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Time Pressure Preferences

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Abstract. Many professional and educational settings require individuals to be willing and able to perform under time pressure. We use a laboratory experiment and survey data to study preferences for working under time pressure. We make three main contributions. First, we develop an incentivized method to measure preferences for working under time pressure and document that participants in our laboratory experiment are averse to working under time pressure on average. Second, we show that there is substantial heterogeneity in the degree of time pressure aversion across individuals and that these individual preferences can be partially captured by simple survey questions. Third, we include these questions in a survey of bachelor's degree students and a nationally representative survey panel and show that time pressure preferences predict career choices and income. Our results indicate that individual differences in time pressure aversion could be an influential factor in determining labor market outcomes.

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Keywords: time pressure • experiment • career choice • validated survey measures

1. Introduction

Many professional and educational settings require individuals to be willing and able to perform under time pressure. Entering ambitious educational and professional career tracks often requires candidates to perform well in time pressured exams (e.g., the GRE, LSAT, and SAT tests) or assessments (e.g., case interviews). Moreover, in many ambitious careers, performing under time pressure is a prominent feature of the work environment itself. Although there is a sizable literature in psychology and experimental economics that studies the effect of time pressure on decision making, little is known about individual preferences for working under time pressure.

We combine a preregistered laboratory experiment with two sets of survey data to study preferences for working under time pressure. We make three main contributions. First, we develop a method for eliciting preferences for working under time pressure in an incentivized way. Participants in our laboratory experiment first perform a cognitive task under various levels of time pressure. We then elicit the minimum additional payment participants require to complete the task under various levels of time pressure versus completing it without time pressure, while controlling for risk preferences and ability. The data show that participants are averse to working under time pressure on average. Second, we show that there is substantial heterogeneity in the degree of time pressure aversion across individuals and that these individual preferences can be partially captured by simple survey questions. Third, we include these questions in a survey of bachelor's degree students and in a nationally representative Dutch survey panel. Students who enjoy working under time pressure and are confident about it are more likely to aim for high-paying, high-pressure careers such as investment banking and consulting. For people of working age, time pressure preferences vary with education level and occupation, and strongly predict income—even conditional on education level, occupation, and other personality traits.

We also look into gender differences in time pressure aversion. We find that female participants, on average, require a higher premium than male participants to accept working under time pressure, likely because time pressure has a larger negative impact on their performance. Women also rate themselves lower on time pressure enjoyment and confidence in all our data sets.

Finally, we use the baseline rounds to explore the overall impact of time pressure on performance in the cognitive task and find a concave relationship between time pressure and productivity: although any level of time pressure leads to more mistakes, intermediate levels of time pressure increase the number of correct answers per unit of time.

The psychological literature has long been interested in the impact of time pressure on decision quality, generally documenting a negative impact (Diederich 1997, Diederich and Busemeyer 2003). This negative effect is related to the reduced possibility to search for potential solutions (Bowden 1985). When individuals are under time pressure, they tend to collect less information and rely more on heuristics (Christensen-Szalanski 1980, Rieskamp and Hoffrage 2008). Although time pressure hampers individual decision quality (Moore and Tenney 2012), forcing people to decide quickly may elicit intuitive responses that are beneficial for society, such as increased cooperation (Rand et al. 2012, 2014) and more altruistic behaviors (Rand et al. 2016), though see Tinghög et al. (2013), Bouwmeester et al. (2017), and Recalde et al. (2018) for other potential explanations for these results.

Research in experimental economics has also studied the impact of time pressure on individuals' elicited preferences and choices. These studies vary time pressure in different domains: bargaining (Sutter et al. 2003), beauty contests (Kocher and Sutter 2006), bidding in auctions (El Haji et al. 2019), level-k reasoning (Lindner and Sutter 2013), risky decisions (Young et al. 2012, Kocher et al. 2013, Saqib and Chan 2015), financial risk taking (Kirchler et al. 2017), and decisions under ambiguity (Baillon et al. 2018). These studies suggest that time pressure can have both a negative effect (by diminishing the quality of decisions) and a positive effect (by speeding up decision making) on economic decisions. Time pressure also makes participants more reliant on simpler decision rules (Spiliopoulos et al. 2018) and less deceptive (Lohse et al. 2018). Kocher et al. (2019) examine whether the ability to make good decisions under time pressure correlates with personality traits, cognitive ability, and intellectual efficiency (i.e., reasoning speed), finding supportive evidence in the context of risky decisions. Spiliopoulos and Ortmann (2018) provide a detailed overview of the literature on time pressure and response times in economics.

Less is known about the causal impact of time pressure on performance in cognitive tasks and whether this effect systematically varies across individuals. The few studies that exist tend to focus on gender differences. In a laboratory experiment, Shurchkov (2012) finds that although women outperform men in a low-time-pressure verbal task, they perform worse than men on average in a high-time-pressure math tournament. In a university exam setting, De Paola and Gioia (2016) find a detrimental effect of time pressure on the performance of women but not men. Dilmaghani (2020) finds that in time-limited games, female chess players underperform their male counterparts with equal chess skills relative to a no-time-pressure setting.[1]

Other papers in economics have documented the performance effects of other sources of pressure, including high stakes and competition. For example, Gneezy et al. (2019) show that raising the stakes may increase performance on high school exams. Other studies have documented gender differences in the response to high stakes in educational settings, where women tend to underperform relative to men in high-stakes exams (Azmat et al. 2016, Iriberri and Rey-Biel 2019, Cai et al. 2019, Montolio and Taberner 2021). Similarly, men have at times been found to respond more strongly than women to competitive incentives both in the laboratory (Gneezy et al. 2003) and in educational settings (Ors et al. 2013).

This literature on time pressure in economics and psychology has so far largely ignored people's preferences, that is, whether people, on average, enjoy or are averse to working under time pressure and how this varies across individuals.[2] Our results indicate that people are substantially averse to time pressure on average and that the degree of aversion predicts career choices and labor market outcomes. This has economic implications. Educational and professional careers that require people to work under time pressure might push away otherwise talented individuals, something we also see in our survey results. Hence, even if time pressure leads to increased performance, which is questionable in light of our results and those of the decision-making literature, there might still be a trade-off between incentive effects and attracting a sufficient number of qualified individuals, in particular, women.

2. Experimental Design

We study time pressure using an online laboratory experiment consisting of three parts. In our experiment, participants first fill out a personality questionnaire and then solve five rounds of a mathematical puzzle task. Prior to the fifth round, we elicit participants' preferences for time pressure in an incentive compatible way. The experiment ends with a survey that elicits risk preferences and basic demographics. Figure 1 presents an overview of the experiment; the full instructions can be found in Online Appendix C.

The personality questionnaire at the beginning of the experiment consists of the short 15-item Big Five Inventory (Lang et al. 2011) plus four additional items. The first two of these additional items serve as simple survey measures of attitudes toward time pressure: "I see myself as someone who enjoys working under time pressure" and "I see myself as someone who is productive under time pressure." Following Buser et al. (2024)

Figure 1. Overview of the Experiment

Part 1: Personality Questionnaire
- 15-item Big Five Inventory
- 2 survey questions eliciting time pressure preferences
- 2 survey questions eliciting risk preferences and competitiveness

Part 2: Real Effort Puzzle Task
- Rounds 1-4 (baseline): exogenous per-game time limit
  10 games with time limit that varies from game to game
  Payment of €10 minus €1 per game not solved correctly
- Round 5 (choice): time limit and payment chosen by participants
  36 choices, one selected to be implemented

Part 3: Post-Experimental Survey
- Incentivized risk preferences elicitation
- Demographic questions

Payment
- Participation fee of €4
- Earnings for one of the five rounds in Part 2 (chosen at random)
- Earnings for the incentivized risk preferences elicitation in Part 3

and Dohmen et al. (2011) we also include two items to measure attitudes toward competition and risk taking: "I see myself as someone who is competitive" and "I see myself as someone who is willing to take risks." The 15 standard Big Five questions measure five personality traits: openness, conscientiousness, extraversion, agreeableness, and neuroticism. Participants answer by choosing the extent to which each statement describes them. Seven answer options are given: "Strongly Disagree," "Disagree," "Slightly Disagree," "Neutral," "Slightly Agree," "Agree," and "Strongly Agree." Presenting our two survey questions of time pressure preferences at the beginning of the experiment prevents the answers from being affected by experience in other parts of the experiment. Including the questions alongside several other personality questions reduces the risk that they affect choices in later parts.

