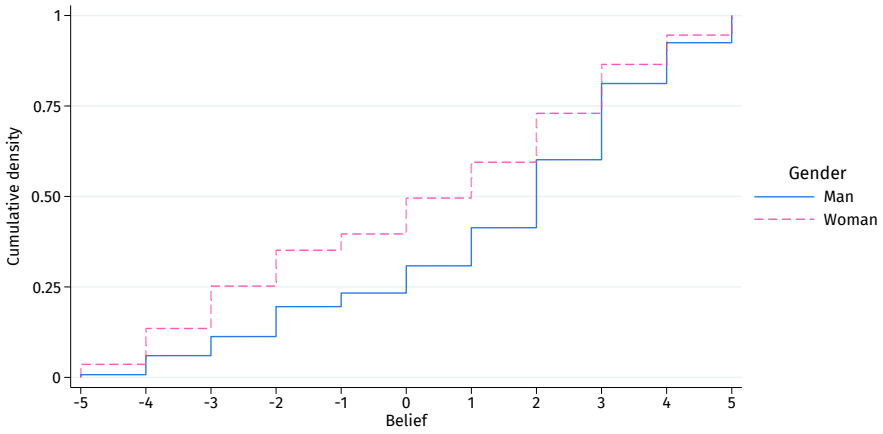


Figure A.2: Cumulative densities of second-order beliefs about gender differences, by gender of respondent

Note: Panel titles indicate the gender to which the second-order belief corresponds. The horizontal axis is the reported second-order belief about a randomly drawn man's or woman's belief about the difference between a randomly drawn man and a randomly drawn woman in the cognitive ability task. Negative values correspond to second-order beliefs that the indicated gender holds woman-favoring beliefs; positive values correspond to second-order beliefs that the indicated gender holds man-favoring beliefs. The unit of measurement is the number of questions answered correctly on the cognitive ability task.

Table A.1: Percentage of variance of beliefs explained by gender

	First-order beliefs			Second-order beliefs about ability	
	(1)	(2)	(3)	(4)	(5)
	Cog. ability	IT ability	IT prefs.	Men	Women
Man	0.682	0.345	0.702	0.436	1.133
	(0.333)	(0.370)	(0.360)	(0.337)	(0.355)
Observations	244	244	244	244	244
R^2	0.017	0.004	0.016	0.007	0.041

Note: Coefficient is from regression of the indicated belief on a constant and indicator variable for the participant being a man. Robust standard errors in parentheses.

Table A.2: Percentage of variance of beliefs explained by gender and covariates

	First-order beliefs			Second-order beliefs about ability	
	(1)	(2)	(3)	(4)	(5)
	Cog. ability	IT ability	IT prefs.	Men	Women
Man	0.720	0.298	0.571	0.491	1.132
	(0.333)	(0.376)	(0.353)	(0.345)	(0.366)
Observations	244	244	244	244	244
R^2	0.079	0.074	0.115	0.059	0.057

Note: Coefficient is from regression of the indicated belief on a constant, an indicator variable for the participant being a man, and covariates. Robust standard errors in parentheses. Covariates include ethnicity, program cohort, highest completed education level, parental education, monthly income, and whether the participant lives with their parents.

