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Public Speaking Aversion

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Thomas Buser and Huaiping Yuan*

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Abstract

Fear of public speaking is very common but we know little about its economic implications. We establish public speaking aversion as an economically relevant preference using three steps. First, we use a lab and a classroom experiment to show that preferences for speaking in public vary strongly across individuals with many participants willing to give up significant amounts of money to avoid giving a short presentation in front of an audience. Second, we introduce two self-reported items to elicit preferences for speaking in public through surveys. We show that these items are strongly related to choices in the incentivized lab experiment and that public speaking aversion is distinct from established traits and preferences including extraversion. Finally, we elicit these items in a student survey and show that public speaking aversion predicts students' career expectations, indicating that it is an influential factor in determining career choices.

Keywords: public speaking, validated survey measures, human capital, career choice

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1 Introduction

Fear of speaking in public is one of the most common phobias (Blöte et al., 2009). It has been shown to be distinct from general social anxiety (Heimberg et al., 1990; Kessler, Stein, and Berglund, 1998; Stein and Deutsch, 2003; Blöte et al., 2009), meaning that many individuals who otherwise feel comfortable with social interaction specifically fear speaking in public. At the same time, speaking in front of others is an integral part of many careers (Anderson and Gantz, 2013; Estrada Worthington, 2014), and even in careers that do not initially require much public speaking, its importance is likely to increase as one moves up the career ladder. Nevertheless, preferences for or against speaking in public have received little attention in economics. We lack methods for measuring public speaking aversion, and we know little about how public speaking aversion varies across individuals and whether it is related to their career choices. That is, the economic implications of public speaking aversion are plausibly important but have hardly been studied at all.

In this study, we develop two methods for measuring public speaking aversion as a continuous individual preference. The first is an incentivized experimental measure and the second is a self-reported measure consisting of two survey items. We document the distribution of public speaking aversion across individuals in a lab and a field experiment and use the incentivized experimental choices to validate the survey questions. We then elicit our self-reported measure in a cohort of undergraduate students, allowing us to investigate the link between public speaking aversion and career expectations.

In the lab experiment, we elicit the minimum payment participants require to give a short presentation in front of a small audience. We document significant heterogeneity. While some participants are happy to present for any amount, a majority chooses a minimum acceptable payment that is magnitudes higher than the usual expected earnings from participating in an experiment, indicating that most participants are averse to public speaking to some degree. We replicate this finding in a lecture hall experiment where we elicit the minimum acceptable payment for giving a short presentation in front of the class, using writing an equivalent essay as a control task. Students asked to give a presentation ask for substantially higher amounts than students asked to write an essay. More than 50 percent of students in the presentation treatment choose a minimum payment above 200 Euros and many choose amounts above 400 Euros.

We also use the data from the lab experiment to validate two survey questions eliciting confidence and preference for speaking in public, which were elicited before the participants knew about the experimental task and which were integrated in a wider personality questionnaire. Both questions strongly predict the minimum required payment for speaking in public, even when controlling for a range of other traits and preferences including extraversion.

We then elicit these questions in a survey of a cohort of first-year economics and business students and show that public speaking aversion predicts expected career choices conditional on a range of other characteristics. In particular, public speaking averse individuals rank careers lower that were ranked as more public speaking intense by other students in an independent survey. In summary, our survey questions predict both the incentivized choice in the lab as well as students' career expectations conditional on a range of other traits and preferences, indicating that public speaking aversion is an economically relevant preference separate from preferences and traits economists and psychologists typically take into account.

Psychologists have studied the fear of public speaking extensively as a phobia, usually known as public speaking anxiety, speech anxiety or glossophobia. This literature characterizes fear of public speaking as a distinct subtype of social anxiety (Heimberg et al., 1990; Kessler, Stein, and Berglund,

1998; Stein and Deutsch, 2003; Blöte et al., 2009), clearly distinguishing public speaking phobics, who are generally comfortable with social interaction but specifically fear speaking in front of others, from generalized social phobics who fear most social situations. One very consistent finding is that public speaking anxiety is highly prevalent among the general population (Stein, Walker, and Forde, 1996; Kessler, Stein, and Berglund, 1998; Ruscio et al., 2008). In surveys, students report public speaking as one of their most common and severe fears (McCroskey, Ralph, and Barrick, 1970; Dwyer and Davidson, 2012; Marinho et al., 2017). Various types of public speaking anxiety treatments have been tried (Pribyl, Keaten, and Sakamoto, 2001; Anderson et al., 2005) but meta studies show that the effectiveness of these treatments is often unclear, especially if behavioral outcome measures are used instead of self-reported measures of fear (Allen, 1989; Allen, Hunter, and Donohue, 1989; Bodie, 2010). Dislike of public speaking thus appears to be a stable trait that cannot be easily changed. However, despite experimental studies documenting that public speaking induces measurable stress responses even in most individuals who are not public speaking phobics (Kirschbaum, Pirke, and Hellhammer, 1993)¹, the literature generally treats public speaking aversion as a phobia one either suffers from or not, rather than a continuous preference that varies across individuals.

Only few studies in economics have examined heterogeneity in willingness to speak in public or related choices, typically focusing on gender differences.² The study most relevant to ours is De Paola et al. (2020). In their field experiment, students were given an opportunity to earn extra credits by explaining their solution to an exercise either privately to the instructor or publicly in front of the entire class. Women were less likely to opt for the extra credits when they had to present publicly while there was no gender difference for willingness to present in private.³

We define public speaking aversion not as a binary choice or phobia, but as a continuous preference that can be measured in an incentivized way, similar to, for example, risk aversion or social preferences. Of course, eliciting preferences for public speaking in an incentivized way requires to actually have study participants give presentations, making incentivized elicitation more cumbersome than for other preferences typically elicited by economists. As a consequence, while incentivized elicitation in surveys is possible for, say, risk or time preferences, this is not the case for public speaking aversion. To enable researchers to elicit public speaking aversion in surveys, we introduce two public speaking preference questions. We follow the approach pioneered by Dohmen et al. (2011) for risk (and later expanded by Falk et al. (2018) for a wide range of economic preferences) and use our incentivized lab experiment to validate the two survey items.

2 Study Design

We conducted a lab experiment and a field experiment and collected survey data from a cohort of first-year economics and business students at the University of Amsterdam. In this section, we describe the design and procedures of the experiments and the survey.

¹Indeed, this stress response is so common that the most established way to induce stress in controlled experiments involves presenting in front of a panel (Kirschbaum, Pirke, and Hellhammer, 1993).

²Many survey-based studies in psychology have identified a gender difference in fears of public speaking (Stein, Walker, and Forde, 1996; Turk et al., 1998; Behnke and Sawyer, 2001; Marinho et al., 2017). Observational data also suggest that women are less likely to speak up in public settings such as seminars and political gatherings (Hinsley, Sutherland, and Johnston, 2017; Carter et al., 2018; Parthasarathy, Rao, and Palaniswamy, 2019)

³Economists have also studied gender differences in related settings. A lab experiment by Coffman (2014) revealed that women are especially less likely to contribute their ideas on stereotypically male subjects. A recent field experiment showed a significant gender gap in leadership willingness (Alan et al., 2020).

2.1 Lab experiment

Participants in the lab experiment were recruited separately as speakers or audience members and remained in that role during the entire experiment.⁴ The aim of the experiment is to elicit both an incentivized and an unincentivized measure of public speaking aversion. Our incentivized measure of public speaking aversion is the minimum monetary compensation speakers are willing to accept in exchange for giving a short presentation in front of a small audience consisting of other participants. We elicit this minimum acceptable compensation using the Becker-DeGroot-Marschak (BDM) mechanism (Becker, DeGroot, and Marschak, 1964). See the appendix for the complete set of instructions.⁵

In the first part of the experiment, speakers were first asked to complete a survey aimed at eliciting two survey items measuring of public speaking preferences as well as a range of standard personality traits and preferences. The survey included demographic information, a HEXACO personality inventory⁶, as well as survey measures of competitiveness, general confidence, and risk aversion. We added our two public speaking questions to the 60-question personality inventory, using the same 5-point Likert scale answer format. In particular, we asked whether speakers agreed with the following statements: *I am good at presenting in front of a group* and *I find presenting in front of a group stressful*. These two statements are chosen to capture both public speaking confidence as well as the (dis)utility experienced when speaking in front of others. For risk-aversion, confidence, and competitiveness, we used single-item measures that have been shown to predict relevant economic outcomes (Dohmen et al., 2011; Buser, Niederle, and Oosterbeek, 2020).