After filling out the questionnaire, participants are introduced to the real-effort mathematical puzzle task that is used in the main part of the experiment (see Figure 2). Each task (or "game") consists of a three-by-three board with nine different two-digit numbers. The goal of the task is to find the two numbers (out of the nine) that jointly add up to a "target number."[3] Participants can select a number by clicking it. Once clicked, the number turns green. They can click the number again to deselect it. After selecting their two numbers, participants need to press a button to submit their answer and continue to the next task. Participants are able to familiarize themselves with the interface through three nonincentivized practice tasks. We chose this task because it can be repeated many times in a relatively short time span and requires higher-level cognitive functions, which have the greatest potential to be impeded by time pressure (see, e.g., Moore and Tenney 2012).

After reading the instructions and completing the practice games, participants play the game for five rounds. Prior to the start of the first round, they are told that one round will be randomly selected for payment. Each round consists of 10 games, and each game needs to be solved within a game-specific time limit, which changes from game to game. For any particular game, the time limit is either 15, 25, or 60 seconds or no time limit. We chose the 15-second limit based on pilot experiments as the limit that would be challenging for virtually all participants and included the other limits in order to look at behavior under differing levels of time pressure.[4]

Figure 2. (Color online) Examples of the Puzzle Task with and without a Time Limit

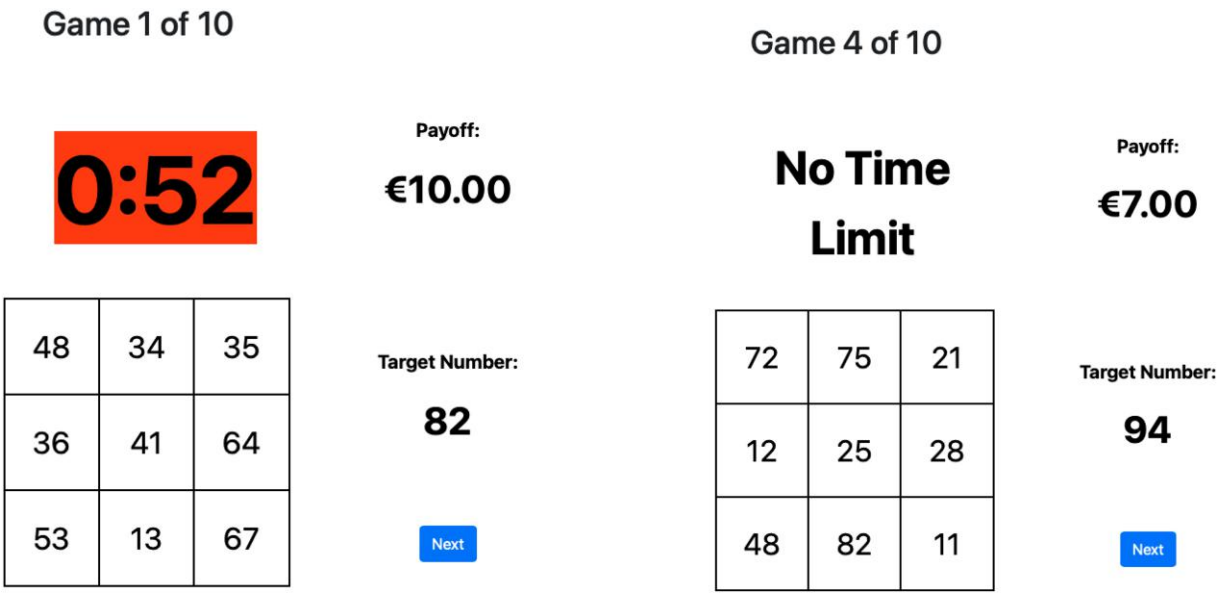


Figure 2 shows examples of the interface with and without a time limit. When the time limit is 15, 25, or 60 seconds (as shown on the left), a countdown is placed directly above the board of numbers. The payoff and the target number are shown to the right of the board. To make time pressure salient, the background of the countdown flashes red every second. When there is no time limit (as shown on the right), the flashing countdown is replaced by "No Time Limit"; everything else remains the same. After each game, participants see a result page that includes the time limit, whether the game was solved, and the cumulative payoff for the current round of 10 games.

The incentives for the game depend on the round. In the first four rounds (the baseline rounds), participants start with a budget of €10 in a given round. One euro is deducted for each game for which they give an incorrect answer or fail to provide an answer within the time limit for that game. The earnings for a given round are then equal to the amount left when the 10 games in that round are finished. All participants complete the same sequence of games in the same order. The time limit for a particular game is randomized across participants under the constraints that each time limit needs to occur exactly 10 times across the four rounds and that no more than two games can have the same limit in a row. This helps ensure that the difficulty of the games is similar across time limits and that no specific sequence of time limits drives our results.

In the fifth round, we instead allow participants to choose their preferred amount of time pressure. We elicit preferences for time pressure in the following way. First, for each time limit x, participants make a binary choice between "No time limit per game with a starting budget of €10" and "x seconds per game with a starting budget of €y." In order to ensure sufficient response variation given expected performance differences under different time limits, we set the starting budget in the second option to €16 for the 15-second limit, €15 for the 25-second limit, and €14 for the 60-second time limit. In a second step after making this first initial choice, participants are given a full price list where they make 11 choices between no time limit per game with a starting budget of €10 and performing under time pressure with a starting budget varying from €10 to €20 in integers. Some decisions are already filled in based on the decision in the binary choice that preceded the price list. Figure 3 shows an example of a prefilled price list. In this example, the participant chose "25 seconds per game with a starting budget of €15" over "No time limit per game with a starting budget of €10" in the binary choice. The price list therefore assumes that they also prefer working under the 25-second limit if the starting budget for working under time pressure is higher than €15. This two-step procedure helps increase the quality of responses on the price list and provides us with two separate preference measures.[5]

