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Working Under Distractions

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Abstract

Distractions are pervasive in modern workplaces, from frequent interruptions to noisy open-plan offices. Using an incentivized laboratory experiment, I study performance and well-being under task-switching and auditory distractions, elicit willingness to pay to avoid them, and develop a survey measure of distraction resilience that captures individuals' willingness and ability to work under distractions. Neither distraction significantly reduces performance, but both reduce well-being. Participants are willing to pay to avoid distractions, with those experiencing lower well-being under distractions willing to pay more. I find no gender differences in the effects on performance or well-being, although women are willing to pay less than men to avoid both distractions. I validate the survey measure of distraction resilience by showing that those scoring higher experience better well-being under both distractions. I then incorporate the validated measure in a representative Dutch panel and find that greater distraction resilience is related to higher income, a greater likelihood of holding a supervisory position, and higher job satisfaction.

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1 Introduction

In modern professional settings, employees are exposed to various forms of distractions. They may frequently be interrupted by phone calls, messages, or colleagues, forcing them to switch attention between tasks. Many people also work in open-plan offices or shared workspaces where chatty coworkers create constant auditory distractions. These distractions could negatively affect workers' performance, and even if they manage to maintain performance, this may come at the cost of increased mental effort and lower well-being. At the individual level, willingness to work under distractions and resilience to their negative effects could be valuable skills that are linked to occupational sorting, higher earnings, and faster career advancement.

To study responses to distractions and the willingness and ability to handle them, I use data from a pre-registered laboratory experiment and the LISS panel, a nationally representative Dutch survey panel. In the laboratory experiment, participants complete a cognitively demanding main task under three conditions: a no-distraction control condition, task-switching distraction, and auditory distraction, using a within-subject design. Under task-switching distraction, the main task is interrupted at pre-determined moments by short secondary tasks that participants must complete before returning to the main task. Under auditory distraction, participants work on the main task with a conversation playing in the background. I measure performance and momentary well-being under each condition and use an incentivized price list to elicit participants' willingness to pay to avoid each type of distraction. Before the task rounds, participants answer eight survey questions designed to capture individual's willingness and ability to work under distractions, which I refer to as distraction resilience.

I find that neither type of distraction significantly reduces performance on the main cognitive task. Task-switching distraction nevertheless reduces performance on the secondary tasks and earnings and delays participants' resumption of the main task after an interruption. Despite these limited effects on main task performance, both distractions reduce momentary well-being during the main task, with a larger reduction under task switching. Consistent with these well-being costs, participants are willing to pay to avoid both distractions and are willing to pay more to avoid task switching. Participants who experience lower well-being under either distraction are also willing to give up more earnings to avoid that distraction, but earnings under either distraction do not predict how much they are willing to pay. Thus, willingness

to avoid distractions appears to reflect the subjective experience of working under distractions more closely than short-run monetary performance.

A central contribution of the paper is to develop and validate a survey measure of distraction resilience. I combine the eight survey items using their first principal component and show that individuals who report greater distraction resilience experience better momentary well-being under both task-switching and auditory distractions. This provides a direct validation of the survey measure against individuals' experiences under controlled exposure to distractions. I then elicit the same questions in the LISS panel and find that individuals with greater distraction resilience have higher monthly income, are more likely to hold a supervisory position, and report higher job satisfaction, even after controlling for education, work sector, standard personality traits, and economic preferences. Taken together, the results show that the same survey measure captures both heterogeneity in experiences under distractions in the laboratory and differences in career outcomes and job satisfaction in representative survey data.

I also examine gender differences in responses to distractions, motivated by the common belief that women are better than men at multitasking. I find no evidence that task-switching or auditory distraction affects women's and men's performance or momentary well-being differently. Women are nevertheless willing to give up less of their earnings than men to avoid both types of distraction. Women and men report similar levels of distraction resilience in the laboratory sample, but women report lower distraction resilience on average in the LISS panel.

The psychology literature has long studied task switching, generally documenting lower performance when participants switch between short, simple, and unincentivized tasks (Rubinstein et al., 2001; Monsell, 2003; Peifer and Zipp, 2019). A smaller economics literature studies multitasking in settings with longer tasks and real-effort incentives. Coviello et al. (2015) find that judges working on multiple trials simultaneously take longer to complete them than those working sequentially, and Buser and Peter (2012) show experimentally that forced multitasking reduces performance relative to sequential work. Murad et al. (2019) show that incentives can also distort how individuals allocate effort across multiple real-effort tasks, with the response differing by gender. My experiment differs from these studies by combining a cognitively demanding main task with a series of short secondary tasks that carry a cost if left incomplete. This setup resembles professional settings in which individuals need to maintain progress on a main project but also respond to less im-

portant demands such as phone calls, messages, or emails. It allows me to measure the effects of task switching on both performance and momentary well-being, as well as the immediate cost of returning to the main task after an interruption.

A growing literature studies digital distractions from smartphones and laptops, particularly in educational settings. University students spend substantial time on their smartphones, which is associated with lower GPA and fewer exams passed (Junco and Cotten, 2012; Amez et al., 2023). Multitasking on laptops (Sana et al., 2013) or simultaneously managing multiple sources of study information (Pollard and Courage, 2017) also reduces educational performance. By contrast, removing sources of distraction through mobile phone bans improves performance among lower-achieving students in England (Beland and Murphy, 2016) and girls from low socioeconomic backgrounds in Norway (Abrahamsson, 2026), but has no effect in Sweden (Kessel et al., 2020). These studies generally examine distractions for which individuals have some discretion over when to respond. I instead study externally imposed interruptions that require an immediate response, a form of task switching that is common in the workplace.

Some studies have also examined whether men and women differ in their ability to multitask. A widespread stereotype is that women are better at multitasking (Szameitat et al., 2015), but experimental evidence is mixed. Stoet et al. (2013) find a female advantage in some but not all tasks across two multitasking experiments, whereas Hirsch et al. (2019) find no gender differences in performance under either task-switching or dual-task conditions. In a labor market setting, Adams et al. (2025) show that more frequent work interruptions among women contribute to lower hourly earnings, particularly among workers with children. Nagler et al. (2025) elicit workers' willingness to pay to avoid work pressure, including frequent multitasking, and find slightly higher willingness to pay among women. My experiment adds to this literature by jointly examining gender differences in performance, momentary well-being, and willingness to pay under experimentally imposed distractions.

A separate literature examines auditory distraction, another common type of distraction in the work environment. Dean (2024) finds that greater noise exposure reduces worker productivity by impairing cognitive functioning, and laboratory studies show that open-plan office noise can reduce memory even when immediate performance is largely unaffected (Jahncke et al., 2011; Sander et al., 2021). Evidence on the well-being effects of both task-switching and auditory distraction is more limited. Pikos (2017) finds that the introduction of new technologies increases

multitasking, which in turn contributes to emotional exhaustion and burnout. Similarly, Nagler et al. (2025) find that high work pressure, including multitasking and interruptions, is associated with worse mental health outcomes. Auditory distraction also reduces psychological well-being and makes participants feel tired and unmotivated (Jahncke et al., 2011; Sander et al., 2021). I bring these strands together by studying performance and momentary well-being under both task-switching and auditory distraction within the same experiment.

Finally, this paper contributes to the literature on individual traits and preferences as predictors of education and labor market outcomes (Heckman et al., 2006; Mueller and Plug, 2006; Lindqvist and Vestman, 2011; Deming, 2017). A related literature develops survey measures that are validated against experimental behavior and can subsequently be used in larger and more representative samples (Dohmen et al., 2011; Buser et al., 2025, 2026). I follow this approach to develop a survey measure of distraction resilience, validating it in the laboratory before eliciting the same measure in the LISS panel. The measure provides a simple way to study heterogeneity in willingness and ability to work under distractions beyond the laboratory.

The remainder of this paper is structured as follows. Section 2 describes the experimental design. Section 3 presents the experimental results on performance, well-being, willingness to pay, and distraction resilience. Section 4 examines the relationship between distraction resilience and labor market outcomes in the LISS panel. Section 5 concludes.

