
Reputational Concerns and Advice-Seeking at Work

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Abstract

We examine the impact of reputational concerns on seeking advice. While seeking can improve performance, it may affect how others perceive the seeker's competence. In an online experiment with white-collar professionals (N=2,521), we test how individuals navigate this tradeoff and if others' beliefs about competence change it. We manipulate visibility of the decision to seek and stereotypes about competence. Results show a sizable and inefficient decline in advice-seeking when visible to a manager. Higher-order beliefs about competence cannot mediate this inefficiency. We find no evidence that managers interpret advice-seeking negatively, documenting a misconception that may hinder knowledge flows in organizations.

Keywords: advice-seeking, reputational concerns, stereotypes, higher-order beliefs, knowledge flows, experiment

JEL codes: J16, J24, D83, D91, M51

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1. Introduction

In the workplace, individuals engage in various activities to manage their reputation by signaling attributes like motivation, dedication, or competence (e.g., Anger, 2008; Campbell and Hahl, 2022). This study focuses on the decision to forego an individually beneficial action to potentially enhance one's perceived competence in the eyes of others, specifically, the decision to seek advice. Seeking advice at work is an important way to learn and to improve. While it facilitates knowledge flows that are crucial for firm productivity (Garicano, 2000; Sandvik et al., 2020) people often fail to seek advice (Lee, 2002; Lee, 1997). We investigate whether reputational concerns contribute to this and ask: do individuals strategically forego the information benefit of advice to appear more competent?

When trading off the information benefit of advice against its expected reputational cost, others' beliefs about competence could amplify or mute perceptions of the cost. Beliefs about competence are oftentimes rooted in stereotypes (Coffman, 2014; Bordalo et al., 2019) with documented impacts on important economic choices such as hiring and performance evaluations (Reuben et al., 2014; Coffman et al., 2021; Barron et al., 2022; Campos-Mercade and Mengel, 2023; Bohren et al., 2019; Sarsons, 2019).¹ People rely on stereotypes the most when competence is uncertain, for example, at a new job. This coincides with a point in time when the information value of advice is particularly large. Hence, we investigate whether others' beliefs about competence affect workplace behavior that may be interpreted as a negative signal of competence. How individuals respond to others' stereotypical beliefs about competence is the next step to understanding how such perceptions influence economic behavior and outcomes. We are the first to consider if anticipating others' stereotypical beliefs about competence changes behavior in the workplace when identity is known.

We conducted a large-sample (N=2,521) artefactual field experiment with white-collar professionals ("Employees") and professionals with managerial experience ("Managers") to establish a causal relationship between the propensity to seek advice and potential reputational concerns. Employees answer a general knowledge quiz for a piece-rate. Thereafter, they have the option to seek computerized advice which simplifies but not

¹While all these studies document stereotypical beliefs about competence connected to gender, they can be linked to other salient group characteristics such as, for example, age, ethnicity or socioeconomic status.

solves the quiz, preserving the Employees' agency over the final answer.² The experiment manipulates two dimensions. First, we vary whether the decision to seek advice is visible to a Manager, who estimates the Employee's independent performance in the quiz based on a short profile. This estimate determines the size of a substantial bonus that the Employee obtains. Second, we vary the topic of the quiz—"Science & Technology" or "Psychology & Linguistics"—to probe how others' stereotypical beliefs about competence affect the decision to visibly seek advice.

Our results demonstrate that reputational concerns hinder knowledge flows, as the rate of advice-seeking decreases by 16 percent when the choice is visible to the Manager. Employees refrain from seeking advice when it is visible, despite the potential for performance improvement and increased payment. Interestingly, we find little evidence that others' stereotypical beliefs about competence influence how individuals weigh the information benefit of advice against reputational concerns on average. If anything, the estimates, though insignificant, point in the direction that professionals may be more reluctant to visibly seek advice when it conflicts with an advantageous competence stereotype. We document significant heterogeneity in the expected reputational cost of seeking advice, ranging from perceiving substantial costs to substantial benefits. However, our analysis of managers' data reveals no actual, economically meaningful reputational cost or benefit associated with seeking advice. Taken together, our findings highlight widespread misperceptions concerning the reputational consequences of advice-seeking among professionals. Correcting them could foster knowledge exchange and learning.

Our empirical strategy offers several key advantages to address our research questions. First, the artefactual field experiment allows us to uncover whether individuals are willing to forego the benefit of advice due to reputational concerns. To achieve this, we simplify the complex interaction of advice-seeking and -giving, while initially holding constant other mediating factors like advisor characteristics, advice quality, or type. Moreover, we focus on the information benefit of seeking advice, excluding other purposes such as relationship-building or networking and initially limiting, by design, the potentially positive signaling value that seeking can have.³ This streamlined decision environment can

²Agency over decisions has been described as the key feature that distinguishes advice from other forms of help (see Brooks et al., 2015).

³Advice-seeking at work could also be perceived positively, as a sign of self-awareness or self-assuredness. Given our research questions, we decided to abstract from this additional potential benefit to seeking advice. We think that introducing it would be a very relevant and interesting extension of this study. In principle, this experiment's measure of the expected reputational cost to seeking advice does also elicit an expected reputational benefit by allowing for negative values. See Section 4.3. for a description of this measure and the corresponding results.

serve as a foundation for further research on the micro-determinants of knowledge flows in organizations. Second, we can manipulate others' beliefs about an individual's competence on a task without altering the task or work environment. This allows us to investigate the causal role of (higher-order) stereotypical beliefs in influencing behavior that can be interpreted as a negative signal of competence. Third, our experimental design enables us to shed light on mechanisms, since we can precisely measure the information benefit of advice, the expected reputational cost to seeking advice and quantify beliefs about others' stereotypical beliefs about competence. Finally, by running our experiment with a sample of white-collar professionals, we consider a population that likely regularly faces a tradeoff between the information benefit of advice and perceptions of competence, due to the nature of knowledge-intensive jobs, where remuneration and career progression also depend on subjective evaluations from superiors and peers (e.g., Benson et al., 2021).

Our study contributes to three distinct literatures. First, it extends a growing body of evidence in economics and related disciplines on what determines the decision to seek advice and how it is perceived.⁴ Previous empirical work has isolated the role of social costs in the form of shame or stigma for advice-seeking (Chandrasekhar et al., 2018) and studied whether anonymity can encourage knowledge seeking on organizational platforms (Mickeler et al., 2023). Other recent studies have put a focus on the relationship between adviser and advisee, investigating homophily (Heikensten and Isaksson, 2019) and the fear of rejection when asking for help in general (Bénabou et al., 2023). Our findings highlight strategic advice-seeking, where professionals weigh the information benefit of advice against possible reputational costs. Further, our results provide first evidence that higher-order beliefs about competence cannot encourage individuals to seek advice. Turning to perceptions of advice-seeking, initial evidence is mixed as to whether it is perceived negatively or positively by others (Rosette et al., 2015; Brooks et al., 2015; Blunden et al., 2019). By jointly studying beliefs about how seeking is perceived and how it is actually perceived, our research design enables us to document widespread *misperceptions* among professionals across a variety of organizations. Our results reveal a potentially significant obstacle to knowledge flows within organizations, and they also suggest a potential solution by addressing misperceptions.

Additionally, we contribute to the literature on the behavioral implications of stereotypical perceptions of competence. Previous research has extensively documented

⁴Highlighting the importance and complexity of understanding advice at work, recent studies examine the content of advice that seekers receive (Gallen and Wasserman, 2021; Kessel et al., 2021).

the presence of gender-based stereotypes in beliefs about competence (e.g., Coffman, 2014; Bordalo et al., 2019) and their impacts on important economic decisions such as hiring or performance evaluations (Reuben et al., 2014; Bohren et al., 2019; Sarsons, 2019; Coffman et al., 2021; Barron et al., 2022; Campos-Mercade and Mengel, 2023). Understanding how individuals respond to others' stereotypical beliefs is an important area for further investigation. Initial evidence suggests that people behave strategically and attempt to act upon others' stereotypical beliefs: they conceal or misreport their gender at the hiring stage (Allston, 2019; Charness et al., 2020) and hide their ethnic minority status or affinity to LGBTQ+ to encourage others' prosocial behaviors towards them (Kudashvili and Lergetporter, 2022; Aksoy et al., 2023). We advance this nascent literature by providing first evidence whether anticipating others' stereotypical beliefs changes behavior when identity is known.

Third, we contribute to the literature investigating how reputational concerns influence workplace behavior when ability is unobservable.⁵ Reputational concerns can incentivize agents to engage in workplace activities—effort or (excessive) risk-taking—that can improve the performance measure from which ability is inferred (see e.g., the models by Gibbons and Murphy (1992) and Holmström (1999)). Theoretically, it has been argued that reputational concerns can further lead to undesirable behaviors, such as an inefficient use of new information (Prendergast and Stole, 1996), unwillingness to convey a true judgment (Morris, 2001; Ottaviani and Sorensen, 2006) or a reduced willingness to help colleagues (Auriol et al., 2002). Causal empirical evidence on how reputational concerns change workplace behavior is relatively scant. Early laboratory experiments focused on testing the incentive effect of reputational concerns (Irlenbusch and Sliwka, 2006; Koch et al., 2009). Beyond that, experiments find that reputational concerns cause individuals to opt for unnecessarily complex and risky solutions to a problem (Katok and Siemsen, 2011) or to spend too much effort on activities that can influence a superior's tenure decision (De Janvry et al., 2023). We expand this literature by showing empirically the causal impact of reputational concerns on workplace behavior that could be interpreted as a negative signal of competence.⁶

⁵The term “reputational concerns” has different meanings in different strands of the microeconomics literature. In theoretical and empirical work on relational contracting, reputation can enforce informal contracts that rely on mutual trust when formal contracts are not available.

⁶In management, there is a large literature studying impression management. Impression management manifests in explicit or implicit attempts to manage how one is perceived by others. This literature largely focuses on self-presentation and its impact on the desired outcomes such as hiring decisions, performance evaluations, and career success (Al-Shatt and Ohana, 2021). Liljenquist (2010) finds that self-promotion—

The remainder of the paper is structured as follows. In section 2, we present the research design. Section 3 introduces a conceptual framework and develops hypotheses. In section 4 we show our results and section 5 discusses them and concludes.

2. Design

To answer our research questions, we designed an artefactual field experiment. Participants took part either as an “Employee” or a “Manager”. In a simulated work environment, Employees worked on a knowledge task for a piece-rate and could decide whether to seek advice on it to improve their performance and pay. They were randomly paired with a Manager who estimated their independent task performance based on seeing the Employee’s profile. Employees’ pay increased in this estimate. The experiment has a 2x2 between-subjects design. First, we randomly varied if Employees’ advice-seeking decision was visible to the Manager (Private or Visible conditions). Second, we relied on gendered stereotypes about domains of knowledge to manipulate stereotypical perceptions of competence with the topic of the knowledge task: “Psychology & Linguistics” or “Science & Technology”. Third, we stratified recruitment by sex to ensure a balanced sample of women and men across experimental conditions.

2.1 Employee Version

Before starting with the main study, Employees answered a brief survey on demographics, education, and their labor market status (see Table A1 for descriptive statistics). Some of their answers were used as input later (see Figure 1 Panel A for a general outline of this version of the experiment).

Part 1

In Part 1, participants answered a general knowledge quiz of 10 multiple-choice questions on either of the two topics. Correct answers paid £0.10. Each question referred to a picture that was instrumental for answering correctly (see Figure A1 Panel A for an example). Participants had 30 seconds to answer each question.⁷ The combination of pictures and the time limit made it practically infeasible to search online for the correct answer. This way,

disguised as seeking advice—allows to increase others’ perceptions of warmth without affecting perceptions of competence. Feedback-seeking, a behavior which does not signal lack of competence, was frequently studied as a tool of impression management (e.g., Ashford et al., 2003).

⁷The time limit of 30 seconds was calibrated with pre-tests. It allowed participants to meaningfully consider the question.

we ensured that Employees had to rely on their knowledge to answer the quiz. We opted for a knowledge quiz to highlight the role of competence in task performance and limit the role of effort. The Part 1 score is our measure of an Employee's task competence. After finishing the quiz, Employees reported their performance belief by stating how many correct answers they thought to have provided. We incentivized these beliefs with £0.25 for a correct report. Employees did not learn their actual performance, i.e., quiz score, until they had completed the study.

Part 2

In Part 2, Employees were offered the opportunity to revisit the same quiz with the *option to seek advice*. If an Employee decided to seek advice, each question had 2 instead of the initial 5 answer options.⁸ Seeking advice on the entire quiz rather than individual questions parallels advice-seeking on complex tasks. A computer randomly selected and removed the same 3 incorrect answer options for all the advice-seekers. By computerizing advice, we eliminated the social component of seeking and reduced its non-monetary costs, for example, due to shame or fear of rejection.⁹ Yet, we gained control over the quality of advice and, importantly, *beliefs* about its quality. An Employee had 15 seconds to answer each simplified question. If their initial answer from Part 1 was among the 2 remaining answer options, it was highlighted. An Employee was free to decide whether and how to revise their initial answer (see Figure A1 Panel B for an example). This way, they retained agency in how to respond to advice. Agency over decisions has been described as the key feature that distinguishes advice from other forms of help (see Brooks et al., 2015). Advice came at a small one-time fee of £0.08, modeling the seeker's and the advice-giver's opportunity cost of time. It could help to improve Employees' performance and pay, since the chance of simply guessing correctly increased from 20% to 50%. Employees received the £0.10 piece-rate per correct answer, regardless of whether it was obtained in Part 1 or after seeking advice in Part 2. Hence, a perfect quiz score with or without advice yielded a "performance pay" of £1.00. If an Employee decided not to seek advice, they proceeded to the final questionnaire without the opportunity to revise their answers. Participants were

⁸During Part 1, participants did *not* know that they would have the possibility to revisit the quiz later. Therefore, Part 1 measured their true independent performance in the quiz.

⁹As an alternative to computerizing advice, the experiment could have used hand-selected human advice based on the answers of previous participants. The selection could have been such that the shown answer would have been correct with some (high) probability. This would have controlled participants' beliefs about the quality of advice as well. However, in the online setting of this study, the two approaches of implementing advice are very similar and both have no interaction between the advice-giver and seeker. Therefore, we opted for the simpler approach—computerized advice—that was easier to understand.

informed that they could learn the correct answers to the quiz at the end of the experiment, regardless of their decision to seek advice. Before making the decision to seek advice, participants saw an example of a screen with the question after advice to illustrate how advice is implemented¹⁰ and for 15 seconds saw the list of questions they encountered in Part 1 without the corresponding pictures. We added these features to limit the roles that curiosity or memory constraints may play for the decision to seek advice.

Employees were randomly paired with a Manager and in addition to the £0.10 piece-rate for correct answers received a “Manager’s reward”. This reward increased linearly in the Manager’s estimate of their independent quiz score without advice, which had been recorded in Part 1. The Manager’s estimate could be any number between 0 and 10 and the Employee received £0.30 times this estimate. Hence, Employees could earn a “Manager’s reward” of up to £3.00. To estimate the Employee’s initial quiz score, Managers saw a short profile of their Employee. This profile was common knowledge between the Employee and the Manager (see Panel B of Figure 1 for example profiles). Employees knew that their Manager would be a professional with reported experience in a managerial role, who would complete the Manager’s version of the study. They were blind to their Manager’s gender.

The large 3:1 ratio of “Manager’s reward” to “performance pay” intends to mirror a promotion in a real organizational setting. Managers were asked to estimate the Employees’ independent quiz performance (Part 1)—as opposed to the performance with advice—as in knowledge-intensive jobs, ability or competence is typically valued in and of itself. Moreover, assessments of competence can play an important role for promotion decisions.

Treatments

The first treatment dimension intended to manipulate the presence of reputational concerns around the decision to seek advice. We varied experimentally whether the Manager would observe the Employee’s decision to seek advice before reporting their estimate of the Employee’s independent quiz score. In the Private condition, no information on advice-seeking appeared in the Employee’s profile displayed to their Manager. In the Visible condition, this profile had an additional bullet, revealing the Employee’s decision to seek advice, for example, “She did not seek advice on the quiz.” or “He sought advice on the quiz.” See Figure 1 Panel B for examples of profiles by condition.

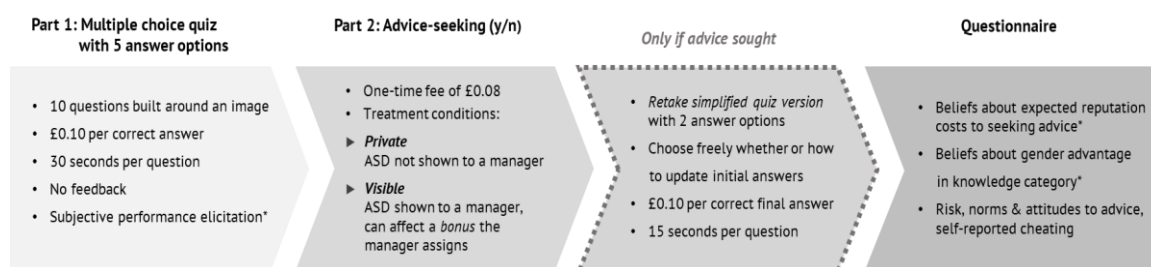
¹⁰This example question was used earlier in the instructions to illustrate the task and was not part of the 10 questions relevant for payment.

The profiles further showed the Employee's sex, their age range, country of residency, information on their education level, and the topic of the quiz that they had answered. Our recruitment strategy ensured that all aspects other than sex, quiz topic and visibility of advice were held constant across experimental conditions.¹¹ We opted for natural filler characteristics in the context of this study such as, for example, the minimum education level or current country of residence, to have sex less salient.

Before Employees decided if they wanted to seek advice, they learned that a substantial part of their payment would be determined by a Manager's estimate of their independent quiz score ("Manager's reward"). Employees also knew what information would be available to their Manager for making this estimate; they saw the profile that their Manager would also see. Employees in Visible saw two possible versions of their profile next to each other in a randomized order. The two profiles differed in the bullet about their advice-seeking behavior that would be determined by their upcoming decision.

Figure 1 Outline of the Experiment and Examples of Employees' Profiles

Panel A. General Outline of the Experiment (Employee Version)



Panel B. Examples of Employees' Profiles as Shown to the Manager

	Age range:	25 – 60 years
	Sex:	Male
	Current country of residence:	UK or Ireland
	Education:	At least A-levels & possibly more
	Quiz topic:	Psychology & Linguistics
	Age range:	25 – 60 years
	Sex:	Female
	Current country of residence:	UK or Ireland
	Education:	At least A-levels & possibly more
	Quiz topic:	Science & Technology
	Advice:	She did not seek advice on the quiz.

Notes. In Panel A: ASD stands for Advice Seeking Decision of the Employee,* indicates incentivized beliefs. Panel B reproduces examples of profiles as shown to Managers by experimental condition (left: *Private*, right: *Visible*). Sex, quiz topic and (if applicable) advice-seeking varied between participants. All other characteristics remained unchanged, and their factual accuracy was ensured through recruitment filters and confirmed in participants' initial survey responses.