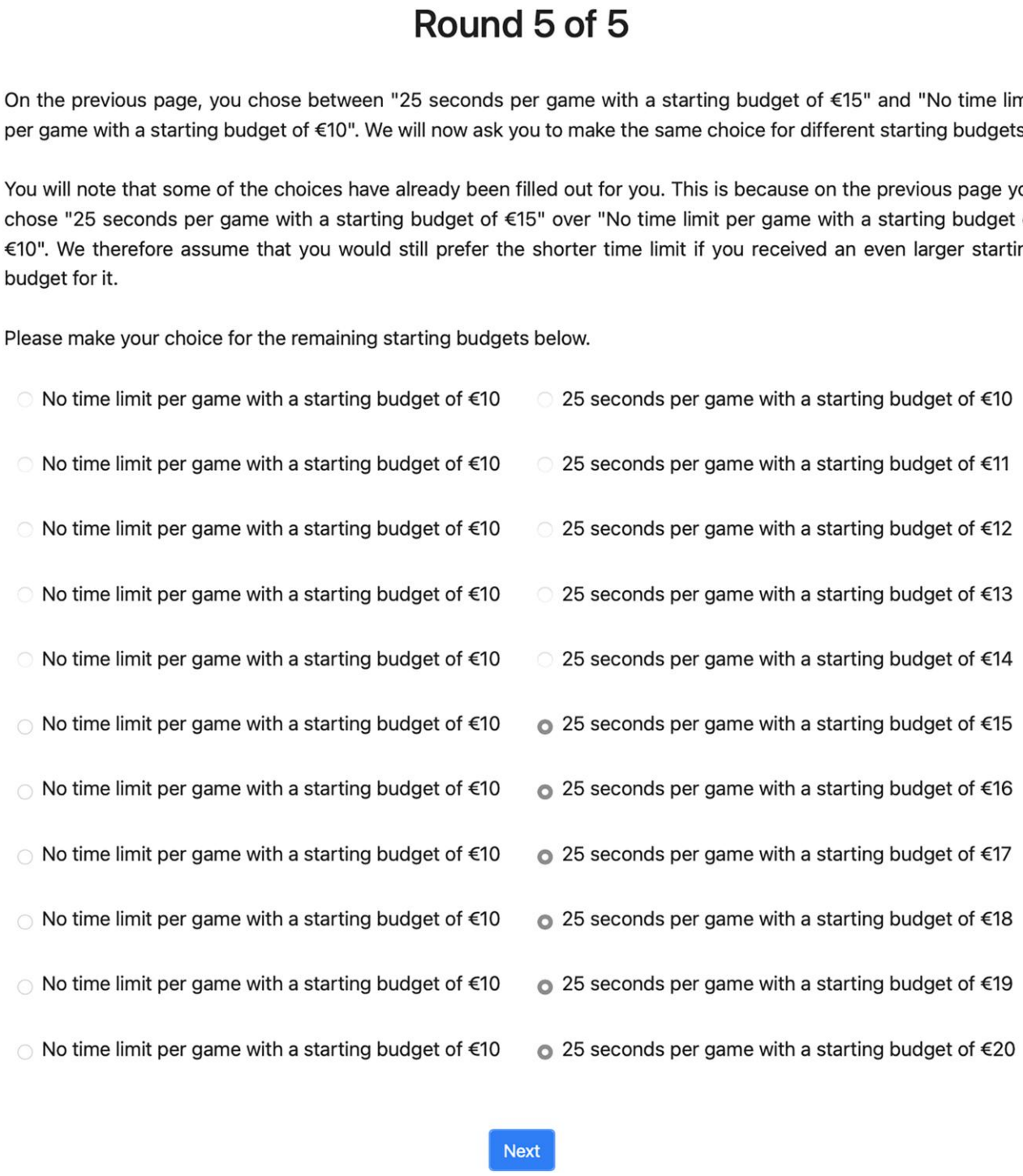
Conditional on performance in the 40 baseline games, these 33 choices serve as a measure of participants' preferences for performing under time pressure. We will also use these choices to construct measures of aggregate aversion to time pressure. In particular, we are interested in whether, on average, participants require a positive premium above their baseline performance to be willing to perform under a particular time limit.

Note, however, that risk-averse participants may also shy away from time pressure because they expect their performance to be more variable under tighter time limits. If participants are risk averse on average, this may bias our estimates of aggregate time pressure aversion upward.

On top of directly eliciting and controlling for risk preferences, we also experimentally control for this potential confound by asking participants to choose the time limit for a two-person winner-takes-all tournament. In particular, we inform participants that they will compete against the performance under the same time limit of another participant from another session.[6] In three separate binary choices, we then ask participants whether they would prefer to compete with a 15- or 25-second, a 15- or 60-second, and a 25- or 60-second limit. Participants receive €10 if their score is superior to the opponent's and nothing if their score is inferior, with ties broken randomly. Because the comparison performance comes from a participant who worked under the same time limit and the prize is fixed, this amounts to a choice between two risky lotteries with identical outcomes but potentially different probabilities of winning and losing. Assuming utility maximization, classical risk aversion does not influence the choice between two random lotteries with identical outcomes but differing probabilities of winning and losing. A utility maximizer should simply choose the lottery (i.e., time limit) under which they believe they perform *relatively* better (i.e., have a greater chance of winning), and/or (for a time-pressure-averse decision maker) the lottery with a less stringent time limit. Differences in absolute ability are irrelevant for this choice as well. Hence, these three competition choices serve as alternative measures of time pressure preferences that control for potential differences in absolute ability and risk preferences by experimental design.

In total, participants make 36 decisions in Round 5, one of which is randomly chosen and implemented. After the five rounds, participants reach a final survey. In addition to basic demographics like age and gender, we also elicit risk preferences using a price list containing 11 choices between a sure amount of €4 and a random lottery between €2 and €6 with changing probabilities. The probability of receiving the high payment increases from 0% in the first decision to

Figure 3. (Color online) The Price List in Round 5 with a 25-Second Limit



100% in the last decision in increments of 10 percentage points. After all 11 decisions are made, one decision is randomly selected and the additional earnings are determined according to the option participants chose in this decision.

The analysis plan was preregistered in the American Economic Association's Randomized Controlled Trials Registry.[7] We also reprinted the analysis plan in Online Appendix B. The experiment was programmed with oTree (Chen et al. 2016) and conducted online in June 2021 using the subject pool of the laboratory of the Center for Research in Experimental Economics and Political Decision Making (CREED) of the University of Amsterdam. Based on power calculations reported in

the analysis plan, we aimed to collect data from a minimum of 200 participants. Overall, 16 sessions took place with 9 to 18 subjects each. In accordance with our analysis plan, we excluded the one participant who switched multiple times in the choice round (Round 5) and another participant who took a long break in the middle of the experiment, leaving us with a sample of 209 participants, of whom 48% are female. Average earnings in the experiment are €16.93 including a participation fee of €4.[8]

3. Results

We present our results in six steps. In Section 3.1, we use the data from the four baseline rounds to estimate the impact of time pressure on performance. In Section 3.2, we move to the main focus of this paper and analyze preferences for working under time pressure. We establish that a majority of participants in our experiment are averse to working under time pressure. In Section 3.3, we describe the answers to the survey questions and show that they are significantly correlated with individual differences in time pressure aversion in the incentivized choices. In Section 3.4, we show that our survey questions predict the career expectations of undergraduate students. In Section 3.5, we use data from a Dutch survey panel to show that our survey questions predict the earnings and occupations of working-age adults. In Section 3.6, we analyze gender differences in performance, elicited preferences, and survey answers.

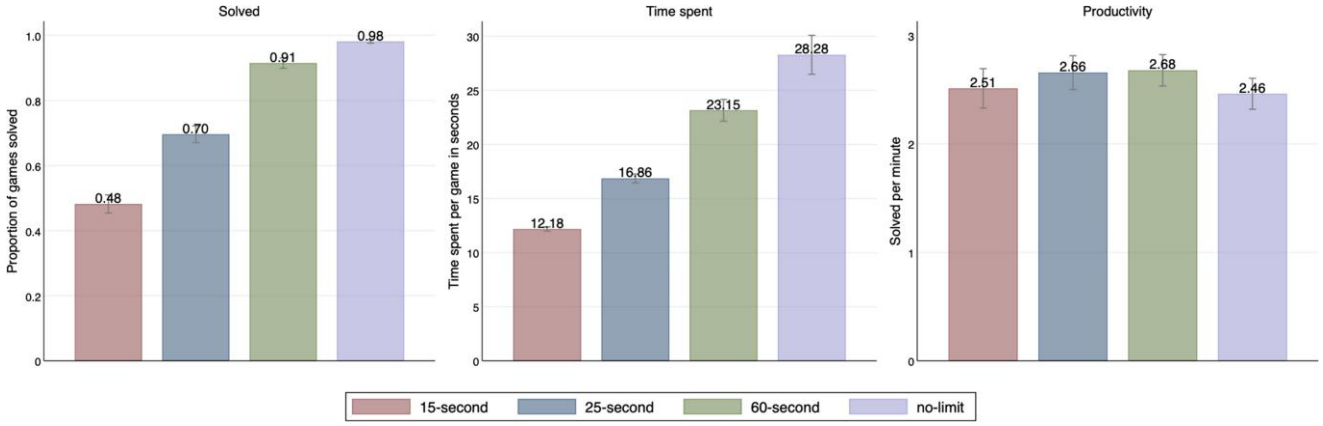
3.1. The Impact of Time Pressure on Performance

Figure 4 presents the average impact of time pressure on performance in the four baseline rounds. We consider three main outcomes: whether a game is solved, the average time spent per game, and productivity. Productivity is defined as the number of games solved per minute and is constructed by dividing the total number of games (out of 10) solved at each time limit by the total number of minutes spent working at each time limit. We present a formal statistical comparison in Table A1 in Online Appendix A.