2 Experimental design

I use a laboratory experiment to study how individuals respond to distractions. Participants first complete a personality questionnaire that includes questions on distraction resilience. They then solve a cognitive task and several small tasks under three treatments: no distraction, task-switching distraction, and auditory distraction. A within-subject design is used in which each participant experiences all three treatments. After each round, I elicit their well-being by asking how they felt while working on the tasks. In the fourth and final round, I use a price list to elicit their willingness to pay to avoid working under distractions. The experiment ends with a survey that elicits basic demographics. Figure 1 shows an overview of the experiment. Full instructions can be found in Appendix C.

Figure 1: Overview of the experiment

Part 1: Personality questionnaire
- 15-item Big Five Inventory
- 8 questions on distraction resilience
- 4 questions on time pressure preferences, risk preferences, and competitiveness

Part 2: Real-effort cognitive tasks
- Treatments: no distraction, task-switching distraction, and auditory distraction
- Rounds 1-3 (baseline):
  Same task order, exogenous treatment order
  Well-being questions after each round
- Round 4 (choice):
  Treatment and payment chosen by participants
- Nonogram:
  10 min per round
  Piece-rate payment: 1 point per correctly labeled square
  Incorrectly labeled squares are auto-corrected at a cost of 5 points
- Adding numbers:
  10 tasks per round
  Solve each task within 1 min; otherwise a 5-point deduction

Part 3: Post-experimental survey
- Demographic questions

The personality questionnaire at the beginning of the experiment consists of the short 15-item Big Five Inventory (Lang et al., 2011) and 12 additional items. Eight of these additional items measure different aspects of distraction resilience: "I dislike working in distracting environments", "I can focus well in noisy environments", "I can easily concentrate after being interrupted", "I am good at working on several projects at the same time", "I enjoy working on several projects at the same time", "I have trouble limiting my phone usage", "I constantly check my phone while studying", and "I am easily distracted". Following Dohmen et al. (2011), Buser et al. (2025), and Buser et al. (2026), I include four previously validated survey items measuring risk taking, preferences for working under time pressure, and competitiveness. The Big

Five Inventory measures agreeableness, conscientiousness, extraversion, neuroticism, and openness. Participants rate the extent to which each statement describes them on a seven-point scale ranging from "Strongly Disagree" to "Strongly Agree". The questionnaire is administered before the task rounds so that responses are not affected by participants' experiences during the tasks.

After completing the questionnaire, participants are introduced to the two cognitive tasks used in the main part of the experiment. The first task is the "Nonogram" (see Figure 2), which serves as the main real-effort cognitive task. Participants have 10 minutes in each round to work on the Nonogram. Each task consists of a 10-by-10 board in which every square needs to be colored either green or gray. The number of consecutive green squares in each row and column must match the sequence of numbers shown at the side and on the top of the board, with neighboring sets of green squares separated by at least one gray square. To color a square, participants first select a color and then click on the square. One point is awarded for each correctly colored square. If a square is colored incorrectly, five points are deducted and the square flashes red before changing to the correct color.[1]

Each Nonogram has a unique solution. To determine the correct color of a particular square, participants need to analyze the information shown at the side and on the top of the board together with any squares that have already been colored. The task therefore requires sustained concentration and cognitive effort, particularly when participants start a new task or return to a partially completed task after an interruption. I chose this task because it is cognitively demanding while being relatively unfamiliar to participants, reducing the role of prior experience.[2] If a participant completes a Nonogram before the 10-minute timer expires, a new one appears and they can continue earning points.[3]

The second task is an adding-numbers task (see Figure 3), which serves as the interrupting task. Participants have 60 seconds to solve each task, with 10 tasks in each round. Each task consists of a 3-by-3 board containing nine unique two-digit numbers. Participants must identify the two numbers that sum to the "target number" displayed on the right side of the screen. They select and deselect numbers by clicking on them, and the experimental program proceeds once the correct pair

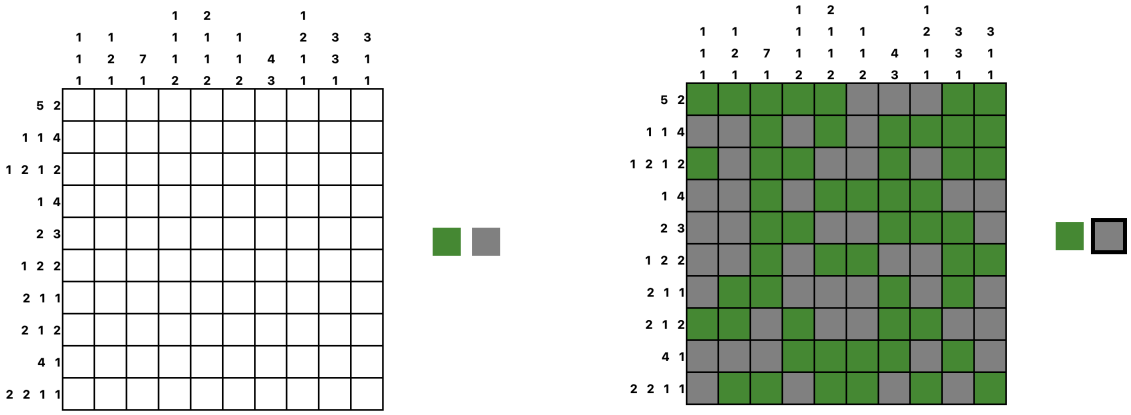
[1]Because a mistake can make it impossible to finish the task correctly and can be difficult to identify at a later stage of the task, mistakes are corrected automatically.

[2]More than 80% of participants had never played Nonogram before.

[3]A maximum of three Nonogram tasks are available in each round.

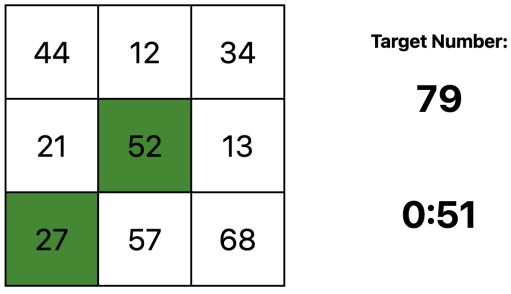
is selected or the time limit expires. Participants receive no additional reward for solving the task correctly but lose five points if they fail to solve it within the time limit. This payoff structure resembles short secondary demands in everyday work, such as emails or other requests that require a response and may carry a cost if left unattended, rather than tasks that individuals complete primarily to earn extra rewards.

Figure 2: Example of the main cognitive task Nonogram



The figure shows an example of a Nonogram. The left panel shows the board as participants first see it, and the right panel shows the completed version.

Figure 3: Example of the interrupting adding-numbers task



The figure shows an example of an adding-numbers task. The selected numbers are shown in green. In this example, 52 and 27 add up to the target number of 79. The timer shows the time remaining.

After reading the instructions and completing the practice tasks,[4] participants complete four rounds of the two tasks. Before the first round begins, they are informed that one round will be randomly selected for payment. At the end of each round, the final score from both tasks is converted into money at a rate of 10 points to €1. If the final score is negative, earnings for that round are set to zero.

Three treatments are implemented in the first three rounds: no distraction, task-switching distraction, and auditory distraction. In the no-distraction treatment, participants solve the Nonogram for 10 minutes, followed by 10 adding-numbers tasks with a 60-second time limit for each. In the task-switching-distraction treatment, the Nonogram is interrupted at 10 pre-determined moments by the adding-numbers tasks.[5] Participants must complete each adding-numbers task before returning to the Nonogram. In the auditory-distraction treatment, participants solve the Nonogram for 10 minutes with a conversation on a topic of general interest playing in the background.[6] After 10 minutes, the conversation stops and participants complete 10 adding-numbers tasks.