B Experiment Screenshots

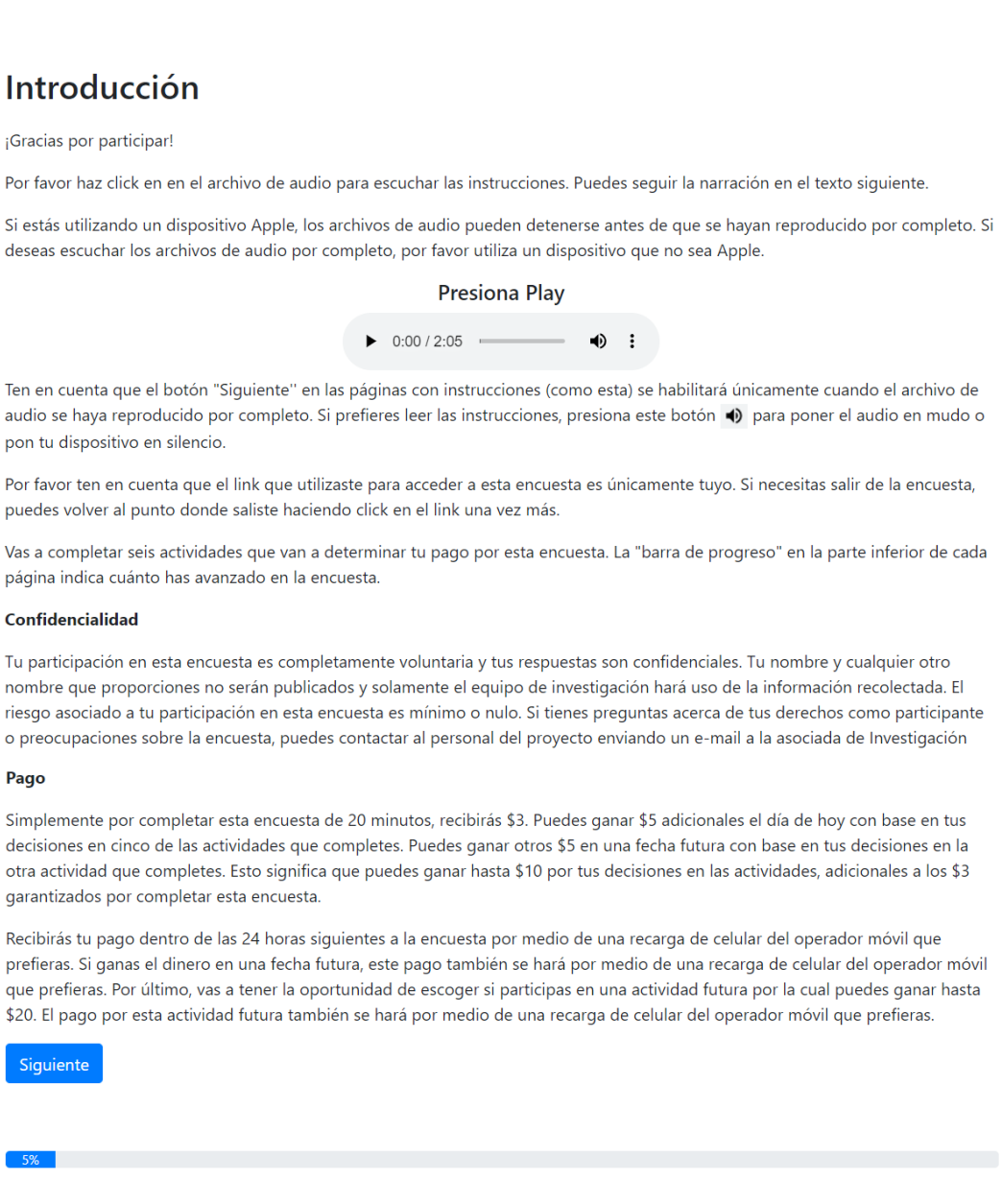


Figure B.1: Experiment screenshots: Introduction

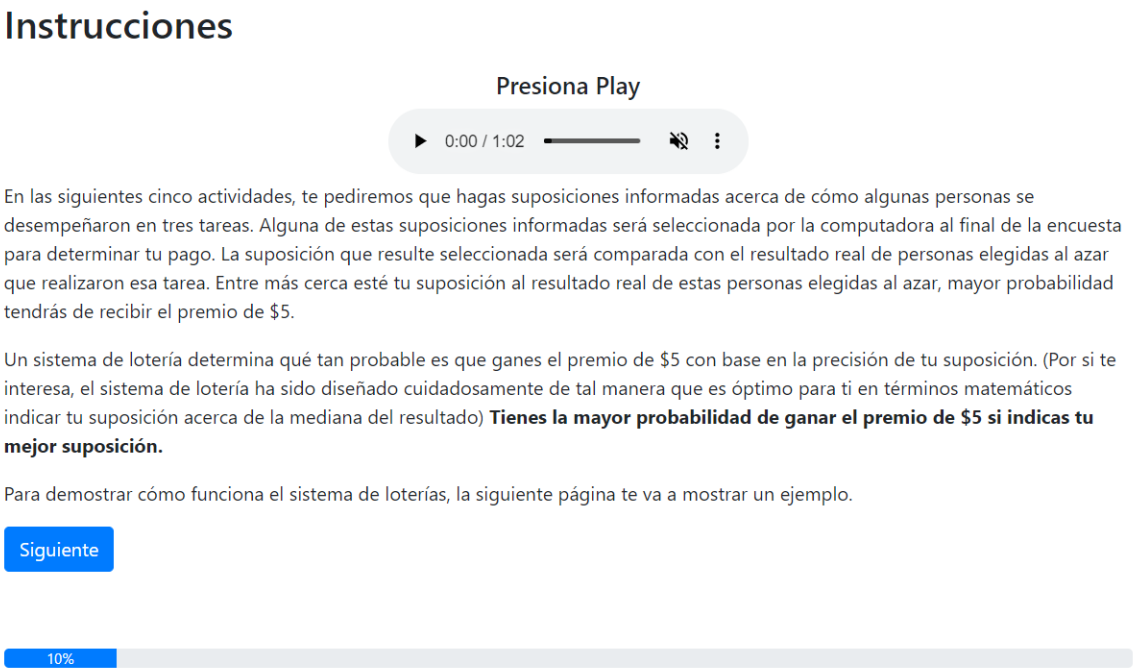


Figure B.2: Experiment screenshots: Initial instructions

Ejemplo

Presiona Play

0:00 / 2:06

En este ejemplo, te vamos a pedir que hagas una suposición informada acerca de cuál ciudad está más cerca de Santiago (Veraguas): Ciudad de Panamá o David. No recibirás dinero por este ejemplo, dado que el objetivo de este ejemplo es asegurarnos de que comprendes cómo hacer tu suposición.

Vas a ver una pantalla como la siguiente:

¿Qué ciudad queda más cerca de Santiago (Veraguas): Ciudad de Panamá o David?

	Ciudad de Panamá					Creo que están a la misma distancia					David
Si la distancia real es:	Ciudad de Panamá queda más cerca por						David queda más cerca por				
	250+	**200**	**150**	**100**	**50**	**0**	**50**	**100**	**150**	**200**	**250+**
Ganas $5 con probabilidad:	50%	60%	70%	80%	90%	100%	90%	80%	70%	60%	50%

Supongamos que tú crees que la Ciudad de Panamá queda 200 kilómetros más cerca de Santiago que David. En ese caso, moverías el deslizador a la sección que dice "Ciudad de Panamá" hasta que diga "200". Fíjate que ahora el deslizador dice "Creo que Ciudad de Panamá queda 200 kilómetros más cerca".

	Ciudad de Panamá					Creo que Ciudad de Panamá queda 200 km más cerca					David
Si la distancia real es:	Ciudad de Panamá queda más cerca por						David queda más cerca por				
	250+	**200**	**150**	**100**	**50**	**0**	**50**	**100**	**150**	**200**	**250+**
Ganas $5 con probabilidad:	90%	100%	90%	80%	70%	60%	50%	40%	30%	20%	10%

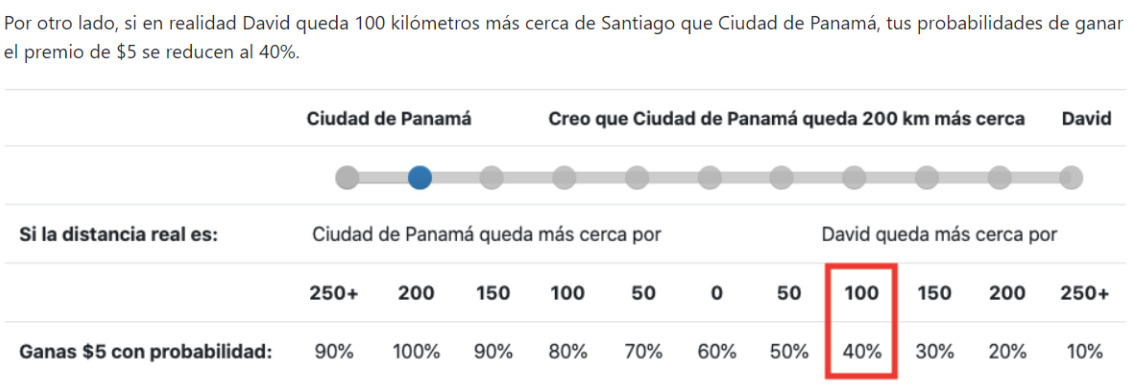
La tabla debajo del deslizador muestra la probabilidad de ganar el premio de $5 de acuerdo a la distancia real y a tu suposición. Por ejemplo, si tu suposición es precisa y Ciudad de Panamá queda 200 kilómetros más cerca de Santiago que David, tú recibes el premio de $5 con certeza (100%).

	Ciudad de Panamá					Creo que Ciudad de Panamá queda 200 km más cerca					David
Si la distancia real es:	Ciudad de Panamá queda más cerca por						David queda más cerca por				
	250+	**200**	**150**	**100**	**50**	**0**	**50**	**100**	**150**	**200**	**250+**
Ganas $5 con probabilidad:	90%	100%	90%	80%	70%	60%	50%	40%	30%	20%	10%

Si en realidad Ciudad de Panamá queda 100 kilómetros más cerca de Santiago que David, tú tienes una probabilidad del 80% de recibir el premio de $5.