Relative to no time limit, both the likelihood of a game being solved and the average number of seconds spent on each game diminish at stricter time limits. However, the relative impact on success and time spent differs across the three limits, resulting in differential impacts on productivity.[9]

Not surprisingly, the likelihood of a game being solved (as well as the number of seconds spent on each game) declines much more strongly at the stricter 25- and 15-second time limits. At 25 seconds, the decrease in the likelihood of a game being solved and the reduction in time spent per game cancel each other out, leading to a productivity that is similar to the 60-second limit (albeit with a much greater number of mistakes and games that are left unsolved) and significantly higher than when solving the games without a time limit. At 15 seconds, the strong decrease in the likelihood of solving a game now dominates the time reduction. As a consequence, the number of games solved per minute is similar to no time limit and significantly lower than under the 60-second time limit (although the number of mistakes and games that are left unsolved is much higher). This suggests an inverse-U-shaped relationship between time pressure and productivity: individuals are more productive under intermediate time pressure than under stringent or no time pressure. This means

Figure 4. (Color online) The Impact of Time Pressure on Performance



Notes. The figure plots the effect of time pressure on three outcomes, using observations from the four baseline rounds. The left-hand panel plots a binary indicator for having correctly solved the game within the time limit. The center panel plots the number of seconds spent on each game (until a solution is submitted or the time runs out). The right-hand panel plots the number of games solved per minute, calculated by dividing the total number of games solved by the total number of minutes spent on the 10 games for a given time limit (no time limit, 60 seconds, 25 seconds, or 15 seconds). The error bars are 95% confidence intervals based on standard errors clustered at the participant level.

that both too much and no time pressure may hamper productivity. The optimal level of time pressure will then depend on how one weighs productivity and the likelihood of mistakes and tasks that are left unsolved.

3.2. Preferences for Working Under Time Pressure

We will now turn to our main focus, preferences for working under time pressure. We are interested in both whether (and to what extent) participants are averse to working under time pressure and in how the degree of time pressure aversion varies across participants. In order to judge whether a given individual is time pressure averse, we will use their performance under the different time limits in the first 40 games as a baseline; that is, we will compare their choices in the fifth round to the choices that would maximize their expected earnings, assuming the proportion of games they would be able to solve in the fifth round under a given time limit is equal to the proportion of games they managed to solve under the same limit over the four baseline rounds.[10]

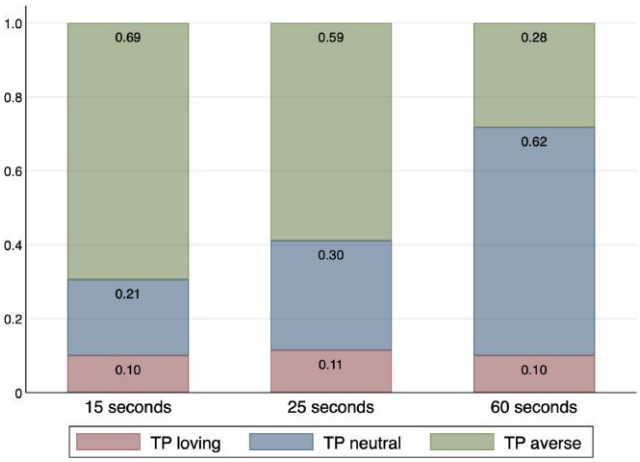
As a reminder, for each of the time limits (15, 25, and 60 seconds), participants first made a binary choice between a starting budget of €10 for solving the 10 games without a time limit and a higher starting budget for solving the games with a time limit (€16 for the 15-second limit, €15 for the 25-second limit, and €14 for the 60-second limit). We can get a first impression of aggregate time pressure preferences by comparing these choices to choices time-pressure-neutral individuals would have made given the baseline performances. For the tightest time limit (15 seconds), 57% of our participants would have maximized their expected earnings by choosing to work under time pressure under a starting budget of €16 (they solved at least 5 out of 10 puzzles under the 15-second limit in the baseline rounds). Nevertheless, only 24% of participants chose to do so. For the 25-second limit, 56% of participants prefer to solve the game with a 25-second limit and a starting budget of €15, which is less than the 79% who scored six or more correct answers under the 25-second limit. For the 60-second limit, most participants (90%) are willing to solve the games with the time limit for a starting budget of €14, which makes sense given that virtually all participants (96%) solved at least seven games under the 60-second time limit.

These binary choices already suggest that a majority of participants are averse to working under time pressure to some degree. We can use the price lists to get a more detailed picture of the extent of this aversion. Remember that after each of the three binary choices, participants were presented with a price list where they could determine the starting budgets (from €10 to €20 in integers) for which they prefer solving the games with time pressure over solving them without time pressure (and a starting budget of €10). This gives us three switching points that give the minimum starting budget participants required to choose performing under each time limit over solving the games without the time limit.

We can construct individual measures of aversion to time pressure by subtracting these switching points from the switching points that would maximize expected payments given performance in the baseline rounds. This gives us three measures of time pressure aversion for each participant, one for each time limit.[11] For example, consider a participant who solved 6 out of 10 games under the 15-second limit in the baseline rounds, and would therefore maximize their expected earnings by selecting the 15-second time limit over no time-limit for starting budgets of €14 or more. If this participant actually only switched to the 15-second time limit for a budget of €18, they would then be classified as having a time pressure premium of €4.[12]

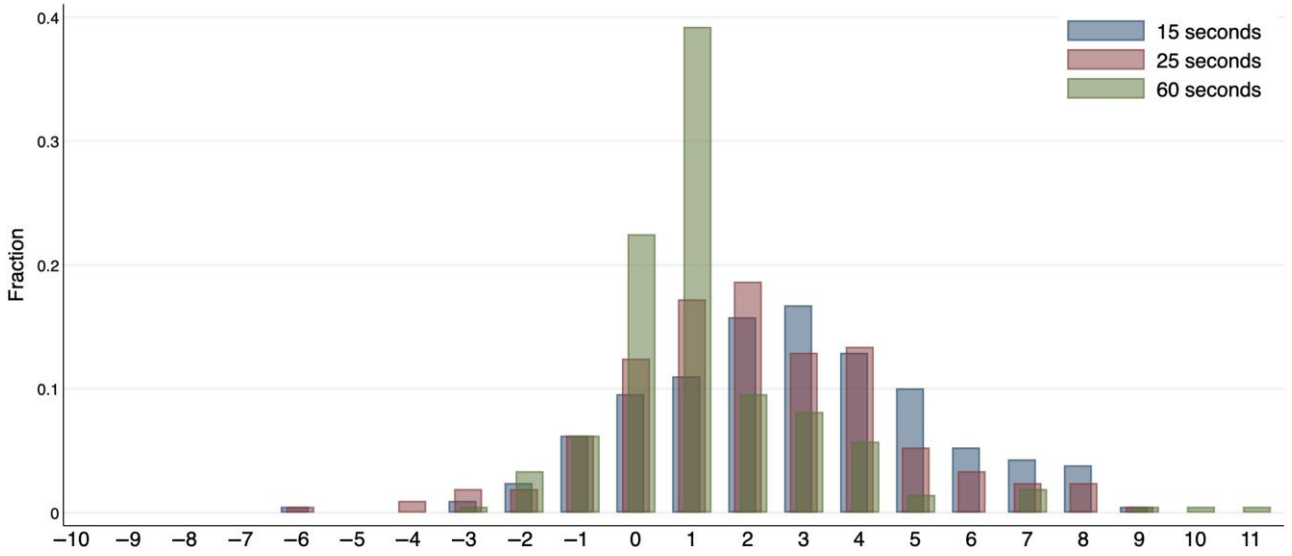
For ease of exposition, Figure 5 summarizes the data by dividing participants into three groups for each time limit: time pressure averse (requiring a premium strictly greater than €1 to accept the time limit), time pressure neutral (requiring a premium of €0 or €1 to accept the time limit), and time pressure loving (requiring a negative premium to accept the time limit).[13] For the 15- and

Figure 5. (Color online) Preferences for Working Under Time Pressure



Notes. The figure shows the proportions of participants who are classified as time pressure (TP) averse, time pressure neutral, and time pressure loving at each of the three time limits. The classification is based on comparing the starting budget at which participants prefer performing under time pressure (as opposed to completing the games with no time pressure and a starting budget of €10) to their expected earnings based on their performance in the baseline games. Participants who require a premium of more than €1 to perform under time pressure are classified as time pressure averse. Participants who switch to performing under time pressure at a negative premium are classified as time pressure loving. Participants who require a premium of €1 or €0 are classified as time pressure neutral.