¹¹Data from the short survey at the beginning of the study ensured that these profiles were factually correct.

The second treatment dimension randomly varied the topic of the general knowledge quiz. Employees either took a quiz on “Science & Technology” or “Psychology & Linguistics”.¹² With the combination of a reported group characteristic, in our case sex, and a quiz topic, we seek to manipulate the Manager’s beliefs about the Employee’s knowledge on a topic and, more importantly, the *Employee’s* belief about this belief, following the method of Coffman (2014).

We calibrated the two quizzes to be of comparable difficulty for men and women (see Section B2 of the Online Appendix for details on the calibration of the two quizzes). We pre-tested several dozen questions per topic in the same subject pool. Based on the knowledge of women and men in our pre-test sample, we selected 10 questions per topic such that participants would, on average, answer 6 questions correctly and 7 being the modal number of correct answers. With this calibration, we wanted to ensure that the information benefit of advice and the difficulty-induced misestimation of own knowledge (Bordalo et al., 2019) would be comparable across experimental conditions. Further, we aimed for a final quiz that was neither too difficult nor too easy. We targeted a unique mode since Managers were incentivized to report the mode of their believed distribution of knowledge in the sample that they were evaluating.

Questionnaire

First, in an open form field, participants were asked to explain what drove their advice-seeking decision. They then indicated how useful they thought it is to seek advice in this study. Afterwards, we elicited beliefs about the Manager’s quiz score estimate for Employees with two profiles. First, participants guessed a Manager’s estimate for another Employee with the exact same profile as theirs. The characteristic of the second profile varied by experimental condition. In Visible, participants saw a profile that was identical to theirs in all dimensions but the counterfactual advice-seeking. In Private, participants saw a profile that was identical to theirs in all dimensions but the Employee’s sex. We incentivized these beliefs with an additional £0.25 if the guess equaled the estimate of a randomly selected Manager. One of the two guesses was randomly chosen to be evaluated for payment. The difference between the two guesses measures the belief about either the reputational cost of advice-seeking (Visible) or others’ stereotypical beliefs about competence (Private).

¹²In pre-tests in the same subject pool, we established that these two topics are highly gender-stereotyped and that women are seen as knowing more, on average, on “Psychology & Linguistics” and men are seen as knowing more, on average, on “Science & Technology”.

The questionnaire proceeded with eliciting beliefs about others' stereotypical beliefs about competence for 6 domains of knowledge with a modified version of the slider measure introduced by Coffman (2014). For each domain, participant reported whether they think that *most people* think that men or women, on average, know more about it. This was done by positioning a slider anywhere between -1 (*most people* think there is a female advantage in knowledge) to 0 (no gender difference) to 1 (*most people* think there is male advantage in knowledge). This was not incentivized and administered to all participants, regardless of the treatment. Further, participants reported beliefs about the quartile in which they place their independent quiz performance relative to others with the same profile as theirs (i.e., same age range, sex, country of residence and education).

Risk preferences were elicited with two unincentivized measures (Falk et al., 2023). 8 items elicited views on advice-seeking and social norms pertaining to it on a 7-point Likert scale (see the Appendix Table A5 for a list of all items). To assess whether participants perceived the general knowledge quiz as a measure of competence, we asked about the relative role of luck versus knowledge in performing well on this type of quiz, using a scale ranging from 0% ('no luck') to 100% ('only luck'). Participants also reported the gender composition of their workplace, prevalence of teamwork and several questions on how they experienced the experiment. They also reported their gender and gender identity (Brenøe et al., 2022). After the questionnaire, participants received feedback on their experimental earnings and had the option to learn the correct quiz answers.

2.2 Manager Version

The Manager version of the study also consisted of two parts. Part 1 was identical to the Employees' version. Managers answered either the general knowledge quiz on "Science & Technology" or "Psychology & Linguistics". The topic of the quiz was randomly assigned. Managers received £0.10 per correct answer. Afterwards, they guessed how many of their answers were correct and received £0.25 for a correct guess. Managers took the quiz to experience the knowledge task themselves, before making an estimate about their matched Employee's performance.

In their Part 2, Manager's main task was to *estimate* how well a matched Employee performed on the general knowledge quiz *without* advice. To make this estimate, the Manager saw an Employee's profile as explained in Section 2.3 and shown in Fig.1 Panel B. The Manager received a bonus of £3.00 for a correct estimate. They also knew how this estimate would influence the experimental earnings of their matched Employee. Each

Manager saw only a single profile and reported a single estimate. This way, Managers were not aware that many filler characteristics were held constants in all profiles.

Managers were randomly assigned to one of 12 profiles, that differed in the sex of the matched Employee (2), the quiz topic (2), whether advice was visible (2) and, when it was visible, the profile either showed that advice was sought or that it was not sought (x2 |visible).

After the incentivized estimation task, Managers proceeded to the questionnaire. First, they were asked to briefly describe how they arrived at their estimate in an open form field. Then, they stated their beliefs about the Employee's advice-seeking strategy. Specifically, they reported a threshold defined as the number of answers that someone with that profile must *not* know to decide to seek advice on the quiz. Lower numbers indicate a believed higher willingness to seek. The rest of the questionnaire was similar to the one presented to Employees. It included questions on demographics, attitudes towards advice-seeking, gender stereotypes about competence for several categories of knowledge, their views on the role of luck versus knowledge in the quiz as well as their beliefs about likelihood of cheating in the Employee version of the study.

2.3 Procedures

The experiment was conducted online in May 2022. Through Prolific Academic, we recruited participants, who: (1) were residents of UK or Ireland¹³, (2) were between 25 and 60 years old, (3) have at least a Bachelor's degree, and (4) an approval rate of over 95% on Prolific. As Managers, we recruited participants who, in addition to these criteria, reported to have experience with being in a management position.¹⁴ Each participant completed the study only once in the role of either Employee or Manager. Table A2 shows the number participants per experimental condition in both versions of the study.

The Employee version was implemented in oTree (Chen et al., 2016) and the Manager version in Qualtrics. Employees took, on average, 17 minutes to complete the study, Managers 12 minutes and they, on average, earned £4.01 and £2.14 respectively. Final earnings included a participation fee of £1.50 for Employees and £1.00 for Managers.

¹³The experiment uses general knowledge questions as the main task. What is considered "general knowledge" is, however, specific to a certain cultural and geographical space. To obtain a degree of control over the knowledge space when constructing the knowledge task, we limit recruitment to participants from the UK or Ireland. See Online Appendix Section B2 for further details on the calibration of the knowledge task.

¹⁴The question to determine relevant participants read as follows: "Do you have any experience being in a management position?"

Employees and Managers were randomly matched ex post to calculate their payoffs. As the focus of the study is Employees' behavior, we recruited more Employees (1,800) than Managers (721). Managers were informed that with some probability, they would be matched with several Employees with identical profiles. In this case, their estimate counted for all these Employees and their estimation bonus was calculated based on one randomly selected match. We implemented a random matching procedure such that 20% of Managers were matched with a single Employee and the rest with several Employees with identical profiles.

Mandatory comprehension questions throughout the study ensured attention to and comprehension of experimental instructions.

3. Conceptual Framework and Hypotheses

The Employee's decision to seek advice $s \in \{0,1\}$ trades off the benefit of advice against its cost. The Employee has knowledge on a topic t and knows $a_i \in \{0,1,2, \dots, 8,9,10\}$ answers. The Employee (she) observes her knowledge a_i but the Manager (he) does not. Her quiz performance $p(a_i, s) \in \{0,1,2, \dots, 8,9,10\}$ is her knowledge when she does not seek $p(a_i, 0) = a_i$, and it can increase with advice, $a_i \leq p(a_i, 1) \leq 10 \forall a_i$. Advice costs a one-time fee of c . Further, the Employee may experience a non-monetary cost to seeking advice, γ_i , for example, because she feels bad if she cannot accomplish this task independently. The Employee receives performance pay b for correct answers. In addition, she receives a bonus $r\hat{a}(g, t, s)$ from her Manager, that increases linearly in the Manager's *estimate* of her knowledge a_i . This estimate is denoted $\hat{a}(g, t, s) \in \{0,1, \dots, 9,10\}$. The variable g stands for the Employee's characteristics, her sex, education etc. that the Manager observes. By design, Employees' characteristics only differ in their sex. The Manager's estimate also depends on the quiz topic t that—together with the Employee's observable sex—induces beliefs about the Employee's knowledge. The Manager can interpret the Employee's behavior when he sees it. Specifically, he can condition his estimate of the Employee's knowledge on her decision to ask advice s . When she decides whether to seek advice, the Employee does not know what the Manager's estimate of her knowledge will be. But she has a belief $\psi(\hat{a}) \in \{0,1, \dots, 9,10\}$ about it.

In *Private*, the Employee's utility from seeking is $u(a_i, s = 1, \psi) = bp(a_i, 1) + r\psi(\hat{a}(g, t)) - c - \gamma_i$, which she compares to her utility from not-seeking $u(a_i, s = 0, \psi) = ba_i + r\psi(\hat{a}(g, t))$. Thus, the Employee will seek whenever the information value of advice

exceeds the advice fee and any non-monetary cost to seeking advice, weighted by the piece-rate for correct answers:

$$p(a_i, 1) - a_i \geq \frac{c + \gamma_i}{b} \quad (1)$$

The piece-rate for correct answers can be interpreted as the opportunity cost of renouncing on advice.

In *Visible*, the Employee's choice is more involved since her Manager observes her decision to seek advice. The Employee now also considers how her advice choice s may influence the Manager's estimate of her knowledge. Her utility from seeking is $u(a_i, s = 1, \psi) = bp(a_i, 1) + r\psi(\hat{a}(g, t, s = 1)) - c - \gamma_i$, which she compares to her utility from not-seeking $u(a_i, s = 0, \psi) = ba_i + r\psi(\hat{a}(g, t, s = 0))$. In *Visible*, the Employee seeks whenever the information value of advice exceeds the advice fee, any non-monetary cost to seeking advice and her expected reputational cost, weighted by the piece-rate for correct answers:

$$p(a_i, 1) - a_i \geq \frac{c + \gamma_i}{b} + \frac{r}{b} \left(\psi(\hat{a}(g, t, s = 0)) - \psi(\hat{a}(g, t, s = 1)) \right) \quad (2)$$

This expected reputational cost $r \left(\psi(\hat{a}(g, t, s = 0)) - \psi(\hat{a}(g, t, s = 1)) \right)$ is the Employee's belief about how her decision to seek advice will change the Manager's estimate of her knowledge and, through that, her bonus.

The two thresholds for seeking advice, (1) and (2), differ by this expected reputational cost, weighted by the piece-rate for correct answers. Whenever the Employee believes that the Manager would interpret her decision to seek advice negatively, that is, $\psi(\hat{a}(g, t, s = 0)) > \psi(\hat{a}(g, t, s = 1))$, this expected reputational cost is positive. A higher threshold for advice-seeking in *Visible* implies that an Employee who would seek in *Private* may not seek when randomly assigned to *Visible*.¹⁵

Comparing the rate at which advice is sought in *Private* to *Visible* estimates the causal effect of reputational concerns on the willingness to seek advice, given random assignment to treatment. We pre-registered the following hypotheses:

¹⁵In our experiment $b = 0.1$, $r = 0.3$ and $c = 0.08$. After advice, an Employee had a 50%-chance to correctly guess an unknown answer, a design feature that can be used to (conservatively) calculate $p(a_i, 1)$ for each level of knowledge a_i . The following statements ignore (sizable) non-monetary costs to seeking advice. With this calibration, in *Private*, the expected net benefit to seeking exceeded its monetary cost whenever $a_i \leq 8$. In *Visible*, an Employee who, for example, believed that the information "sought advice" would lower the Manager's estimate of her knowledge by one answer, would find it profitable to seek advice when $a_i \leq 5$. This threshold would be lower, $a_i \leq 2$, for an Employee who expected a reputational cost of 2 answers.

Hypothesis 1: The rate at which advice is sought is lower in Visible when compared to Private.

Moreover, we test whether reputational concerns change with others' stereotypical perceptions of competence. By design, female and male participants in our study face different perceptions of competence for a given quiz topic. Therefore, we pre-registered that we would test Hypothesis 2 separately for women and men:

Hypothesis 2: The change in the rate at which advice is sought in Visible, when compared to Private, differs when stereotypes about competence assign participants an advantage in knowledge compared to a disadvantage.

Others' beliefs about competence may affect the way individuals trade off the information benefit of advice against its expected reputational cost for several reasons. First, people may have a desire to confirm an advantageous competence stereotype or to disconfirm a disadvantageous one. For example, senior employees—if stereotyped as less technically proficient—might be particularly reluctant to ask their colleagues for help in navigating a new software, even when this slows them down. Both motives would imply that the non-monetary cost to visibly seeking advice depended on others' perception of competence. If one motive was relatively stronger than the other one, on average, we would observe that the visibility gap in advice-seeking would change, all else equal, with others' perceptions of competence.

Second, others' beliefs about competence may amplify or mute the expected reputational cost of seeking advice. This could happen if, for example, professionals expected others to interpret the information “advice was sought” (negative information about knowledge) or “advice was not sought” (positive information about knowledge) in a way that confirms their stereotypical perception of competence. Individuals could expect the negative information “advice was sought” to influence the Manager's estimate more strongly when his perception of competence is low compared to when it is high. However, an expected confirmatory reading of information could also influence a person's high-order belief in the opposite way: she could expect that the positive information “advice was not sought” influences the Manager's estimate more strongly when his perception of competence is high, compared to when it is low. Therefore, it is ambiguous in which direction an expected confirmation bias, if at all, would change the expected reputational cost to seeking advice of professionals who face an advantageous competence stereotype compared to those who face a disadvantageous one. Our study seeks to uncover empirically—with actual choices and a direct measure of beliefs—whether others'

stereotypical beliefs about competence change the expected reputational cost of seeking advice. This is an important question to ask and answer: if members of groups facing high or low beliefs about their competence perceived, all else equal, the reputational consequences of seeking advice at work systematically differently, career consequences could be far-reaching.

4. Results

4.1. How does visibility affect advice-seeking?

To begin, we report results from analyzing pooled data (both quiz topics, women and men). The rate at which advice is sought is 64% when this decision is private. Revealing it to the Manager leads to a decrease of 10 ppts [6.1,15.1] ppts¹⁶ to a rate of about 54% ($p < 0.0001$, two-sided test of proportions), corresponding to a 16% reduction. This is consistent with the interpretation that participants trade off the information benefit of advice against a reputational cost when this choice is visible.

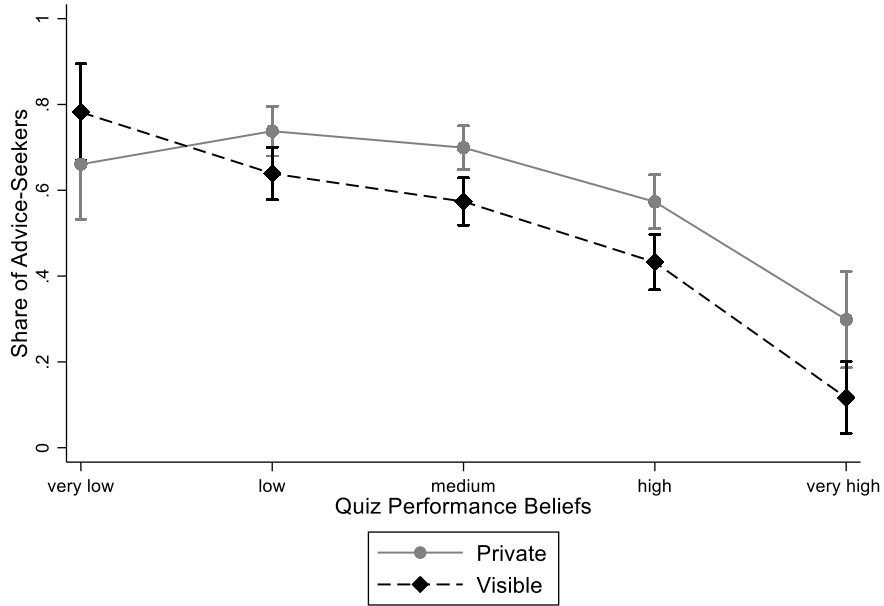
The rate of advice-seeking decreases nearly monotonically with participants' subjective quiz performance in both, Private and Visible (see Figure 2). This strongly suggests that the information benefit of advice plays a role in the decision to seek. The gap between Private and Visible is remarkably constant for all subjective performance levels except the very lowest, for which we cannot reject that the share of advice-seekers is the same in Visible and Private.

Estimates of a linear probability model in which we control for beliefs about own performance, quiz topic and Employee's sex confirm that visibility causes a decrease in the propensity to seek (see column 1 of Table 1). Conditional on these controls, the propensity to seek advice decreases by 11 ppts, on average, when it is visible to the Manager ($p < 0.001$) with a 95%-CI of [-15.5, -6.8] ppts. Estimating the model separately for women and men, we observe, respectively, a 13 ppts and 10 ppts drop in the propensity to seek advice when it is visible ($p < 0.01$) with 95%-CI of [-19.0, -6.7] ppts and [-16.3, -3.9] ppts, respectively (see columns 2 and 3 of Table 1). This analysis leads to the first main result of the paper:

Result 1: *Visibility causes a large decline in the propensity to seek advice.*

¹⁶95%-confidence interval (CI).

Figure 2 Share of Employees Who Sought Advice by Quiz Performance Beliefs and Treatment



Notes. The *Quiz Performance Beliefs* are based on the Employees' subjective performance belief elicited after completing the quiz in Part 1 by answering the question: "Guess, how many of your answers are correct?". The range from 0 to 10 and are binned as follows: very low: 0-2 (n=111), low (n=466): 3-4 medium (n=628): 5-6, high (n=468): 7-8, very high (n=127): 9-10. The bars represent the 95%-CI.

From the perspective of individual performance, this large reduction in the willingness to seek is inefficient since the expected information benefit of advice is positive for most participants. Whenever subjective (actual) quiz performance is lower than or equal to eight correct answers, an Employee's expected increase (actual expected increase) in performance and pay exceeds the advice fee.¹⁷ In Private (Visible), 92.6% (93.3%) of participants *believe* to have an initial quiz score lower than or equal to eight and 80.95% (80.16%) have such a score. Figure 2 shows that the rate at which advice is sought in Private is well below 100% at every level of subjective quiz performance. In fact, it does not exceed 74%. The rate of advice-seeking is also well below 100% at every actual performance level (see Figure A3 in the Appendix). In sum, we find that a substantial share of Employees refrain from seeking advice, even when it has a positive expected net monetary value based on what they believe or how they performed. Visibility exacerbates this inefficiency. The low level of advice-seeking even in Private points to the fact that factors other than the expected net benefit of advice influence the propensity to seek. We explore such additional factors in the Section 4.4.

¹⁷After advice, a participant who has no clue about the correct answer has a 50% chance of guessing correctly.

Regarding the realized gain from advice-seeking, 84% of seekers improved their quiz score after advice. On average, the pay increased by £0.10 net the advice fee. This corresponds to an average pay increase of 22% relative to what seekers would have received for their independent quiz score from Part 1.