	Ciudad de Panamá					Creo que Ciudad de Panamá queda 200 km más cerca					David
Si la distancia real es:	Ciudad de Panamá queda más cerca por						David queda más cerca por				
	250+	**200**	**150**	**100**	**50**	**0**	**50**	**100**	**150**	**200**	**250+**
Ganas $5 con probabilidad:	90%	100%	90%	80%	70%	60%	50%	40%	30%	20%	10%

Figure B.3: Experiment screenshots: Example Task Instructions (Part 1)



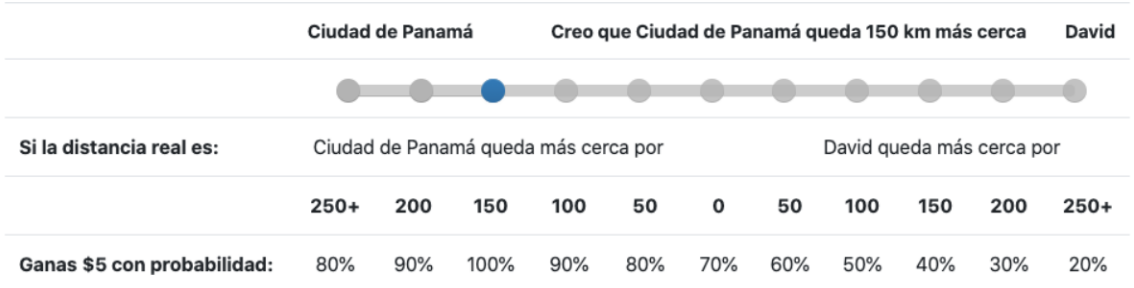


Figure B.4: Experiment screenshots: Example Task Instructions (Part 2)

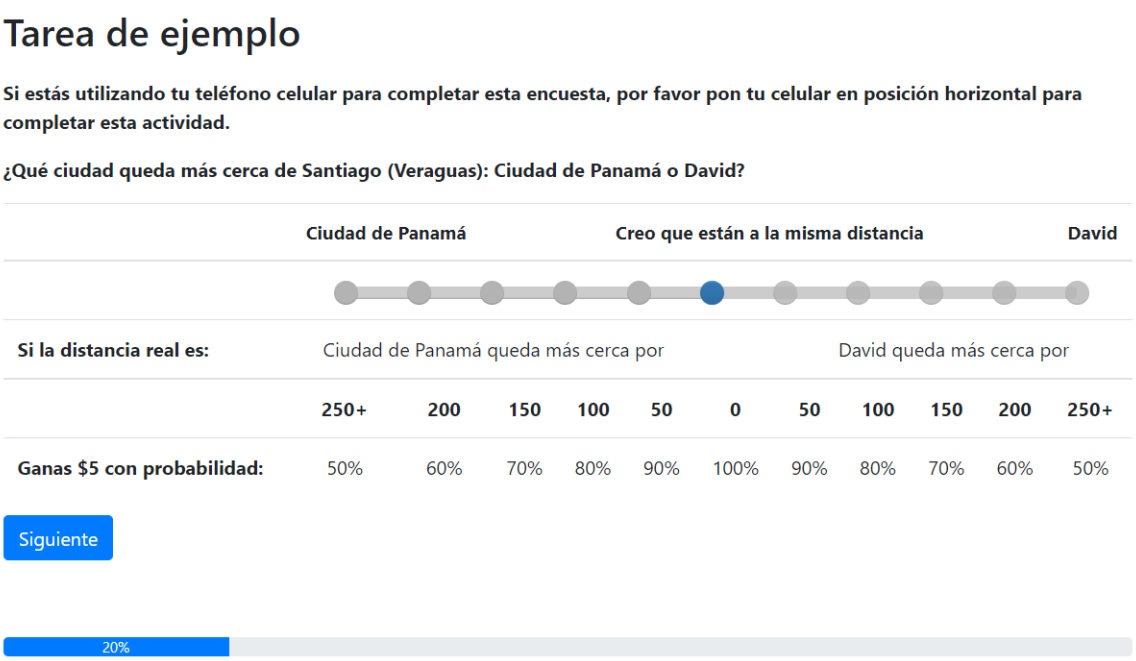


Figure B.5: Experiment screenshots: Example Task

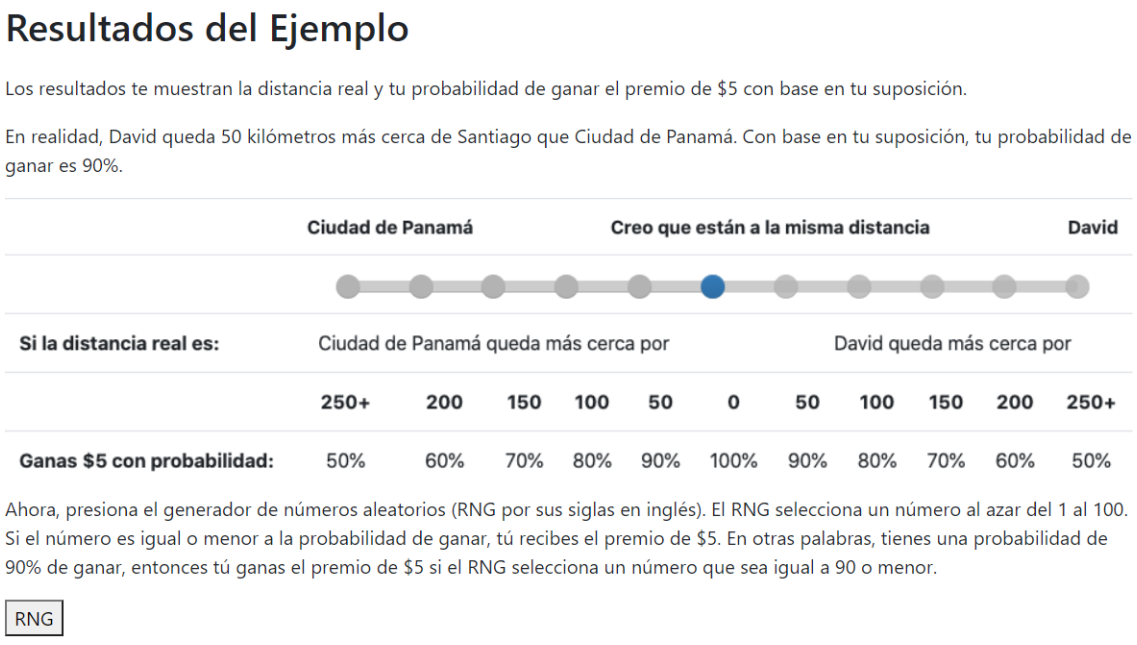


Figure B.6: Experiment screenshots: Example Task Results

Instrucciones

Presiona Play

0:00 / 3:09

Ahora harás tus cinco suposiciones acerca de tres tareas. Recuerda que una de estas cinco suposiciones será seleccionada para determinar si recibes el premio de $5 al final de la encuesta.