Participants complete the same sequence of tasks in all three rounds, with the treatment assigned to each round in random order. After completing all tasks in a round, they see a results page that shows their Nonogram score, the number of adding-numbers tasks solved, the points deducted for unsolved adding-numbers tasks, the final score across both tasks, and their earnings for the round.

After each round, participants answer three questions about their experience when solving each task: "I felt stressed while playing Nonogram (the adding-numbers games)", "I felt happy while playing Nonogram (the adding-numbers games)", and "I felt frustrated while playing Nonogram (the adding-numbers games)". Responses are given on the same seven-point scale used in the personality questionnaire. These items capture participants' momentary well-being, providing a measure of their immediate subjective experience under each treatment.

In the fourth and final round, I elicit participants' willingness to pay to avoid working under distractions. For each type of distraction, participants make a series of binary choices between solving the Nonogram under distraction and solving

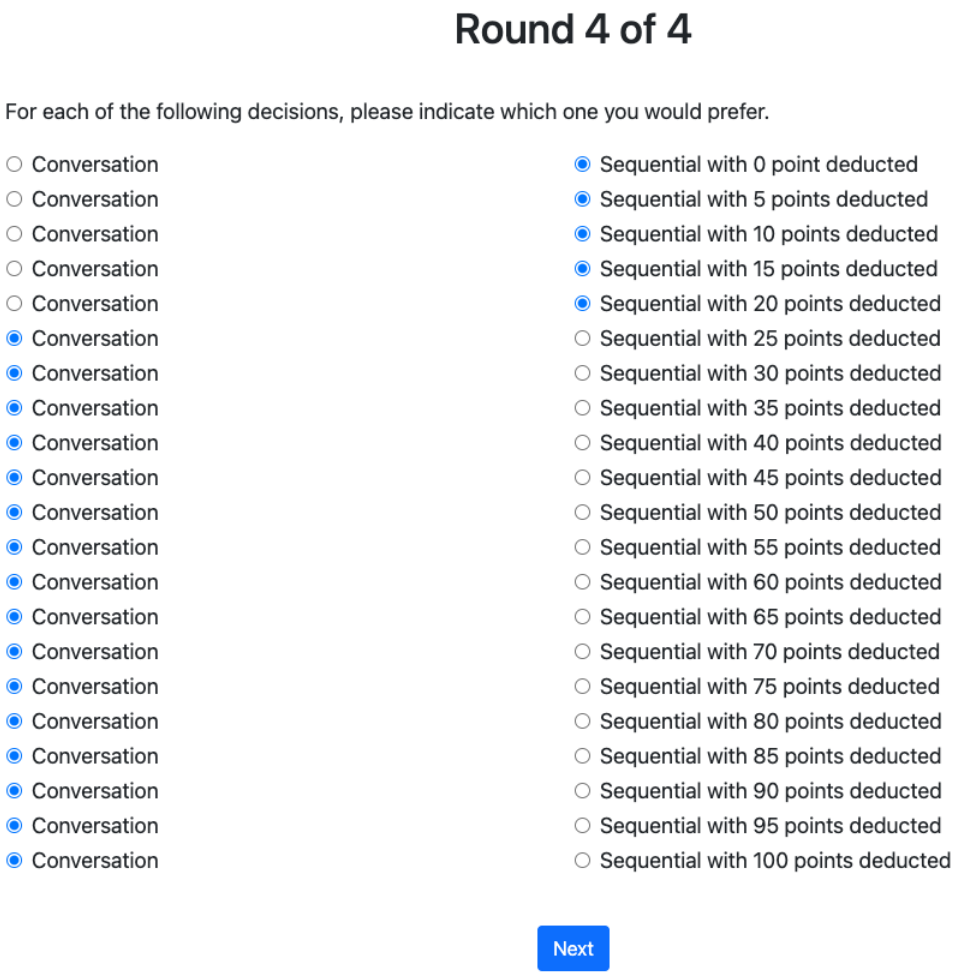
[4]Participants could spend up to 10 minutes to practice the Nonogram and could proceed at any time. They also completed three practice adding-numbers tasks, each with a 60-second time limit. None of the practice tasks were incentivized.

[5]The 10 interruption times were randomly chosen in advance and fixed across participants.

[6]Participants worked in individual soundproofed rooms, with conversation volume set to avoid sound spillovers across rooms.

it without distraction but with points deducted from their final score. The point deduction ranges from 0 to 100 points in increments of five points (see Figure 4).[7] Participants make 42 choices in total, one of which is randomly selected for implementation. These choices indicate participants' willingness to pay to avoid each type of distraction.

Figure 4: Example of the price list in round 4



The figure shows the price list for the auditory-distraction treatment. "Conversation" refers to solving the Nonogram while the background conversation is played. "Sequential" refers to solving the Nonogram followed by the adding-numbers tasks without any distraction.

[7]When participants select an option for one choice, the remaining choices are automatically filled in to prevent inconsistent responses.

After the four rounds, participants complete a final survey that collects basic demographic information including age and gender, and whether they have played Nonogram or similar puzzle games before. They also make several incentivized choices between a sure amount and a lottery for additional earnings to measure risk preferences.

The analysis plan was pre-registered in the AEA RCT Registry[8] and is re-printed in Appendix B. The pre-registered power analysis suggested a minimum sample of 200 participants. The experiment was programmed using oTree (Chen et al., 2016) and conducted at the CREED laboratory using the University of Amsterdam subject pool in November and December 2023. Following the pre-registered criteria, I excluded 22 participants who completed all three Nonogram tasks within 10 minutes in at least one treatment, four participants with a final score below -100 points in at least one treatment, and three participants who failed an attention check. I also excluded two participants who attempted to turn off the conversation by switching off the computer.[9] This leaves a final sample of 217 participants, of whom 54% are female. Average earnings were €25.80, including a €7 participation fee.

3 Experimental results

I present my results from the laboratory experiment in four sections. In Sections 3.1 and 3.2, I use data from the first three rounds to estimate the impact of distractions on performance and momentary well-being respectively. In Section 3.3, I use the choice data from the fourth round to estimate participants' willingness to pay to avoid working under distractions. Finally, in Section 3.4, I construct a survey measure of distraction resilience from eight questionnaire items and examine how it relates to the experimental outcomes.

3.1 The impact of distractions on performance

Table 6 in Appendix A reports descriptive statistics for the main performance outcomes by treatment in the first three rounds. The outcomes include the score for the main cognitive task Nonogram, the number of adding-numbers tasks solved under

[8] https://www.socialscienceregistry.org/trials/12534.

[9] This criterion was not specified in the analysis plan because this behavior was not anticipated. After these incidents, participants were reminded in the instructions not to press any buttons on the computer.

a 60-second limit (out of 10), the actual earnings calculated from converting points earned across both tasks at a conversion rate of 10 points to €1, and the payable earnings to the participants with negative actual earnings set to zero.[10] The raw means suggest that performance is very similar in the no-distraction and auditory-distraction treatments, but lower under the task-switching-distraction treatment, especially on the adding-numbers tasks.

Table 1 presents the average impact of distractions on task performance. Each column reports coefficients from a regression of a performance outcome on treatment dummies, controlling for task and individual fixed effects. Column (1) reports the main outcome of interest: the final score in the main cognitive task, the Nonogram. The estimated effects of both task-switching and auditory distraction are negative, but neither is statistically significant. These limited effects are somewhat surprising because solving the Nonogram requires sustained attention and integrating information across the 10-by-10 board. On average, however, participants perform similarly even when they are intermittently interrupted by the adding-numbers tasks or exposed to a background conversation.[11]

Although task-switching distraction does not significantly reduce the Nonogram score, it delays participants' resumption of the task following an interruption.[12] Using the first interruption, Table 8 in Appendix A shows that participants take approximately 2.6 seconds longer to make their next Nonogram move than at the corresponding point in the no-distraction treatment. No comparable delay is observed in the auditory-distraction treatment. The probability that the next move after the interruption is correct does not differ significantly across treatments.

[10]Payable earnings are used in the remaining analysis and is referred to as earnings. Results remain similar when actual calculated earnings is used instead.