Table 1 Linear Probability Models Predicting Employees' Propensity to Seek Advice

DV: <i>Advice</i> (1/0)	(1) Pooled	(2) Female Employee	(3) Male Employee	(4) Female Employee	(5) Male Employee	(6) Pooled
<i>Visible</i> (1/0)	-0.112*** (0.022)	-0.128*** (0.031)	-0.101*** (0.032)	-0.169*** (0.044)	-0.083* (0.045)	-0.082*** (0.032)
<i>Science & Tech</i> (1/0)	-0.030 (0.023)	-0.021 (0.031)	-0.032 (0.034)	-0.061 (0.043)	-0.014 (0.045)	
<i>Visible x Science & Tech</i>				0.080 (0.063)	-0.036 (0.063)	
<i>Male</i> (1/0)	-0.035 (0.023)					-0.034 (0.023)
<i>Advantageous Competence Stereotype</i> (1/0)						0.023 (0.031)
<i>Visible x Advantageous Competence Stereotype</i>						-0.060 (0.045)
Private mean <i>Advice</i>	0.643	0.700	0.588	0.700	0.588	0.643
Subj. performance-level- dummies	yes	yes	yes	yes	yes	yes
Adjusted R ²	0.078	0.051	0.094	0.052	0.093	0.078
# of Employees	1800	900	900	900	900	1800

Notes. The dependent variable in all specifications is *Advice* that equals 1 if the Employee sought advice and 0 otherwise. *Visible* indicates that the Employee was in the treatment condition in which the advice-decision was revealed to the Manager. *Science & Tech* indicates that the Employee took the Science & Technology quiz. *Male* indicates that the Employee's sex is male. *Advantageous Competence Stereotype* indicates whether a stereotype about competence and an Employee's sex are congruent. For women, it takes the value of 1 in the "Psychology & Linguistics" quiz and for men in the "Science & Technology" quiz. *Private mean Advice* is the mean of *advice* for the (sub-) sample of Employees as described in the column header. *Subj. performance-level-dummies* bin Employees' incentivized beliefs about their independent quiz score in Part 1 into five levels: 0-2, 3-4, 5-6, 7-8, 9-10, with 5-6 as the omitted category. Robust standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

4.2. Do others' stereotypical beliefs about one's competence change how professionals trade off the information benefit of advice against reputational concerns?

Our second treatment dimension randomly varied the topic of the knowledge task. This way, we successfully manipulated participants' beliefs about the Manager's stereotypical beliefs about their competence. We confirm this with two measures of higher-order beliefs,

one incentivized elicited between-subjects and one unincentivized elicited within-subject. These manipulation checks strongly suggest that the average woman who took the “Psychology & Linguistics” quiz believed that her matched Manager would believe that she was competent on the topic. In contrast, the average woman who took the “Science & Technology” quiz believed that her Manager had a relatively low perception of her competence. The reverse is true for men. Section A2 of the Appendix gives a detailed account of these manipulation checks.

Because women and men held, by design, different higher-order beliefs about their competence, we split the sample for an analysis of the interaction between the decision to visibly seek advice and the quiz topic (in line with our pre-registration). In a linear probability model, we add the interaction of the treatment indicators Visibility and Science & Technology and estimate the model separately for women and men (Table 1, columns 4 and 5). For women, this interaction term estimates whether the visibility gap in the propensity to seek advice increases or closes, on average, when the person who interprets this choice has a relatively low perception of her competence compared to a high one, holding constant subjective performance beliefs. For men, the interpretation is reverse. Turning first to our sample of women, we estimate a positive coefficient on the interaction term, 8 ppts, with the 95%-CI [-4.32, 20.27] ppts that includes zero. For men, we estimate an interaction term of -4 ppts with the 95%-CI [-16.04, 8.82] ppts that also includes zero. These different signs of the estimated coefficients point to the same average behavior. Directionally, these estimates suggest that individuals may be more reluctant to visibly seek advice when it conflicts with an advantageous competence stereotype, compared to a disadvantageous one. However, even with our substantial sample size of 900 women and 900 men, we cannot reject the null hypothesis that higher-order beliefs about competence do not mediate the visibility gap in the propensity to seek advice. Indeed, even when pooling the sample of women and men and estimating the interaction between visibility and an indicator for an advantageous competence stereotype¹⁸, the 95%-CI around the estimated coefficient includes zero [-14.74, 2.75] ppts (see Table 1, column 6). This leads to the second main result of the paper:

¹⁸The indicator takes the value of 1 for women who took the Psychology & Linguistics quiz and 1 for men who took the Science & Technology quiz.

Result 2: *We find little evidence that others' stereotypical perceptions of competence change the way that professionals trade off the information benefit of advice against reputational concerns, on average.*

We consider the robustness of our two main results by replicating Table 1 with the actual quiz scores from Part 1 (see Table A3 in the Appendix). The estimated coefficients and the statistical inference on them are very similar.

4.3. Expected reputational cost of advice-seeking

By asking participants to report incentivized beliefs, we attempted to quantify their expected reputational cost of advice-seeking. In Visible, each Employee reported two beliefs about a Manager's quiz score estimate: one for another participant with a profile identical to theirs (which includes identical advice-seeking decision) and the other one for another participant with a profile identical to theirs except for the counterfactual advice-seeking decision. We interpret the difference between the belief reported for someone who did not seek advice and someone who sought advice, all else equal, as the *expected reputational cost* of seeking. Whenever it is positive, an Employee perceived that the Manager would interpret the signal "advice was sought" negatively and lower their quiz score estimate. Whenever it is negative, an Employee perceived that the Manager would interpret the signal "advice was sought" positively and increase their quiz score estimate.

According to this measure, the *expected reputational cost* to seeking advice differs substantially (see Figure 3 for a histogram), ranging from large expected benefit (-6) to large expected cost (+6). The average expected cost is close to zero (-0.08) and the median expected cost is at 0. Interestingly, about half of participants reported beliefs that are consistent with an expected reputational *benefit* to advice-seeking in this setting. For women and men, the distributions of expected reputational cost do not differ systematically between the quiz topics (p of rank sum tests >0.64). This is in line with our Result 2.

Overall, the rate at which advice is sought when visible varies for different levels of expected reputational cost and benefit (see Figure A4). After an initial and significant increase¹⁹ in the rate of visibly seeking advice moving from an expected reputational cost of zero to one (i.e., a difference in one point in the Manager's performance estimate), the rate of seeking declines as the expected reputational cost increases. The pattern for an expected reputational benefit is similar: the rate of visibly seeking advice nearly

¹⁹Two-sided test of proportions $p=0.017$.

monotonically decreases in the size of the expected reputational benefit. Given this inverted V-pattern, we correlate actual advice-seeking behavior with second-order beliefs, conditional on expecting a reputational benefit or a reputational cost when compared to no reputational consequence. In a linear probability model that predicts the propensity to seek advice, we add our usual controls for subjective performance levels. The estimated correlation coefficients are 0.055²⁰ for an expected reputational benefit and -0.030 for an expected reputational cost. This analysis suggests that the slopes illustrated in Figure A4 are (weakly) statistically significant (p-values < 0.08). It suggests, counterintuitively, that a reported larger expected reputational benefit correlates with less advice-seeking. We elicited these second-order beliefs after measuring behavior. Further, we elicited beliefs about two other Employees and not about self when compared to another Employee. This was done to limit the extent to which a self-other gap in judgement could influence the second-order belief measure (e.g., Möbius et al., 2022). Both factors can, however, contribute to the fact that these beliefs correlate weakly and inconsistently with observed advice-seeking behavior.

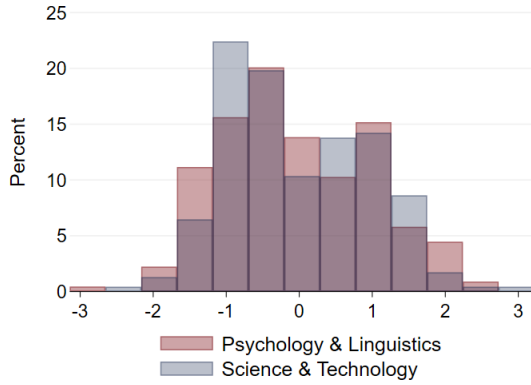
However, other direct evidence speaks to the reputational mechanism through which visibility lowers the rate at which advice is sought. To gain insights into how the professionals in our study reasoned about advice-seeking, we asked about their motives behind this choice in an open form field. The free form responses were classified by 3 raters blind to the research question into ten pre-defined categories (see Table A6).²¹ Of the 10 motives, there are only two that are mentioned significantly more often in Visible compared to Private and both pertain to the Manager. In Visible, 16% of those who did not seek state that this choice was driven by an expected reputational cost; they gave the negative impact of advice-seeking on the manager's quiz score estimate as a reason. In Private, this share is merely 2% of those who did not seek. Turning to those who did seek advice, 1% of them in Visible explained that this was driven by an expected reputational benefit, compared to 0% of them in Private. While we observe a substantial share of participants in Visible who expect a reputational benefit to seeking advice according to our second-order beliefs measure, negligibly few of them state that it motivated them to visibly seek advice.

²⁰The expected reputational benefit is a negative number, such that a positive correlation coefficient indicates that larger absolute values are associated with a lower propensity to seek.

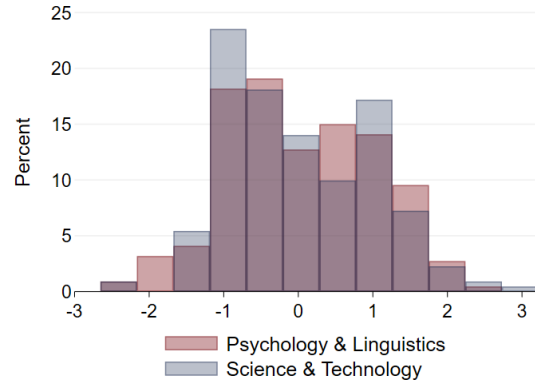
²¹There is generally high to very high agreement in classification of the free form responses among the raters (see Krippendorff's alphas for each category in Table B4).

Figure 3 Expected Reputational cost to Seeking Advice by Topic and Gender

Panel A. Women (N=900)



Panel B. Men (N=900)



Notes. *Expected Reputational Cost* is the belief of Manager's quiz score estimate for a *non-seeker* [0,10] minus the belief of Manager's quiz score estimate for a *seeker* [0,10]. Positive numbers indicate an expected reputational cost and negative numbers an expected reputational benefit to advice with respect to a Manager's performance estimate. These incentivized beliefs were elicited in Visible.

4.4. What explains further heterogeneity in advice-seeking?

Of all the 10 motives for the seeking decision, confidence in own performance is mentioned most frequently: seekers stated that they did not feel confident in their performance and therefore sought advice (64% in Private and 68% in Visible) and non-seekers stated that they felt confident and therefore did not seek advice (44% in Private and 42% in Visible). The information benefit of advice (or perceived lack of it) was the second most frequent explanation for behavior (63% in Private and 60% in Visible among advice-seekers and 23% and 27% among non-seekers). Among those who did not seek, around 17% mentioned that they preferred solving the quiz on their own without external input, and this rate is the same in Private and Visible. Less than 1% of the responses suggest that the participant had not properly understood the incentives.

These insights into the professionals' motives for (not) seeking advice are corroborated with estimates of a linear probability model in which we correlate the decision to seek advice with items from our questionnaire controlling for subjective performance beliefs, separately for Visible and Private. Given the exploratory nature of this analysis and the multitude of correlations we are testing, we use the 0.5% level as the threshold for statistical significance (Benjamin et al., 2018). These results (see Table A5) indicate that a lower perceived usefulness of advice as well as a general negative attitude towards not accomplishing tasks independently significantly correlate with lower seeking in both, Private and Visible. We find no evidence that factors such as, for example, attitude toward

risk, the belief that reputation matters for career advancement or social image concerns in general correlate with advice-seeking in our study.²²

Contrary to the stereotype that men, on average, have a lower propensity to seek advice than women, we find little evidence that women and men differ in their propensity to seek, when we condition on performance beliefs (see Table 1, column 1). The estimated coefficient of the male indicator is -3.5 ppts with 95%-CI [-8.0, 1.1]. If we, instead, control for actual quiz performance, the estimated coefficient of the male indicator is -7 ppts with 95%-CI [-11.6, -2.5] ppts (Appendix Table A4, column 1).

Once we condition on actual rather than subjective performance levels, we can additionally consider whether self-stereotyping might play a role in advice-seeking (Coffman, 2014). Since self-stereotyping has been found to operate largely through confidence, we control for it in our main specifications. The estimates presented in columns 3 and 4 of Table A4 suggest that self-stereotyping may influence men's propensity to seek advice but not that of women. For men, the average propensity to seek advice on the "Psychology & Linguistics" quiz is significantly higher compared to the "Science & Technology" quiz, conditional on actual performance levels and an indicator for the Visibility treatment.

4.5. How do Managers interpret the decision to seek advice?

Turning to the Managers' side, we next present results on how they interpret the decision to seek advice. Each Manager evaluated a single profile that was randomly assigned. We analyze how characteristics conveyed by the profiles (gender, quiz topic²³ and—in Visible—the decision to seek advice) affected the Manager's estimates of Employee's competence. While the profiles included more information (e.g. about age, education and country of residence), only these characteristics varied experimentally. In linear regressions we can estimate the average causal effect of a specific profile characteristic by comparing estimates for profiles that differ in this characteristic, conditional on the other randomly varying characteristics. We include the Manager's own subjective quiz performance as a control variable.

²²Since we do not find systematic differences for women and men, we only report pooled specifications in Table A5.

²³A manipulation check confirms that the quiz topics induced stereotypical perception of competence in this sample of professionals with reported managerial experience, as measured with a slider ranging from -1 "women know more, on average" to 1 "men know more, on average". The average slider position is -0.17 for "Psychology & Linguistics" and 0.25 for "Science & Technology". Both averages are significantly different from 0 "no gender difference" (t-test $p < 0.001$).

Table 2 OLS Regressions Predicting Managers' Quiz Score Estimate

	(1)	(2)	(3)	(4)	(5)
DV: Manager's Estimate (#)	<u>Visible</u> Pooled	<u>Visible</u> Female Employee	<u>Visible</u> Male Employee	Private & <u>Visible</u> Female Employee	Private & <u>Visible</u> Male Employee
<i>Advice sought</i> (1/0)	-0.139 [-0.368,0.091] (0.117)	-0.214 [-0.570,0.142] (0.181)	-0.101 [-0.385,0.183] (0.144)		
<i>Visible</i> (1/0)				-0.194** (0.090)	0.036 (0.091)
<i>Science & Tech</i> (1/0)	0.244** (0.105)	0.003 (0.147)	0.502*** (0.151)	0.064 (0.091)	0.426*** (0.092)
<i>Advice x Science & Tech</i>	0.158 (0.163)	0.220 (0.230)	0.100 (0.233)		
<i>Female Employee</i> (1/0)	-0.131 (0.082)				
<i>Own subj. quiz performance</i> (#)	0.238*** (0.022)	0.263*** (0.032)	0.216*** (0.030)	0.249*** (0.026)	0.200*** (0.023)
Mean Estimate	5.554	5.325	5.779	5.661	5.750
Adjusted R ²	0.254	0.262	0.253	0.258	0.231
# of Managers	480	241	239	362	359

Notes. The dependent variable in all specifications is the Manager's *Estimate* of a matched Employee's quiz score. This variable is standardized to have a mean of zero and standard deviation of 1. *Advice sought* indicates that the matched Employee sought advice on the quiz. *Visible* indicates that Managers observed the matched Employee's advice-seeking decision. *Science & Tech* indicates that Manager and the matched Employee took the Science & Technology quiz. *Female Employee* indicates that the matched Employee is a woman. *Own subj. quiz performance* is the Manager's subjective belief of their own quiz performance and ranges from 0 to 10. *Mean Estimate* is the overall mean of the Managers' estimate for the sample specified in the column header. Results presented in Column (1)-(3) are restricted to Managers who were randomly assigned to Visible while column (4) and (5) include all Managers who were matched with female and male Employees, respectively. 95% confidence intervals in squared brackets. Robust standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

First, we consider the sample of professionals with reported managerial experience who saw their matched Employee's advice-seeking decision (Managers in Visible). We estimate that the decision to seek advice lowers the Manager's quiz score estimate by about -0.139σ (13.9 percent of a standard deviation), on average, with a 95%-CI $[-0.368 \sigma, 0.091 \sigma]$ that includes zero ($N=480$) (see column 1 of Table 2). The overall take-away is the same if we split the sample by Employee sex, considering separately managers in Visible who evaluated women and those who evaluated men (columns 2 and 3 of Table 2). The estimated coefficients of the indicator "Advice" are small and negative for women (-0.214σ) and men (-0.101σ) with a 95%-CI of $[-0.570 \sigma, 0.1424 \sigma]$ and $[-0.3846 \sigma, 0.1828 \sigma]$, respectively. Though insignificant, the estimated effect size is double for women as for

men. Yet, we cannot reject that the coefficients are the same when estimating the interaction of “advice sought” and “male” in the pooled sample ($p=0.290$). Further, we find no evidence that the manager’s sex impacts their estimate in any way (see Online Appendix Table B6).

We collected additional data to better understand how Managers reason about their quiz score estimate. This is also to confirm that they attended to the information provided in the profiles. In the final questionnaire, Managers were prompted to briefly explain in their own words how they arrived at their estimate.²⁴ Their free-form answers were coded independently by 3 raters who were blind to the research question (Table A7)²⁵. These results give confidence that a large majority of Managers attended to and used the profile information when providing their estimate. Overall, the Managers mentioned the profile information on education (41.3%), quiz topic (25.2%) and age (16.9%) most often. Further, 24.8% of responses show that the Managers were aware of the Employee’s sex, although only 3.8% mention it as a reason for providing a certain estimate. In addition to profile information, 34% of Managers reported that they had compared the Employee’s profile to themselves when forming a belief about the Employee’s quiz score. The reasons are largely the same in Private and Visible conditions with the notable exception of the mention of advice. Specifically, 18.5% of Managers in Visible explicitly mention the Employee’s advice-seeking behavior when explaining how they arrived at their performance estimate, compared to 2.4% in Private. Overall, about 18.3% of Managers state that they have guessed their estimate. Significantly more Managers report having guessed the quiz score of their Employees in Private (24%) than in Visible (15%). This may suggest that observing the choice to seek advice helps the Managers to form a belief about the Employee’s competence. However, looking at actual correct estimates, there is no indication that Managers in Visible are, in fact, better at estimating the quiz score: 12.9% of Managers correctly estimated their matched Employee’s quiz score in Private and 13.3% in Visible (test of proportions, $p=0.86$).

Why does the decision to seek advice not affect the score estimates, on average? If Managers believed that all or most employees sought advice, regardless of their competence, then, their score estimates should not change when observing the decision to seek advice. Direct evidence on Managers’ beliefs about their matched Employee’s advice-

²⁴The wording of the question was: “We would like to understand how you arrived at your estimate of the quiz-taker’s quiz performance without advice. Please, briefly describe your thought process.”