En encuestas previas, se le pagó a algunas personas por completar las tres actividades que describiremos a continuación. Las personas que completaron las encuestas previas cumplían con los requisitos para una beca al Programa de Certificado para Jóvenes en Soporte de Tecnología. En ese momento, las personas que eran elegibles para el programa de becas:

- NO tenían un empleo formal
- NO estaban estudiando
- vivían en Chiriquí o en Panamá Oeste
- tenían de 18 a 22 años
- habían terminado su educación secundaria (bachillerato)
- eran ciudadanos panameños o residentes legales en Panamá

La primera actividad era una prueba de habilidad mental. La prueba estaba compuesta por 12 preguntas que iban aumentando en dificultad. De esta manera, la mayoría de las personas respondieron correctamente la primera pregunta, pero pocas personas respondieron correctamente la última pregunta. Los participantes de la encuesta previa podían ganar $0.42 por cada respuesta correcta. Entonces, si los participantes respondían correctamente las 12 preguntas, recibirían un total de $5.04.

La segunda actividad era una medida acerca del tipo de tareas que la persona prefería hacer. Los participantes en la encuesta previa podían ganar $5 por ver un video y completar una tarea que podían estar relacionados a alguno de los siguientes seis temas: Administración, Contabilidad, Publicidad en Redes Sociales, Robótica, Soporte de Tecnologías de la Información y Ventas. Los participantes organizaron los temas en orden de preferencia, del tema más preferido al menos preferido. Supongamos, por ejemplo, que una persona ubicó la tarea de Ventas en la primera (1°) posición y la tarea de Contabilidad en la sexta (6°) posición. Esto quiere decir que la tarea preferida de esta persona era la relacionada a Ventas y la ubicó 5 posiciones por encima de la tarea relacionada a Contabilidad. Entre más alto ubicara una persona un tema en la lista, mayor probabilidad tenía de que se le asignara la tarea relacionada a ese tema. Los participantes recibían $5 sin importar la tarea que les fuera asignada.

La tercera actividad era una prueba de aptitud en Soporte de Tecnologías de Información. La prueba estaba compuesta por 10 preguntas de distintos niveles de dificultad. Los participantes en la encuesta previa podían ganar $0.50 por cada respuesta correcta. Entonces, si los participantes respondían correctamente las 10 preguntas, recibirían un total de $5.

Considera tus elecciones con cuidado. Recuerda que alguna de tus suposiciones será seleccionada al azar por una computadora para determinar tu pago. Cada una de las suposiciones tiene la misma probabilidad de ser seleccionada, pero no sabrás cuál de las suposiciones es seleccionada para el pago hasta el final de la encuesta. Para garantizar el mayor pago posible, trata cada actividad como si esta fuera la que determinara tu pago.

Vas a tener 5 minutos para completar la siguiente actividad. Por favor inicia la actividad únicamente si tienes por lo menos 5 minutos para completarla.

Siguiente

Figure B.7: Experiment screenshots: First-Order Beliefs Task Instructions

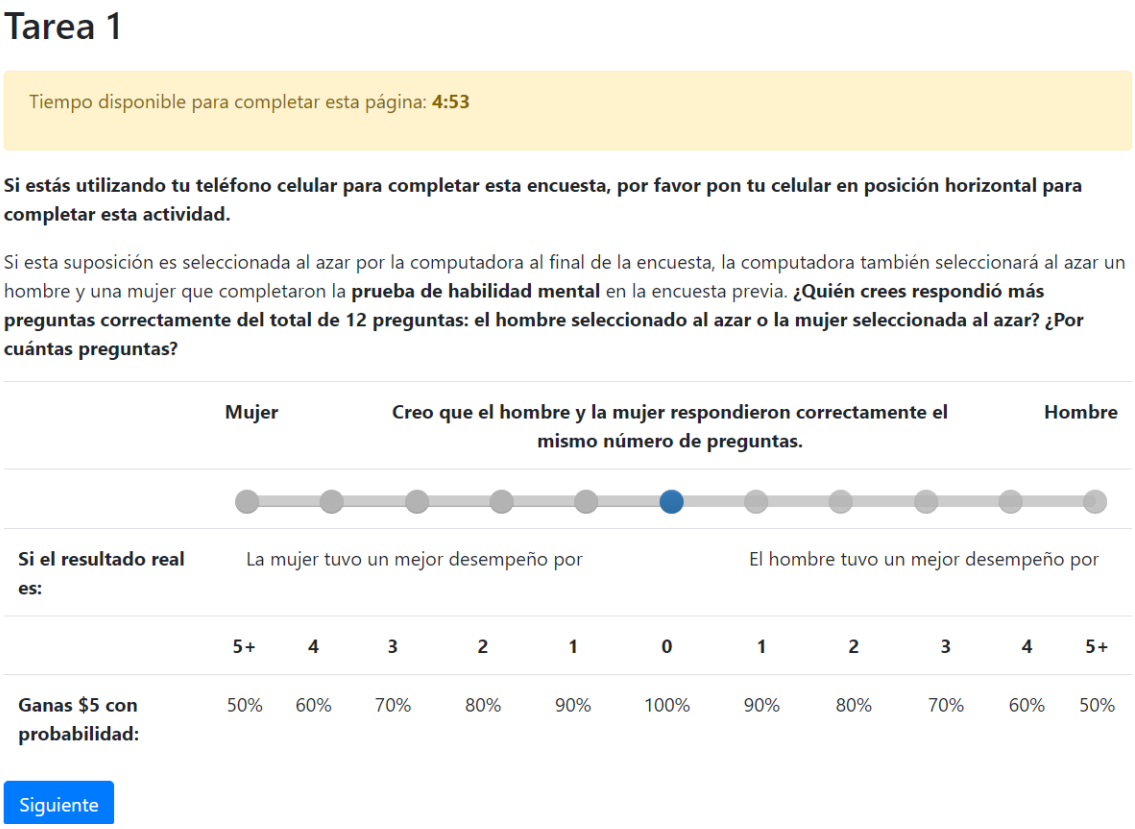


Figure B.8: Experiment screenshots: First-Order Beliefs about Cognitive Ability Task

Tarea 2

Tiempo disponible para completar esta página: **4:49**

Si estás utilizando tu teléfono celular para completar esta encuesta, por favor pon tu celular en posición horizontal para completar esta actividad.

Si esta suposición es seleccionada al azar por la computadora al final de la encuesta, la computadora también seleccionará al azar un hombre y una mujer que completaron **la prueba de aptitud en Soporte de Tecnologías de Información** en la encuesta previa. **¿Quién crees respondió más preguntas correctamente del total de 10 preguntas: el hombre seleccionado al azar o la mujer seleccionada al azar? ¿Por cuántas preguntas?**

	Mujer					**Creo que el hombre y la mujer respondieron correctamente el mismo número de preguntas.**					**Hombre**
Si el resultado real es:	La mujer tuvo un mejor desempeño por						El hombre tuvo un mejor desempeño por				
	5+	**4**	**3**	**2**	**1**	**0**	**1**	**2**	**3**	**4**	**5+**
Ganas $5 con probabilidad:	50%	60%	70%	80%	90%	100%	90%	80%	70%	60%	50%

Figure B.9: Experiment screenshots: First-Order Beliefs about IT Ability Task

Tarea 3

Tiempo disponible para completar esta página: **4:42**

Si estás utilizando tu teléfono celular para completar esta encuesta, por favor pon tu celular en posición horizontal para completar esta actividad.