After completing the survey, speakers were informed about the detailed steps for the rest of the experiment. First, they were informed about the BDM mechanism and had to choose a minimum acceptable payment between 0 and 40 Euros for giving a five-minute presentation on an unknown topic in front of an audience consisting of approximately 6 other participants.⁷ Then a 20 minute compulsory preparation time started, during which all participants were asked to prepare a presentation about Otto I, a Holy Roman Emperor.⁸ At this stage participants were allowed to use their own laptops or smart phones to access the internet to help them prepare. Only after this preparation stage, the computer drew the random payment which determined whether a participant had to actually give the presentation. In detail, the procedure works as follows. The computer generates a random integer number between 0 and 40 with equal probability. If this number is equal to or higher than the minimum acceptable payment chosen by the participant, the participant has to give the five-minute presentation and receives a payment equal to the randomly generated number. If the number is lower than the minimum acceptable payment, there is no presentation and no payment for the speaker. Note that regardless of the minimum payment chosen by a participant, there is always some probability of being asked to present.⁹ This means that all participants had to prepare for the presentation, allowing us

⁴The separate recruitment was due to a large difference in expected duration of the experiment for speakers and audience members. Subjects who participated in one of the two roles, were excluded from the subject pool of the other role. Note that even though we refer to all participants recruited in the first role as speakers, not all of them gave a presentation in front of the audience.

⁵Z-tree Fischbacher (2007) was used to program the survey and experiment.

⁶HEXACO is a six-dimensional personality structure that includes the widely accepted Big Five traits Goldberg (1992) and an additional trait: honesty-humility (Lee and Ashton, 2004). The HEXACO inventory included 60 statements on a five-point Likert scale, such as "I would be quite bored by a visit to an art gallery".

⁷The exact audience size varied depending on how many audience members showed up for the experiment

⁸During the BDM elicitation stage, speakers were only told that the subject of the presentation would not be well-known. We did not want familiarity with the subject of the presentation to play a role in the choice of minimum payments.

⁹The highest amount participants could choose is 40 Euros. The computer draws a random integer number from 0 to 40 with equal probability, so even if a participant chooses a minimum payment of 40, there is still a positive probability

to measure the minimum compensation needed for the five-minute presentation, holding constant the effort needed to prepare.

Presentations were given in a separate room and were not observable to other participants in the speaker role.¹⁰ The audience members listened to all the 5-minute presentations during a session and were asked to score each presentation on four dimensions: content, delivery, how stressed the speaker appeared to be, and an overall aggregate score from 1 to 10. The scoring was incentivized.¹¹ Speakers were informed ex-ante that scores would not be shared with them.

A total of six sessions were conducted at the University of Amsterdam Center for Research in Experimental Economics and Political Decision Making (CREED) laboratory in January and February 2019. 209 speakers (104 female and 105 male) and 31 audience members (3-7 audience members per session) participated in our experiment. The speakers showed up in small groups at staggered intervals of 15 minutes to minimize the amount of waiting time before the presentations. The experiment lasted approximately 45 minutes for the speakers and 3 hours for the audience members. The speakers were paid an average of 21,48 Euros, which included a 7 Euros show-up fee. 110 of the 209 speakers actually had to give a presentation at the end of the experiment and received a bonus payment averaging 27,52 Euros on top of their show-up fee. The audience members were paid an average of 35.48, which included a 30 Euros show-up fee. 2 out of the 6 sessions were run in Dutch, where the speakers were also allowed to present in Dutch. The remaining sessions were conducted in English.

3 out of the 209 participants walked out after filling in the questionnaire when they read the instructions and realized that the experiment involved a public speaking component. They confirmed with a lab assistant that they understood the BDM mechanism and would forfeit a bonus payment of up to 40 Euros. In our analysis, we will include these observations and assume these individuals are extremely public speaking averse. That is, we set their minimum acceptable payment to the maximum amount of 40 Euros and include them in the descriptive results and regressions linking the minimum acceptable payment to the survey responses. Throughout, we use tobit regressions that take censoring into account (apart from the small number of walk-outs, many speakers chose the maximum possible amount of 40). Results look very similar when we exclude the three walk-out observations.

2.2 Classroom experiment

In October 2019, we replicated our lab experiment in a classroom setting to determine whether our finding of substantial and widespread public speaking aversion holds outside the lab in a natural setting where the audience is many times larger and the stakes are higher. The experiment involved economics students who attended a compulsory first-year microeconomics course at the University of Amsterdam. Using a very similar procedure to the lab experiment, we elicited the minimum acceptable payment for giving a short presentation in front of the entire class two weeks later. We used a short online survey that could be completed on smart phones and laptops within a few minutes. The first-year cohort in economics is large, typically 500 students. Attendance at lectures is not compulsory and typically numbers around 300, meaning the presentation would need to be given in front of a large

of being asked to present equal to 1/41. During the experimental sessions, we observed that all participants, including those who chose the maximum possible payment of 40, put in a serious effort to prepare for the presentation.

¹⁰If another participant was still presenting at this time, the participant would be asked to wait in a designated waiting room. Both the waiting room and the presentation room were obscured from other participants. Participants were recruited for staggered time slots that ensured that waiting times were generally very short.

¹¹At the end of each session, one of the presentations was randomly chosen for payment. An audience member received a bonus of 2 euros for each score that matched the most often chosen score for the selected presentation. A similar mechanism was used by Krupka and Weber (2013) to identify social norms.

audience consisting of fellow students and the professor teaching the course.

While we used the same BDM mechanism to elicit public speaking aversion, the field experiment differed from the lab experiment in several ways. First, we included a control task: students were randomized into one of two treatments and were asked to either give a presentation in front of the class or to write an equivalent essay that would be shared on the course website. Since the preparation of a presentation requires some time at home, we used a control task that would require approximately the same amount of time to complete.¹² The addition of a control task also allows us to exclude certain channels that could contribute to a high minimum payment that are not exclusively related to public speaking, such as aversion to being evaluated by others (Eil and Rao, 2011). Any difference in the distribution of the chosen minimum acceptable payments between the control task and the presentation task should therefore be driven by aversion to public speaking. Second, one student in each treatment was randomly selected to (potentially) give the presentation or write the essay. Third, we increased the maximum payment from 40 Euros to 500 Euros to reflect the higher stakes and the low probability of being selected. Fourth, we allowed students to pick a maximum amount above 500, leading to a zero probability of being selected to write or present.

Students were informed by the lecturer at the start of a regular lecture hour that everyone was invited to participate in a short experiment that could be completed right away on their smart phones. While participation was not mandatory, it was strongly encouraged by the lecturer who explained that participation would potentially be rewarded by a large cash payment. Students accessed the experimental environment on Qualtrics through a link or by scanning a QR code and were given 10 minutes before the lecture started to complete the experiment.

On the welcome screen, students were first asked to enter their student number, gender and age. Depending on whether their student number was odd or even, they were assigned to either the Essay treatment or the Presentation treatment. They were then informed that one of the participants in the class would get an opportunity to give a 5-minute presentation (or, if they were in the essay treatment, hand in a 600 word essay) on a course-related topic for a payment of up to 500 Euros. The presentation had to be given in the same lecture 2 weeks later and the essay would be published on the course website so that all students could access it. The payments for both treatments were randomly generated ex-ante by a draw from 0 to 500 and displayed in two sealed envelopes in front of the class.¹³ We also used a multiple-choice question to check whether the participants understood the mechanism. The participants were then asked to enter a non-negative number to represent the minimum payment they would accept in exchange for performing the real-effort task. A short personality questionnaire followed and students were also asked to rate their English proficiency on a scale from 1 to 5 and for their gender and country of birth.

After the lecture in which students completed the questionnaire, we randomly selected one student from the Essay treatment and one student from the Presentation treatment for payoff. These 2 students were informed about their payment and the topic the day after. Both selected students had chosen a minimum acceptable payment that was lower than the random amount in the envelopes. They were paid 91 Euros and 388 Euros for the presentation and essay respectively.

¹²The essay length was chosen such that the required time to read it out loud roughly equaled the duration of the presentation task. This ensured that the amount of content that had to be prepared was comparable for both real effort tasks. We assumed that an average presenter speaks 120 words per minute.

¹³These envelopes were used to reduce the probability of participants misunderstanding the BDM mechanism, a strategy that has also been used by others (Schade, Kunreuther, and Koellinger, 2012). Specifically, we wanted to make it explicit that the exact payment for the real-effort task was predetermined and therefore not dependent on their choices.

2.3 Student survey

To investigate whether public speaking aversion is related to career choices, we added our public speaking preference questions, as well as survey questions eliciting career expectations, to a periodic survey of first-year Economics and Business Economics bachelor students conducted at the University of Amsterdam for program evaluation purposes. The questions about public speaking and the questions about career preferences were included in two different waves spaced two months apart. In the earlier wave, students were asked to indicate how much they agreed on a scale from 0 to 10 with the two public speaking aversion statements from our lab experiment: *I am good at presenting in front of a group* and *I find presenting in front of a group stressful*.¹⁴ Two months later, they were asked to rank the attractiveness of 12 career options. The choice of career options was based on the department website which lists the most common occupations of graduates. Information about other individual traits and preferences including the Big Five personality traits, competitiveness, confidence and risk aversion were obtained from a separate, earlier wave of the student survey. All surveys were distributed and collected at the start of mandatory tutorials or lectures.