²⁵There is a high agreement in classification of the free form responses among the raters (see Krippendorff’s alphas for each category in Online Appendix Table B10).

seeking strategy that we elicited in the questionnaire speaks against this interpretation.²⁶ The average Manager believes that someone with the profile they evaluated would decide to seek advice if at least 4.5 answers were unknown to them. This threshold is virtually the same in Private (4.5) and Visible (4.5) and, overall, for female (4.6) and male (4.5) Employees. Importantly, the average believed threshold is well above zero or one unknown answer. This zero or one unknown answer threshold would be consistent with the belief that all participants in the role of Employee would always seek advice.

5. Discussion and Conclusion

In this paper, we present evidence from an artefactual field experiment investigating whether white-collar professionals seek advice strategically and whether their strategies depend on others' stereotypical beliefs about their competence. While asking for advice is an important way to access knowledge and improve performance, professionals may be reluctant to do so if they believe it to signal incompetence. Our research aims at uncovering this potentially important barrier to knowledge flows in organizations.

Our experimental design simplifies a complex interaction between advice-seeker and -giver to causally study the role of reputational concerns. We experimentally vary whether the decision to seek advice is visible to a Manager who estimates the Employee's independent performance in a knowledge quiz, our measure of the Employee's task competence. The Employee's pay increases in her quiz performance—which can improve with advice—and in the Manager's belief about her task competence. The randomly assigned topics of the knowledge task varied (higher-order) beliefs about competence, relying on gendered stereotypes about domains of knowledge.

In this decision environment, we document strategic advice-seeking: the rate of seeking advice on a knowledge task decreases by about 16% when it is visible to a Manager compared to when it is private, despite its potential to increase task performance and earnings. Moreover, we find no evidence that Managers interpret the decision to seek advice negatively when estimating task competence, on average. However, professionals who play the role of Employees hold heterogeneous beliefs about how the decision to seek would affect the Manager's perception of their competence, ranging from a large negative

²⁶The wording of the question was “In your opinion, how many answers must a quiz-taker with this profile not know to decide to seek advice on the Science & Technology/Psychology & Linguistics quiz?”. The topic of the quiz varied, depending to which one the respondent was randomly assigned.

to a large positive effect. Taken together, these results point to a widespread misperception about the reputational consequences of advice-seeking among professionals.

We find little evidence that professionals trade off the information value of advice against a reputational cost differently when others hold a stereotypically favorable perception of their competence compared to a less favorable one. This finding is noteworthy considering that the literature has extensively documented stereotypical perceptions of competence to matter for important labor market outcomes. At first glance, this finding suggests that professionals may, on average, not cater the signals about competence they send to others' stereotypical beliefs about their competence. An alternative interpretation is that, on the one hand, the desire to disconfirm a disadvantageous stereotype and, on the other hand, the desire to confirm an advantageous one are equally strong, on average. Both channels would imply that the willingness to seek is lower compared to a situation when others have no preconception of competence, which would be an interesting extension of our research.

The results further suggest that seeking may be subject to other internalized barriers since, even in the absence of reputational concerns, a considerable share of professionals does not tap into the increased earnings potential from advice. The desire to perform tasks independently is, according to this paper's findings, one such barrier. Defying conventional wisdom, our results also show that in this study's setting, internalized barriers to seeking advice are not systematically different for women and men, once we control for confidence.

The experimental decision environment we designed to answer our research questions deliberately abstracted from factors that could additionally affect the willingness to seek advice at work, some of which have been studied in related work. Objective difficulty of the task on which advice is sought is likely to also play a role for the expected reputational consequences from seeking advice. Looking at other costs, the seeker can experience psychological costs in the form of stigma and shame (Chandrasekhar et al., 2018) or simply fear that her request for help may be rejected (Bénabou et al., 2022). The opportunity cost of the advice-givers' time can be non-negligible (Espinosa and Stanton, 2022), something that the seeker may also consider when deciding whether to ask. Regarding the benefits of advice-seeking at work, the wish to build a relationship with the advice-giver or to show self-assuredness and self-awareness are likely motivators of the willingness to seek. Our novel experimental design can be flexibly adapted to isolate some of these or other potential determinants of the willingness to seek or study the compound effect of several ones.

In our stylized environment, the evaluating Manager does not see the Employee's actual task performance. In practice, however, managers can observe work outcomes—which is something they care about—in addition to competence. This makes a decision-maker's tradeoff between the information benefit of advice and an expected reputational cost even more complex. The benefit to seeking advice is larger when a work outcome is visible, yet, the manager will have to make a judgement about how to attribute the outcome to inherent competence versus external input. This way, advice-seeking can lead to ambiguity regarding the source of performance outcomes. Previous work has shown that in the face of ambiguous performance outcomes, people may use simple heuristics to attribute credit, for example, in teamwork based on seniority or gender (Jin et al., 2019; Sarsons et al., 2021).

Just as managers typically have more information to base their evaluation on, professionals outside of our stylized decision environment can resort to sourcing knowledge without seeking advice, for example, online. We believe that our results bear relevance also for such environments. In these cases, reputational concerns linked to advice-seeking could manifest as preferring other sources of knowledge over asking others for advice. With multiple sources of knowledge, not seeking advice does not necessarily compromise a final work result but can make the process longer. On the one hand, searching independently may be inefficient while, on the other hand, excessive asking can also lower the productivity of others (Espinosa and Stanton, 2022). Whom, when and about what to ask for advice is a skill in and of itself in the knowledge economy, with a fast-moving knowledge frontier.

The paper uncovers a potentially important barrier to efficient knowledge flows: reputational concerns and widespread misperceptions concerning the reputational consequences of seeking advice among professionals. Correcting such misperceptions could foster knowledge exchange and learning at work. Understanding the micro-determinants of knowledge flows is an open and important area for further empirical research.

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A. Appendix

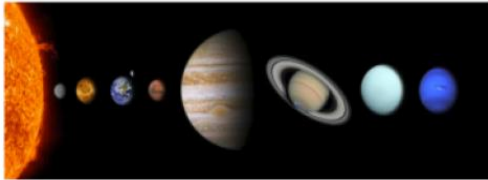
A1. Additional Figures and Tables

Figure A1 Quiz Example Question Before and After Advice

Panel A. Example Question. Science & Technology Quiz (Part 1)

Remaining time: 0:26

What is the name of the rightmost planet?




Uranus
Mercury
Jupiter
Neptune
Mars

Continue

Panel B. Example Question. Science & Technology Quiz After Advice Is Sought (Part 2)

Remaining time: 0:09

What is the name of the rightmost planet?



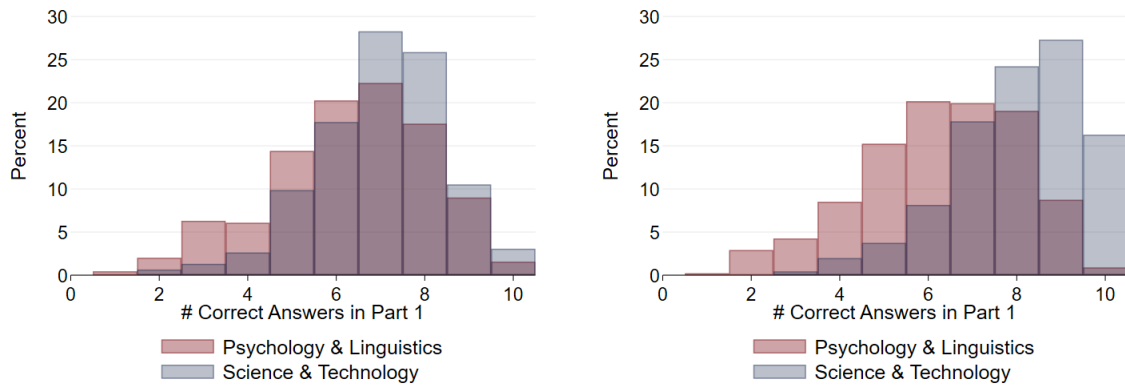
Neptune
Mars

Continue

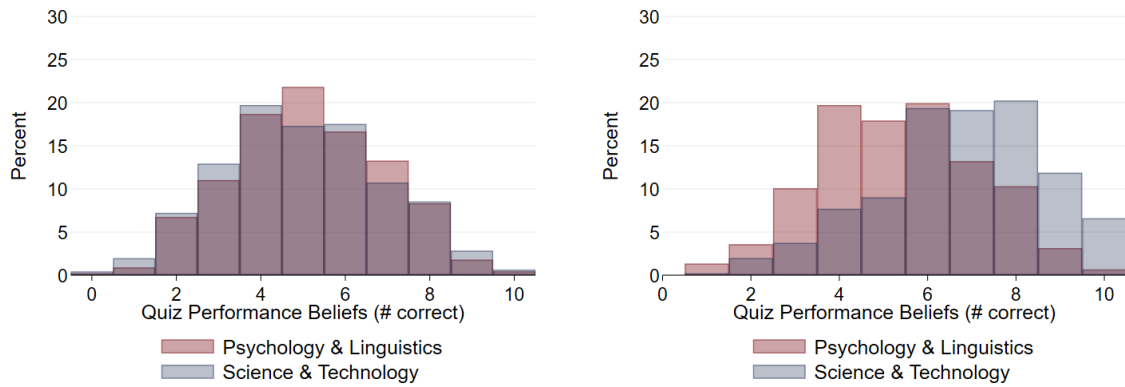
Notes. Example of 1/10 image-based quiz questions from the “Science & Technology”-quiz in Part 1 (panel A) and Part 2 (panel B), i.e., when the Employee had sought advice. Half of the participants were randomly assigned to this topic and the other half to the “Psychology & Linguistics”-quiz. There was a time limit of 30 seconds in Part 1 and 15 seconds in Part 2 to answer each question, before participants were auto-advanced.

Figure A2 Actual and Subjective Quiz Score by Topic and Gender

Panel A. Actual Score of Women (left, n=900) and Men (right, n=900) by Topic

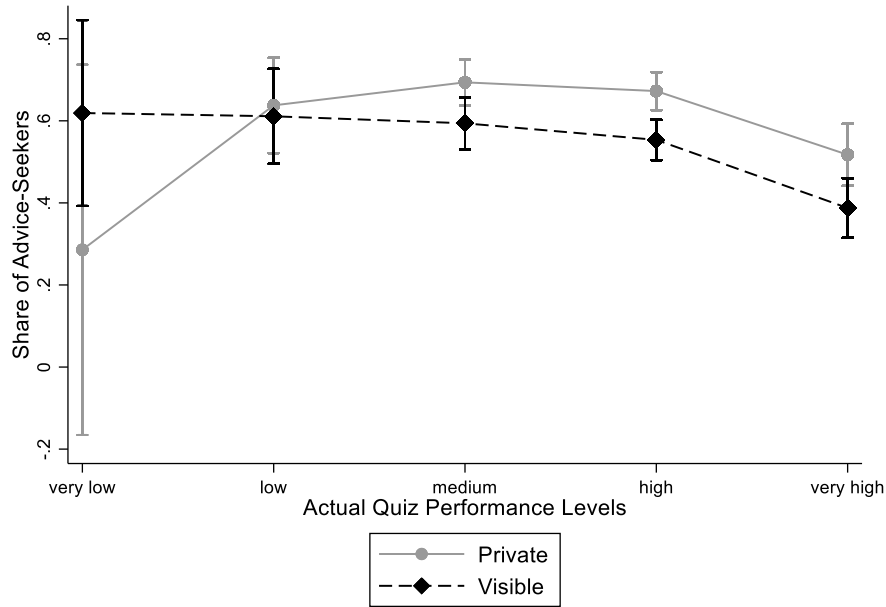


Panel B. Quiz Score Beliefs of Women (left, n=900) and Men (right, n=900) by Topic



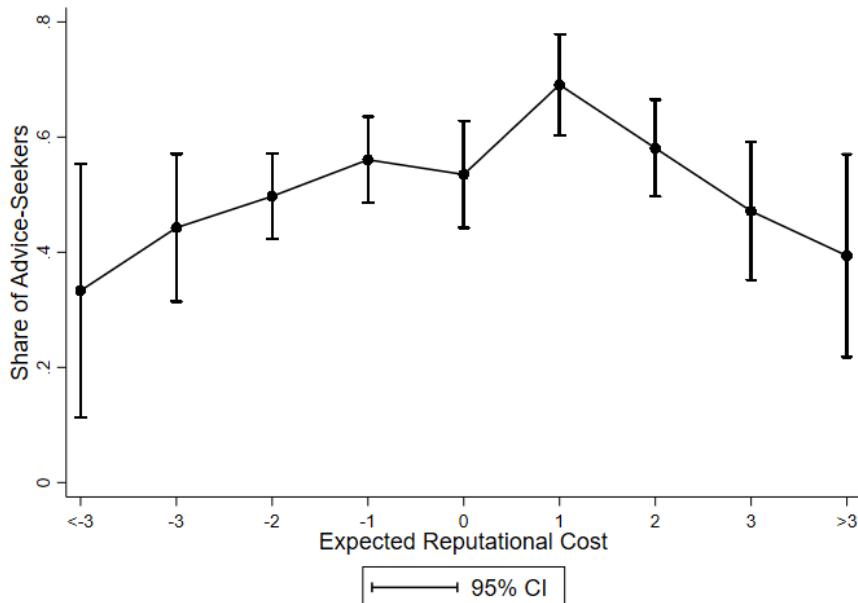
Notes. Actual Score (Panel A) is the quiz score in Part 1, ranging from 0 to 10. Quiz Performance Beliefs (Panel B) is an incentivized belief about the independent quiz score in Part 1. It is the answer to the following question “Guess, how many of your answers are correct?”, ranging from 0 to 10.

Figure A3 Share of Employees who Sought Advice by Actual Performance Level and Treatment



Notes. The *Actual Quiz Performance Levels* are based on the Employees' independent quiz score in Part 1, binned in the following way: very low ($n=28$): 0-2, low ($n=141$): 3-4, medium ($n=492$): 5-6, high ($n=789$): 7-8, very high ($n=350$): 9-10. The bars represent 95% confidence intervals.

Figure A4 Share of Employees Who Sought Advice by Expected Reputational Cost



Notes. *Expected Reputational Cost* is the belief of Managers' quiz score estimate for a *non-seeker* $\{0,1,...,9,10\}$ minus the belief of Managers' quiz score estimate for a *seeker* $\{0,1,...,9,10\}$. Positive numbers indicate an expected reputational cost and negative numbers an expected reputational benefit to seeking advice. These incentivized second-order beliefs were elicited in Visible ($N=897$). The bars represent 95% confidence intervals.

Table A1 Descriptive Statistics: Employees

	(1) Pooled	(2) Male Employees	(3) Female Employees
<i>Age (average in years)</i>	38.18 (SD=9.3)	38.23 (SD=9.24)	38.13 (SD=9.35)
<i>Resident of UK or Ireland</i>	100.00%	100.00%	100.00%
<i>Employment</i>			
Full-time	65.06%	75.56%	54.56%
Unemployed	10.17%	8.11%	12.22%
Part-time	13.72%	6.67%	20.78%
Self-employed	11.06%	9.67%	12.44%
<i>Minimum Bachelor's Degree</i>	100.00%	100.00%	100.00%
<i>Subject Studied</i>			
Humanities	27.62%	22.16%	33.03%
Business & economics	15.69%	17.87%	13.53%
Other social sciences	14.24%	9.86%	18.58%
Engineering & computer science	15.40%	24.48%	6.42%
Life science	11.36%	9.16%	13.53%
Cognitive science	2.48%	1.62%	3.33%
Other natural sciences & math	9.17%	11.25%	7.11%
Law	4.04%	3.60%	4.47%
# of Employees	1800	900	900

Table A2 Sample Size per Experimental Condition and Total by Role*Panel A: Employee (N=1,800)*

		Topic	
		Science & Technology (n=910)	Psychology & Linguistics (n=890)
Advice	Private (n=903)	224 women 233 men	220 women 226 men
	Visible (n=897)	232 women 221 men	224 women 220 men

Panel B: Manager (N=721)

		Topic	
		Science & Technology (n=360)	Psychology & Linguistics (n=361)
Advice	Private (n=241)	62 women 60 men	59 women 60 men
	Visible (n=480)	120 women 118 men	121 women 121 men

Table A3 Logit Models Predicting Employees' Propensity to Seek Advice

DV: <i>Advice</i> (1/0)	(1) Pooled	(2) Pooled	(3) Female Employee e	(4) Female Employee e	(5) Male Employee e	(6) Male Employee e
<i>Visible</i> (1/0)	-0.121*** (0.024)	-0.134*** (0.035)	-0.134*** (0.033)	-0.179*** (0.048)	-0.112*** (0.035)	-0.092* (0.050)
<i>Science & Tech</i> (1/0)	-0.032 (0.024)	-0.046 (0.035)	-0.022 (0.033)	-0.069 (0.049)	-0.034 (0.037)	-0.014 (0.051)
<i>Visible X Science & Tech</i>		0.027 (0.048)		0.087 (0.066)		-0.040 (0.070)
<i>Male</i> (1/0)	-0.037 (0.025)	-0.037 (0.025)				
Baseline mean <i>Advice</i>	0.643	0.643	0.700	0.700	0.588	0.588
Subj. performance-level-dummies	yes	yes	yes	yes	yes	yes
Adjusted R ²	0.062	0.062	0.045	0.046	0.075	0.076
# of Employees	1800	1800	900	900	900	900

Notes. Logit marginal effects (dF/dx) in all columns. The dependent variable in all specifications is *Advice* that equals 1 if the Employee sought advice and 0 otherwise. *Visible* is an indicator that equals 1 if the Employee was in the treatment condition where their advice seeking decision was visible to the Manager and 0 otherwise. *Science & Tech* is an indicator that equals 1 if the Employee encountered the quiz topic “Science & Technology” and 0 when they encountered the “Psychology & Linguistics”-quiz. *Male* is an indicator for Employee’s sex equaling 1 if they are male and 0 if they are female. *Baseline mean Advice* is the mean of *Advice* for the (sub-)sample of Employees in each column header. *Subj. performance-level-dummies* bin Employees’ incentivized beliefs about their achieved quiz score ranging from 0 to 10 and binned into five levels: 0-2, 3-4, 5-6, 7-8, 9-10. Robust standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A4 Linear Probability Models Predicting Employees' Propensity to Seek Advice with Actual Performance-level Controls

DV: <i>Advice</i> (1/0)	(1) Pooled	(2) Female Employee	(3) Male Employee	(4) Female Employee	(5) Male Employee	(6) Pooled
<i>Visible</i> (1/0)	-0.105*** (0.023)	-0.129*** (0.032)	-0.082** (0.033)	-0.168*** (0.045)	-0.059 (0.046)	-0.077** (0.032)
<i>Science & Tech</i> (1/0)	-0.049** (0.024)	-0.012 (0.033)	-0.096** (0.037)	-0.051 (0.044)	-0.073 (0.049)	
<i>Male</i> (1/0)	-0.071*** (0.023)					-0.069*** (0.023)
<i>Visible X Science & Tech</i>				0.077 (0.064)	-0.045 (0.066)	
<i>Favorable Competence Stereotype</i> (1/0)						-0.002 (0.032)
<i>Visible x Favorable Competence Stereotype</i>						-0.055 (0.046)
Private Mean <i>Advice</i>	0.643	0.700	0.588	0.700	0.588	0.643
<i>Performance-level-dummies</i>	yes	yes	yes	yes	yes	yes
Adjusted R-sq	0.035	0.023	0.032	0.023	0.031	0.034
# of Employees	1800	900	900	900	900	1800