Figure 6. (Color online) Distribution of Time Pressure Aversion



Notes. The figure shows the full distribution of time pressure aversion for each time limit. Time pressure aversion is calculated by subtracting the switching point that maximizes expected earnings (based on the performance in the four baseline rounds under each time limit) from the actual starting budget participants chose to perform under the time limit over solving the games without a time limit. More details on how time pressure aversion is calculated are presented in the text.

25-second limits, a majority of participants are classified as time pressure averse; that is, 69% and 59% are willing to forgo at least €2 in expectation to avoid performing under the 15-second limit and 25-second limit, respectively. By contrast, under the 60-second time limit, most participants (62%) are classified as time pressure neutral.[14] This is consistent with 60 seconds not being seen as a stringent time limit for this task (51% of participants were able to solve all 10 games under the 60-second limit in the baseline rounds). In line with this, the average premium required to perform under time pressure (given our assumptions on censored observations) is €2.75 for the 15-second limit, €2.11 for 25 seconds, and €1.26 for 60 seconds. The full distributions of time pressure aversion for each time limit are presented in Figure 6.[15]

These numbers indicate that a majority of participants in the experiment are willing to sacrifice money to avoid working under the stricter time limits. A possible challenge to interpreting this as evidence for an aversion to working under time pressure is that stricter time limits may generate greater performance uncertainty, leading to riskier payoffs. The average decision maker might then require a premium to choose a stricter time limit not because of an aversion to working under time pressure, but because of an aversion to risk. We can tackle this issue in two ways.

First, we can look at the binary competition choices which should be independent of risk preferences. Recall that for these choices, participants chose under which limit they want to compete against the performance of another participant who previously performed under the same limit. The loser receives nothing, and the winner receives €10. The choice between the two competitions is essentially a choice between two lotteries where the probabilities of winning depend on the beliefs of the decision maker. Losing means getting nothing, and winning means earning €10 for either option. Independent of their risk aversion (the curvature of their utility function), a utility-maximizing decision maker will choose the lottery (competition) with the higher (perceived) chance of winning, or—for a time-pressure-averse decision maker—the lottery with a less stringent time limit.

When asked whether they prefer to compete under a 15- or 25-second limit, only 9% of participants choose the 15-second limit. Twenty-one percent choose to compete under the 15-second limit rather than under the 60-second limit. Only when asked to choose between a 25-second and 60-second limit are participants close to indifferent, with 46% choosing the 25-second limit. Note that, as expected, the proportion of participants who had a higher rank and would therefore maximize their expected income under the tighter limit is close to 50% in all three cases.[16] Overall, even in choices where risk preference (and ability) confounds are ruled out by design, we find strong evidence of time pressure aversion in two out of three cases.[17]

The second approach we can use to correct for the confounding effects of risk preferences relies on our elicited risk preference measures. In Figures A.2 and A.3 in Online Appendix A, we graph the proportion of participants who are classified as time pressure averse—based on the premiums they require to work under

the 15- and 25-second time limits—as a function of their risk preferences. Figure A.2 uses the lottery measure, and Figure A.3 uses self-judged willingness to take risks. Whether they are risk averse, risk neutral, or even risk loving, a majority of participants require a premium to work under time pressure.

In Table A.3 in Online Appendix A, we use a different strategy to determine whether participants in our experiment are averse to time pressure while controlling for risk preferences. We regress our continuous measure of time pressure preferences on the number of risky options chosen in the lottery, normalized by subtracting 5.5 so that a score of zero indicates risk neutrality. This allows us to interpret the constant as a measure of overall time pressure aversion for participants who are risk neutral. The key result is that the constant remains significantly larger than one (our threshold for time pressure aversion) for the 15-second and 25-second limits even after adjusting for risk preferences. In other words, even risk-neutral participants in our sample are estimated to be willing to pay average premiums of €2.56 and €1.78 to avoid time pressure under the 15-second and 25-second limits, respectively. For the 60-second time limit, we find no systematic evidence of time pressure aversion regardless of whether we control for risk preferences. All in all, we therefore conclude that time pressure aversion is a preference that is at least partially orthogonal to risk aversion.[18]

3.3. A Survey Measure of Time Pressure Preferences

Our data also show that among the majority who are time pressure averse, there is substantial variation in the degree of aversion (see Figure 6 for the full distributions of time pressure aversion levels for each of the three time limits). If these individual differences carry over to contexts outside of the laboratory, time pressure aversion could influence economically important professional or educational choices. To investigate this link, we need to be able to measure time pressure preferences in large samples and link them to survey data on relevant outcomes. Unlike, for example, lottery-choice tasks to measure risk preferences, our incentivized measures based on real-effort tasks are too cumbersome to include in large-scale surveys. A solution to this problem is to measure individual attitudes toward working under time pressure through survey questions that are validated by incentivized choices. This approach was pioneered by Dohmen et al. (2011) for risk preferences and was later expanded by Falk et al. (2018) and Falk et al. (2023) for a range of economic preferences.[19]

Figure A.4 in Online Appendix A shows the distributions of answers to our two survey questions. The first measure is the degree to which participants agree with the statement "I see myself as someone who enjoys working under time pressure," which we will refer to as *TP enjoyment*. The second measure is the degree to which participants agree with the statement "I see myself as someone who is productive under time pressure," which we will refer to as *TP confidence*. For most of our analyses, we combine the two measures into a single measure. We refer to this combined measure as *TP preference*.

We will now look into the correlation between our two self-judged measures of attitudes toward working under time pressure and the choices participants made in the fifth round of the experiment. We deviate from the preanalysis plan and use the obviously related instrumental variables (ORIV) method (Gillen et al. 2019) instead of ordinary least squares (OLS) to properly estimate the correlation in the presence of measurement error. This approach eliminates the uncorrelated part of the measurement error in the two time pressure measures by using the two measures as instruments for each other. For brevity, we will also combine the experimental choices into a few aggregate choice measures. The preregistered standard OLS estimates and disaggregated results for each survey question and choice can be found in Tables A.4 and A.5 in Online Appendix A.

In the top panel of Table 1, we regress five different indicators of choices and performance in the experiment on our preference measure using the ORIV method. The indicators are (1) the sum of the three binary choices between working under time pressure (one) and solving the games without a time limit (zero); (2) the sum of the switching points in the three price lists (i.e., the premium required to choose time pressure under each of the three limits);[20] (3) the sum of the three competition choices (i.e., the number of times out of three a participant decided to compete under the stricter time limit); (4) the first component from a principal components analysis of the three previously mentioned choices; and (5) the total number of puzzles solved (out of 30) in all baseline games with a time limit (15, 25, or 60 seconds). The first four regressions control for the number of games solved (out of 10) under the 15-, 25-, and 60-second time limits in the baseline rounds. We standardize both the dependent variables and the survey measures, which allows us to interpret the coefficients as partial correlations.