The 12 career options were scored on the importance of public speaking by another group of 200 students recruited through Prolific.¹⁵ The Prolific participants were selected to be similar to our student survey sample and included only current students with an economics or business administration related major. The average participant spent less than 5 minutes on this task and participants were paid 1 pound for their time. Table A1 in the appendix shows the 12 career options and how they were ranked in terms of public speaking requirements.

To determine whether a student favors careers involving more or less public speaking, we construct an individual index of the public speaking intensity of career expectations based on the Prolific ranking of career options. Specifically, for each individual i we calculate:

$$PS\ Intensity_i = \frac{1}{12} \sum_{j=1}^{12} Career\ PS\ Intensity\ Rank_j * Career\ Attractiveness\ Rank_{i,j}$$

where j indexes the 12 career options. Career PS Intensity Rank represents the rank of a career option in terms of public speaking intensity and was determined by the Prolific ranking. Career Attractiveness Rank represents the rank of a given career option j for individual i and is based on the answers in the student survey.¹⁶

3 Results

3.1 Lab experiment

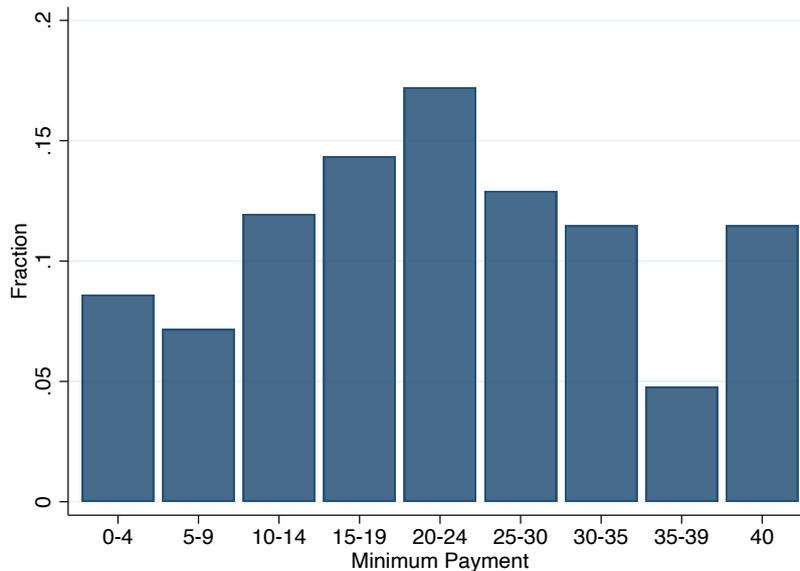
Our incentivized preference elicitation experiment shows that a majority of people are averse to public speaking. On average, participants asked for a minimum payment of 19.9 Euros for giving the 5 minute presentation, which roughly corresponds to a 240 Euros hourly wage. Nearly 10 percent chose the maximum amount of 40 Euros. Compared to the expected payment for experiments in the CREED

¹⁴In the lab, we used a five-point scale to make the public speaking questions fit in the HEXACO questionnaire. We used a 11-point scale in the student survey to make our questions consistent with the format of other questions.

¹⁵<https://www.prolific.co/>.

¹⁶Not all respondents used unique ranks from 1 to 12 to rank the 12 career options. The career attractiveness ranks are standardized to ensure that the sum of all ranks is fixed to 78: rank 1 is assigned to the least attractive career, rank 12 to the most attractive. If 2 or more career options are tied, they are all assigned the average rank (i.e. if 2 careers are tied for rank 1, they are both assigned rank 1.5).

Figure 1: Distribution of minimum acceptable payment



Note: The histogram shows the distribution of the minimum payment requested for giving the five-minute presentation in front of a small audience (in Euros). Chosen payments are bunched at multiples of 5 Euros and we therefore show the distribution in bins of 5 Euros. $N=209$.

lab of approximately 15 Euros per hour, the amount of money participants were willing to forgo to avoid a 5 minute presentation is high. The distribution of chosen minimum payments requested is shown in Figure 1. It is notable that the distribution is relatively flat and covers the entire range of available choices, indicating that the degree to which individuals are averse to public speaking is highly heterogeneous. Nevertheless, a large majority of participants ask for a significant premium relative to what they usually expect to earn in a lab experiment and we conclude that a majority of them are public speaking averse to at least some degree.

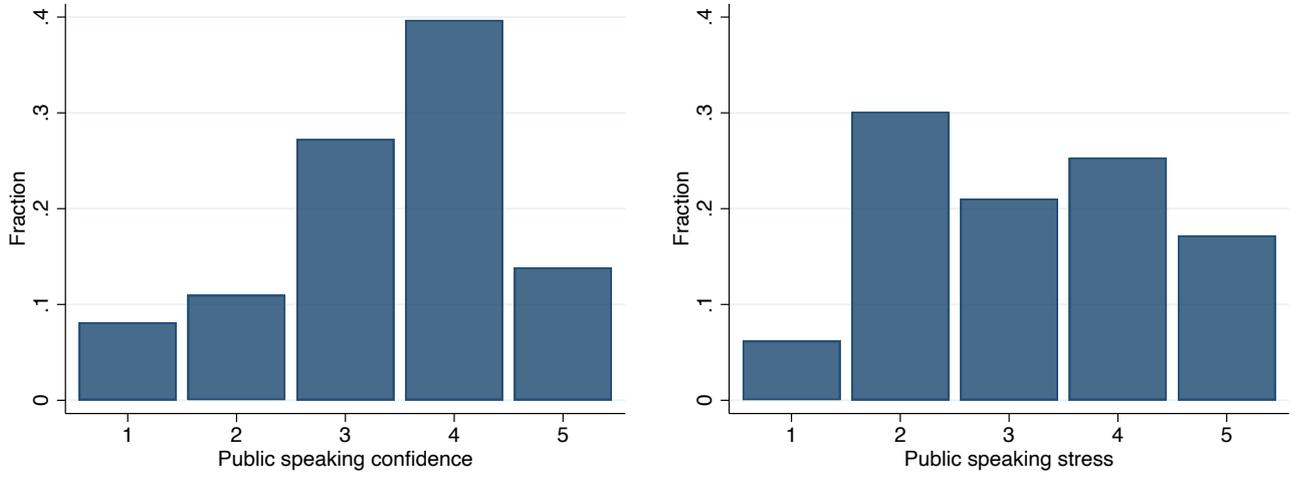
We will now take a look at our survey items: *I am good at presenting in front of a group* (PS Confidence) and *I find presenting in front of a group stressful* (PS Stress). The histograms in Figure 2 show how the answers to the two questions are distributed. In terms of confidence, a majority of students rate themselves as a 3 or 4 out of 5. The answers to the stress question are more spread out: many more participants, 43 percent vs 19 percent, rate themselves as stressed when presenting (4 or 5 on the second question) than as bad at presenting (1 or 2 on the first question). However, very few participants choose the lowest (least stress) option of 1.

Next, we ask how our survey measures are related to the chosen minimum payment. Raw correlations are -0.23 and 0.21 for confidence and stress respectively ($p < 0.01$). Figure 3 shows the average minimum payment chosen by participants for each possible answer on each of the two questions. The most confident participants ask for 10.6 Euro less compared to the least confident participants. The most stressed participants ask for 8.3 Euros more compared to the least stressed participants.