Notes. The dependent variable in all specifications is *Advice* that equals 1 if the Employee sought advice and 0 otherwise. *Visible* indicates that the Employee was in the treatment condition in which the advice-decision was revealed to the Manager. *Science & Tech* indicates that the Employee took the Science & Technology quiz. *Male* indicates that the Employees' sex is male. *Favorable Competence Stereotype* indicates whether a stereotype about competence and an Employee's sex are congruent. For women, it takes the value of 1 in the "Psychology & Linguistics"-quiz and for men in the "Science & Technology"-quiz. *Private mean Advice* is the mean of *advice* for the (sub-)sample of Employees as described in the column header. *Performance-level-dummies* bin Employees' actual independent quiz score in part 1 (ranging from 0 to 10) into five levels: 0-2, 3-4, 5-6, 7-8, 9-10, with 7-8 as the omitted category. Robust standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A5 Correlation Between Advice-Seeking and Additional Variables by Visibility

Category	Independent Variable (Statement)	(1) Private	(2) Visible
<i>a. Instrumental value of advice</i>	1) Usefulness of advice	-0.168*** (0.013)	-0.186*** (0.013)
	2) Importance of luck in quiz (%)	-0.071*** (0.017)	-0.035* (0.017)
<i>b. Gender and norms</i>	3) Male (0/1)	-0.061 (0.032)	-0.006 (0.033)
	4) Continuous gender identity	0.012 (0.017)	-0.011 (0.017)
	5) On average, men are less willing to ask others for advice than women.	0.001 (0.016)	0.009 (0.016)
	6) In general, it is more socially acceptable for women to ask for advice than for men.	-0.002 (0.016)	0.018 (0.016)
<i>c. Expectations and reputation</i>	7) Reputation is very important for one's career advancement and promotions.	0.041** (0.015)	-0.001 (0.016)
	8) Seeking advice from others can hurt my reputation if others have high expectations about my ability.	-0.019 (0.016)	-0.001 (0.016)
	9) Seeking advice from others can hurt my reputation if others have low expectations about my ability.	-0.022 (0.015)	-0.023 (0.016)
<i>d. Other individual factors</i>	10) Overconfidence	-0.024 (0.02)	-0.013 (0.019)
	11) Risk	-0.004 (0.016)	-0.039* (0.017)
	12) It is particularly uncomfortable to ask for advice in a work-related task that others think I am competent at.	-0.004 (0.015)	0.008 (0.016)
	13) I do not care what others think of me.	-0.010 (0.015)	0.011 (0.016)
	14) I feel bad if I cannot accomplish tasks independently.	-0.194*** (0.007)	-0.169*** (0.006)
	15) Uncomfortable that Manager controls pay	0.014 (0.015)	-0.003 (.016)
	16) Job requires less team work	0.019 (0.016)	-.006 (0.016)
<i>e. Work environment</i>	17) More/most colleagues are female	0.009 (0.016)	0.012 (0.017)
	18) Employment status:		
	i) Unemployed	0.037 (0.051)	0.076 (0.053)
	ii) Part-Time	0.060 (0.046)	0.060 (0.046)
	iii) Self-employed	0.049 (0.047)	0.008 (0.053)
# of Employees		903	897

Notes. Individual level regression results from a linear probability model, correlating each independent variable, 1-18, with the dependent variable *Advice* (1 if advice was sought, 0 otherwise), conditional on *subjective performance-level-dummies*. All independent variables except for 3) and 18) are standardized (mean zero, standard deviation one). The independent variables are worded as follows in the questionnaire: 1) "In your view, how useful is it to seek advice in this study?" with choices: 1: 'Always useful', 2: 'Only useful if you have an idea about the correct answer', 3: 'Only useful if you do not have an idea about the correct answer', 4: 'Never useful'. 2) "When answering a quiz like today's, how important is the role of luck, as

opposed to knowledge, in getting the correct answer?” with choices: 0 % ‘no luck’ to 100 % ‘only luck’. 3) *Male* is an indicator for Employee’s sex that equals 1 if the Employee is male and 0 otherwise. 4) *“In general, how do you see yourself? Where would you put yourself on this scale from 0- ‘very masculine’ to 10- ‘very feminine’?”* 10) *Overconfidence* is the difference between subjective confidence and objective Part 1. 11) *Risk* is a combined, weighted risk measure following Falk et al. 2018 using the weights from a experimental validation procedure of Falk et al. 2016 for staircase risk and willingness to take risks.). 15) *“How comfortable are you with the manager controlling a large part of your earnings for this study? Please indicate your answer on the scale below.”* With choices: 1: ‘very comfortable’ to 7: ‘very uncomfortable’. 16) *.” Does your job require working in teams?”*, choices: 1: ‘Always’, 2: ‘Mostly’, 3: ‘Balanced shares of team & individual work’, 4: ‘Rarely’, 5: ‘Never’. 17) *.” What would best describe your colleagues at your current workplace?”*, choices: 1: ‘By far most of my colleagues are men’, 2: ‘A somewhat bigger share of my colleagues are men’, 3: ‘Among my colleagues, the share of men and women is about equal’, 4: ‘A somewhat bigger share of my colleagues are women’, 5: ‘By far most of my colleagues are women’, 6: ‘I have no colleagues’. In this specification, 5.4% of Employees who have no colleagues are excluded from the regression, leaving N=849 and N=845 Employees in Private and Visible, respectively. 18) *Employment status* is a categorical variable with the choices i) to iii) above and iv) Full-Time which is the omitted category. All other independent variables 5) - 9) and 12)-14) are measured on a Likert scale, indicating agreement to a statement on a scale from: 1: ‘strongly disagree’ to 7: ‘strongly agree’. Robust standard errors in parentheses. *p<0.05, **p< 0.01, ***p< 0.005.

Table A6 Frequencies of Motives for Seeking and Not Seeking Advice by Visibility to Manager

Motive	Advice			No advice		
	(1) Private	(2) Visible	(3) p-value	(4) Private	(5) Visible	(6) p-value
<i>Information value of advice</i>	0.63	0.60	0.37	0.00	0.01	0.72
<i>No benefit of advice</i>	0.00	0.00	-	0.21	0.18	0.30
<i>Manager rewards seeking advice</i>	0.00	0.01	0.01	0.00	0.00	-
<i>Manager discounts seeking advice</i>	0.00	0.00	0.27	0.03	0.16	0.00
<i>Preference for independent performance</i>	0.00	0.00	-	0.18	0.17	0.90
<i>Poor understanding of incentives</i>	0.01	0.00	0.11	0.02	0.03	0.54
<i>Economic cost benefit tradeoff</i>	0.23	0.19	0.12	0.23	0.27	0.24
<i>Confidence in own performance</i>	0.00	0.00	0.27	0.44	0.42	0.61
<i>Little confidence own performance</i>	0.64	0.68	0.26	0.03	0.03	0.71
<i>Control own payment</i>	0.00	0.00	-	0.00	0.01	0.45
# of Employees	581	482		322	415	

Notes. Three raters blind to the research question independently classified each response to the question “First, briefly describe why you chose to [not] seek advice?” into the 10 motives. These three (yes/no)-classification were aggregated by taking the median. The median classification was then used to calculate the frequencies of motives for [not] seeking advice among seekers and non-seekers in Private and Visible. P-values of a two-sided test of proportions with H0 that proportions are the same in Private and Visible. Statistic of inter-rater agreement (Krippendorff’s alpha) and description of each motive in Tables B5 and B6 in the Online Appendix.

Table A7 Frequencies of Reasons Stated in Quiz Score Estimate Descriptions of Managers by Visibility of Advice

Reason	(1)	(2)	(3)	(4)
	Pooled	Private	Visible	P-Value
<i>Comparison to self</i>	0.34	0.37	0.33	0.196
<i>Education</i>	0.41	0.38	0.43	0.168
<i>Age</i>	0.17	0.17	0.17	0.797
<i>Knows sex</i>	0.25	0.17	0.29	0.000
<i>Explanation sex</i>	0.04	0.05	0.04	0.503
<i>Advice</i>	0.13	0.03	0.19	0.000
<i>Topic</i>	0.25	0.25	0.25	0.879
<i>Quiz difficulty</i>	0.13	0.16	0.12	0.108
<i>Guess</i>	0.18	0.24	0.15	0.005
# of Managers	721	241	480	

Notes. Three raters blind to the research question independently classified each response to the question “We would like to understand how you arrived at your estimate of the quiz-taker’s quiz performance without advice. Please, briefly describe your thought process:” into the 9 reasons. These three (yes/no)-classifications were aggregated by taking the median. The median classification was then used to calculate the frequencies of reasons in the pooled sample of all Managers and split by visibility. P-values of a two-sided test of proportions with H0 that proportions are the same in Private and Visible. Statistic of inter-rater agreement (Krippendorff’s alpha) and description of each reason in Tables B11 and B12 in the Online Appendix.

A2. Manipulation Check Quiz Topics

Do quiz topics manipulate beliefs about the Manager's stereotypical beliefs about competence? In the final questionnaire, second-order beliefs about Managers' beliefs about competence were elicited in two ways.

First, we elicited beliefs about others' stereotypical views on what women and men know, on average, about different topics with a slightly modified version of the continuous slider measure introduced by Coffman (2014).²⁷ This unincentivized measure ranges from -1 (*most people* think there is a female advantage in knowledge) to 0 (no gender difference) to 1 (*most people* think there is male advantage in knowledge). Every participant answered these sliders on six different topics.

Second, whenever an Employee was randomly assigned to Private, she was asked to report her belief about the Manager's quiz score estimate for two other participants: a woman and a man. She reported these beliefs for the same quiz topic that she had worked on, such that this measure varies between subjects. This elicitation was incentivized. The outcome *female advantage* is the difference in the reported beliefs and is positive, whenever a participant believes that a Manager would estimate that a women performed better than a man. According to either measure, we can conclude that the selected quiz topics successfully manipulated participants' beliefs about the Manager's belief about their competence (see averages presented in Table A8).

Table A8 Manipulation Checks Quiz Topic

	Psychology & Linguistics				Science & Technology			
	Slider	p	Fem A.	p	Slider	p	Fem A.	p
Overall	-0.20	<0.001	0.126	0.027	0.29	<0.001	-0.379	<0.001
Women	-0.22	<0.001	-0.073	0.374	0.28	<0.001	-0.638	<0.001
Men	-0.17	<0.001	0.319	<0.001	0.30	<0.001	-0.129	0.070

Notes. Averages for the slider measure (slider) and the female advantage measure (Fem A.) P-values for two-sided t-test against H0 that an average is equal to zero.

²⁷ Originally, the slider asks participants to report their own views. We, instead, asked about higher-order beliefs: what do you think *most people think*?

B. Online Appendix: Alternative Specifications and Robustness Checks

B1. Additional Tables

Table B1 LPM Predicting the Willingness to Seek Advice by Quiz Topic

DV: <i>Advice</i> (1/0)	(1)	(2)	(3)	(4)
	Science & Tech	Science & Tech	Psychology & Linguistics	Psychology & Linguistics
<i>Visible</i> (1/0)	-0.100*** (0.031)	-0.085* (0.044)	-0.122*** (0.032)	-0.168*** (0.044)
<i>Male</i> (1/0)	-0.033 (0.034)	-0.017 (0.046)	-0.027 (0.032)	-0.072* (0.043)
<i>Visible X Male</i>		-0.031 (0.063)		0.091 (0.063)
Baseline mean <i>Advice</i>	0.602	0.602	0.686	0.686
Subj. performance-level-dummies	yes	yes	yes	yes
Adjusted R ²	0.100	0.099	0.042	0.043
# of Employees	910	910	890	890

Notes. Individual level regression coefficients from a linear probability model. The dependent variable in all specifications is *Advice* that equals 1 if the Employee sought advice and 0 otherwise. *Visible* is an indicator that equals 1 if the Employee was in the treatment condition where their advice seeking decision was visible to the Manager and 1 otherwise. *Male* is an indicator for Employee's sex equaling 1 if they are male and 0 if they are female. *Baseline mean Advice* is the mean of *Advice* for the (sub-)sample of Employees in each column header. *Subj. performance-level-dummies* bin Employees' incentivized beliefs about their achieved quiz score ranging from 0 to 10 and binned into five levels: 0-2, 3-4, 5-6, 7-8, 9-10. The column headers indicate the randomly assigned quiz topic. Robust standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table B2 Frequencies of Motives for Seeking and Not Seeking Advice by Employee Sex and Visibility to Manager: Employees Who Did *Seek* Advice

Motives	Private			Visible		
	(1) Male	(2) Female	(3) p-value	(4) Male	(5) Female	(6) p-value
<i>Information value of advice</i>	0.69	0.57	0.37	0.66	0.55	0.72
<i>No benefit of advice</i>	0.00	0.00	-	0.00	0.00	0.30
<i>Manager rewards seeking advice</i>	0.00	0.00	0.01	0.01	0.02	-
<i>Manager discounts seeking advice</i>	0.00	0.00	0.27	0.01	0.00	0.00
<i>Preference independent performance</i>	0.00	0.00	-	0.00	0.00	0.90
<i>Poor understanding of incentives</i>	0.00	0.01	0.11	0.00	0.00	0.54
<i>Economic cost benefit tradeoff</i>	0.31	0.16	0.12	0.25	0.14	0.24
<i>Confidence in own performance</i>	0.00	0.00	0.27	0.00	0.00	0.61
<i>Little confidence own performance</i>	0.62	0.67	0.26	0.65	0.70	0.71
<i>Control own payment</i>	0.00	0.00	-	0.00	0.00	0.45
# Employees	270	311		221	261	

Notes. Median of binary (yes/no)-ratings from three independent raters blind to the research question used to calculate the relative frequencies with which each motive for seeking advice occurred by the gender of the Employee and visibility to the manager in columns (1), (2), (4) and (5). P-values of a proportion test against H0 that proportions are the same in Visible and Private reported in columns (3) and (6). Employees who sought advice only. Description of each motive in Table B5 in the Online Appendix.

Table B3 Frequencies of Motives for Seeking and Not Seeking Advice by Employee Sex and Visibility to Manager: Employees Who Did *Not* Seek Advice

Motive	Private			Visible		
	(1) Male	(2) Female	(3) p-value	(4) Male	(5) Female	(6) p-value
<i>Information value of advice</i>	0.00	0.01	0.37	0.01	0.00	0.72
<i>No benefit advice</i>	0.17	0.27	-	0.10	0.28	0.30
<i>Manager rewards seeking advice</i>	0.00	0.00	0.01	0.00	0.00	-
<i>Manager discounts seeking advice</i>	0.04	0.01	0.27	0.17	0.14	0.00
<i>Preference for independent performance</i>	0.17	0.19	-	0.15	0.21	0.90
<i>Poor understanding of incentives</i>	0.02	0.03	0.11	0.01	0.05	0.54
<i>Economic cost benefit tradeoff</i>	0.24	0.22	0.12	0.32	0.21	0.24
<i>Confidence in own performance</i>	0.56	0.27	0.27	0.49	0.34	0.61
<i>Little confidence own performance</i>	0.02	0.05	0.26	0.01	0.05	0.71
<i>Control own payment</i>	0.00	0.01	-	0.00	0.02	0.45
# Employees	189	133		220	195	

Notes. Median of binary (yes/no)-ratings from three independent raters blind to the research question used to calculate the relative frequencies with which each motive for not seeking advice occurred by gender of the Employee and visibility to the manager in columns (1), (2), (4) and (5). P-values of a proportion test against H0 that proportions are the same in Visible and Private reported in columns (3) and (6). Employees who did not seek advice only. Description of each motive in Table B5 in the Online Appendix.

Table B4 Inter-rater Agreement for Classified Motives (Employees)

Motive	Krippendorff's alpha
<i>Information value of advice</i>	0.302
<i>No benefit advice</i>	0.719
<i>Manager rewards seeking advice</i>	0.497
<i>Manager discounts seeking advice</i>	0.896
<i>Preference for independent performance</i>	0.814
<i>Poor understanding of incentives</i>	0.348
<i>Economic cost benefit tradeoff</i>	0.655
<i>Confidence in own performance</i>	0.848
<i>Little confidence own performance</i>	0.713
<i>Control own payment</i>	0.051

Notes. Three student assistants blind to the research question independently classified each response to the question “First, briefly describe why you chose to [not] seek advice?” into the 10 motives. These motives were defined by the authors. Krippendorff’s alpha is a measure of inter-rater agreement. An alpha of 1 indicates perfect agreement and a value of 0 implies no more agreement than what would be expected by chance. Typically, values between 0.41–0.60 are interpreted to indicate moderate agreement, values between 0.61–0.80 to indicate substantial agreement and values above 0.81 to indicate almost perfect agreement.