To summarize the results, attitudes toward working under time pressure as measured by our two survey items significantly predict experimentally measured preferences for working under time pressure, but not performance under time pressure in the baseline rounds. The partial correlations between the survey measures and the experimental choices conditional on baseline performance range from 0.19 to 0.26 depending on the experimental measure, which is within the range of previously validated survey measures for established economic preferences.[21] This allows us to

Table 1. Relationship Between the Survey Measures and Experimental Outcomes

Outcome	(1) Binary	(2) Switching	(3) Competition	(4) Component	(5) Performance
TP preference	0.189*	−0.239**	0.249**	0.260**	−0.045
	(0.102)	(0.102)	(0.115)	(0.102)	(0.121)
Performance controls	Yes	Yes	Yes	Yes	No
TP preference	0.182	−0.229**	0.250**	0.252**	−0.103
	(0.113)	(0.110)	(0.115)	(0.110)	(0.129)
Performance controls	Yes	Yes	Yes	Yes	No
Personality traits	Yes	Yes	Yes	Yes	Yes
N	209	209	209	209	209

Notes. The table shows coefficients from ORIV regressions of five experimental time pressure measures on the survey measure of time pressure preference. "Binary" is the sum of the three binary choices between working under time pressure (one) and solving the games without a time limit (zero). "Switching" is the sum of the switching points in the three price lists (i.e., the premium required to choose time pressure over no time pressure under each of the three limits). "Competition" is the sum of the three competition choices (i.e., the number of times out of three a participant decided to compete under the stricter time limit). "Component" is the first component from a principal components analysis of all the previously mentioned choices. "Performance" is the total number of puzzles solved (out of 30) in all baseline games with a time limit (15, 25, or 60 seconds). *TP preference* captures both our survey measures by using one as an instrument for the other following the ORIV approach. The first four regressions control for the number of games solved (out of 10) under the 15-, 25-, and 60-second time limits in the baseline rounds. The lower panel also controls for the Big Five personality traits and our survey measures of risk aversion and competitiveness. All dependent variables and independent variables are standardized. Robust standard errors are shown in parentheses.

*$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

use the survey measures to look at the predictive power of time pressure preferences for student career expectations in Section 3.4 and labor market outcomes in Section 3.5.[22]

The bottom panel of Table 1 presents results controlling for the personality traits elicited in the questionnaire (Big Five, risk aversion, and competitiveness). The estimates of the partial correlations between our preference measure and the experimental measures hardly change. This is true despite the fact that our survey measure of time pressure preferences is negatively correlated with neuroticism and positively correlated with risk tolerance, extraversion, and (at the 10% significance level) competitiveness (Table A.6 in Online Appendix A). Despite this, however, none of the standard personality traits predicts our incentivized measures of time pressure preferences in a consistent way (Table A.7).

3.4. Time Pressure Preferences and Career Expectations in a Student Survey

Our validated survey measures make it possible to elicit time pressure preferences in large-scale surveys and study their relationship with career choices and labor market outcomes. As a first illustration of the possibilities, we added our two time pressure survey items, as well as survey questions eliciting career expectations, to a survey of a cohort of first-year economics and business bachelor's degree students conducted at the University of Amsterdam for program evaluation purposes. The time pressure questions and the questions about career preferences were included in two different waves spaced several months apart. To elicit career plans, students were asked to rank the attractiveness of 12 career options. The choice of career options was based on the department website, which lists the most common occupations of graduates. All surveys were distributed and collected at the start of mandatory tutorials or lectures. To fit with other questions in the student survey, answers to our time pressure questions were on a scale from 0 to 10, rather than from 1 to 7 as in the online laboratory experiment. Figure A.5 in Online Appendix A shows the distributions of the answers to the two survey questions.

In Table 2, we regress—for each career option separately—the rank a student gave that career option on our time pressure preference measure controlling for gender and study major (either business or economics) using the ORIV method. The rank given to each career option is scored from 12 (favorite) to 1 (least favorite). In the table, the career options are ordered according to their ranking in terms of expected salaries given by another group of 200 students recruited through Prolific.[23] Both the dependent and the independent variables are standardized.

The results show that students who state that they enjoy working under time pressure and are productive at it are significantly more attracted to several higher-paying career options, including investment banking, data analysis, and consulting, and significantly less attracted to several lower-paying options, including front office positions and management traineeships. To avoid multiple testing issues and test the overall statistical significance of the correlation between attitudes toward time pressure and career expectations, the last

Table 2. Relationship Between Time Pressure Preferences and Career Option Rankings

Outcome	Investment banking	Data analyst	Business analyst	Accounting	Consulting	Back office	Av. rank high pay
TP preference	0.121**	0.116**	0.062	−0.023	0.200***	−0.105*	0.158***
	(0.060)	(0.058)	(0.061)	(0.060)	(0.057)	(0.058)	(0.059)
N	795	795	795	795	795	795	795
	Entrepreneur	Front office	Academia	Management trainee	Public researcher	Sales	Ave. rank low pay
TP preference	−0.009	−0.134**	−0.018	−0.126**	−0.025	−0.036	−0.158***
	(0.060)	(0.061)	(0.059)	(0.054)	(0.059)	(0.060)	(0.059)
N	795	795	795	795	795	795	795

Notes. The table shows coefficients from ORIV regressions of the rank given to each career option from 1 (least favorite) to 12 (favorite) by the surveyed bachelor's students on the survey measure of time pressure preference. The final column examines the average rank given to the six career options in the respective row. *TP preference* captures both our survey measures by using one as an instrument for the other following the ORIV approach. The regressions control for gender and study major (economics or business). All dependent variables and independent variables are standardized. The analysis includes data from all students who were present during both survey waves, reported their gender, and answered both time pressure questions and all 10 career ranking questions. Robust standard errors are shown in parentheses.

*$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

column of Table 2 shows how our survey measure of time pressure preferences relates to the average rank given to the six higher-paying and the six lower-paying career options, respectively. The relationship is highly statistically significant; that is, more positive attitudes toward working under time pressure are associated with higher ranks given to the six higher-paying career options (and corresponding lower ranks given to the six lower-paying options).

In Table A10 in Online Appendix A, we repeat this analysis controlling for the Big Five personality traits and survey measures of risk seeking and competitiveness, with very similar results. Table A11 in Online Appendix A shows that we also obtain similar results using OLS instead of the ORIV method.

3.5. Time Pressure Preferences and Labor Market Outcomes in Nationally Representative Survey Data

To test whether time pressure preferences are correlated with realized labor market outcomes, we elicited our survey measures in the Longitudinal Internet studies for the Social Sciences (LISS) panel. The LISS panel is a long-running survey panel of approximately 7,500 individuals that is representative of the Dutch population. We can then link our survey measures to the rich panel data that include monthly earnings, education level, and occupation, as well as a rich set of other personality traits. Figure A.6 in Online Appendix A shows the distributions of answers to the two time pressure questions.[24]

In Table 3, we show results from ORIV regressions of standardized gross monthly income on our combined measure of time pressure preferences with different sets of controls. Education level is based on six categories defined by Statistics Netherlands. Occupation is defined based on two-digit International Standard Classification of Occupations (ISCO) codes.[25] As before, our personality controls include the Big Five personality traits, risk tolerance, and competitiveness. In addition to the ORIV regressions, in Table A12 in Online Appendix A, we also show results from standard OLS regressions as well as from quantile regressions at the 50th and 90th percentiles of the income distribution. The results are qualitatively similar across the four estimation methods. In the following discussion, we will focus on the ORIV results.