Table 1 presents results from tobit regressions that confirm that both measures of public speaking aversion are significant predictors of the incentivized choice conditional on other traits and preferences.¹⁷ In columns 1 and 3, we regress the minimum acceptable payment on public speaking confidence and public speaking stress respectively controlling only for gender. Moving up one step on the public speaking confidence scale is associated with a 2.8 Euro decrease in the chosen minimum

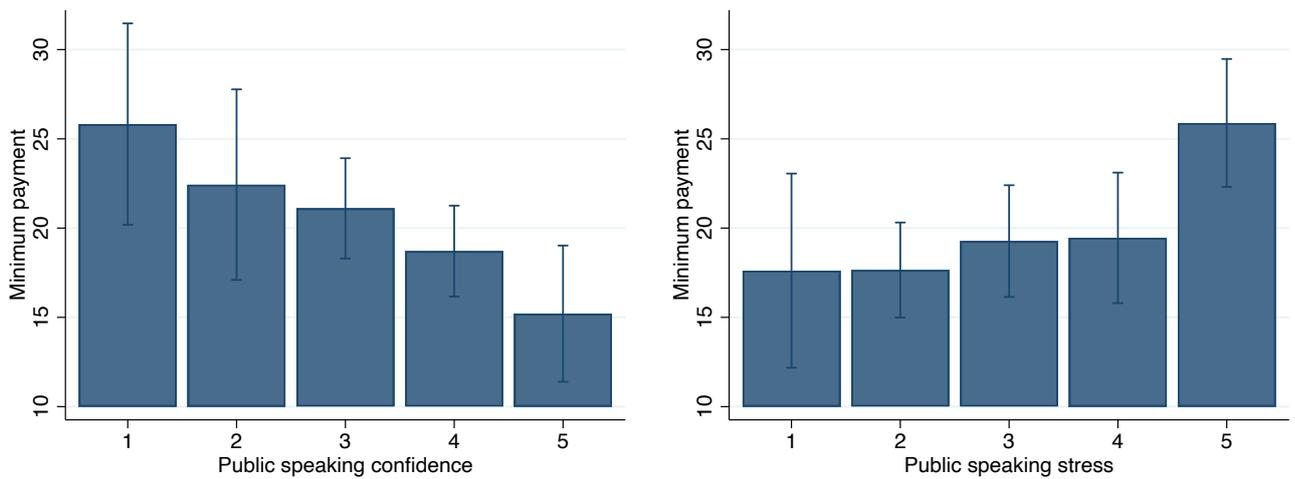
¹⁷We use tobit rather than OLS regressions to take into account that the chosen minimum payment is bounded at 0 and 40 by design. Using OLS instead leads to qualitatively identical results.

Figure 2: Distribution of answers to the two survey questions



Note: The histograms show the proportion of participants who picked each of five possible answer options to the two survey questions on public speaking preferences, where 1 indicates the least agreement and 5 indicates the most agreement. “Public speaking confidence” refers to the question “I am good at presenting in front of a group” and “Public speaking stress” refers to the question “I find presenting in front of a group stressful”.

Figure 3: Correlation between questionnaire answers and the chosen minimum payment



Note: the graphs show the average minimum payment for participants who chose a particular answer option to each of the survey questions. The error bars represent 95-percent confidence intervals based on robust standard errors from a regression of the chosen minimum payment on dummies for each possible answer option.

Table 1: Incentivized choice and self-reported public speaking aversion

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---------------------|----------------------|---------------------|---------------------|--------------------|---------------------|--------------------|
| PS Confidence (1-5) | -2.759*** (0.811) | -2.155** (0.973) | | | | |
| PS Stress (1-5) | | | 2.291*** (0.757) | 1.711** (0.864) | | |
| PSA (standardized) | | | | | 3.232*** (0.908) | 2.678** (1.109) |
| Female | 0.895 (1.786) | 1.808 (2.009) | 0.519 (1.827) | 1.496 (2.023) | 0.442 (1.803) | 1.559 (2.009) |
| Extraversion | | -1.087 (1.199) | | -1.464 (1.153) | | -0.999 (1.195) |
| Agreeableness | | -0.247 (0.974) | | -0.345 (0.980) | | -0.348 (0.975) |
| Conscientiousness | | -1.462 (0.995) | | -1.392 (0.999) | | -1.410 (0.994) |
| Emotional Stability | | 0.517 (1.032) | | 0.650 (1.046) | | 0.693 (1.039) |
| Openness | | -1.051 (0.895) | | -1.019 (0.900) | | -0.968 (0.896) |
| Honesty-Humility | | -0.263 (0.923) | | -0.257 (0.926) | | -0.234 (0.922) |
| Competitiveness | | -0.654 (1.013) | | -0.862 (1.013) | | -0.753 (1.009) |
| Risk Tolerance | | -0.417 (1.038) | | -0.458 (1.040) | | -0.398 (1.036) |
| Confidence | | 0.767 (1.111) | | 0.822 (1.117) | | 0.852 (1.112) |
| <i>N</i> | 209 | 209 | 209 | 209 | 209 | 209 |

Note: Coefficients are from Tobit regressions of the minimum acceptable payment as the outcome variable. Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

payment. Conversely, moving up one step on the stress scale is associated with a 2.3 Euro increase in the chosen minimum payment. In column 5, we combine the two survey questions into a single standardized measure, which we refer to as PSA or Public Speaking Aversion.¹⁸ A one standard deviation increase in PSA is associated with a 3.2 Euro increase in the chosen minimum payment (28 percent of a standard deviation).

In columns 2, 4 and 6 we additionally control for a range of established individual traits and preferences: the six HEXACO traits, general confidence, competitiveness, and risk tolerance (all control variables are standardized for ease of comparison). The coefficients for our three public speaking aversion measures remain statistically significant. Most importantly, PSA is a better predictor of the chosen minimum payment than any of the other traits, including extraversion. Also, while PSA strongly and significantly predicts the incentivized choice conditional on all other traits, this is not the case for extraversion. This indicates that public speaking aversion is a separate preference that is not captured by extraversion or other established personality traits and preferences. Table A2 in the appendix displays the bivariate correlations for each pair of traits. Extraversion, emotional stability, openness, competitiveness, confidence and risk tolerance are all negatively correlated with PSA.

¹⁸PSA is calculated as PS Stress minus PS Confidence and then standardized to have mean zero and standard deviation one.

Finally, we turn to the question of whether public speaking aversion varies by gender (De Paola et al., 2020). Women chose minimum payments that were 1.40 Euros higher on average, a small difference that is not statistically significant (two-tailed t-test; $p=0.40$). Figure A1 in the appendix displays the distribution shown in Figure 1 separately for men and women. Although women were about twice as likely to have selected the highest payment of 40 Euros, the overall distribution does not significantly differ between men and women (two-sample Kolmogorov-Smirnov test; $p=0.80$). On the other hand, women self-report higher levels of public speaking aversion in the two survey questions. On a scale from 1 to 5, women rated their public speaking ability 0.32 points lower (ranksum test; $p=0.04$) and public speaking stress levels 0.56 higher (ranksum test; $p<0.01$).¹⁹

3.2 Classroom experiment

In our lecture-hall experiment, we want to check whether our lab result of wide-spread public speaking aversion translates to a more natural and higher-stakes setting. A total of 285 students started the experiment by filling in their student number on our Qualtrics welcome screen, which represents the majority of students who attended the lecture. Out of these, 253 students completed the entire experiment including 108 in the Presentation treatment and 145 in the Essay treatment. Attrition during the survey was significantly higher for students in the Presentation treatment (16% vs 7%; Fischer’s exact test; $p=0.02$). The higher drop-out rate for the Presentation treatment could indicate that some students were not willing to present even for 500 Euros and therefore saw no point in continuing to fill in the questionnaire. This differential attrition could bias down the estimated premium students require to present relative to writing an essay. In some specifications we therefore include the dropouts and group them with participants who chose a minimum payment above 500, using tobit regressions to take censoring into account.

The distributions of the requested minimum payment in the two treatments are shown in Figure 4. Participants in the Presentation treatment requested significantly higher minimum payments compared to participants in the Essay treatment (two-sample t-test; $p<0.01$).

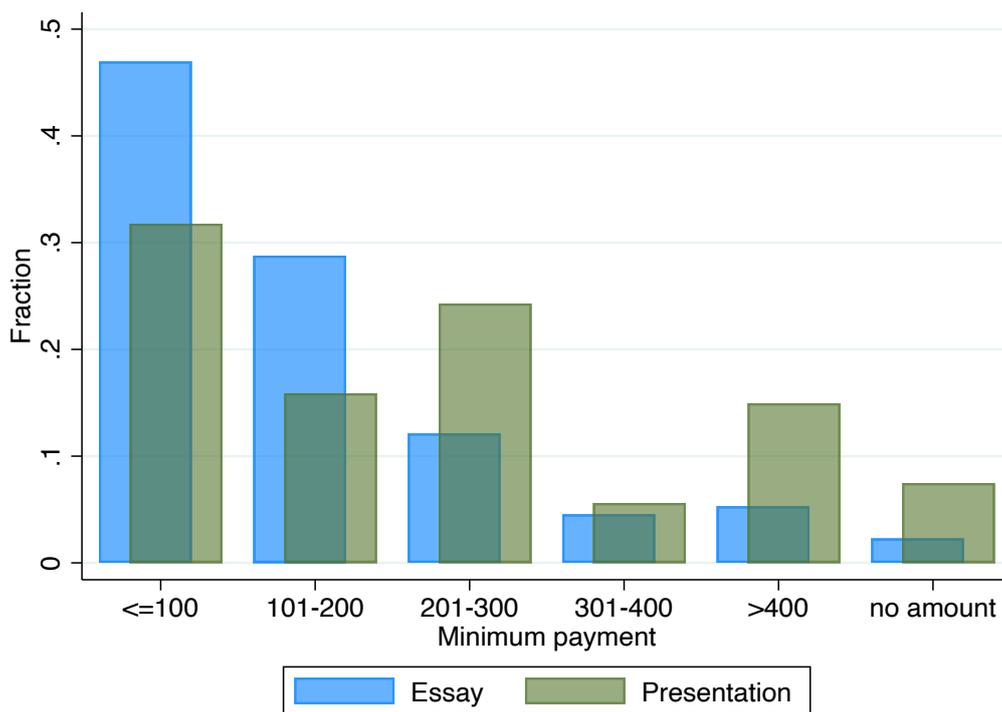
In Table 2, we confirm this result using tobit regressions.²⁰ Depending on the specification, participants asked for 58 to 79 Euros more in the Presentation treatment compared to the Essay treatment. Column 1 includes the entire sample of participants, including those who dropped out after reading the instructions (and whose minimum payment we set to the censored amount of 501). Column 2 excludes participants who dropped out before choosing a minimum payment and column 3 excludes participants who answered the test question about the BDM mechanism incorrectly. In column 4, we additionally control for self-reported English proficiency.²¹ Regardless of sample choice, we always find that students in the Presentation treatment asked for a significantly higher compensation than students in the Essay treatment. In column 5, we examine whether women are more averse to giving a presentation in front of the class compared to men (De Paola et al., 2020). The coefficient estimate for the *Female*Presentation* interaction shows that women did not ask for a higher premium for the