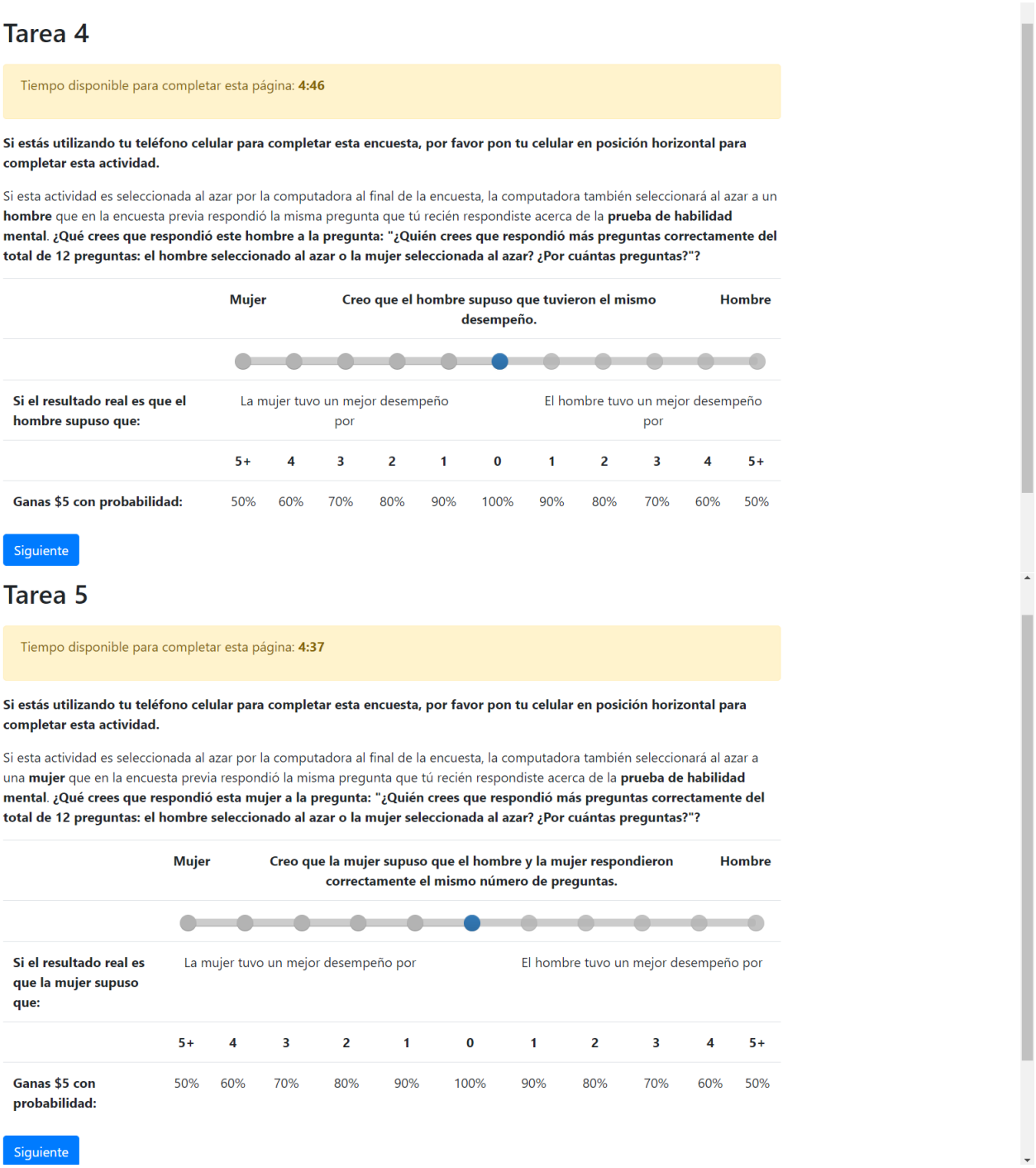
Si esta suposición es seleccionada al azar por la computadora al final de la encuesta, la computadora también seleccionará al azar un hombre y una mujer que **organizaron en orden de preferencia la lista de temas a los que preferían ser asignados** en la encuesta previa. Recuerda que los seis temas eran Administración, Contabilidad, Publicidad en Redes Sociales, Robótica, Soporte de Tecnologías de la Información (TI) y Ventas.**¿Quién crees que ubicó la tarea de Soporte de Tecnologías de la Información (TI) en una posición más alta en su lista: el hombre seleccionado al azar o la mujer seleccionada al azar? ¿Por cuántas posiciones?**

	Mujer					**Creo que el hombre y la mujer ubicaron TI en la misma posición.**					**Hombre**
Si el resultado real es:	La mujer ubicó TI más alto por						El hombre ubicó TI más alto por				
	5	**4**	**3**	**2**	**1**	**0**	**1**	**2**	**3**	**4**	**5**
Ganas $5 con probabilidad:	50%	60%	70%	80%	90%	100%	90%	80%	70%	60%	50%

Siguiente

Figure B.10: Experiment screenshots: First-Order Beliefs about IT Preferences Task

Figure B.11: Experiment screenshots: Second-Order Beliefs Task Instructions



Tarea 4

Tiempo disponible para completar esta página: **4:46**

Si estás utilizando tu teléfono celular para completar esta encuesta, por favor pon tu celular en posición horizontal para completar esta actividad.

Si esta actividad es seleccionada al azar por la computadora al final de la encuesta, la computadora también seleccionará al azar a un **hombre** que en la encuesta previa respondió la misma pregunta que tú recién respondiste acerca de la **prueba de habilidad mental**. **¿Qué crees que respondió este hombre a la pregunta: "¿Quién crees que respondió más preguntas correctamente del total de 12 preguntas: el hombre seleccionado al azar o la mujer seleccionada al azar? ¿Por cuántas preguntas?"?**

	Mujer					Creo que el hombre supuso que tuvieron el mismo desempeño.					Hombre
Si el resultado real es que el hombre supuso que:	La mujer tuvo un mejor desempeño por						El hombre tuvo un mejor desempeño por				
	5+	**4**	**3**	**2**	**1**	**0**	**1**	**2**	**3**	**4**	**5+**
Ganas $5 con probabilidad:	50%	60%	70%	80%	90%	100%	90%	80%	70%	60%	50%

Siguiente

Tarea 5

Tiempo disponible para completar esta página: **4:37**

Si estás utilizando tu teléfono celular para completar esta encuesta, por favor pon tu celular en posición horizontal para completar esta actividad.