The coefficient in column (1) of Table 3 shows that, conditional on gender and age, a one-standard-deviation increase in our measure of time pressure preferences is associated with a 0.34-standard-deviation increase in gross monthly income. In columns (2), (3),

Table 3. Relationship Between Time Pressure Preferences and Gross Monthly Income

Outcome	(1)	(2)	(3)	(4)	(5)
TP preference	0.340***	0.241***	0.199***	0.174***	0.146***
	(0.033)	(0.030)	(0.030)	(0.029)	(0.033)
Gender, age	√	√	√	√	√
Education level		√		√	√
Occupation codes			√	√	√
Personality					√
Observations	2,077	2,077	2,077	2,077	2,077

Notes. The table shows coefficients from ORIV regressions of standardized gross monthly income on the survey measure of time pressure preference. *TP preference* captures both our survey measures by using one as an instrument for the other following the ORIV approach. Age controls consist of age and age squared. Education level means six dummies for the education categories defined by Statistics Netherlands. Occupation code dummies are based on two-digit ISCO codes (see Figure A.8 in Online Appendix A for additional details). Personality controls include the Big Five personality traits, competitiveness, and risk tolerance. The sample consists of all respondents who are between 25 and 65 years old and for whom all variables are available. All dependent variables and independent variables are standardized. Robust standard errors are shown in parentheses.

*$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

and (4), we explore whether this correlation between preferences and income is partially due to differences in preferences across education levels and occupations.

Column (2) shows that controlling for education level reduces the coefficient by 29%, indicating that the correlation of time pressure preferences with income is partially due to people with higher education levels being less averse to working under time pressure. To explore this further, we show differences in time pressure preferences across levels of tertiary education in Figure A.7 in Online Appendix A. Conditional on age and gender, people with no tertiary education are around half a standard deviation more averse to working under time pressure relative to people who graduated from university. The difference in time pressure preferences across education levels is highly significant ($p < 0.001$; Wald test).

Column (3) shows that controlling for occupation reduces the coefficient of time pressure preferences by 41%. This reduction suggests that people in different careers differ in their time pressure preferences. To explore this further, we show differences in time pressure preferences across occupations in Figure A.8 in Online Appendix A. Business professionals, managers, and protective service workers (which includes police, firefighters, and armed service personnel) have the highest preference for working under time pressure, whereas care workers (which includes employees of daycares and elderly homes) and people in elementary occupations (which includes cleaners and laborers) are the most averse to working under time pressure. The difference between the highest and lowest ranked occupations is larger than 0.7 standard deviations. The difference in time pressure preferences across occupations is highly significant ($p < 0.001$; Wald test).

When we control for both education level dummies and occupation code dummies in column (4), the time pressure preferences coefficient remains sizable and highly statistically significant. Even for people who hold broadly the same occupation and have the same education level, a one-standard-deviation increase in our preference measure is associated with a 0.17-standard-deviation increase in income. Finally, in column (5), we show that controlling for standard personality traits only leads to a small further reduction in the magnitude of the preference coefficient.

3.6. Gender Differences in Performance and Preferences

Several papers document gender differences in the effect of time pressure on performance (Shurchkov 2012, De Paola and Gioia 2016, Dilmaghani 2020). In this section, we use our experimental data to look at gender differences in performance as well as preferences for working under time pressure.

Table A.9 in Online Appendix A shows gender differences in performance in the baseline rounds. We regress a binary indicator of whether a game was solved on a gender dummy, time limit dummies, and the interactions among them. The results in column (1) show that female and male participants are equally likely to solve a game under no time limit and a 60-second time limit. With a time limit of 15 or 25 seconds, female participants are significantly less likely to solve a game than male participants. This suggests that, in our sample, women do not perform worse at the task than men, but are worse at handling time pressure. This is in line with the result from Shurchkov (2012), who finds no significant performance differences between men and women in a math task under low time pressure but finds a significant gender gap at high time pressure. Note, however, that we cannot fully exclude the possibility that women are worse at the task overall in a manner that manifests only when the task is relatively difficult, for example, under time pressure. The fact that women solved the games at a similar speed to men (29.2 seconds per game versus 27.5 seconds per game; $p = 0.35$, t-test) under no time limit makes this less plausible.

Next, we look at gender differences in preferences for working under time pressure. This is done through regressing the choice indicators on a gender dummy, with and without controlling for the total number of games solved under different time limits in the baseline rounds. Columns (1) to (8) in Table A13 in Online Appendix A present the results. Compared with male participants, women are less likely to choose the more stringent time limit in the binary choices, switch to the more stringent time limit option at a higher starting budget, and choose the more stringent time limit in the competition choices. These differences can largely be explained by the gender gap in performance under time pressure. After controlling for performance under different time limits (the even columns), the estimated gender differences in preferences diminish substantially.

In columns (9) and (10), we look at the gender difference in how the survey items are answered. Women on average rate themselves 0.33 standard deviations lower on the combined measure. The exact distributions of the answers to the two survey measures split by gender are shown in Figure A.9 in Online Appendix A. More male than female participants chose "Agree" and above for both questions. The gender difference in our survey measure is confirmed by the student survey data, where women's average preference is around 0.38 standard deviations lower ($p < 0.001$, t-test, combined measure), and the LISS panel data, where women's average preference is around 0.12 standard deviations lower ($p < 0.001$, t-test, combined measure). We can also use our LISS panel survey data to explore how time pressure preferences vary with age in the general population. Figure A10 in Online

Appendix A shows averages of our standardized combined preference measure across age categories separately for men and women. Time pressure preferences increase in early adulthood and then decline steadily with age. The gender difference in preferences is smallest for young people and increases slightly with age.

4. Conclusion

We use an incentivized experiment and survey data to investigate preferences for working under time pressure. Our first main contribution lies in documenting the presence of aggregate time pressure aversion in the incentivized experiment, that is, the average participant is willing to leave money on the table to avoid working under time pressure. We also show that the degree of time pressure aversion varies substantially across individuals. This heterogeneity could be an explanatory factor for economically consequential career decisions. Willingness to perform under time pressure is a prerequisite to many steps on the career ladder. Studying for tertiary degrees generally requires the ability and willingness to perform in timed exams, access to many high-profile careers depends on assessment methods that involve a high degree of time pressure, and there is substantial variation in the presence of time pressure in the day-to-day reality across different careers. People who are averse to working under time pressure might be willing to forgo new opportunities or higher expected wages to reduce the degree of time pressure they face.

To investigate whether preferences for working under time pressure have consequences for people's careers, we need to be able to measure preferences for working under time pressure in large-scale surveys. Compared with some standard incentivized elicitation methods for, say, risk or time preferences, our experimental method for eliciting time pressure preferences is too cumbersome to include in most surveys. We therefore formulate two survey items in the spirit of Dohmen et al. (2011) and Falk et al. (2018). We show that these self-reported measures are significantly correlate with participants' choices in the experiment. Despite this being the first experiment that uses either the survey or the experimental measures for time pressure preferences, the resulting correlations are comparable to correlations found in previous work. This suggests that our survey measure may have a validity that is comparable to widely used survey measures, for example, risk and social preferences.

We include our survey items in a survey of economics and business students as well as in a nationally representative survey panel. We show that students who enjoy working under time pressure more are also more attracted to high-paying careers such as investment banking or consulting. In the general population, people who have a higher preference for time pressure have higher education levels, have different occupations, and, even conditional on education level and occupation, earn significantly more. Both the correlations between our preference measure and experimental choices as well as the correlations between our preference measure and career outcomes are robust to controlling for a range of widely studied personality traits. This suggests that preferences for working under time pressure are a separate trait that influences behavior for reasons that are not well captured by traditional personality or economic preference variables. Our survey items can be easily added to survey panels and will enable researchers in all social sciences to elicit preferences for working under time pressure in large samples and link them to survey or registry data on educational and labor market outcomes.

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Endnotes

[1] These gender differences might translate into differences in the labor market. Amer-Mestre and Charpin (2021) find that among medical students, women prefer medical specializations that are characterized by lower levels of time pressure.

[2] The exception is Shurchkov (2012), who shows that for women, but not for men, willingness to enter a math competition depends on the degree of time pressure. Also related is Nagler et al. (2022), who document that German employees in a stated-choice experiment are averse to work pressure more generally.

[3] To ensure that there were no particularly easy games, the games were generated under the following rules: (1) all nine candidate numbers are at least as big as 9; (2) the target number is in the range of 51 to 99; (3) no number is a multiple of 10; (4) no candidate number has the same last digit as the target number.