¹⁹The women who gave a presentation were not seen as more stressed than their male counterparts by audience members. Note, though, that this is a selected sub-sample because participants who chose a lower minimum payment were more likely to give a presentation and audience scores are only available for those who presented. Women’s stress levels scored 0.245 higher on a scale from 1 to 10, with a standard error of 0.299.

²⁰The minimum required payment is censored at 0 and 500. Participants could enter amounts above 500, leading to a zero probability of having to present or write the essay. We set all amounts above 500 to the censored amount of 501.

²¹There is a further drop in the number of observations because some participants who chose a minimum payment did not complete the questionnaire.

Figure 4: Distribution of the minimum acceptable payment for presenting and writing an essay in the classroom experiment



Note: Minimum payment requested (in Euros) by treatment. This figure shows how often a minimum payment was selected. *No amount* refers to participants who dropped out after reading the instructions.

presentation task.²²

3.3 Student Survey

The student surveys were conducted in several waves during the academic year 2018-2019 and aimed at the cohort of first-year economics and business students at the University of Amsterdam. 1050 students answered the public speaking related questions and 915 students gave a rank to each of the 12 career options. The two questions were asked in separate waves and our analysis will be based on the 641 students who answered both questions completely, including 421 Business Administration majors and 220 Economics and Business Economics majors.²³ In accordance with other questions asked in the same surveys, answers to our public speaking questions were on a scale from 0 to 10, rather than 1 to 5 as in the lab. Figure 5 shows histograms for each of the two questions. As in the lab, the answers to the stress question are more evenly spread out across all answer options whereas the answers to the confidence question are bunched between 6 and 8 for roughly half of the respondents.

To investigate whether public speaking aversion matters for career choice, we correlate our public speaking questions with the public speaking intensity of the students' career rankings (see Section

²²We also conducted a post-experimental questionnaire where we elicited our two public speaking questions. The correlations of the survey items with the minimum acceptable payment are -0.29 ($p < 0.01$) for public speaking confidence, 0.09 for public speaking stress ($p = 0.36$), and 0.20 ($p = 0.04$) for our combined measure of public speaking aversion. The classroom experiment is less suitable than the lab experiment for validating the questions for several reasons. First, to minimize dropout, we elicited the questions after the experiment (rather than before as in the lab), which means that both the treatment and participants' choices might influence the answers. Second, not all participants completed the questionnaire, which might lead to selectivity.

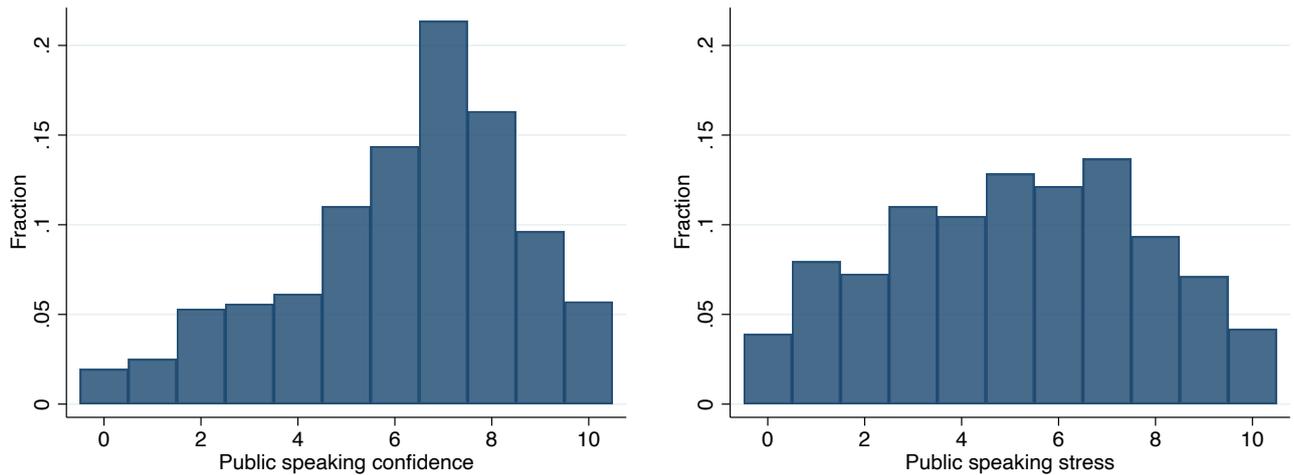
²³Excluded from the analysis are 23 Fiscal Economics students, who represent less than 3 percent of survey participants and who participate in a highly specialized program which prepares them for a different and restricted set of careers.

Table 2: Impact of the presentation treatment in the classroom

| | (1) | (2) | (3) | (4) | (5) |
|--|---------------------|---------------------|---------------------|---------------------|---------------------|
| Presentation | 78.61*** (21.04) | 57.69*** (19.28) | 61.40*** (20.12) | 65.30*** (20.17) | 72.75*** (26.57) |
| Female | 5.83 (21.19) | -2.88 (19.40) | 2.01 (20.16) | -0.33 (19.93) | 7.11 (26.39) |
| Female*Presentation | | | | | -17.40 (40.44) |
| Control for English proficiency | No | No | No | Yes | Yes |
| Excludes incorrect test question responses | No | No | Yes | Yes | Yes |
| Excludes missing responses | No | Yes | Yes | Yes | Yes |
| <i>N</i> | 285 | 270 | 228 | 215 | 215 |

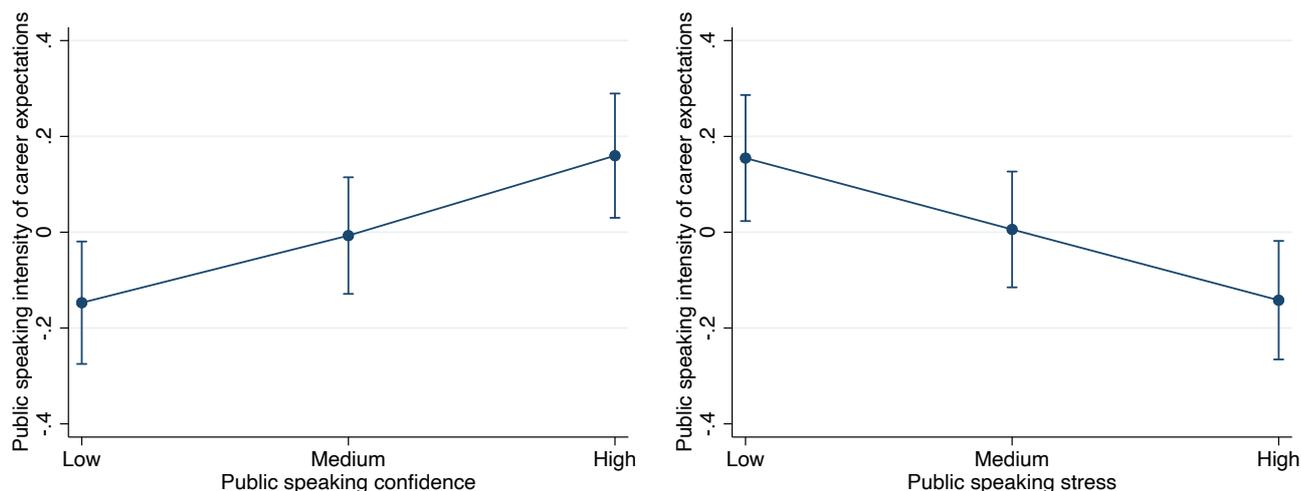
Note: Coefficients are from tobit regression with the chosen minimum payment as the outcome, censored at 501 euros. Missing responses are assigned the value of 501 in column 1. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Figure 5: Distribution of answers to the two survey questions in the student survey



Note: The histograms show the proportion of participants who picked each of five possible answer options to the two survey questions on public speaking preferences, where 0 indicates the least agreement and 10 indicates the most agreement. “Public speaking confidence” refers to the question “I am good at presenting in front of a group” and “Public speaking stress” refers to the question “I find presenting in front of a group stressful”.