Table B5 Description of Motives for Classification Task (Employees)

Motive	Description
<i>1. Information value of advice</i>	Taking the advice option is considered useful: some additional information contained in advice which increases probability of answering a question correct. Hence, believed to improve the quiz performance (=score), including the ambition to reach a perfect score. Also, for reassurance in the original answers. <i>Example: „To increase my chance of making more money“</i>
<i>2. No benefit of advice</i>	Taking the advice option is considered useless for improving the quiz performance (=score), e.g., because narrowing down options from 5 to 2 would not help. Dislike of the risk of still getting things wrong. <i>Example: “Because I was fairly confident on enough of the answers and I didn't want the Manager to see I'd sought advice.”</i>
<i>3. Manager rewards seeking advice</i>	Taking the advice option increases Manager's perception of oneself and thereby the allocated bonus. <i>Example: “I guessed that the Manager would estimate higher if he/she was shown that I had revised my answers based on advice.”</i>
<i>4. Manager discounts seeking advice</i>	Taking the advice option decreases Manager's perception of oneself and thereby the allocated bonus. <i>Example: “Because I was fairly confident on enough of the answers and I didn't want the Manager to see I'd sought advice.”</i>
<i>5. Preference for independent performance</i>	Preference for solving the quiz on one's own without external help of advice option, i.e., e.g., testing own knowledge, Ownership, "risk it". <i>Example: “I chose not to seek advice as I like to learn and answer independently. I guessed that the Manager would estimate higher if he/she was shown that I had revised my answers based on advice.”</i>
<i>6. Poor understanding of incentives</i>	Any statement revealing that one has not understood the incentive structure of the experiment. For instance, thinking the advice comes from Manager/another candidate. <i>Example: “I did not seek advice because I don't think another average participant knows more than me and can give good advice on the quiz.”</i>
<i>7. Economic cost benefit tradeoff</i>	Mentioning in both a tradeoff between any monetary expected benefits (pay) and costs (advice fee) to seeking advice for justifying the advice decision (yes/no). For the non-seekers: considering the fee too high/not worth it. <i>Example: “For a small one off fee there was a good chance of selecting the correct answer in Part 2 and earning more money.”</i>
<i>8. Confidence in own performance</i>	Stated high confidence in own knowledge and answers provided independently in part 1 of the study. <i>Example: “I am confident in my own abilities.”</i>
<i>9. Little confidence own performance</i>	Stated low confidence in own knowledge and answers provided independently in Part 1 of the study. <i>Example: “I wasn't confident in the answers I provided in section 1”</i>
<i>10. Control own payment</i>	Stated preference for being the person (solely) in control of one's payment with possibly limiting/minimizing anyone else's impact via own decision. Similar to 5. <i>Preference for independent performance</i> but with clear monetary component. <i>Example: “I trust my own judgement. I don't trust others much.”</i>

Table B6 OLS Regressions Predicting Managers' Quiz Score Estimate
Controlling for Manager Sex

DV: Manager's Estimate (#)	(1) <u>Visible</u> Pooled	(2) <u>Visible</u> Female Employee	(3) <u>Visible</u> Male Employee	(4) Private & <u>Visible</u> Female Employee	(5) Private & <u>Visible</u> Male Employee
<i>Advice</i> (1/0)	-0.140 [-0.369,0.089] (0.117)	-0.214 [-0.571,0.142] (0.181)	-0.103 [-0.387,0.181] (0.144)		
<i>Visible</i> (1/0)				-0.191** (0.090)	0.033 (0.091)
<i>Science & Tech</i> (1/0)	0.239** (0.105)	0.009 (0.149)	0.488*** (0.151)	0.065 (0.092)	0.420*** (0.092)
<i>Advice</i> x <i>Science & Tech</i>	0.164 (0.163)	0.215 (0.232)	0.118 (0.234)		
<i>Female Employee</i> (1/0)	-0.119 (0.084)				
<i>Male Manager</i> (1/0)	-0.050 (0.087)	-0.014 (0.123)	-0.099 (0.125)	-0.033 (0.094)	0.017 (0.096)
<i>Own subj.</i> <i>quiz performance</i> (#)	0.241*** (0.023)	0.264*** (0.034)	0.222*** (0.032)	0.251*** (0.027)	0.198*** (0.025)
Mean <i>Estimate</i>	5.554	5.325	5.779	5.661	5.750
Adjusted R ²	0.252	0.259	0.249	0.256	0.226
# of Managers	477	239	238	360	357

Notes. The dependent variable in all specifications is the Manager's *Estimate* of a matched Employee's quiz score. This variable is standardized to have a mean of zero and standard deviation of 1. *Advice* *t* indicates that the matched Employee sought advice on the quiz. *Visible* indicates that Managers observed the matched Employee's advice-seeking decision. *Science & Tech* indicates that Manager and the matched Employee took the Science & Technology quiz. *Female Employee* indicates that the matched Employee is a woman. *Male Manager* indicates that the Manager's sex is male. As four Managers have indicated a non-binary sex or refused to answer this question, the sample size is slightly lower than in Table 2. *Own subj. quiz performance* is the Manager's subjective belief of their own quiz performance and ranges from 0 to ²⁸10. *Mean Estimate* is the overall mean of the Managers' estimate for the sample specified in the column header. Results presented in Column (1)-(3) are restricted to Managers who were randomly assigned to Visible while column (4) and (5) include all Managers who were matched with female and male Employees, respectively. 95% confidence intervals in squared brackets. Robust standard errors in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01.

²⁸ The wording of the question was: "We would like to understand how you arrived at your estimate of the quiz-taker's quiz performance without advice. Please, briefly describe your thought process:".

Table B7 OLS Regressions Predicting Manager's Estimate in Private

	(1) <u>Private</u> Pooled	(2) <u>Private</u> Female Employee	(3) <u>Private</u> Male Employee
DV: <i>Manager's Estimate</i> (#)			
<i>Female Employee</i> (1/0)	0.296 (0.237)		
<i>Science & Tech</i> (1/0)	0.258 (0.229)	-0.065 (0.252)	0.294 (0.231)
<i>Female Employee</i> x <i>Science & Tech</i>	0.278 (0.330)		
<i>Own subj. quiz performance</i>	0.338*** (0.044)	0.409*** (0.061)	0.279*** (0.063)
<i>Baseline mean Estimate</i>	5.587	5.481	5.694
# of Managers	241	121	120
R ²	0.216	0.242	0.198

Notes. Managers' individual level regression coefficients from an OLS regression model. Managers in *Private* only. The dependent variable in all specifications is a Manager's *Estimate* (standardized, mean zero, standard deviation one) of a matched Employee's quiz score ranging between 0 and 10. *Female Employee* is an indicator that equals one if the sex of the matched Employee is female and zero otherwise. *Science & Tech* is an indicator that equals one if the matched Employee and Manager encountered the quiz topic Science & Technology and zero when they encountered the Psychology & Linguistics quiz. *Own subj. quiz performance* is the Manager subjective belief of their own quiz performance and ranges between 0 and 10. This belief elicitation was incentivized. *Baseline mean Estimate* is the Mean of *Estimate* for the subsample of Managers matched with the respective type of Employee in each column header. Robust standard errors in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01.

Table B8 Linear Probability Models Predicting the Likelihood of Manager's Estimate of Employee Performance being Correct

DV: <i>Correct Estimate</i> (1/0)	(1) Pooled	(2) Pooled	(3) Visible	(4) Visible
<i>Visible</i> (1/0)	0.002 (0.026)	0.003 (0.026)		
<i>Science & Tech</i> (1/0)	-0.023 (0.025)	-0.023 (0.025)	-0.013 (0.031)	-0.013 (0.031)
<i>Male Manager</i> (1/0)	0.022 (0.026)		0.033 (0.032)	0.033 (0.032)
<i>Same-sex pairing</i> (1/0)		-0.002 (0.025)		
<i>Advice</i> (1/0)			0.009 (0.031)	0.008 (0.033)
<i>Advice mentioned in statement</i> (1/0)				0.002 (0.043)
<i>Correct guess own performance</i> (1/0)	-0.008 (0.032)	-0.009 (0.032)	-0.012 (0.039)	-0.012 (0.039)
<i>Own subj. quiz performance</i> (#)	0.018*** (0.007)	0.019*** (0.007)	0.014* (0.008)	0.014* (0.008)
Constant	0.031 (0.040)	0.035 (0.043)	0.040 (0.045)	0.040 (0.045)
<i>Correct Estimate Mean</i>	0.129	0.129	0.133	0.133
Adjusted R ²	0.007	0.006	0.001	-0.001
# of Managers	717	717	477	477

Notes. The dependent variable in all specifications is an indicator of the Manager's *Correct Estimate* of a matched Employee's quiz score. It takes on the value 1 if the estimate is correct and 0 otherwise. *Visible* indicates that Managers observed the matched Employee's advice-seeking decision. *Science & Tech* indicates that Manager and the matched Employee took the Science & Technology quiz. *Male Manager* indicates that the Manager's sex is male. As four Managers have indicated a non-binary sex or refused to answer this question, the sample size is slightly lower than in Table 2. *Same-sex pairing* indicates that the matched Manager and Employee have the same sex. *Advice* indicates that the matched Employee sought advice on the quiz. *Advice mentioned in statement* indicates that Managers have mentioned the term "advice" when reasoning about how they arrived at their estimate for the matched employee's quiz score. The wording of the question was: "We would like to understand how you arrived at your estimate of the quiz-taker's quiz performance without advice. Please, briefly describe your thought process:". *Correct guess own performance* indicates that Managers have correctly guessed their own quiz score. *Own subj. quiz performance* is the Manager's subjective belief of their own quiz performance and ranges from 0 to 10. *Mean Estimate* is the overall mean of the Managers' estimate for the sample specified in the column header. Results presented in Column (1) and (2) include all Managers while column (3) and (4) are restricted to Managers in the *Visible* – Condition only, respectively. 95% confidence intervals in squared brackets. Robust standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table B9 Frequencies of Reasons Stated in Manager's Description of Their Quiz Score Estimate

Reason	<u>Male Employees</u>			<u>Female Employees</u>		
	Visible	Private	P-Value	Visible	Private	P-Value
<i>Comparison to self</i>	0.310	0.367	0.278	0.340	0.380	0.454
<i>Education</i>	0.414	0.383	0.574	0.448	0.372	0.166
<i>Age</i>	0.146	0.192	0.272	0.187	0.157	0.485
<i>Knows sex</i>	0.280	0.183	0.045	0.299	0.149	0.002
<i>Explanation sex</i>	0.038	0.058	0.370	0.033	0.033	0.995
<i>Advice</i>	0.205	0.017	0.000	0.166	0.033	0.000
<i>Topic</i>	0.247	0.242	0.914	0.261	0.256	0.915
<i>Quiz difficulty</i>	0.117	0.175	0.132	0.120	0.149	0.448
<i>Guess</i>	0.163	0.233	0.108	0.145	0.248	0.016
# Managers	239	120		241	121	

Notes. Median of binary (yes/no)-ratings from three independent raters blind to the research question used to calculate the relative frequencies of reasons mentioned in Managers' open text descriptions of their reasoning behind their quiz score estimate of a matched Employee. The wording of the question was: "We would like to understand how you arrived at your estimate of the quiz-taker's quiz performance without advice. Please, briefly describe your thought process:". P-values of a proportion test against H0 that proportions are the same in Visible and Private. Description of each reason in Table B11 in the Online Appendix.

Table B10 Inter-rater Agreement for Classified Reasons (Managers)

Reason	Krippendorff's alpha
<i>Comparison to self</i>	0.868
<i>Education</i>	0.678
<i>Age</i>	0.724
<i>Knows sex</i>	0.885
<i>Explanation sex</i>	0.772
<i>Advice</i>	0.929
<i>Topic</i>	0.705
<i>Quiz difficulty</i>	0.541
<i>Guess</i>	0.523

Notes. Three student assistants blind to the research question independently classified each response to the following prompt "We would like to understand how you arrived at your estimate of the quiz-taker's quiz performance without advice. Please, briefly describe your thought process:" into the 9 reasons. These reasons were defined by the authors. Krippendorff's alpha is a measure of inter-rater agreement. An alpha of 1 indicates perfect agreement and a value of 0 implies no more agreement than what would be expected by chance. Typically, values between 0.41–0.60 are interpreted to indicate moderate agreement, values between 0.61–0.80 to indicate substantial agreement and values above 0.81 to indicate almost perfect agreement.

Table B11 Description and Examples of Reasons for Classification Task (Managers)

Reason	Description	Examples
1. Comparison to self	Manager compares profile to himself/herself or their knowledge/abilities/how difficult they found the quiz. Manager took their own performance as a reference point.	<i>"Based on my own performance, similar background and age. That's all I had to go on, so I went with it."</i> <i>"I just guessed based on my own performance."</i>
2. Education	Manager refers to the information on the employee's education level e.g., "a-levels".	<i>"I wondered what A levels this quiz-taker had taken, as this might include some areas of knowledge pertinent to the questions."</i> <i>"Looked at level of education"</i> <i>"She is intelligent"</i> .
3. Age	Manager explains that s/he considered the employee's age when making an estimate.	<i>"Took into account age, education and type of questions"</i> <i>"she could have been younger than me "</i>
4. Knows sex	Manager's explanation shows that s/he knows the Employee's sex, for example, by using pronouns.	<i>"she could have been younger than me "</i> <i>"he is male so probably more interested in the subject, profile suggests he is intelligent."</i>
5. Explanation sex	Manager explains that s/he considered the employee's sex when making an estimate.	<i>"he is male so probably more interested in the subject, profile suggests he is intelligent."</i> <i>"As a woman, she may be interested in psychology."</i>
6. Advice	Manager explains that s/he based the estimate (also) on the Employee's decision to seek advice.	<i>"I took in consideration his age, his education and that he sought advice"</i> <i>"I noted that the quiz-taker took advice and therefore the choices of each were narrowed to 2, he had taken a-levels and I guessed that he might have studied the subject in question."</i>
7. Topic	Manager mentions that his/her estimate is (also) based on the quiz topic ("Science & Technology" or "Psychology & Linguistics"). The manager could also mention the topic indirectly (e.g. "the subject was hard")/	<i>"The Science & Tech knowledge he has pretty much is the deciding factor."</i> <i>"Knowledge of psychology methods and authors amongst the general population is low so I would imagine most answers were guess work."</i> <i>"I assume that she knows little about the topic."</i>
8. Quiz difficulty	Manager comments on their perception of the difficulty of the quiz.	<i>"It's a fairly difficult quiz so I went with slightly more than half "</i>
9. Guess	Manager states no reason other than a (random) guess	<i>"It was a guess"</i> <i>"Picked an average score"</i>

B2. Calibration of the Knowledge Task

For constructing the knowledge task of this study, we collected over 160 questions from various domains and gathered the performance data from 119 individuals in the same subject pool as the main study.²⁹ Simultaneously, we elicited beliefs about average performance of men and women in several domains of knowledge (“Art & Art History”, “Geography & Geology”, “History”, “Information Science & Technology”, “Linguistics & Language Use”, “Literature”, “Philosophy”, “Physics & Astrophysics”, “Politics”, “Popular Culture”, “Psychology” and “Sports”. Participants reported their beliefs on a scale from -1 (women know more on average) to 1 (men know more on average) where 0 reflects parity Coffman, 2014. We selected the most stereotypical and potentially labor-market-relevant domains of knowledge to combine them into one topic, namely “Science & Technology” as well as “Psychology & Linguistics”. In our sample, stereotypes assign women and men, respectively, a knowledge advantage. We curated the final set of questions per quiz to be of a comparable difficulty. Based on the knowledge of women and men in our pre-test sample, we selected 10 questions per topic. The questions were selected such that women and men gave 6 correct answers, on average, and had the same modal number of correct answers (7).

All reported p-values are from a two-sided t-test for an equality of means. Looking at the actual quiz performance in Part 1 in the main study, the “Science & Technology” quiz—with an average score of 7.5 correct answers—turned out slightly easier than the “Psychology & Linguistics” quiz with an average score of 6.3 ($p < 0.001$). Overall, the modal quiz scores are 7 and 8, respectively. On the “Psychology & Linguistics” quiz, women and men performed equally well, on average: women with an average score of 6.4 and men with an average score of 6.3 ($p = 0.69$). The modal score is 7 for women and 6 for men. On the “Science & Technology” quiz, women had an average score of 7.0, whereas men performed slightly better with an average score of 8.0 ($p < 0.001$). The modal score is 9 for men and 7 for women.

²⁹ Participants of any of our quiz calibration pilots or pre-tests were excluded from our main data collection.

C. Experimental Instructions

1. Employee version.

Screens marked with a and b reflect treatment variations, i.e., each participant saw either version of the screen in line with the random treatment assignment.

Screen 1

Welcome!

Overview: You are participating in a research study on economic decision making. It consists of a short initial survey, two main parts in which you make decisions for an extra bonus payment, and a final questionnaire. Your *bonus* payment depends on your decisions and the decisions of other participants throughout the study. Therefore, it is important that you read all instructions carefully. Your responses are *anonymous*.

Payment: You will receive a participation pay of **1.50 GBP**. In addition, you can earn up to **4.50 GBP**. If you complete all parts of the study, you will receive payment within the next 4 working days.

General Rules of Conduct: This study will take around 15 minutes. We ask for your *full attention*. Please find a quiet space to complete the study and do not use other devices, talk to other people, use social media, etc. Please remain solely in this browser tab for the entire time of the study.

Comprehension Checks: During the study, you will be asked several comprehension questions referring to the instructions on the same screen. You can only proceed once you answer them correctly.

Consent: I have read and understood the information above. I agree to comply with these rules of conduct and want to participate in this study. I confirm that I am not using a mobile phone to complete it.

Please click "Continue" to proceed.

Continue

Screen 2

Initial Survey

To begin, please answer a short survey about yourself.

1

How old are you?

2

What is your sex?

☐ Female ☐ Male

3

Have you completed A levels or an equivalent level of education that qualifies you for university studies?

☐ Yes ☐ No

4

Were you a university student at some point in time during your life, including current enrollment?

☐ Yes ☐ No

5

Are you currently employed?

☐ Full-Time ☐ Part-Time ☐ Self-employed ☐ No

Continue

Screen 3a – Psychology & Linguistics

Part 1: The Quiz

In Part 1, you will take a general knowledge quiz on **Psychology & Linguistics**.

You will answer 10 multiple-choice questions. You will receive **0.10 GBP** for each correct answer and no extra payment for wrong answers.

The questions are all structured in the same way: a question text, a corresponding image, and 5 possible answers, one of which is correct (see an example picture).

Question 1

Remaining time: 0:28

What is meant by the phrase in the image?



No answer is still an answer

My aunt is always my aunt

The words remain the words

Let love rule

A waste of time

Submit

To submit an answer, choose one and click "Submit". You will then advance to the next question. You will have **30 seconds** to submit your answer, before you are automatically advanced.

We encourage you to submit your best guess before the time runs out, even if you do not know the correct answer with certainty. You have a 20%-chance to simply guess correctly.

Comprehension Question

Is this statement true or false?

Even if I do not know the answer to a question, submitting any guess will increase the chance to receive 0.10 GBP from 0% to 20%.

☐ True ☐ False

Continue

Screen 3b: Science & Technology

Part 1: The Quiz

In Part 1, you will take a general knowledge quiz on **Science & Technology**.

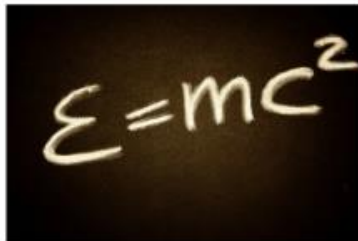
You will answer 10 multiple-choice questions. You will receive **0.10 GBP** for each correct answer and no extra payment for wrong answers.

The questions are all structured in the same way: a question text, a corresponding image, and 5 possible answers, one of which is correct (see an example picture).

Question 1

Remaining time: 0:27

What denotes the 'E' in this well-known formula?



- Electricity
- Efficiency
- Effort
- Elasticity
- Energy

Submit

To submit an answer, choose one and click "Submit". You will then advance to the next question. You will have **30 seconds** to submit your answer, before you are automatically advanced.

We encourage you to submit your best guess before the time runs out, even if you do not know the correct answer with certainty. You have a 20%-chance to simply guess correctly.

Comprehension Question

Is this statement true or false?

Even if I do not know the answer to a question, submitting any guess will increase the chance to receive 0.10 GBP from 0% to 20%.

☐ True ☐ False

Continue

[Quiz – Part 1: 10 sequential screens with multiple choice questions as in the example screen above, participants have 30 seconds to answer each question, after they submitted an answer or timed out, they see the next question of the quiz or proceed with the rest of the experiment.]

Screen 4

Guess, how many of your answers are correct?

You just answered 10 questions on Psychology & Linguistics. How many of your answers are correct? You will receive an extra **correct-guess-pay of 0.25 GBP** if your *guess* equals your actual number of correct answers.

Please enter a number from 0 (no correct answers) to 10 (all correct answers):

At the end of the study, you will see how many of your answers are correct. You will also have the option to learn the correct answers if you want.

Continue

Screen 5 (Psychology & Linguistics, text otherwise equivalent)

Part 2: Revision with Advice

In Part 2, you can seek advice on this Psychology & Linguistics quiz and revise your answers. Seeking advice costs a **one-time fee of 0.08 GBP** (8 pence) and it can help you to submit more correct answers for payment.