[11]A potential concern is that participants may learn and improve over the course of the experiment. In addition to controlling for task fixed effects in the main specification, I address this concern by restricting the analysis to the first round. Because treatment order is randomized, this provides a between-subject comparison that is unaffected by learning across rounds. Columns (1) to (3) of Table 7 in Appendix A present the results. As in the main analysis, the estimated effect of task-switching distraction on the Nonogram score is small, negative, and statistically insignificant. By contrast, the estimated effect of auditory distraction is positive, although it is statistically significant only at the 10 percent level. Overall, the first-round results do not suggest that learning masks a negative effect of either distraction on Nonogram performance.

[12]I use the Nonogram time at which the first interruption occurs in the task-switching treatment as the reference point and measure the time until the next Nonogram move at the corresponding point in all three treatments. I focus on the first interruption because participants in the no-distraction and task-switching-distraction treatments have identical treatment histories up to that point.

Table 1: Effect of distractions on performance

	(1) Nonogram score	(2) Solved adding-numbers	(3) Earnings
Task-switching	-3.569	-1.425***	-0.909***
	(2.387)	(0.198)	(0.240)
Auditory	-1.426	0.119	-0.002
	(2.341)	(0.093)	(0.234)
Constant	75.184***	8.507***	6.885***
	(2.007)	(0.129)	(0.206)
N	651	651	651

The table shows coefficients from regressions of performance measures on treatment dummies, controlling for task and individual fixed effects. Nonogram score is the final score on the main cognitive task. Solved adding-numbers is the number of adding-numbers tasks solved out of 10 under a 60-second limit. Earnings are the payable amounts, with negative calculated total earnings from both tasks set to zero. Robust standard errors are clustered at the individual level and are shown in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Column (2) uses the total number of adding-numbers tasks solved out of 10 under a 60-second limit. Task-switching distraction significantly reduces the number of tasks solved. When participants have to solve the adding-numbers tasks at random moments while working on the Nonogram, they solve fewer tasks than when completing them sequentially after the Nonogram. One possible explanation is that participants remain mentally engaged with the interrupted Nonogram, leaving fewer cognitive resources available for the adding-numbers tasks. By contrast, the number of adding-numbers tasks solved is not significantly affected in the auditory-distraction treatment, where the background conversation ends before participants begin the adding-numbers tasks.[13]

Column (3) uses the earnings payable to participants, with negative calculated earnings set to zero. Relative to the no-distraction treatment, auditory distraction has little effect on earnings, whereas task-switching distraction causes a significant decline, driven by worse performance on the adding-numbers tasks. Overall, the results suggest that task-switching distraction mainly hampers performance on the interrupting task rather than the main task, and auditory distraction has little effect on either task.

[13]Participants nevertheless complete the adding-numbers tasks significantly faster than in the no-distraction treatment (p=0.045, paired t-test).

There is a stereotypical belief that women are better at multitasking than men (Szameitat et al., 2015; Stoet et al., 2013). To study gender differences in performance, I regress the Nonogram score, the number of adding-numbers tasks solved, and earnings on a gender dummy, treatment dummies, and their interactions. The first three columns of Table 9 in Appendix A present the results. None of the coefficients on the interaction terms is statistically significant, providing no evidence that task-switching or auditory distraction affects women and men differently. Overall, the results do not support the stereotypical belief that women perform better when multitasking.

Table 2: Effect of distractions on momentary well-being

	(1)	(2)
	Well-being	
	Nonogram	Adding-numbers
Task-switching	-0.632***	-0.292***
	(0.087)	(0.095)
Auditory	-0.374***	0.192**
	(0.095)	(0.080)
Constant	4.595***	3.396***
	(0.085)	(0.066)
N	651	651

The table shows coefficients from regressions of momentary well-being for each type of task on treatment dummies, controlling for task and individual fixed effects. Momentary well-being for each type of task is a composite measure constructed by taking the average of the answers to the three questions: "I felt stressed while playing Nonogram (the adding-numbers games)", "I felt happy while playing Nonogram (the adding-numbers games)", and "I felt frustrated while playing Nonogram (the adding-numbers games)". The responses to the stress and frustration questions are reverse coded so that a higher value in the composite measure indicates better momentary well-being while solving the tasks. Robust standard errors are clustered at the individual level and are shown in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

3.2 The impact of distractions on well-being

Results from Section 3.1 suggest that individuals maintain their performance under distractions in the short run. However, doing so may come at the cost of greater stress, less enjoyment, and lower well-being. Such effects are relevant from an economics perspective because persistent reductions in well-being may contribute to burnout, which has adverse physical and psychological consequences (Salvagioni et al., 2017) and may reduce performance over the longer run.

For each task under each treatment, I construct a composite measure of momentary well-being by averaging the three items on stress, happiness, and frustration. The stress and frustration items are reverse coded, so that higher values indicate better momentary well-being.[14] For brevity, I refer to this measure as well-being throughout the experimental analysis. To estimate the effect of distractions, I regress well-being during each task on treatment dummies, controlling for task and individual fixed effects. Table 2 presents the results. For the main cognitive task, the Nonogram, both being interrupted by the adding-numbers tasks and working in the presence of a background conversation significantly reduce well-being relative to the no-distraction treatment. The reduction is significantly larger under task-switching distraction than under auditory distraction (p=0.011).

For the adding-numbers tasks, participants report lower well-being when they are required to complete them at random moments before resuming the Nonogram than when they complete them sequentially after the Nonogram. Task switching therefore reduces well-being while participants perform both the main and the interrupting task. In the auditory-distraction treatment, the background conversation ends before participants begin the adding-numbers tasks. Participants report higher well-being while solving these tasks than in the no-distraction treatment. This higher well-being may reflect relief from the background conversation once it ends.[15]

Taken together with the limited effect on main task performance in Section 3.1, the well-being results suggest that participants may preserve performance under distraction by exerting greater effort. Because performance is incentivized, participants may compensate for distraction in a way that leaves output largely unchanged but makes the work experience less pleasant. Another possibility is that distractions affect the process of working without translating into lower aggregate performance. Consistent with this, task-switching distraction delays participants' return to the Nonogram after an interruption even though their overall Nonogram score is not

[14]Pairwise correlations among the three items range from 0.357 to 0.759 across tasks and treatments, and Cronbach's alpha ranges from 0.704 to 0.816. These results support combining the items into a composite measure of momentary well-being. Table 10 in Appendix A presents the full set of pairwise correlation tables.

[15]To examine whether lower attention or engagement in later rounds contributes to the results, I repeat the analysis using first-round observations only. The estimates are smaller and statistically insignificant, except for the positive effect of auditory distraction on well-being during the adding-numbers tasks, which remains significant at the 5 percent level. Overall, the first-round analysis provides partial support for the main findings and suggests that the negative well-being effects become more pronounced as participants progress through the experiment. Columns (4) and (5) of Table 7 in Appendix A present the results.

significantly lower.

Finally, I examine whether the effects of distractions on well-being differ by gender. Columns (4) and (5) of Table 9 in Appendix A report the results separately for the Nonogram and the adding-numbers tasks. In the no-distraction treatment, female participants report significantly lower well-being than male participants while solving the adding-numbers tasks, whereas the gender difference for the Nonogram is not statistically significant. None of the interactions between the female indicator and the treatment dummies is statistically significant for either task. Taken together with the performance results, these findings suggest no substantial gender difference in the ability to handle distractions, whether measured by performance or well-being.

3.3 Willingness to pay to avoid distractions

The previous sections show that participants maintain their performance on the main cognitive task under distractions, but at the cost of lower momentary well-being. A natural next question is how participants value these experiences and whether they are willing to give up earnings to avoid distractions. In this section I examine participants' willingness to pay to avoid each type of distraction and how it relates to their performance and well-being.

In the fourth round, participants repeatedly choose between completing the Nonogram under a given distraction and completing it without distraction but with a deduction of between 0 and 100 points. This choice is elicited separately for auditory and task-switching distraction. The deduction at which a participant switches from choosing no distraction to accepting the distraction reflects their willingness to pay (WTP) to avoid it. Figure 5 presents the distributions of WTP for the two types of distraction.