Si esta actividad es seleccionada al azar por la computadora al final de la encuesta, la computadora también seleccionará al azar a una **mujer** que en la encuesta previa respondió la misma pregunta que tú recién respondiste acerca de la **prueba de habilidad mental**. **¿Qué crees que respondió esta mujer a la pregunta: "¿Quién crees que respondió más preguntas correctamente del total de 12 preguntas: el hombre seleccionado al azar o la mujer seleccionada al azar? ¿Por cuántas preguntas?"?**

	Mujer					Creo que la mujer supuso que el hombre y la mujer respondieron correctamente el mismo número de preguntas.					Hombre
Si el resultado real es que la mujer supuso que:	La mujer tuvo un mejor desempeño por						El hombre tuvo un mejor desempeño por				
	5+	**4**	**3**	**2**	**1**	**0**	**1**	**2**	**3**	**4**	**5+**
Ganas $5 con probabilidad:	50%	60%	70%	80%	90%	100%	90%	80%	70%	60%	50%

Siguiente

Figure B.12: Experiment screenshots: Second-Order Beliefs Task

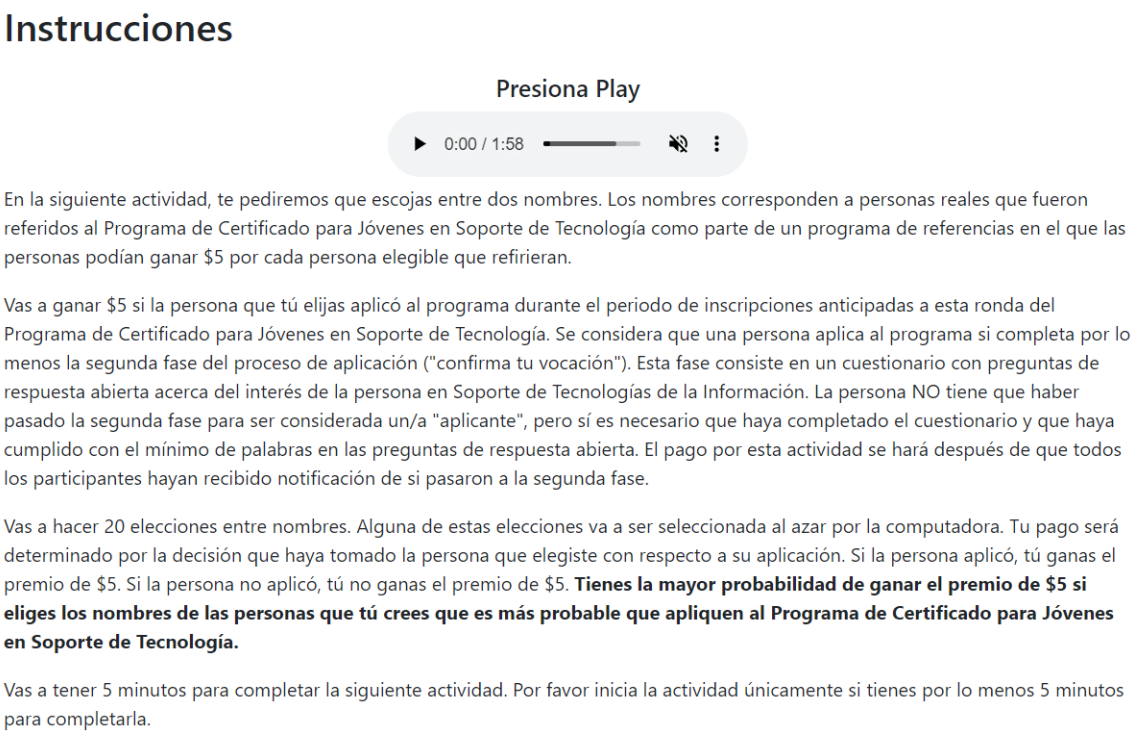


Figure B.13: Experiment screenshots: Betting Task Instructions

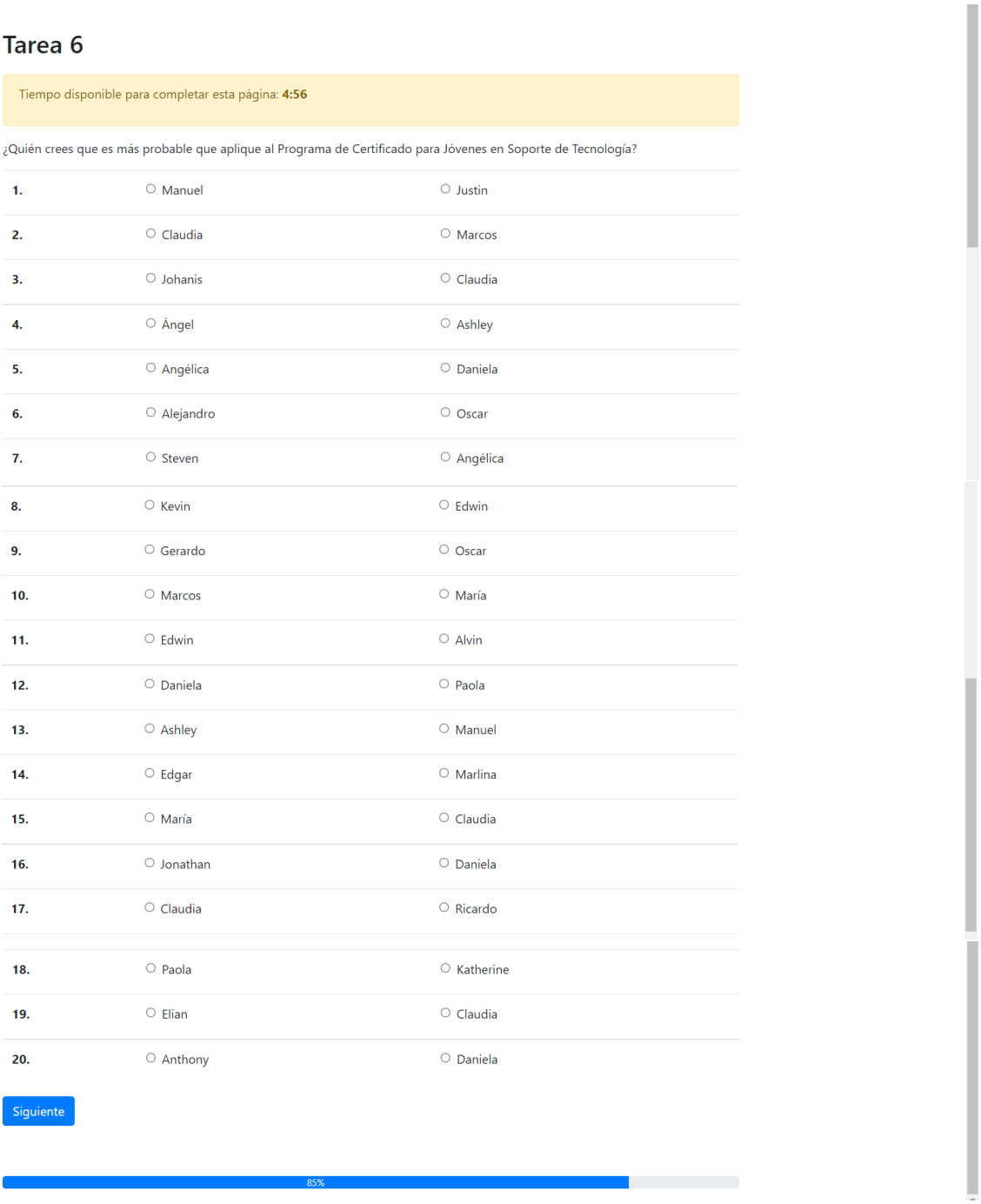


Figure B.14: Experiment screenshots: Betting Task

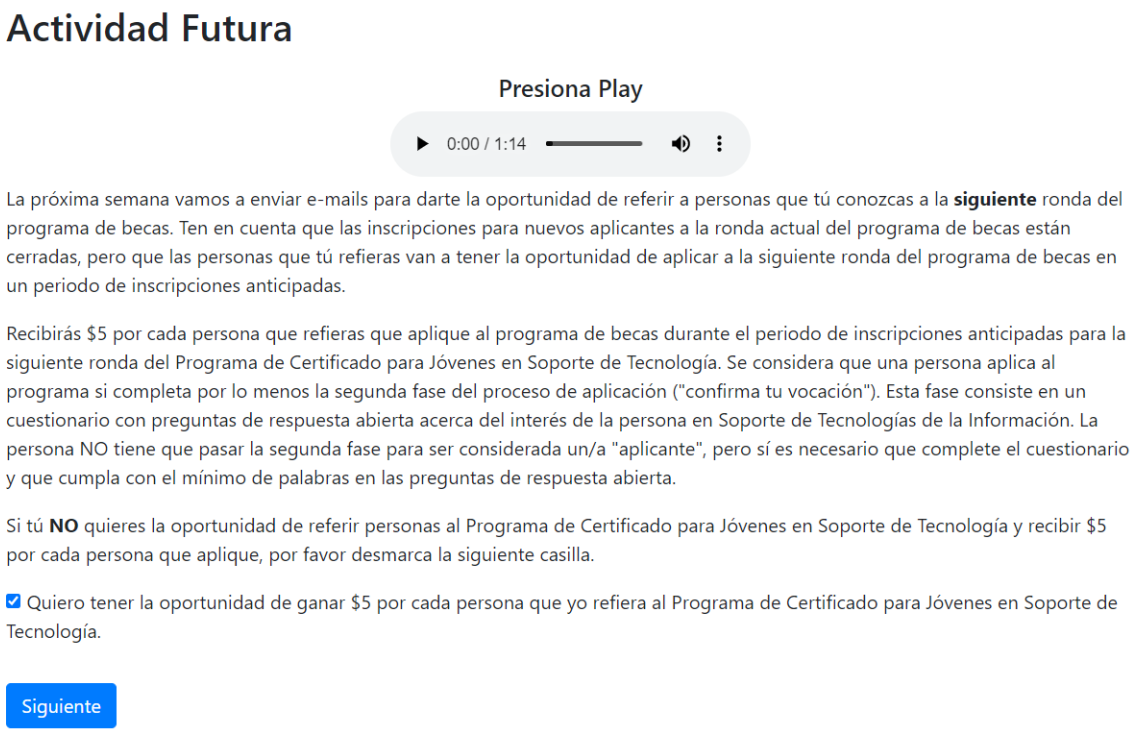


Figure B.15: Experiment screenshots: Referral Activity Opt-Out Page

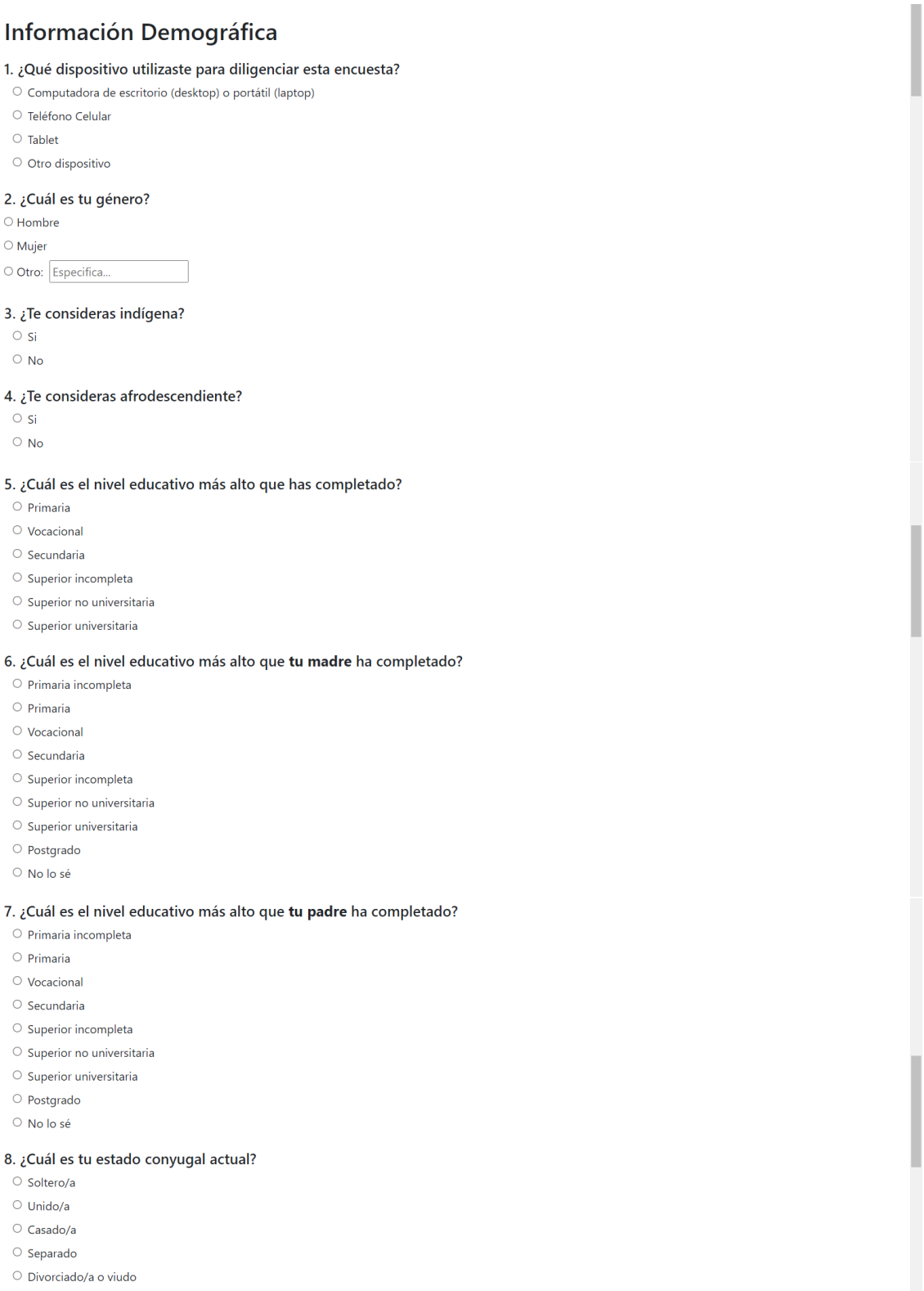


Figure B.16: Experiment screenshots: Demographics Survey (Part 1)