Advice

If you decide to seek advice, you will answer each question again but with only 2 instead of 5 answer choices (see an example below). For this simplified quiz, **the computer randomly removed 3 wrong answers**. Your initial answer will be highlighted if it is among the remaining choices. You will have **15 seconds** to review and revise each question. If you run out of time or proceed without a revision, your initial answer will count for payment. Your payment for correct answers will equal **0.10 GBP times your performance in Part 2 after the revision of your answers** in the simplified quiz.

If you decide to not seek advice, you will proceed to the final questionnaire. Your payment for correct answers will equal **0.10 GBP times your quiz performance in Part 1, which was already recorded**.

Question 1

Remaining time: 0:14

What is meant by the phrase in the image?



The words remain the words

A waste of time

Submit

Comprehension Questions

With advice, each question has only 2 instead of 5 answer choices. This increases the chance to simply guess correctly from 20% to ...

- ☐ ...25% ☒ ...50%

Consider the following situation: *a person has sought advice and revised their answers to two questions. This yielded two additional correct answers.*

How much more will that person earn for the 2 correct answers submitted during the revision?

- ☐ 0.00 GBP since correct answers after advice do not count.
☒ 0.20 GBP since that person gets 0.10 GBP for two more correct answers.

How much does this person pay for seeking advice?

- ☐ 0.16 GBP ☒ 0.08 GBP

Continue


Screen 6a: Private

Additional Pay

You can earn more money, which will be added to your other payments. A "manager" will estimate your prior knowledge on Science & Technology, as recorded with your quiz performance in Part 1. The manager is another participant who reported to Prolific to have experience in a managerial position and who will complete a different version of this study.

Your manager will estimate how many questions you have answered correctly **without advice in Part 1**, based on your profile as shown below. You will earn **0.30 GBP** times the manager's estimate. This pay is higher, the more questions the manager thinks you have answered correctly without advice in Part 1. It can be as high as **3.00 GBP**--if the manager thinks that you have answered all 10 questions correctly in Part 1--and as low as **0.00 GBP**.

The manager will *only* see *your profile* to make their estimate of your quiz performance without advice in Part 1 and have no other information about you. Your profile does **not** show your upcoming decision on whether to seek advice.

	Age range:	25-60
	Sex:	Female
	Current country of residence:	UK or Ireland
	Education:	at least A levels and possibly more
	Quiz topics:	Science & Technology

The manager will earn **3.00 GBP** if their estimate of your quiz performance without advice in Part 1 equals your actual performance, and **0.00 GBP** otherwise. Therefore, the manager is motivated to estimate your quiz performance without advice in Part 1 correctly.

The manager will take the same quiz and read a complete summary of your version of the study.

Comprehension Questions

The manager estimates your...

- ☐ quiz performance without advice in Part 1. ☐ your quiz performance after a revision with advice in Part 2.

Consider the following situation: a manager estimates that a person has answered 5 questions correctly without advice in Part 1.

This person will then receive the following pay for the manager's estimate of their quiz performance in Part 1:

- ☐ 3.00 GBP ☐ 1.00 GBP ☐ 1.50 GBP

Continue


Screen 6b: Visible


Additional Pay

You can earn more money, which will be added to your other payments. A "manager" will estimate your prior knowledge on Psychology & Linguistics, as recorded with your quiz performance in Part 1. The manager is another participant who reported to Prolific to have experience in a managerial position and who will complete a different version of this study.

Your manager will estimate how many questions you have answered correctly **without advice in Part 1**, based on your profile as shown below. You will earn **0.30 GBP** times the manager's estimate. This pay is higher, the more questions the manager thinks you have answered correctly without advice in Part 1. It can be as high as **3.00 GBP**--if the manager thinks that you have answered all 10 questions correctly in Part 1--and as low as **0.00 GBP**.

The manager will *only see your profile* to make their estimate of your quiz performance without advice in Part 1 and have no other information about you. If you decide to seek advice, the manager sees the left profile, if you decide not to seek advice, the manager sees the right profile.

	Age range: 25-60
	Sex: Male
	Current country of residence: UK or Ireland
	Education: at least A levels and possibly more
	Quiz topic: Psychology & Linguistics
	Advice: He sought advice on the quiz.

	Age range: 25-60
	Sex: Male
	Current country of residence: UK or Ireland
	Education: at least A levels and possibly more
	Quiz topic: Psychology & Linguistics
	Advice: He did not seek advice on the quiz.

The manager will earn **3.00 GBP** if their estimate of your quiz performance without advice in Part 1 equals your actual performance, and **0.00 GBP** otherwise. Therefore, the manager is motivated to estimate your quiz performance without advice in Part 1 correctly.

The manager will take the same quiz and read a complete summary of your version of the study.

Comprehension Questions

The manager estimates your...

- ☐ quiz performance without advice in Part 1. ☐ your quiz performance after a revision with advice in Part 2.

Consider the following situation: a manager estimates that a person has answered 5 questions correctly without advice in Part 1.

This person will then receive the following pay for the manager's estimate of their quiz performance in Part 1:

- ☐ 3.00 GBP ☐ 1.00 GBP ☐ 1.50 GBP

Continue


[After answering the comprehension questions correctly (6a,b), participants were reminded of the quiz questions. They saw the list of questions without corresponding pictures or answer options for 15 seconds.]

Screen 7b: Visible (In Private, profiles do not contain the last row, see Screen 6a)


Do You Want to Seek Advice?

You can now decide to seek advice.

- If you seek advice, you pay a **one-time advice fee of 0.08 GBP** and can revise your answers in the simplified quiz.
- **A correct answer** pays **0.10 GBP**, regardless of whether you arrived at it without advice in Part 1 or after seeking advice in Part 2.
- You will earn **0.30 GBP** times your manager's estimate of your quiz performance without advice in Part 1. This estimate ranges from 0 (no correct answers) to 10 (all correct answers).
- To make this estimate, the manager will *only* see the information in your profile, either the left or the right one.



Age range:	25-60
Sex:	Male
Current country of residence:	UK or Ireland
Education:	at least A levels and possibly more
Quiz topic:	Psychology & Linguistics
Advice:	He sought advice on the quiz.



Age range:	25-60
Sex:	Male
Current country of residence:	UK or Ireland
Education:	at least A levels and possibly more
Quiz topic:	Psychology & Linguistics
Advice:	He did not seek advice on the quiz.

Only in Visible. Row is not displayed in Private.

At the end of the study, you will see how many questions you answered correctly in Part 1 and, if applicable, in Part 2 after the revision. **Regardless of your decision now, at the end of the study you can see the correct answers to all the questions.**

Do you want to seek advice and revise your answers in the simplified quiz?

[Proceed without advice](#)

[Seek advice](#)

After making the choice, participants saw the following popup. They had to confirm the choice they made or could reconsider.

Confirm Choice

You chose to seek advice. Please confirm your choice.

[No, reconsider](#) [Yes, proceed](#)

[Quiz Part 2: If participants chose to seek advice, they saw the same 10 general knowledge questions again with 2 instead of 5 answer options. They had 15 seconds per question. If they chose not to seek advice, they proceeded with the questionnaire.]

Screen 8

Questionnaire (1/8)

This short questionnaire is the final part. Afterwards, you will see an overview of your earnings and can learn the correct answers.

First, please briefly describe why you chose to not seek advice:

In your view, how useful is it to seek advice in this study?

- ☐ Always useful
- ☐ Only useful if you have an idea about the correct answer
- ☐ Only useful if you do not have an idea about the correct answer
- ☐ Never useful

Continue

Screen 9a: Private


Questionnaire (2/9)

In this part of the questionnaire, you can **earn extra payment by guessing the manager's estimate correctly**.

We ask you to provide two guesses. *One of them* is randomly selected by the computer to count for payment. If you guess the manager's estimate correctly, you will receive an **extra correct-guess-pay of 0.25 GBP**.

Guess 1

Consider a participant with the same profile as you. Below is the profile that the manager sees when estimating their quiz performance without advice in Part 1. This is the only information that the manager sees about them:

	Age range:	25-60
	Sex:	Female
	Current country of residence:	UK or Ireland
	Education:	at least A levels and possibly more
	Quiz topic:	Science & Technology

In your view, what will be the manager's estimate of this participant's quiz performance without advice in Part 1? Please enter a number from 0 (no correct answers) to 10 (all correct answers):

Continue


Screen 10a: Private

Questionnaire (3/9)

You will receive **0.25 GBP** if this guess is correct and randomly selected to count for the correct-guess-pay.

Guess 2

Consider another participant. Below is the profile that the manager sees when estimating their quiz performance without advice in Part 1. This is the only information that the manager sees about them:

	Age range:	25-60
	Sex:	Male
	Current country of residence:	UK or Ireland
	Education:	at least A levels and possibly more
	Quiz topic:	Science & Technology

In your view, what will be the manager's estimate of this participant's quiz performance without advice in Part 1? Please enter a number from 0 (no correct answers) to 10 (all correct answers):

Continue

Screen 9b: Visible


Questionnaire (2/9)

In this part of the questionnaire, you can **earn extra payment by guessing the manager's estimate correctly**.

We ask you to provide two guesses. *One of them* is randomly selected by the computer to count for payment. If you guess the manager's estimate correctly, you will receive an **extra correct-guess-pay of 0.25 GBP**.

Guess 1

Consider a participant who chose, like you, not to seek advice on the quiz. Below is the profile that the manager sees when estimating their quiz performance without advice in Part 1. This is the only information that the manager sees about them.

	Age range:	25-60
	Sex:	Male
	Current country of residence:	UK or Ireland
	Education:	at least A levels and possibly more
	Quiz topic:	Psychology & Linguistics
	Advice:	He did not seek advice on the quiz.

In your view, what will be the manager's estimate of this participant's quiz performance without advice in Part 1? Please enter a number from 0 (no correct answers) to 10 (all correct answers):

Continue

Screen 10b: Visible


Questionnaire (3/9)

You will receive **0.25 GBP** if this guess is correct and randomly selected to count for the correct-guess-pay.

Guess 2

Consider another participant who chose, **unlike you**, to seek advice on the quiz in Part 2. This participant's profile is, otherwise, the same as the one you just looked at.

Below is the profile that the manager sees when estimating their quiz performance without advice in Part 1. This is the only information that the manager sees about them:

	Age range:	25-60
	Sex:	Male
	Current country of residence:	UK or Ireland
	Education:	at least A levels and possibly more
	Quiz topic:	Psychology & Linguistics
	Advice:	He sought advice on the quiz.

In your view, what will be the manager's estimate of this participant's quiz performance without advice in Part 1? Please enter a number from 0 (no correct answers) to 10 (all correct answers):

Continue

Screen 11

Questionnaire (4/9)

Your Relative Performance

You guessed that you submitted 6 correct answers without advice.

Think about all other study participants with the same profile (25-60 years old, male, UK or Ireland resident, at least A levels or equivalent and possibly more) who took the *same* Psychology & Linguistics quiz as you.

How does your quiz performance without advice in Part 1 compare to theirs?

My performance is in the...

- ☐ Top 25%
- ☐ Somewhere between the top 25% and the bottom 25% but closer to the top 25%
- ☐ Somewhere between the top 25% and the bottom 25% but closer to the bottom 25%
- ☐ Bottom 25%

Continue

Screen 12

Questionnaire (5/9)

What gender are you currently?

- ☐ Man (including Trans Male/Trans Man)
☐ Women (including Trans Female/ Trans Women)
☐ Non-binary
☐ Rather not say

In general, how do you see yourself? Where would you put yourself on this scale from 0-"very masculine" to 10-"very feminine"? Please click the blue bars to reveal the sliders and indicate your answer.



In general, how willing or unwilling you are to take risks? Where would you put yourself on this scale from 0-"very unwilling to take risks" to 10-"very willing to take risks"? Please click the blue bar to reveal the slider.



Continue

Screen 13 - 17

Questionnaire (6/9)

Please imagine the following situation: You can choose between a sure payment of a particular amount of money, **or** a lottery, where you would have an equal chance of getting 300 GBP or getting nothing. We will present to you five different situations.

1) What would you prefer: **a 50 percent chance of winning 300 GBP** when at the same time there is 50 percent chance of winning nothing, or would you rather have the amount of **160 GBP as a sure payment**?

- ☐ lottery ☐ sure payment

Continue

Questionnaire (6/9)

Please imagine the following situation: You can choose between a sure payment of a particular amount of money, **or** a lottery, where you would have an equal chance of getting 300 GBP or getting nothing. We will present to you five different situations.

2) What would you prefer: **a 50 percent chance of winning 300 GBP** when at the same time there is 50 percent chance of winning nothing, or would you rather have the amount of **80 GBP as a sure payment**?

- ☐ lottery ☒ sure payment

Continue

Questionnaire (6/9)

Please imagine the following situation: You can choose between a sure payment of a particular amount of money, **or** a lottery, where you would have an equal chance of getting 300 GBP or getting nothing. We will present to you five different situations.

4) What would you prefer: **a 50 percent chance of winning 300 GBP** when at the same time there is 50 percent chance of winning nothing, or would you rather have the amount of **60 GBP as a sure payment**?

☐ lottery ☒ sure payment

Continue

Questionnaire (6/9)

Please imagine the following situation: You can choose between a sure payment of a particular amount of money, **or** a lottery, where you would have an equal chance of getting 300 GBP or getting nothing. We will present to you five different situations.

5) What would you prefer: **a 50 percent chance of winning 300 GBP** when at the same time there is 50 percent chance of winning nothing, or would you rather have the amount of **50 GBP as a sure payment**?

☐ lottery ☒ sure payment

Continue

Screen 18

Questionnaire (7/9)

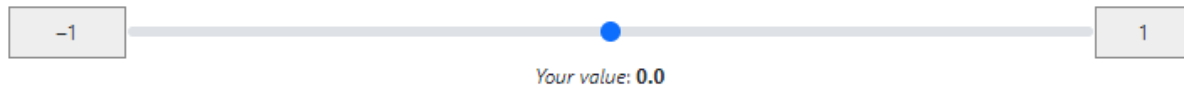
For each of the topics listed below, tell us whether **most people** think that men or women, on average, know more about it.

Indicate your answer on the scale below, where 0 means no gender difference.

The bigger the gender difference, the more you should move the slider in that direction.

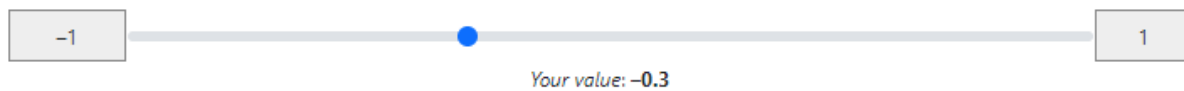
Arts & Literature

(-1: Women know more, on average; 0: no difference; 1: Men know more, on average)



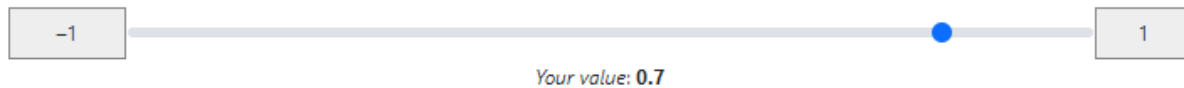
Science & Technology

(-1: Women know more, on average; 0: no difference; 1: Men know more, on average)



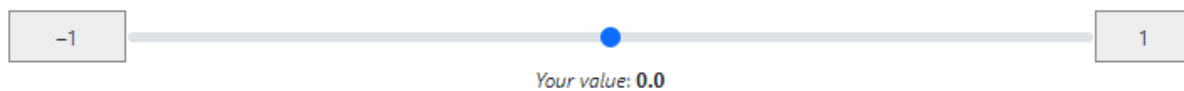
Psychology & Linguistics

(-1: Women know more, on average; 0: no difference; 1: Men know more, on average)



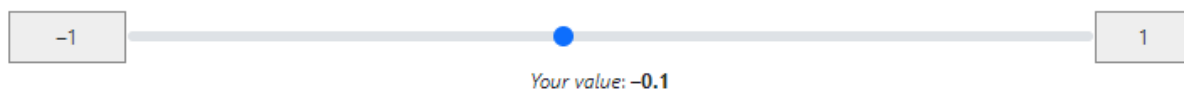
History & Politics

(-1: Women know more, on average; 0: no difference; 1: Men know more, on average)



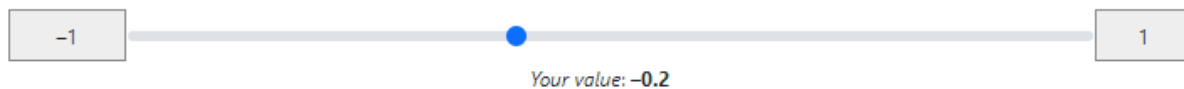
Pop Culture

(-1: Women know more, on average; 0: no difference; 1: Men know more, on average)



Sports

(-1: Women know more, on average; 0: no difference; 1: Men know more, on average)



Continue

Screen 19

Questionnaire (8/9)

For each statement, please indicate your agreement with it on a scale from **1 - strongly disagree** to **7 - strongly agree**. There are **no right or wrong answers**.

	1	2	3	4	5	6	7
Reputation is very important for one's career advancement and promotions.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Seeking advice from others can hurt my reputation if others have low expectations about my ability.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I do not care what others think of me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It is particularly uncomfortable to ask for advice on a work-related task that others think I am competent at.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In general, it is more socially acceptable for women to ask for advice than for men.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel bad if I cannot accomplish tasks independently.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Seeking advice from others can hurt my reputation if others have high expectations about my ability.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Please select '6' in this row.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
On average, men are less willing to ask others for advice than women.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

[Continue](#)

Screen 20

Questionnaire (9/10)

What would best describe your colleagues at your current workplace? If you are currently unemployed, please answer with respect to your most recent workplace.

- ☐ By far most of my colleagues are men
- ☐ A somewhat bigger share of my colleagues are men
- ☐ Among my colleagues, the share of men and women is about equal
- ☐ A somewhat bigger share of my colleagues are women
- ☐ By far most of my colleagues are women
- ☐ I have no colleagues

Does your job require working in teams? If you are currently unemployed, please answer with respect to your most recent job.

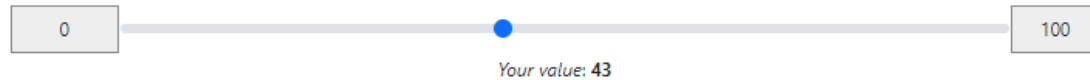
- ☐ Always
- ☐ Mostly
- ☐ Balanced shares of team & individual work
- ☐ Rarely
- ☐ Never

[Continue](#)

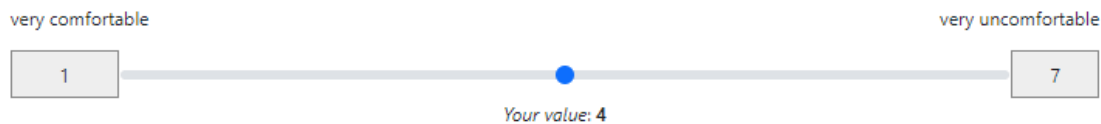
Screen 21

Questionnaire (10/10)

When answering a quiz like today's, how important is the *role of luck*, as opposed to *knowledge*, in getting the correct answer? Please indicate the role of luck on this scale from 0 % (no luck) to 100 % (only luck).