Participants are willing to pay to avoid both types of distraction. On average, they are willing to pay 11.77 points (€1.18) to avoid task-switching distraction and 8.76 points (€0.88) to avoid auditory distraction. WTP is significantly higher for task-switching than auditory distraction (p=0.001, paired t-test). While 67% of participants are willing to pay at most 5 points (€0.50) to avoid auditory distraction, 50% are willing to pay more than 5 points to avoid being interrupted by the adding-numbers tasks. The cumulative distribution functions in Figure 6 in Appendix A show that the WTP to avoid task-switching distraction first-order stochastically dominates the WTP to avoid auditory distraction. This is consistent with the earlier

results showing that task-switching distraction is more detrimental than auditory distraction for both earnings and well-being.

I next examine how participants' WTP relates to their performance and momentary well-being under each type of distraction. Table 3 reports regressions of WTP to avoid each type of distraction on earnings and well-being under that treatment, controlling for the corresponding outcomes in the no-distraction treatment.[16] For both types of distraction, lower well-being under distraction is associated with significantly higher WTP, conditional on well-being in the no-distraction treatment. By contrast, earnings under distraction are not significantly related to WTP after controlling for earnings in the no-distraction treatment.[17] These results suggest that participants' willingness to pay to avoid distractions is more closely related to their subjective experience than to their realized monetary performance. One possible explanation is that the immediate psychological costs of working under distractions are more salient than modest short-run differences in earnings.

I next examine whether men and women differ in their willingness to pay to avoid distractions. Table 11 in Appendix A reports regressions of WTP to avoid each type of distraction on a gender dummy. Compared with male participants, female participants are willing to pay 34% less to avoid task-switching distraction and 40% less to avoid auditory distraction, and both differences are statistically significant. Taken together with the earlier results showing no substantial gender differences in the effects of distractions on performance or well-being, these findings suggest that men are willing to give up more earnings to avoid working under distractions, despite being affected by them in a similar way as women.

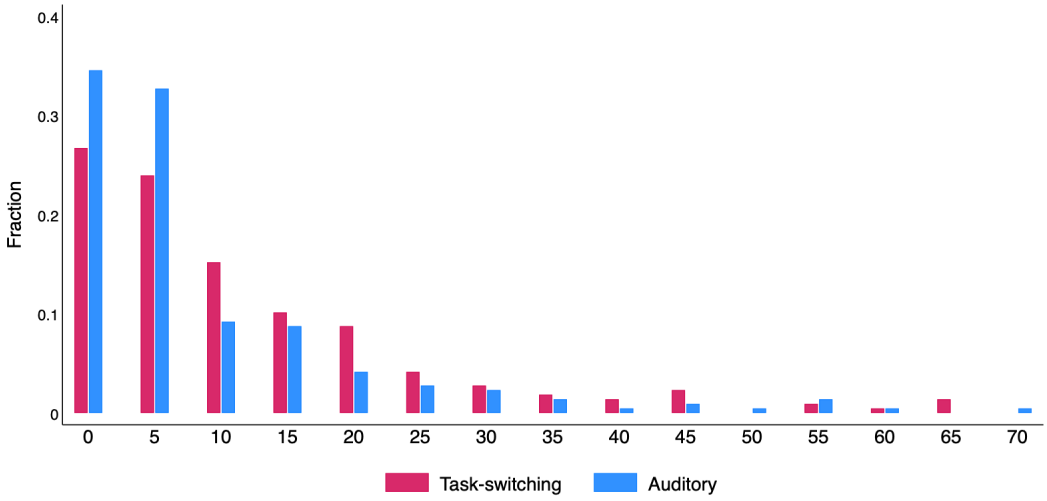
3.4 Survey measure of distraction resilience

The previous sections document the average effects of distractions on performance, momentary well-being, and willingness to pay. However, individuals may differ substantially in how they respond to distractions. I next examine whether this heterogeneity can be predicted by survey questions about working under distractions. If

[16] Because the WTP choice concerns the full treatment experience including both tasks, momentary well-being is measured as the average of the six items reported for both the Nonogram and adding-numbers tasks. The stress and frustration items are reverse coded so that higher values indicate better well-being.

[17] The results are robust to additionally controlling for the Big Five personality traits, risk tolerance, competitiveness, and time pressure preferences.

Figure 5: WTP to avoid distractions



The figure shows the distribution of the willingness to pay to avoid each type of distraction. The WTP is the point deduction that makes participants switch from solving the Nonogram without distraction but with point deduction to solving the Nonogram under the specific type of distraction.

Table 3: Relationship between WTP and earnings and well-being

	(1)	(2)
	WTP	
	Task-switching	Auditory
Earnings	-0.057	-0.013
	(0.107)	(0.095)
Well-being	-0.256***	-0.305***
	(0.084)	(0.098)
Earnings no-distraction	√	√
Well-being no-distraction	√	√
N	217	217

The table shows coefficients from regressions of the willingness to pay to avoid task-switching and auditory distractions on earnings and momentary well-being under the specific type of distraction, controlling for earnings and momentary well-being in the no-distraction treatment. Please refer to the notes for Table 1 and Figure 5 for description of earnings and WTP. Well-being is the average of all six questions on how participants felt while solving both types of tasks. All dependent and independent variables are standardized. Robust standard errors are shown in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 4: Relationship between distraction resilience and experimental outcomes

	(1)	(2)	(3)	(4)	(5)	(6)
	Task-switching			Auditory		
	Earnings	Well-being	WTP	Earnings	Well-being	WTP
Distraction resilience	0.048	0.132**	0.013	0.007	0.163***	-0.078
	(0.048)	(0.056)	(0.062)	(0.050)	(0.059)	(0.060)
Earnings no-dist.	√		√	√		√
Well-being no-dist.		√	√		√	√
N	217	217	217	217	217	217

The table shows coefficients from regressions of experimental outcomes under each type of distraction on the distraction resilience measure. Distraction resilience is the first component from a principal component analysis of the eight survey items, coded so that higher values indicate greater willingness and ability to work under distractions. Please refer to the notes for Table 1, Table 3, and Figure 5 for description of all other variables. Columns (1) and (4) control for earnings in the no-distraction treatment, columns (2) and (5) control for momentary well-being in the no-distraction treatment, and columns (3) and (6) control for both. All dependent and independent variables are standardized. Robust standard errors are shown in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

these questions are associated with responses in the experiment, they could be used to measure individuals' willingness and ability to work under distractions outside the laboratory.

Figure 7 in Appendix A presents the distributions of responses to the eight survey items on distraction resilience: "I dislike working in distracting environments", "I can focus well in noisy environments", "I can easily concentrate after being interrupted", "I am good at working on several projects at the same time", "I enjoy working on several projects at the same time", "I have trouble limiting my phone usage", "I constantly check my phone while studying", and "I am easily distracted". The distributions show considerable heterogeneity in individuals' self-reported distraction resilience. After reverse coding the negatively worded items, I construct a composite measure using the first principal component of all eight items. Higher values indicate greater distraction resilience, reflecting a greater willingness and ability to work under distractions.[18]

Next, I examine whether distraction resilience is associated with three experimental outcomes under each type of distraction: (1) earnings from the Nonogram and adding-numbers tasks; (2) momentary well-being, measured as the average of

[18]Female and male participants report similar levels of distraction resilience (p=0.928, t-test).

the six questions on how participants felt while completing the two tasks; and (3) willingness to pay to avoid the distraction. Table 4 reports separate regressions for the task-switching and auditory-distraction treatments. The earnings and well-being regressions control for the corresponding outcome in the no-distraction treatment, and the WTP regressions control for both. All dependent and independent variables are standardized.