[4] An implicit timer of five minutes (not shown on the task screen) was implemented for games under no time limit. All 60 participants from our pilot sessions who worked under no time limit submitted an answer to all games within five minutes (in 600 games total).

[5] The price list also serves as a rationality check. If participants switch more than once between no time limit and time limit, they receive a pop-up message mentioning that their choices are inconsistent. Only one participant still switched multiple times even after seeing the message.

[6] To get the performance of this other participant, we ran one separate session for each of the three time limits on Prolific, an online platform for experiments (www.prolific.co). In each session, 10 participants solved the exact same set of 10 games current participants solve in Round 5. One performance (out of the 10) was randomly selected as the comparison performance for each participant.

[7] See https://doi.org/10.1257/rct.7667-1.0.

[8] Three pilot sessions with 40 participants each were run on Prolific prior to the main experiment. One session was run to test whether the game was suitable for testing the effect of time pressure on performance, one session was run to determine the proper time limits and finalize the design details, and one session was run to determine the starting budgets for the binary choices in the choice round (Round 5).

Another pilot session was run with 20 participants from the CREED laboratory subject pool to ensure there were no technical issues.

[9] Some of these effects may be driven by the 8% of no-time-limit games in which participants took more than 60 seconds. However, a similar shift in speed is observed throughout the distribution, to the point where the distribution of seconds spent under no time limit first order stochastically dominates the 60-second distribution (see Figure A1 in Online Appendix A). This implies that adding time pressure also increased the speed of participants who are able to finish the games within 60 seconds.

[10] A potential issue with this approach is that participants could improve their performance over the course of the experiment, in particular if the extent of the improvement depends on the degree of time pressure. However, we find no evidence that the fraction of games solved changes over the course of the experiment for any level of time pressure ($p > 0.30$ for each level of time pressure, OLS with standard errors clustered at the participant level; see Table A.2 in Online Appendix A).

[11] In constructing these measures, we need to make a number of choices. First, some participants (16% for the 15-second limit, 3% for the 25-second limit, and 1% for the 60-second limit) are unwilling to choose time pressure even with a starting budget of €20, which would guarantee weakly higher earnings. We code their switching point as €21 in our main analysis. Other participants (0.5% for the 15-second limit, 4% for the 25-second limit, and 12% for the 60-second limit) choose time pressure even without a premium, that is, with a starting budget of €10. We code their switching point as €10. Results look similar if we instead exclude both these types of participants. In addition, we assume that participants believe they can solve all 10 games correctly when performing without a time limit (98% of games were solved in the baseline under no time limit). Note that this is a conservative choice in the sense that we err in the direction of underestimating an individual's degree of time pressure aversion.

[12] We need to keep in mind that, because it depends on each participant's performance under each time limit, our aversion measure is censored. The aversion measure of participants who performed poorly under time pressure is censored from above, whereas the aversion measure of participants who scored highly under time pressure is censored from below. For example, the aversion measure of a participant who scored 10 out of 10 correct answers under all time limits in the baseline rounds cannot be lower than €0. In practice, both types of extremes are rare under the 15- and 25-second time limits. Under 15 seconds (25 seconds), only 1 participant (21 participants) solved all 10 games correctly, and only 2 participants (1 participant) had zero correct games. Out of the 21 participants who solved all games within 25 seconds, only one chose to accept time pressure without extra compensation, leading to a censored observation. One hundred and seven participants (51%) solved every game under the 60-second time limit, 17 of whom chose to accept time pressure without additional compensation.

[13] Note that a €1 premium is consistent with both time pressure neutrality and (modest) time pressure aversion. By classifying these participants as time pressure neutral, Figure 5 therefore presents a conservative estimate of the number of time-pressure-averse individuals. If we instead classify participants with a premium of €1 as time pressure averse, the fractions of time-pressure-averse participants increase to 80%, 76%, and 67% under 15-second, 25-second, and 60-second time limits, respectively.

[14] A similar proportion of participants are classified as time pressure loving across the three time limits. For each limit, a majority of these participants chose a premium of €−1 (see Figure 6). Moreover, participants who are designated as time pressure loving under one limit are not significantly more likely to have chosen a negative premium under the other two limits. This makes it likely that at least some of these participants are time-pressure-neutral participants who made a small mistake.

[15] Time pressure aversion could conceivably also reflect a desire to avoid the time pressure game screen with its flashing red light. Yet because this screen is constant across all time limits, this cannot explain the increasing time pressure premium for the more stringent limits nor the time pressure aversion observed in the competition choices described below (which always have at least some time pressure).

[16] Participants who perform worse under high time pressure than under low time pressure are significantly more likely to avoid it when the low time pressure alternative is the 60-second limit. Because only half of our participants perform relatively poorly under high time pressure, this cannot explain why the majority of participants choose the low time pressure environment in two out of our three choices.

[17] Note that participants might reasonably assume a win chance close to 50% under the 60-second limit, where most answer all questions correctly within the time limit. This implies that ambiguity-averse (e.g., Gilboa and Schmeidler 1989) participants might prefer the less ambiguous 60-second competitions over the more ambiguous 25-second and 15-second alternatives, where it is less clear what the win chance will be. Yet we find the strongest time pressure aversion in the 15-second versus 25-second choice, where both options are arguably equally ambiguous (and we find no time pressure aversion on average in the 25-second versus 60-second choice). This speaks against ambiguity aversion being an important force in explaining the degree of time pressure aversion we observe in the competition choices.

[18] Loss aversion could also explain time pressure aversion in our main measure. Similar to risk preferences, the competition choices should be independent of loss aversion. Also, the lottery choice measure—which we constructed to have a similar structure to the price lists—should capture both risk preferences and loss aversion in the context of our experiment.

[19] These papers show that general survey items for traits such as risk taking and time discounting capture both the choices individuals make in incentivized preference elicitation tasks and predict relevant choices and outcomes outside of the laboratory. Other examples include Buser et al. (2024), who establishes a survey measure for willingness to compete, and Buser and Yuan (2023), who establishes a survey measure for public speaking aversion.

[20] As in the previous section, we code the switching point of those who never choose to perform with a time limit as €21 and the switching point for those who always choose time pressure as €10. We obtain similar results if we omit these participants from the analysis instead; the results are available upon request. We obtain near-identical results if we replace the switching points with our time pressure aversion measure from the previous section; we report the switching points here to be in line with our preanalysis plan.

[21] Falk et al. (2023) examine correlations between experimental and survey measures for trust, reciprocity, altruism, and risk and time preferences. Out of 188 survey measures, 34 (18%) are greater than our median correlation of 0.244 (Online Appendix D in Falk et al. 2023). Buser et al. (2024) find a correlation of 0.15 between a survey and experimental measure of competitiveness. Fallucchi et al. (2020) look at 10 survey measures of competitiveness and find a median correlation of 0.09 and a maximum correlation of 0.26.

[22] Table A.5 in Online Appendix A repeats the analysis in the top panel of Table 1 using disaggregated experimental choices and also shows results for each of the two survey items separately. Time pressure enjoyment tends to be more predictive of experimental choices than time pressure confidence. One potential reason for this is that responses to the confidence questions are more highly concentrated

around a few values than answers to the enjoyment question. Table A.8 in Online Appendix A splits the correlation of column (5) in Table 1 by the level of time pressure and also examines the correlation between our survey measure and the time spent per puzzle. The results again show no significant correlations between our survey measure and either of the two outcomes for any level of time pressure.

[23] Participants on Prolific were selected to be similar to our student survey sample and included only current students with an economics or business administration related major. Participants were paid £1 to fill out the short survey.

[24] The answers to the enjoyment question are less concentrated in the LISS panel survey than they are in the online experiment and the student survey. Possibly, the prevalence of high answers to this question in the other data sets is due to the samples being made up of university students who are partially selected on their performance in high-pressure exams.

[25] In some instances, we have to group categories to avoid a very small number of observations per cell. See Figure A.8 in Online Appendix A for details.

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