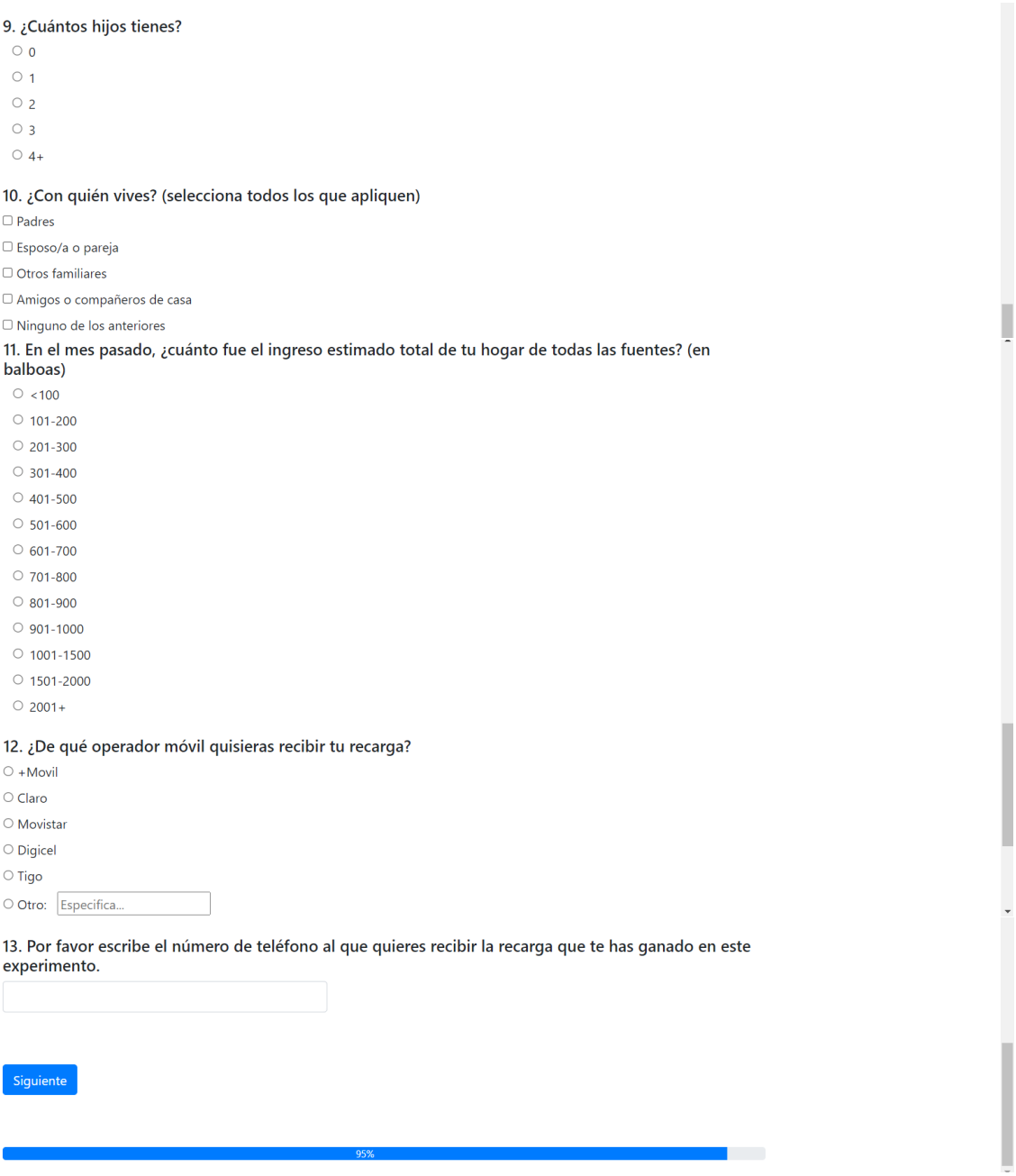


Figure B.17: Experiment screenshots: Demographics Survey (Part 2)

Resultados

¡Gracias por participar! Has ganado $3 por completar la encuesta. Ahora, haz click en el botón "Elegir Suposición" para determinar cuál de las cinco suposiciones es seleccionada al azar por la computadora para determinar tu pago.

Elegir Suposición

100%

Resultados

¡Gracias por participar! Has ganado $3 por completar la encuesta. Ahora, haz click en el botón "Elegir Suposición" para determinar cuál de las cinco suposiciones es seleccionada al azar por la computadora para determinar tu pago.

Tu suposición en la pregunta '¿Quién crees respondió más preguntas correctamente del total de 10 preguntas: el hombre seleccionado al azar o la mujer seleccionada al azar? ¿Por cuántas preguntas?' ha sido seleccionada para el pago. Tú supusiste que el hombre y la mujer respondieron correctamente el mismo número de preguntas. En realidad, el hombre seleccionado al azar respondió correctamente 3 preguntas más. Esto quiere decir que tu probabilidad de ganar es 70%.

Ahora, presiona el generador de números aleatorios (RNG por sus siglas en inglés). El RNG selecciona un número al azar del 1 al 100. Si el número es igual o menor a la probabilidad de ganar, tú recibes el premio de $5. Entonces, tú ganas el premio de $5 si el RNG selecciona un número que sea igual a 70 o menor.

RNG

100%

Resultados

¡Gracias por participar! Has ganado $3 por completar la encuesta. Ahora, haz click en el botón "Elegir Suposición" para determinar cuál de las cinco suposiciones es seleccionada al azar por la computadora para determinar tu pago.

Tu suposición en la pregunta '¿Quién crees respondió más preguntas correctamente del total de 10 preguntas: el hombre seleccionado al azar o la mujer seleccionada al azar? ¿Por cuántas preguntas?' ha sido seleccionada para el pago. Tú supusiste que el hombre y la mujer respondieron correctamente el mismo número de preguntas. En realidad, el hombre seleccionado al azar respondió correctamente 3 preguntas más. Esto quiere decir que tu probabilidad de ganar es 70%.

Ahora, presiona el generador de números aleatorios (RNG por sus siglas en inglés). El RNG selecciona un número al azar del 1 al 100. Si el número es igual o menor a la probabilidad de ganar, tú recibes el premio de $5. Entonces, tú ganas el premio de $5 si el RNG selecciona un número que sea igual a 70 o menor.

El número aleatorio es 35, así que ganaste el premio de $5.

¡Gracias por participar en la encuesta! Recibirás tu pago de $8 en las próximas 24 horas. Adicionalmente, vas a recibir un e-mail a finales de junio para notificarte si ganaste los $5 de acuerdo a tus elecciones en la actividad en la que elegiste entre varios nombres.

¡No olvides estar atento del email para referir personas al Programa de Certificado para Jóvenes en Soporte de Tecnología y recibir $5 por cada persona que aplique!

100%

Figure B.18: Experiment screenshots: Results Page