Distraction resilience is not significantly associated with earnings or willingness to pay under either type of distraction. It is, however, positively associated with well-being under both task-switching and auditory distractions, conditional on well-being in the no-distraction treatment. In other words, individuals who report greater distraction resilience tend to experience better well-being when working under such conditions. A one-standard-deviation increase in distraction resilience is associated with a 0.132-standard-deviation increase in well-being under task-switching distraction and a 0.163-standard-deviation increase under auditory distraction.[19] These results suggest that the survey measure captures individual differences in the subjective experience of working under distractions more closely than differences in earnings or willingness to pay to avoid distractions.[20]

[19]The relationships are similar when additionally controlling for the Big Five personality traits, competitiveness, risk tolerance, and time pressure preferences.

[20]The first principal component provides a concise overall summary of the eight survey items, but the items may capture several related dimensions of distraction resilience. A three-component principal component analysis with varimax rotation separates the items into three groups: (1) items 3, 6, 7, and 8 capture distraction management; (2) items 1 and 2 capture tolerance of distracting environments; and (3) items 4 and 5 capture multitasking orientation. This produces a clearer and more interpretable grouping than the two-component PCA, which combines the environmental-tolerance and multitasking items into a single component. A three-factor exploratory factor analysis with promax rotation produces a closely corresponding structure and is also more clearly interpretable than the two-factor EFA. Table 12 in Appendix A reports the rotated PCA and EFA loadings, and Table 13 in Appendix A reports regressions in which the three standardized PCA components are included jointly. The component-specific regressions are broadly consistent with the main results: distraction management is positively associated with momentary well-being under both distractions. It is also related to higher earnings under task-switching distraction. Tolerance of distracting environments is related to higher well-being under task-switching distraction and lower WTP to avoid auditory distraction.

4 Distraction resilience and labor market outcomes in representative survey data

The experimental results show that the composite survey measure of distraction resilience is related to individual differences in the effect of distractions on momentary well-being. I next examine whether the measure is also related to economic outcomes outside the laboratory. Previous research has shown that related non-cognitive abilities and preferences, such as conscientiousness, social skills, willingness to compete, and preferences for working under time pressure, predict labor market outcomes (Mueller and Plug, 2006; Deming, 2017; Buser et al., 2022, 2025). I therefore examine whether distraction resilience shows a similar relationship with labor market outcomes.

4.1 Distraction resilience in the LISS panel

To do so, I elicit the same eight survey items in the LISS panel (Longitudinal Internet studies for the Social Sciences), a nationally representative longitudinal survey of the Dutch population managed by Centerdata at Tilburg University. The panel has been running since 2007 and includes approximately 7,500 panel members. They participate in monthly surveys covering a wide range of economic and social outcomes. This allows me to link the distraction resilience measure to respondents' actual labor market outcomes, including monthly income, career attainment, job satisfaction, as well as education level, occupation, and a range of standard personality traits and economic preferences.

I construct the distraction resilience measure using the same procedure as in Section 3.4. After reverse-coding the negatively worded items, I use the first principal component of the eight survey items and standardize the resulting score. Figure 9 in Appendix A shows how distraction resilience varies by age and gender. Women score 0.14 standard deviations lower than men on average ($p<0.001$, t-test), and distraction resilience tends to be higher among older respondents. Among LISS respondents with a university degree, who are more comparable to the laboratory sample, there is no evidence of a gender difference in distraction resilience after controlling for age group ($p=0.608$).

Table 5: Relationship between distraction resilience and labor market outcomes

	(1)	(2)	(3)	(4)
Panel A: Monthly income				
Distraction resilience	0.153***	0.150***	0.142***	0.089***
	(0.023)	(0.020)	(0.020)	(0.023)
Adj. R-squared	0.152	0.298	0.324	0.346
Observations	1,843	1,843	1,843	1,843
Panel B: Supervisory position				
Distraction resilience	0.030***	0.029***	0.029***	0.016***
	(0.007)	(0.007)	(0.007)	(0.008)
Adj. R-squared	0.032	0.078	0.085	0.100
Observations	1,970	1,970	1,970	1,970
Panel C: Job satisfaction				
Distraction resilience	0.206***	0.202***	0.204***	0.111***
	(0.027)	(0.027)	(0.027)	(0.030)
Adj. R-squared	0.040	0.045	0.048	0.080
Observations	1,732	1,732	1,732	1,732
Gender, age	√	√	√	√
Education level		√	√	√
Work sector			√	√
Personality and preferences				√

The table reports OLS estimates from regressions of gross monthly income, whether holding a supervisory position, and job satisfaction on distraction resilience using different sets of controls. Supervisory position is an indicator equal to one if the respondent classifies their current or most recent profession as a higher supervisory profession, including managers, directors, owners of large companies, and supervisory civil servants. Job satisfaction is measured by the response to the survey question "Everything considered, I [am/was] satisfied with my job." Distraction resilience is the first principal component of the eight survey items. Age controls include age fixed effects. Education level consists of six categories defined by Statistics Netherlands, and work sector follows the work-sector classification used by the LISS panel. Personality controls include the Big Five personality traits, competitiveness, and risk tolerance. The sample consists of respondents aged 25 to 65 for whom all variables are available. Gross monthly income, job satisfaction, distraction resilience, and personality and preferences controls are standardized. Robust standard errors are shown in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

4.2 Distraction resilience and career attainment

I first examine whether distraction resilience is related to career attainment, starting with gross monthly income. Panel A of Table 5 presents OLS regressions of standardized gross monthly income on the standardized distraction resilience measure using different sets of controls. Education level is based on six categories defined by Statistics Netherlands, and work sector follows the classification used by the LISS panel.[21] Personality and preference controls include the Big Five personality traits, competitiveness, and risk tolerance.

Column (1) shows that, conditional on gender and age, a one-standard-deviation increase in distraction resilience is related to a 0.153-standard-deviation increase in gross monthly income. After controlling for education level in column (2), the coefficient changes little, suggesting that the relationship between distraction resilience and income is not explained by differences in education.

The correlation between distraction resilience and income could reflect either sorting into different types of work or differences in earnings within a given type of work. Adding work-sector controls in column (3) leaves the coefficient on distraction resilience largely unchanged. This suggests that sorting across broad sectors explains little of the relationship between distraction resilience and income. To explore whether sorting appears at a more detailed level, Figure 8 in Appendix A shows average standardized distraction resilience across occupations.[22] Distraction resilience differs significantly across occupations (p=0.025, Wald test). Managers, trades workers, and business professionals report the highest levels of distraction resilience, while care workers and clerical workers, including customer service and office workers, report the lowest.

Another question is whether standard measures of economic preferences and personality traits account for the relationship between distraction resilience and income. Table 14 in Appendix A reports correlations between distraction resilience and these measures. Neuroticism has the strongest correlation with distraction resilience in absolute terms at -0.43, indicating that individuals who are more prone to stress and worry report lower distraction resilience. This is followed by openness, conscientiousness, and extraversion. When the full set of preference and personality controls

[21] The work sectors include agriculture, industry, construction, retail, catering, transport, financial services, business services, government, education, healthcare, culture and recreation, and other.

[22] Two-digit ISCO occupation codes are used rather than sector categories since occupation information is available for a smaller sample.

is added in column (4) of Table 5, the coefficient on distraction resilience falls from 0.142 to 0.089 but remains statistically significant. This suggests that these traits account for part, but not all, of the relationship between distraction resilience and income. Table 15 in Appendix A reports the coefficients on each preference and personality trait, with higher competitiveness and extraversion associated with higher gross monthly income, and higher neuroticism associated with lower income.

As a second measure of career attainment, I examine whether distraction resilience is related to holding a supervisory position, defined as an indicator equal to one if respondents classify their current or most recent profession as a higher supervisory profession. Panel B of Table 5 shows that, conditional on age and gender, a one-standard-deviation increase in distraction resilience is related to a 3-percentage-point higher probability of holding a supervisory position. The coefficient changes little after controlling for education and work sector and remains positive and statistically significant after additionally controlling for personality traits and economic preferences. Taken together with the income results, this suggests that distraction resilience is positively related to career attainment, both in terms of earnings and holding a supervisory position.