Figure 6: Public speaking aversion and public speaking intensity of career expectations



Note: Students are divided into three equally-sized groups according to their answers to the two survey questions. The graphs show the average of our standardized measure of the public speaking intensity of the career expectations of the students in each group. Error bars show 95-percent confidence intervals based on robust standard errors from a regression of public speaking intensity on dummies for each of the three groups.

2 for a description of how we calculate the public speaking intensity of the career rankings). The raw correlation between the standardized public speaking intensity of the career expectations and the survey questions is 0.13 for public speaking confidence and -0.11 for public speaking stress ($p < 0.01$ in both cases). In the two graphs in Figure 6, we divide the students into three roughly equally sized groups based on their answers to the two survey questions. The graphs show the average standardized public speaking intensity of the career expectations for students in each group. The one-third most confident students expect to choose careers that are 31 percent of a standard deviation more public speaking intense compared to the one-third least confident students. Similarly, the one-third most stressed students expect to choose careers that are 30 percent of a standard deviation less public speaking intense compared to the one-third least stressed students.

In Table 3, we further explore the link between public speaking aversion and career expectations using OLS regressions. In columns 1 and 2, we confirm that students' answers to both questionnaire items significantly predict the public speaking intensity of their career expectations. In column 3, we again combine our two survey questions into a single measure of public speaking aversion (PSA), which we standardize for ease of interpretation. A one standard deviation increase in PSA is associated with a decrease in the public speaking intensity of career preferences of 15 percent of a standard deviation. In columns 4 and 5, we additionally control for other individual traits and preferences. In column 4, we focus on extraversion. Although extraversion is significantly positively correlated with the public speaking intensity of the job ranking, the coefficient on our public speaking aversion measure remains large and precisely estimated, again indicating that public speaking aversion and extraversion are at least partially distinct. In column 5, we add the remaining Big 5 traits plus competitiveness, risk tolerance and general confidence. The coefficient for PSA shrinks slightly.

In Figure A2 in the appendix, we show how PSA is associated with preferences for each of the 12 individual careers. Each plot shows the coefficient on our standardized PSA measure from a regression of the ranking students gave to a particular career option on PSA controlling for gender and study major. The careers are ordered by public speaking intensity. Additionally, in the three

Table 3: Effect of public speaking preferences on public speaking intensity of career expectations

| | (1) | (2) | (3) | (4) | (5) |
|--|---------------------|----------------------|----------------------|---------------------|--------------------|
| Presentation confidence (0-10) | 0.061*** (0.017) | | | | |
| Presentation stress (0-10) | | -0.047*** (0.015) | | | |
| PSA (standardized) | | | -0.150*** (0.041) | -0.107** (0.045) | -0.082* (0.047) |
| Extraversion (standardized) | | | | 0.097** (0.043) | 0.082* (0.048) |
| Female | 0.038 (0.082) | 0.028 (0.084) | 0.044 (0.084) | 0.038 (0.083) | 0.043 (0.096) |
| Controls for: | | | | | |
| Study major | Yes | Yes | Yes | Yes | Yes |
| Big 5, competitiveness, risk seeking and confidence | No | No | No | No | Yes |
| <i>N</i> | 641 | 641 | 641 | 641 | 641 |

Note: Coefficients are from OLS regressions where the outcome variable is our measure of the public speaking intensity of career expectations. Robust standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

right-most plots, we group the career options into three categories: high public speaking (academia, entrepreneur, sales and consulting), medium public speaking (front office, business analyst, researcher in the public sector and investment banking), and low public speaking (management trainee, data analyst, accounting and back office).

Students with higher public speaking aversion are significantly less attracted to careers with high public speaking requirements, with the negative correlation being strongest for consulting. They are also significantly more attracted to careers with low public speaking requirements, in particular data analyst and back office careers. Finally, public speaking aversion is unrelated to the ranking of careers with medium public speaking requirements.

4 Conclusions

In this paper, we establish public speaking aversion as an economically relevant preference. We measure public speaking aversion at the individual level using both incentivized experiments and self-reported questionnaire items which can be applied in large-scale surveys. Our results indicate that a majority of people is averse to speaking in public. We also show that, in a sample of economics and business student, the extent to which someone is averse to public speaking is a significant predictor of career expectations. We further show that individual preferences for speaking in public are not fully captured by a range of other preferences and traits including the big five personality traits, risk seeking, confidence and competitiveness.

In our experiments, we show that a significant share of participants are willing to give up large amounts of money to avoid giving a short presentation. We also use the incentivized choices in the lab to validate two survey items which elicit public speaking aversion. We then use these items to elicit public speaking aversion in a survey of business and economics students and show that it predicts their career plans. In particular, public speaking averse individuals avoid public-speaking intensive careers such as consulting and are more attracted to careers in which public speaking plays a minor role, such as data analyst or back office positions.

Being able to measure public speaking aversion through survey items is particularly important because contrary to other preferences, such as risk and time preferences, public speaking aversion cannot be elicited in an incentivized way through questionnaires. Researchers can use our validated survey items to elicit public speaking aversion in large-scale surveys where it can be linked to survey or registry data on labor market outcomes.

An important question is how public speaking aversion changes over the life cycle and how it is shaped by experience. This could be addressed in future research by including our survey items in panel surveys. Finally, it will be interesting to investigate how easy or difficult it is to overcome one's aversion to speaking in public through deliberate practice or interventions and whether (some) individuals overestimate the cost of achieving this, thereby forgoing valuable opportunities.

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5 Appendix

Table A1: Careers scored on public speaking requirements and starting wage

| | Public Speaking requirement rank |
|----------------------------------|----------------------------------|
| Academia | 12 |
| Entrepreneur | 11 |
| Sales | 10 |
| Consulting | 9 |
| Front Office | 8 |
| Business Analyst | 7 |
| Researcher at public institution | 6 |
| Investment Banking | 5 |
| Management trainee | 4 |
| Data Analyst | 3 |
| Accounting | 2 |
| Back Office | 1 |
| N | 200 |

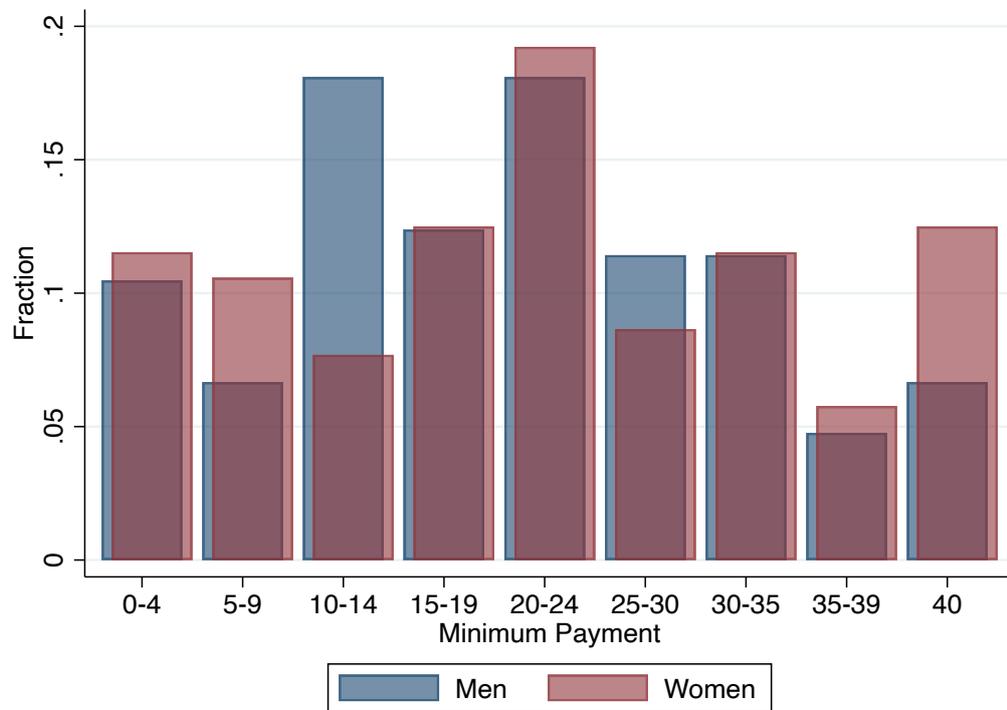
Careers were scored on public speaking requirements by Prolific participants. Higher rank means careers where public speaking is more important.