How comfortable were you with the manager controlling a large part of your earnings for this study? Where would you put yourself on this scale from 1-"very comfortable" to 7-"very uncomfortable"?



When answering the quiz, did you look up answers in any way or asked someone for help? Please respond truthfully to this question. It has NO impact on your payment or your future invitations to participate in studies on Prolific.

☐ Yes ☐ No

Did you have enough time to complete the tasks?

☐ Yes, more than enough time ☐ Yes, just enough time ☐ No, just not enough time ☐ No, by far not enough time

Were all 10 images in the quiz and the screenshots of the profiles displayed correctly? If not, please briefly describe what was wrong in the comments field below.

☐ Yes ☐ No

Do you have any comments about the content of this study you would like to share with us?

Continue

Screen 22

Overview of Your Earnings

Your participation pay is **1.50 GBP**.

Here is an overview of your extra bonus payments:

- **Quiz Performance & Advice Seeking**
 - Your performance in Part 1 is 1 correct answers. You did not seek advice on the quiz.
 - Hence, your bonus payment from this part of the study amounts to **0.10 GBP**.
- **Pay for Manager's Estimate**
 - The manager will review your profile shortly and, depending on the manager's estimate of your quiz performance without advice in Part 1, you will receive a pay ranging from **0.00 GBP to 3.00 GBP**.
- **Correct-guess-pay**
 - You estimated that you answered 6 questions correctly in Part 1. Since you actually answered 1 questions correctly, you do not receive the correct-guess-pay of **0.25 GBP**.
 - You provided two guesses about the manager's estimate. **Guess 2** has been randomly selected by the computer as the one-that-counts for payment. You will receive an additional **0.25 GBP** if your guess was correct.

Summary: Your *minimum payment* is **1.60 GBP** and it can increase **up to 4.85 GBP**, depending on your manager's estimate and your guess of other manager's behavior. The payment will be administered within the next 4 working days.

If you want, you can find the correct answers to the 10 general knowledge questions on Psychology and Linguistics [here](#).

Continue

2) Manager Version

Screen 1

Welcome!

Overview: You are participating in a research study on economic decision-making. It consists of two main parts in which you make decisions for an extra bonus payment and a final questionnaire. Your bonus payment depends on your decisions and the decisions of other participants throughout the study. Therefore, it is important that you read all instructions carefully. Your responses are anonymous.

Payment: You will receive a participation payment of 1.00 GBP. In addition, you can earn an extra bonus payment of up to 4.25 GBP. The payment will be processed within the next 4 working days. Please be advised that only complete submissions will be paid.

General Rules of Conduct: This study will take about 10 minutes. We ask for your full attention. Please find a quiet space to complete the study and do not use other devices, talk to other people, use social media, etc. Please remain solely in this browser tab for the entire time of the study.

Comprehension Checks: During the study, you will be asked several comprehension questions referring to the instructions on the same screen. You can only proceed once you answer them correctly.

Consent: I have read and understood the information above. I agree to comply with these rules of conduct and want to participate in this study.

Please click "next" to proceed.

next

Screen 2

What is your Prolific ID? *Please note that this response should auto-fill with the correct ID.*

next

Screen 3a – Psychology & Linguistics

Part 1

In part 1, you will take a general knowledge quiz on **Psychology & Linguistics**. You will answer 10 multiple-choice questions. You will receive **0.10 GBP** for each correct answer and no extra payment for wrong answers.

The questions are all structured in the same way: a question text, a corresponding image, and 5 answer choices, one of which is correct (see an example picture).

Question 1

Remaining time: 0:28

What is meant by the phrase in the image?



No answer is still an answer

My aunt is always my aunt

The words remain the words

Let love rule

A waste of time

Submit

To submit an answer, choose one answer choice and click "submit". You will then advance to the next question. You will have **30 seconds** to submit your answer, before you are automatically advanced.

We encourage you to submit your best guess before the time runs out, even if you do not know the correct answer with certainty. You have a 20%-chance to simply guess correctly.

Comprehension Question

Even if I do not know the answer to a question, submitting any guess will increase the chance to receive 0.10 GBP from 0% to 20%.

True

False

next

Screen 3b – Science & Technology

Part 1

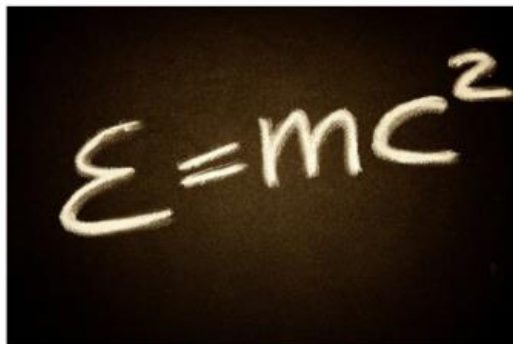
In part 1, you will take a general knowledge quiz on **Science & Technology**. You will answer 10 multiple-choice questions. You will receive **0.10 GBP** for each correct answer and no extra payment for wrong answers.

The questions are all structured in the same way: a question text, a corresponding image, and 5 answer choices, one of which is correct (see an example picture).

Question 1

Remaining time: 0:27

What denotes the 'E' in this well-known formula?



Electricity

Efficiency

Effort

Elasticity

Energy

Submit

To submit an answer, choose one answer choice and click "submit". You will then advance to the next question. You will have **30 seconds** to submit your answer, before you are automatically advanced.

We encourage you to submit your best guess before the time runs out, even if you do not know the correct answer with certainty. You have a 20%-chance to simply guess correctly.

Comprehension Question

Even if I do not know the answer to a question, submitting any guess will increase the chance to receive 0.10 GBP from 0% to 20%.

True

False

next

Screen 4a –Psychology & Linguistics (Screen 4b looks identical for quiz type “Science & Technology”)

Start the Quiz

When you are ready, click “next” to begin the general knowledge quiz on Psychology & Linguistics.

next

Screen 5a (Question 1 out of 10 Questions of the Psychology & Linguistics quiz. For each question, its text referred to a picture. The picture was instrumental to providing a correct answer (see Figure A1 for an example). The pictures made it essentially impossible to search online for the correct answer given the time limit of 30 seconds.)

16



What is the basic idea behind this well-known psychological theory?

To preserve this psychologist's theory forever

It depicts that everyone has desires

The road to enlightenment consists of many small steps

It shows the three factors underlying self-actualization, one on each corner

As one takes care of basic needs, the "higher needs" become more relevant

Screen 5b (Question 1 out of 10 Questions of the Science & Technology quiz. For each question, its text referred to a picture. The picture was instrumental to providing a correct answer (see Figure A1 for an example). The pictures made it essentially impossible to search online for the correct answer given the time limit of 30 seconds.)

16



This physicist is most well-known for his research on.....?

Higgs boson

Condensed matter

Black moons

Supermassive compact objects

Black holes

Screen 6a

Guess, how many of your answers are correct?

You just answered 10 questions on Psychology & Linguistics. How many of your answers are correct? You will receive **an extra correct-guess-pay of 0.25 GBP** if your guess equals your actual number of correct answers.

Please enter a number from 0 (no answers correct) to 10 (all correct answers):

At the end of the study, you will see how many of your answers are correct. You will also have the option to learn the correct answers if you want.

[next](#)

Screen 6b

Guess, how many of your answers are correct?

You just answered 10 questions on Science & Technology. How many of your answers are correct? You will receive **an extra correct-guess-pay of 0.25 GBP** if your guess equals your actual number of correct answers.

Please enter a number from 0 (no answers correct) to 10 (all correct answers):

At the end of the study, you will see how many of your answers are correct. You will also have the option to learn the correct answers if you want.

[next](#)

Part 2

In part 2, you are asked to **estimate how many questions another participant answered correctly in the same quiz** you just took. We will refer to this participant as the *quiz-taker*. The quiz-taker is another Prolific participant who completed a different version of this study.

For each correctly answered question, the quiz-taker also got **0.10 GBP**. They did not receive any feedback on their quiz performance.

Afterwards, quiz-takers could decide whether to seek advice on the **Psychology & Linguistics quiz** and **revise their answers**.

- If a quiz-taker **decided to seek advice**, they revisited every question with only 2 instead of 5 answer choices. For this simplified quiz, the computer had randomly removed 3 wrong answers to each question. A quiz-taker had 15 seconds to review and revise each question.
- If a quiz-taker **did not seek advice**, they proceeded to the final questionnaire.

Seeking advice cost a **one-time fee of 0.08 GBP**. Advice could help a quiz-taker to submit more correct answers and increase their payment. They received **0.10 GBP**, regardless of whether they submitted correct answers before or after advice.

When taking the quiz for the first time, quiz-takers did *not know* that they could later *revise* their answers in the simplified quiz with advice.

Part 2

In part 2, you are asked to **estimate how many questions another participant answered correctly in the same quiz** you just took. We will refer to this participant as the *quiz-taker*. The quiz-taker is another Prolific participant who completed a different version of this study.

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When taking the quiz for the first time, quiz-takers did *not know* that they could later *revise* their answers in the simplified quiz with advice.

Screen 8a

Your Task: Estimate Quiz-Taker's Quiz Performance without Advice

Your task is to estimate the prior knowledge of a quiz-taker on Psychology & Linguistics, as recorded with their quiz performance without advice.

You were *randomly* matched with the quiz-taker by a computer. To make your estimate you will see the quiz-taker's profile.

Your Estimate and Payment

Your estimate affects **your own payment and the payment of the quiz-taker** as follows:

If your estimate equals the number of correct answers that the quiz-taker submitted without advice, you will receive an estimation **bonus of 3 GBP**. This estimation bonus will be added to your final payment.

The quiz-taker will receive **0.30 GBP** times your estimate of their quiz performance without advice, regardless of whether your estimate is correct. This was known to the quiz-taker. The quiz-taker also knew what profile you will see of them, before deciding whether to seek advice.

Your estimate may affect the payment of more than one quiz-taker with identical profiles. Yet, the quiz performance of only one of these randomly matched quiz-takers determines if you receive the estimation bonus.

Comprehension Questions

Your task is to estimate how many correct answers (0-10) the quiz-taker submitted...

...without advice

....after the revision with advice

Is this statement true or false?

To get the estimation bonus of 3 GBP, you need to provide a correct estimate of the quiz-taker's quiz performance without advice.

True

False

Screen 8b

Your Task: Estimate Quiz-Taker's Quiz Performance without Advice

Your task is to estimate the prior knowledge of a quiz-taker on Science & Technology, as recorded with their quiz performance without advice.

You were *randomly* matched with the quiz-taker by a computer. To make your estimate you will see the quiz-taker's profile.

Your Estimate and Payment

Your estimate affects **your own payment and the payment of the quiz-taker** as follows:

If your estimate equals the number of correct answers that the quiz-taker submitted without advice, you will receive an estimation **bonus of 3 GBP**. This estimation bonus will be added to your final payment.

The quiz-taker will receive **0.30 GBP** times your estimate of their quiz performance without advice, regardless of whether your estimate is correct. This was known to the quiz-taker. The quiz-taker also knew what profile you will see of them, before deciding whether to seek advice.

Your estimate may affect the payment of more than one quiz-taker with identical profiles. Yet, the quiz performance of only one of these randomly matched quiz-takers determines if you receive the estimation bonus.

Comprehension Questions

Your task is to estimate how many correct answers (0-10) the quiz-taker submitted...

...without advice

....after the revision with advice

Is this statement true or false?

To get the estimation bonus of 3 GBP, you need to provide a correct estimate of the quiz-taker's quiz performance without advice.


True

False

Screen 9a

Your performance estimate

You have been randomly matched with a quiz-taker with the following profile:



Age range:	25-60
Sex:	Male
Current country of residence:	UK or Ireland
Education:	at least A levels and possibly more
Quiz topic:	Psychology & Linguistics
Advice:	He sought advice on the quiz.


How many correct answers did the quiz-taker submit without advice?
If your estimate is correct, you will get the estimation bonus of **3 GBP**.

Please enter a number from 0 (no correct answers) to 10 (all answers correct):

Screen 9b

Your performance estimate

You have been randomly matched with a quiz-taker with the following profile:



Age range:	25-60
Sex:	Female
Current country of residence:	UK or Ireland
Education:	at least A levels and possibly more
Quiz topic:	Science & Technology
Advice:	She did not seek advice on the quiz.

How many correct answers did the quiz-taker submit without advice?
If your estimate is correct, you will get the estimation bonus of **3 GBP**.

Please enter a number from 0 (no correct answers) to 10 (all answers correct):

Screen 9c

Your performance estimate

You have been randomly matched with a quiz-taker with the following profile:



Age range:	25-60
Sex:	Female
Current country of residence:	UK or Ireland
Education:	at least A levels and possibly more
Quiz topic:	Science & Technology

How many correct answers did the quiz-taker submit without advice?

If your estimate is correct, you will get the estimation bonus of **3 GBP**.

Please enter a number from 0 (no correct answers) to 10 (all answers correct):

Screen 9d

Your performance estimate

You have been randomly matched with a quiz-taker with the following profile:



Age range:	25-60
Sex:	Male
Current country of residence:	UK or Ireland
Education:	at least A levels and possibly more
Quiz topic:	Psychology & Linguistics

How many correct answers did the quiz-taker submit without advice?

If your estimate is correct, you will get the estimation bonus of **3 GBP**.

Please enter a number from 0 (no correct answers) to 10 (all answers correct):

Note that screen 9a – 9d exist all with opposite Employee sex and quiz category. Screen 91 & 9b additionally exist with opposite advice-seeking decisions amounting to a total of 12 different screens (i.e., treatment conditions).

Screen 10

Questionnaire

This short questionnaire is the final part. Afterwards, you will see an overview of your earnings and can learn the correct answers.

[next](#)

Screen 11

We would like to understand how you arrived at your estimate of the quiz-taker's quiz performance without advice. Please, briefly describe your thought process:

[next](#)

Screen 12a (exists for all different 12 profile versions, see screen 9).

The next two questions refer to a quiz-taker with this profile:

	Age range:	25-60
	Sex:	Male
	Current country of residence:	UK or Ireland
	Education:	at least A levels and possibly more
	Quiz topic:	Psychology & Linguistics
	Advice:	He sought advice on the quiz.

For quiz-takers seeking advice cost a one-time fee of 0.08 GBP and could increase paid performance in the quiz by 0.10 GBP per correct answer. After advice, each question had only 2 answer choices instead of 5.

In your opinion, how many answers must a quiz-taker with this profile **not** know to decide to seek advice on the Psychology & Linguistics quiz?

Please enter a number from 0 (no answers) to 10 (all answers):

What do you think is the likelihood that a quiz-taker with this profile cheated on this quiz (e.g., by googling answers or asking others for help)?

Please indicate the likelihood on this scale from 0 % to 100 %.

0%

50%

100%



Screen 13

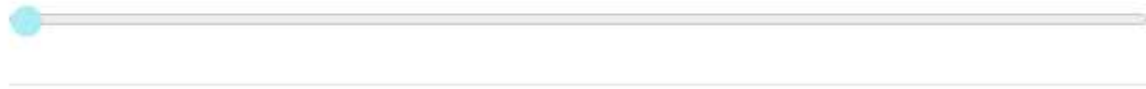
In your opinion, how big is the role of luck, as opposed to knowledge, in answering a multiple-choice general knowledge quiz like the one you took today?

Please indicate the role of luck on this scale from 0 % (no luck) to 100 % (only luck).

0%-no luck

50%

100%- only luck



Screen 14

For each of the topics listed below, tell us whether **you** believe that **men or women**, on average, **know more** about it. There are no right or wrong answers.

Indicate your answer on the scale below, where 0 means no gender difference. The bigger the gender difference, the more you should move the slider in that direction.

Please note that you must move the slider in any case to validate your response. The slider has to be moved even if you want to place your response at the original position.

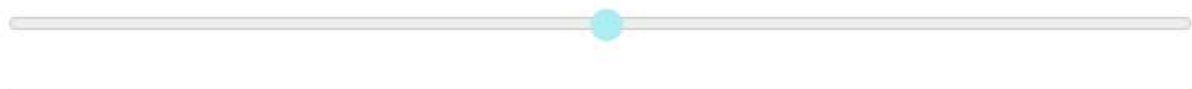
Arts & Literature

(-1: Women know more, on average, 0: no gender difference, 1: Men know more, on average)

-1

0

1



Science & Technology

(-1: Women know more, on average, 0: no gender difference, 1: Men know more, on average)

-1

0

1



Psychology & Linguistics

(-1: Women know more, on average, 0: no gender difference, 1: Men know more, on average)



History & Politics

(-1: Women know more, on average, 0: no gender difference, 1: Men know more, on average)



Pop Culture

(-1: Women know more, on average, 0: no gender difference, 1: Men know more, on average)



Sports

(-1: Women know more, on average, 0: no gender difference, 1: Men know more, on average)



next

Screen 15

Please evaluate several statements in terms of how well they apply to you or others in general. For each statement, please indicate whether you agree with it or not on the provided scale (ranging from **1 = strongly disagree** to **7 = strongly agree**). Keep in mind that there are no right or wrong answers.

	strongly disagree	disagree	somewhat disagree	neutral	somewhat agree	agree	strongly agree
Reputation is very important for one's career advancement and promotions.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Seeking advice from others can hurt my reputation if others have low expectations about my ability.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I do not care what others think of me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It is uncomfortable to ask for advice on a work-related task that others think I am competent at.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In general, it is more socially acceptable for women to ask for advice than for men.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel bad if I cannot accomplish tasks independently.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Seeking advice from others can hurt my reputation if others have high expectations about my ability.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Please select 'agree'.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
On average, men are less willing to ask others for advice than women.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

[next](#)

Screen 16

Finally, please answer a few questions about yourself. Afterwards, you will see an overview of your earnings.

How old are you?

What gender are you currently?

Man (including Trans Male/Trans Man)

Woman (including Tans Female/Trans Woman)

Non-binary

Would rather not say

Were you a university student at some point in time during your life, including current enrollment?

Yes

No

Are you currently employed?

Yes, full time

Yes, part time

Self-employed

No

next

Screen 17

What is your current occupation?

Do you have **managerial responsibilities** at your current employment that would involve, for instance, directly supervising others, the ability to hire or terminate other employees, etc.?

Yes

No

next

Screen 18

Do you have any comments for us?

next

Screen 19

Thank you for participating in our study.

Payment

Your participation pay is **1 GBP**.

You answered 10 questions correctly and receive **1 GBP** for answering the quiz.

You guessed that you answered 8 questions correctly, therefore you **do not** receive 0.25 GBP.

The computer will compare your estimate of the quiz-taker's quiz performance with the quiz-taker's actual data.

Therefore, *should your estimate be correct*, your total earnings from this study will be **5 GBP**.

Your payment will be administered within the next 4 working days. Please click the button to finish the study.

If you want, you can find the correct answers to the 10 general knowledge questions on Science & Technology [here](#).

complete