4.3 Distraction resilience and job satisfaction

In parallel with the evidence from the laboratory experiment on momentary well-being, I examine whether distraction resilience is also related to how individuals feel about their work in the labor market. This is proxied by job satisfaction, measured by the response to the question "Everything considered, I [am/was] satisfied with my job". Panel C of Table 5 reports OLS regressions of standardized job satisfaction on the standardized distraction resilience measure, using the same sets of controls as in Panels A and B. Column (1) shows that, conditional on age and gender, a one-standard-deviation increase in distraction resilience is associated with a 0.206-standard-deviation increase in job satisfaction. The coefficient changes little after controlling for education and work sector.

After additionally controlling for standard personality traits and economic preferences, the coefficient falls by about half but remains statistically significant. Column (3) of Table 15 in Appendix A shows that, among these additional traits, neuroticism is the only one significantly related to job satisfaction. Neuroticism is negatively correlated with both distraction resilience and job satisfaction, suggesting

that it accounts for part of the relationship between the two. Nevertheless, distraction resilience remains significantly related to both income and job satisfaction after controlling for these traits.

5 Conclusion

Distractions are a common feature of modern work environments, and their costs may extend beyond immediate effects on performance. I use an incentivized laboratory experiment to study how individuals respond to two common forms of distraction: task switching and background conversation. Neither distraction significantly reduces performance on the main cognitive task. Task-switching distraction nevertheless reduces performance on the secondary tasks and earnings and delays participants' resumption of the main task after an interruption. Both distractions reduce momentary well-being during the main task, with a larger reduction under task switching. Participants are willing to pay more to avoid task switching than auditory distraction, and willingness to pay is higher among those who experience lower well-being under distraction but is unrelated to earnings under distraction. Taken together, these results suggest that the costs of working under distractions may be reflected more clearly in individuals' subjective experiences than in their immediate performance.

Beyond these average effects, the experiment also shows substantial heterogeneity in how individuals experience distractions. I develop a survey measure of distraction resilience from eight questions on individuals' willingness and ability to work under distracting conditions and validate it against their responses to experimentally induced distractions. Individuals with greater self-reported distraction resilience experience better momentary well-being under both task-switching and auditory distractions. I then elicit the same questions in the LISS panel and relate the measure to labor market outcomes. From a human capital perspective, the survey results suggest that distraction resilience may be a valuable skill: individuals with greater distraction resilience have higher monthly income, are more likely to hold a supervisory position, and report higher job satisfaction. These relationships remain after accounting for education, work sector, standard personality traits, and economic preferences. The results therefore suggest that distraction resilience captures an economically relevant dimension of individual heterogeneity that extends beyond the

laboratory.

I also examine gender differences in responses to distractions. Despite the common belief that women are better at multitasking, I find no evidence that task-switching or auditory distraction affects women's and men's performance or momentary well-being differently. Women are nevertheless willing to give up less of their earnings than men to avoid both types of distraction. Women and men also report similar levels of distraction resilience in the laboratory sample, although women report lower distraction resilience on average in the representative survey data. These findings provide little support for a general female advantage in handling multiple demands and instead point to gender differences in preferences for avoiding distracting work environments.

More broadly, the limited effects on main task performance in the laboratory do not imply that distractions are costless. Individuals may be able to maintain their immediate performance while experiencing substantially lower well-being. If exposure to distractions persists over time, reductions in well-being may contribute to burnout or turnover and could eventually reduce productivity. The costs of distracting work environments may therefore extend beyond short-run productivity losses. At the same time, the relationship between distraction resilience and labor market outcomes suggests that differences in how individuals handle these environments may matter for career trajectories and well-being at work. The validated survey measure provides a simple way to examine such differences in larger samples and other labor market settings.

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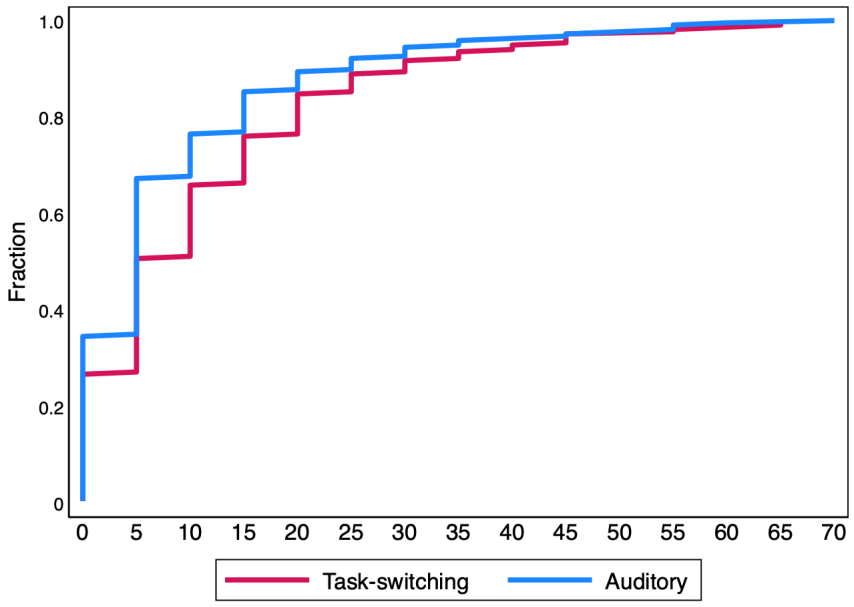
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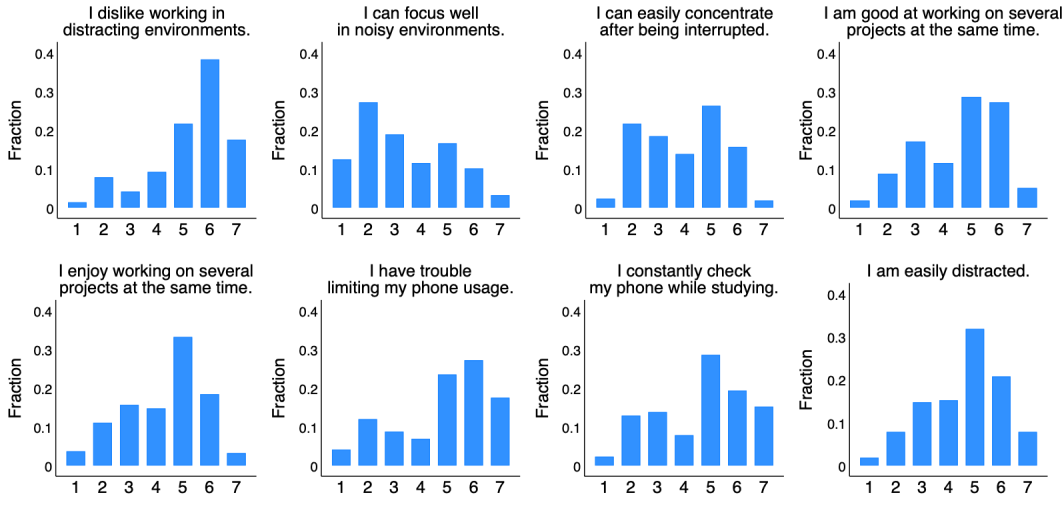
Appendix A: Additional Tables and Figures