Table A2: Correlation between PSA and other preferences and traits

| | PS conf. | PS stress | PSA | Extra. | Agree. | Consc. | Emo. Stab. | Open. | Honesty. | Competitive. | Risk Tol. | Confidence |
|---------------------|----------|-----------|-------|--------|--------|--------|------------|-------|----------|--------------|-----------|------------|
| PS confidence | 1.00 | | | | | | | | | | | |
| PS stress | -0.65 | 1.00 | | | | | | | | | | |
| PSA | -0.90 | 0.92 | 1.00 | | | | | | | | | |
| Extraversion | 0.55 | -0.47 | -0.56 | 1.00 | | | | | | | | |
| Agreeableness | -0.02 | 0.03 | 0.03 | 0.05 | 1.00 | | | | | | | |
| Conscientiousness | 0.04 | -0.04 | -0.04 | 0.11 | -0.17 | 1.00 | | | | | | |
| Emotional Stability | 0.25 | -0.32 | -0.31 | 0.26 | 0.15 | -0.17 | 1.00 | | | | | |
| Openness | 0.11 | -0.14 | -0.14 | 0.05 | -0.12 | -0.04 | 0.02 | 1.00 | | | | |
| Honesty-Humility | -0.06 | 0.06 | 0.07 | -0.10 | 0.18 | 0.07 | -0.08 | -0.01 | 1.00 | | | |
| Competitiveness | 0.23 | -0.15 | -0.21 | 0.26 | -0.29 | 0.20 | 0.04 | -0.02 | -0.13 | 1.00 | | |
| Risk Tolerance | 0.24 | -0.22 | -0.25 | 0.22 | -0.03 | -0.26 | 0.25 | 0.12 | -0.13 | 0.28 | 1.00 | |
| Confidence | 0.36 | -0.34 | -0.39 | 0.55 | 0.07 | 0.12 | 0.19 | 0.01 | -0.13 | 0.25 | 0.30 | 1.00 |

Correlation matrix of public speaking aversion measures and other personality traits. All measures are standardized.

Figure A1: Distribution of willingness to present in the lab experiment by gender



Minimum payment requested (in Euros) by gender. Includes data from 105 males and 104 female speakers.

Figure A2: Effect of public speaking aversion on ranking of careers

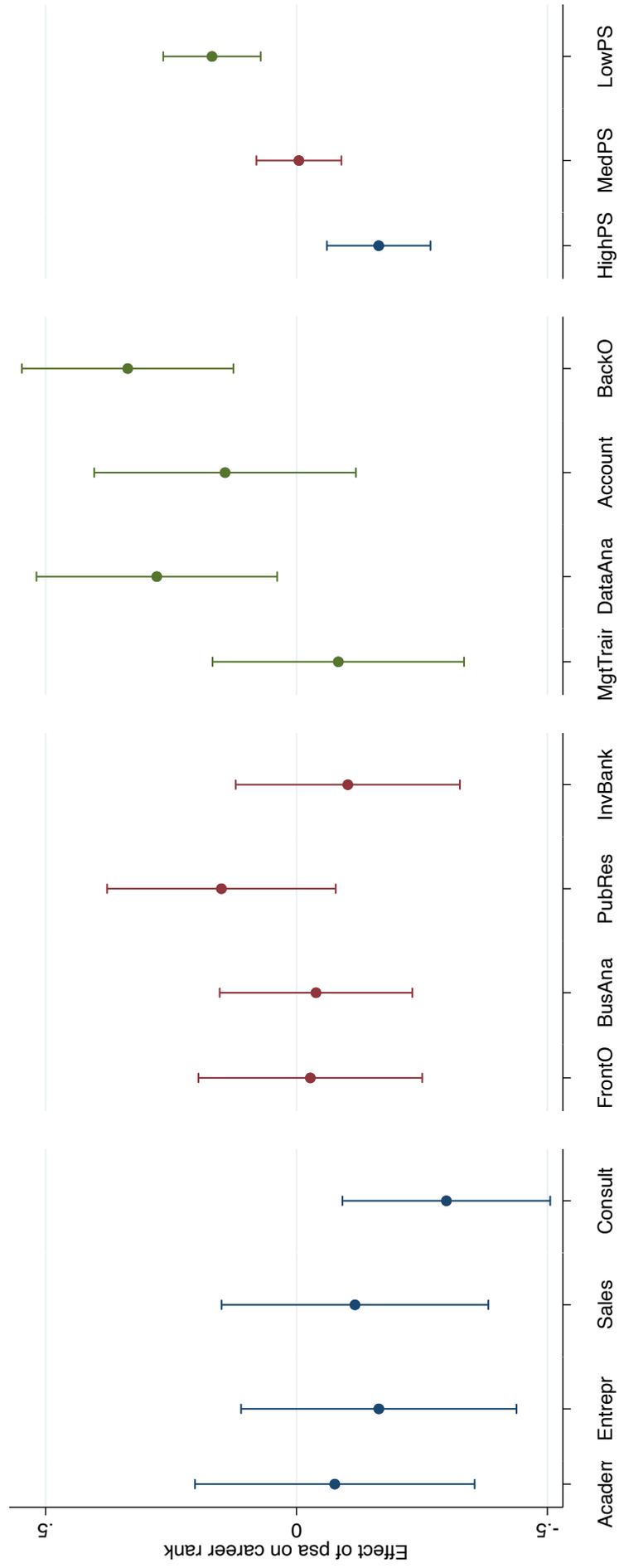


Figure A3: Instructions lab experiment

Welcome!

This experiment consists of two parts. The first part contains a questionnaire, which takes approximately 15-20 minutes to complete. The rest of the experiment will be explained at the start of the second part. Click on the "OK" button at the bottom right of the screen to continue.

Please enter your participant number:

What is your gender? Male
 Female

How old are you?

What is your native language (mother tongue)? You can enter multiple native languages here

What is your proficiency in English? Very bad Very good

What is your major?

What year are you in? 1st year Bachelor
 2nd year Bachelor
 3rd year Bachelor
 1st year Master
 2nd year Master
 Other

How do you see yourself: are you generally a person who is fully prepared to take risks or do you try to avoid taking risks?

0=Not at all willing to take risks; 10=Very willing to take risks 0 ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ 10

How competitive are you?

0=Not at all competitive; 10=Very competitive 0 ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ 10

How much do you agree or disagree with the following statement: I have confidence in my abilities

0=Strongly disagree; 10=Strongly agree 0 ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ 10

OK

On the following pages you will find a series of statements about you. Please read each statement and decide how much you agree or disagree with that statement.

There are 62 statements in total, spread over 6 screens. It usually takes less than 15 minutes to complete this questionnaire.

Your answers will not affect the payment you receive at the end of this experiment.

OK

Please read each statement and decide how much you agree or disagree with that statement.

- I would be quite bored by a visit to an art gallery 1 ○ ○ ○ ○ ○ 5
- I plan ahead and organize things, to avoid scrambling at the last minute 1 ○ ○ ○ ○ ○ 5
- I find presenting in front of a group stressful 1 ○ ○ ○ ○ ○ 5
- I rarely hold a grudge, even against people who have badly wronged me 1 ○ ○ ○ ○ ○ 5
- I feel reasonably satisfied with myself overall 1 ○ ○ ○ ○ ○ 5
- I would feel afraid if I had to travel in bad weather conditions 1 ○ ○ ○ ○ ○ 5
- I wouldn't use flattery to get a raise or promotion at work, even if I thought it would succeed 1 ○ ○ ○ ○ ○ 5
- I'm interested in learning about the history and politics of other countries 1 ○ ○ ○ ○ ○ 5
- I often push myself very hard when trying to achieve a goal 1 ○ ○ ○ ○ ○ 5
- People sometimes tell me that I am too critical of others 1 ○ ○ ○ ○ ○ 5
- I rarely express my opinions in group meetings 1 ○ ○ ○ ○ ○ 5

Key:

1: Strongly disagree 2: Disagree 3: Neutral (neither agree nor disagree) 4: Agree 5: Strongly agree

OK

Please read each statement and decide how much you agree or disagree with that statement.

- I sometimes can't help worrying about little things 1 ○ ○ ○ ○ ○ 5
- If I knew that I could never get caught, I would be willing to steal a million dollars 1 ○ ○ ○ ○ ○ 5
- I would enjoy creating a work of art, such as a novel, a song, or a painting 1 ○ ○ ○ ○ ○ 5
- When working on something, I don't pay much attention to small details 1 ○ ○ ○ ○ ○ 5
- People sometimes tell me that I'm too stubborn 1 ○ ○ ○ ○ ○ 5
- I prefer jobs that involve active social interaction to those that involve working alone 1 ○ ○ ○ ○ ○ 5
- When I suffer from a painful experience, I need someone to make me feel comfortable 1 ○ ○ ○ ○ ○ 5
- Having a lot of money is not especially important to me 1 ○ ○ ○ ○ ○ 5
- I think that paying attention to radical ideas is a waste of time 1 ○ ○ ○ ○ ○ 5
- I make decisions based on the feeling of the moment rather than on careful thought 1 ○ ○ ○ ○ ○ 5

Key:

1: Strongly disagree 2: Disagree 3: Neutral (neither agree nor disagree) 4: Agree 5: Strongly agree

OK

Please read each statement and decide how much you agree or disagree with that statement.

- People think of me as someone who has a quick temper 1 ○ ○ ○ ○ ○ 5
- I am good at presenting in front of a group 1 ○ ○ ○ ○ ○ 5
- On most days, I feel cheerful and optimistic 1 ○ ○ ○ ○ ○ 5
- I feel like crying when I see other people crying 1 ○ ○ ○ ○ ○ 5
- I think that I am entitled to more respect than the average person is 1 ○ ○ ○ ○ ○ 5
- If I had the opportunity, I would like to attend a classical music concert 1 ○ ○ ○ ○ ○ 5
- When working, I sometimes have difficulties due to being disorganized 1 ○ ○ ○ ○ ○ 5
- My attitude toward people who have treated me badly is "forgive and forget" 1 ○ ○ ○ ○ ○ 5
- I feel that I am an unpopular person 1 ○ ○ ○ ○ ○ 5
- When it comes to physical danger, I am very fearful 1 ○ ○ ○ ○ ○ 5
- If I want something from someone, I will laugh at that person's worst jokes 1 ○ ○ ○ ○ ○ 5

Key:

1: Strongly disagree 2: Disagree 3: Neutral (neither agree nor disagree) 4: Agree 5: Strongly agree

OK

Please read each statement and decide how much you agree or disagree with that statement.

- I've never really enjoyed looking through an encyclopedia 1 ○ ○ ○ ○ ○ 5
- I do only the minimum amount of work needed to get by 1 ○ ○ ○ ○ ○ 5
- I tend to be lenient in judging other people 1 ○ ○ ○ ○ ○ 5
- In social situations, I'm usually the one who makes the first move 1 ○ ○ ○ ○ ○ 5
- I worry a lot less than most people do 1 ○ ○ ○ ○ ○ 5
- I would never accept a bribe, even if it were very large 1 ○ ○ ○ ○ ○ 5
- People have often told me that I have a good imagination 1 ○ ○ ○ ○ ○ 5
- I always try to be accurate in my work, even at the expense of time 1 ○ ○ ○ ○ ○ 5
- I am usually quite flexible in my opinions when people disagree with me 1 ○ ○ ○ ○ ○ 5
- The first thing that I always do in a new place is to make friends 1 ○ ○ ○ ○ ○ 5

Key:

1: Strongly disagree 2: Disagree 3: Neutral (neither agree nor disagree) 4: Agree 5: Strongly agree

OK

Please read each statement and decide how much you agree or disagree with that statement.

- I can handle difficult situations without needing emotional support from anyone else 1 ○ ○ ○ ○ ○ 5
- I would get a lot of pleasure from owning expensive luxury goods 1 ○ ○ ○ ○ ○ 5
- I like people who have unconventional views 1 ○ ○ ○ ○ ○ 5
- I make a lot of mistakes because I don't think before I act 1 ○ ○ ○ ○ ○ 5
- Most people tend to get angry more quickly than I do 1 ○ ○ ○ ○ ○ 5
- Most people are more upbeat and dynamic than I generally am 1 ○ ○ ○ ○ ○ 5
- I feel strong emotions when someone close to me is going away for a long time 1 ○ ○ ○ ○ ○ 5
- I want people to know that I am an important person of high status 1 ○ ○ ○ ○ ○ 5
- I don't think of myself as the artistic or creative type 1 ○ ○ ○ ○ ○ 5
- People often call me a perfectionist 1 ○ ○ ○ ○ ○ 5

Key:

1: Strongly disagree 2: Disagree 3: Neutral (neither agree nor disagree) 4: Agree 5: Strongly agree

OK

Please read each statement and decide how much you agree or disagree with that statement.

- Even when people make a lot of mistakes, I rarely say anything negative 1 ○ ○ ○ ○ ○ 5
- I sometimes feel that I am a worthless person 1 ○ ○ ○ ○ ○ 5
- Even in an emergency I wouldn't feel like panicking 1 ○ ○ ○ ○ ○ 5
- I wouldn't pretend to like someone just to get that person to do favors for me 1 ○ ○ ○ ○ ○ 5
- I find it boring to discuss philosophy 1 ○ ○ ○ ○ ○ 5
- I prefer to do whatever comes to mind, rather than stick to a plan 1 ○ ○ ○ ○ ○ 5
- When people tell me that I'm wrong, my first reaction is to argue with them 1 ○ ○ ○ ○ ○ 5
- When I'm in a group of people, I'm often the one who speaks on behalf of the group 1 ○ ○ ○ ○ ○ 5
- I remain unemotional even in situations where most people get very sentimental 1 ○ ○ ○ ○ ○ 5
- I'd be tempted to use counterfeit money, if I were sure I could get away with it 1 ○ ○ ○ ○ ○ 5

Key:

1: Strongly disagree 2: Disagree 3: Neutral (neither agree nor disagree) 4: Agree 5: Strongly agree

OK

Instructions

This is an explanation of the second part of the experiment. In this part you can earn money on top of the show-up fee of 7 euros. It works as follows.

You will be given the option to give a presentation of 5 minutes for a bonus payment. The payment you receive will be determined by the computer, but you decide whether you want to give the presentation for this payment. First you are asked to enter the minimum payment for which you would like to give the presentation of 5 minutes. You do this by choosing a payment between 0 and 40 euros. Then you will be given 20 minutes to prepare for the presentation. You have to use the 20 minutes for preparation regardless of the minimum payment you choose.

The topic of the presentation is revealed at the start of the 20 minutes. It is unlikely that you will know the topic well, but you are allowed to use the internet during preparation. There is sufficient information on wikipedia and other websites. The presentation is given in front of an audience of approximately 6 jury members. They will score your presentation, but your scores will not be revealed to you.

You are allowed to use your own mobile phones to look for information on the internet. You can also ask for a tablet computer to access the internet. During the presentation you are not allowed to use notes.

After the preparation time the computer determines whether you will have to give your presentation. The computer will randomly choose a number between 0 and 40.

- 1) If the minimum payment you chose is higher than the number generated by the computer, you will not be asked to give your presentation. You will also not receive the bonus payment.
- 2) If the minimum payment you chose is equal or lower than the number generated by the computer, you will have to give your presentation. You will receive the randomly generated number (in euros) as payment.

You are not allowed to change your choice after you enter your minimum payment. You will receive only the show-up fee if you do not give the presentation and the show-up fee plus the bonus payment if you do present.

The next question will check whether you understood the explanations of the experiment correctly. Please read the instructions above carefully before you continue.

OK

This question checks whether you understood the explanations of the experiment correctly.

Assume that you chose a minimum payment of 10 euros and the computer randomly generated the number 18. Which of the following statements would be correct?

- I do not have to give a presentation and do not receive a bonus payment
- I have to give the presentation and receive a bonus payment of 10 euros
- I have to give the presentation and receive a bonus payment of 18 euros
- I have to give the presentation and receive a bonus payment of 40 euros

OK

Assume that you chose a minimum payment of 10 euros and the computer randomly generated the number 18. Which of the following statements would be correct?

Correct answer: I have to give the presentation and receive a bonus payment of 18 euros

The answer you selected was **correct**.

OK

After the preparation time of 20 minutes the computer will randomly generate a number between 0 and 40.

- 1) If the minimum payment you chose is higher than the number generated by the computer, you will not be asked to give your presentation. You will also not receive the bonus payment.
- 2) If the minimum payment you chose is equal or higher than the number generated by the computer, you will have to give your presentation. You will receive **the randomly generated number** (in euros) as payment.

What is the minimum payment (in euros) you want for giving the presentation? (Choose a number between 0 and 40)

OK

Presentation instructions and preparation

You have 20 minutes to prepare a presentation. The presentation must be exactly 5 minutes. After 20 minutes you will automatically advance to the next screen.

The topic of the presentation is the **German emperor Otto I the great**. Google and wikipedia can be used for the preparation.

You are allowed to use your own phone to find information on the internet. You can also ask for a tablet to access the internet. Please raise your hand if you need a tablet.

The randomly generated number is: **27 euros**

The minimum payment you wanted for the presentation is: **20 euros**

You now have to give a presentation of 5 minutes. On top of the show-up fee of 7 euros you will also receive a bonus payment of 27 euros for the presentation. Please raise your hand to indicate that you finished this part of the experiment.

Please do not continue to the next screen

End experiment