Figure 6: CDF of willingness to pay to avoid distractions



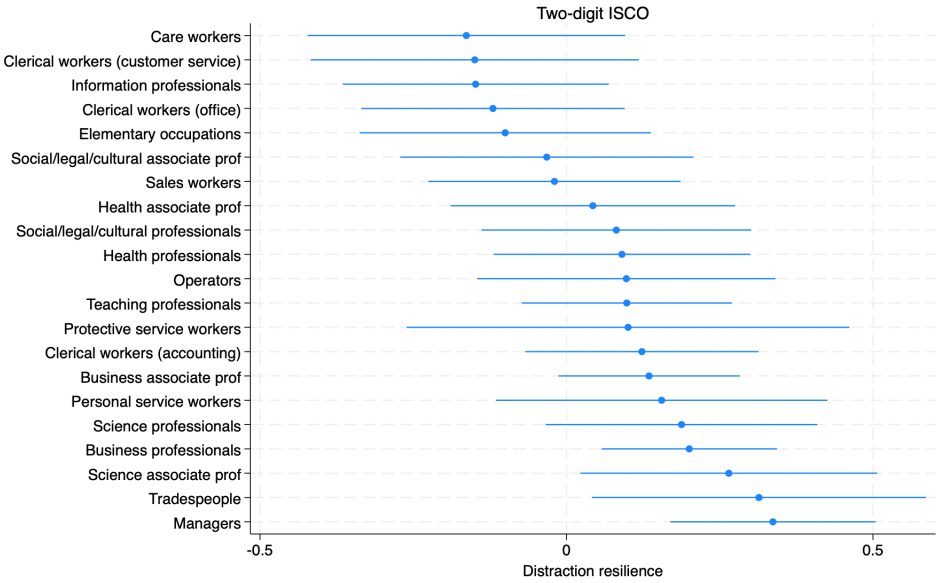
The figure shows the cumulative distribution functions (CDFs) for the willingness to pay to avoid being distracted by each type of distraction.

Figure 7: Distributions of answers to survey questions in the laboratory experiment



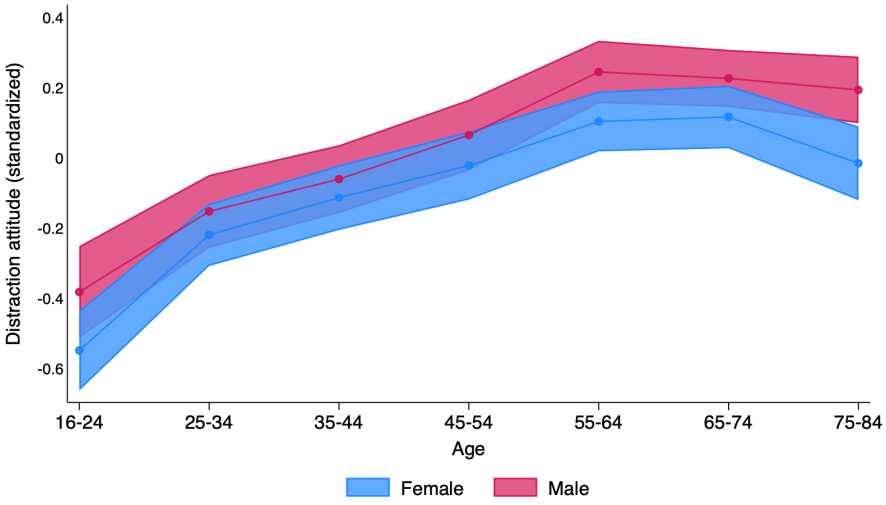
The figure shows the distributions of answers to the eight survey questions on distraction resilience in the laboratory experiment. Seven answer options are given: from 1 ("Strongly Disagree") to 7 ("Strongly Agree").

Figure 8: Distraction resilience across occupations (LISS panel)



The graph shows the average standardized distraction resilience across occupations while controlling for gender, age, age squared, and education level. The sample consists of all respondents who are between 25 and 65 years old and for whom all variables are available. Occupations are based as much as possible on the two-digit International Standard for Classification of Occupations (ISCO) level. The following changes were made to ensure a sufficient number of observations in each cell: all managerial occupations were combined into a single category; information technicians were grouped with science technicians; armed forces personnel were grouped with protective workers; people in agricultural occupations were dropped from the sample; all crafts and trades were combined into a single category; all operators and drivers were grouped into a single category; all cleaners and laborers were grouped into a single category. Error bars show 95-percent confidence intervals based on robust standard errors.

Figure 9: Distribution of distraction resilience by gender and age (LISS panel)



The figure shows the distribution of distraction resilience by gender and age. Distraction resilience is the standardized first component from a principal component analysis on all eight survey questions. The shaded areas represent 95% confidence intervals.

Table 6: Descriptive statistics for the laboratory experiment

	Mean	Std. dev.	Min	Max
No distraction				
Nonogram score	98.84	44.81	-19	253
Solved adding-numbers	8.86	1.45	3	10
Actual earnings	9.31	4.65	-2.80	25.30
Payable earnings	9.35	4.56	0	25.30
Task-switching				
Nonogram score	93.86	45.53	-27	214
Solved adding-numbers	7.42	3.113	0	10
Actual earnings	8.10	5.24	-7.20	21.40
Payable earnings	8.30	4.82	0	21.40
Auditory				
Nonogram score	99.50	47.59	-71	234
Solved adding-numbers	8.97	1.24	4	10
Actual earnings	9.44	4.94	-7.60	23.40
Payable earnings	9.55	4.66	0	23.40

The table reports descriptive statistics for the main performance outcomes by treatment in the first three rounds of the experiment. Please refer to the notes for Table 1 for detailed description of Nonogram score, solved adding-numbers, and payable earnings. Actual earnings are calculated from the points earned across both tasks at a conversion rate of 10 points to €1 and can therefore be negative.

Table 7: Effect of distractions on outcomes (using round 1 only)

	(1) Nonogram score	(2) Solved adding-numbers	(3) Earnings	(4) Well-being Nonogram	(5) Well-being adding-numbers
Task-switching	-2.370	-1.898***	-0.781	-0.208	-0.104
	(5.875)	(0.416)	(0.598)	(0.190)	(0.238)
Auditory	9.745*	0.443*	1.144*	0.045	0.543**
	(5.783)	(0.249)	(0.596)	(0.219)	(0.254)
Constant	71.493***	8.589***	6.504***	4.315***	3.224***
	(3.862)	(0.189)	(0.395)	(0.128)	(0.175)
N	217	217	217	217	217

The table shows coefficients from regressions of outcome measures on the two types of distractions using data from the first round only. Please refer to the notes for Tables 1 and 2 for detailed description of the outcome variables in each column. Robust standard errors are shown in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 8: Immediate effect of the first interruption on Nonogram performance

	Time to next move	Next move correct
Task-switching	2.560***	-0.053
	(0.885)	(0.032)
Auditory	-0.916	-0.043
	(0.737)	(0.028)
Constant	8.989***	0.862***
	(0.849)	(0.025)
N	651	651

The table reports coefficients from regressions of the time to the next Nonogram move and an indicator for whether that move is correct on treatment dummies, controlling for task and individual fixed effects. The reference point is the time at which the first interruption occurs in the task-switching treatment. Outcomes in the no-distraction and auditory-distraction treatments are measured at the corresponding point in the Nonogram. Only the first interruption is used because treatment histories are identical in the no-distraction and task-switching treatments up to that point. Robust standard errors are clustered at the individual level and are shown in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 9: Gender differences in outcomes

	(1) Nonogram score	(2) Solved adding-numbers	(3) Earnings	(4) Well-being Nonogram	(5) Well-being adding-numbers
Female	3.103	-0.308	0.157	-0.258	-0.605***
	(5.524)	(0.192)	(0.559)	(0.170)	(0.183)
TS	-2.671	-1.459***	-0.787**	-0.585***	-0.299*
	(3.352)	(0.304)	(0.334)	(0.128)	(0.152)
Aud	1.926	0.235*	0.402	-0.353**	0.289**
	(3.552)	(0.124)	(0.349)	(0.154)	(0.127)
Female×TS	-1.660	0.063	-0.226	-0.087	0.013
	(4.755)	(0.400)	(0.474)	(0.173)	(0.194)
Female×aud	-6.235	-0.217	-0.752	-0.040	-0.181
	(4.720)	(0.183)	(0.469)	(0.196)	(0.161)
Constant	73.503***	8.671***	6.799***	4.735***	3.721***
	(4.005)	(0.167)	(0.405)	(0.137)	(0.147)
N	651	651	651	651	651

The table shows coefficients from regressions of outcome measures on a gender dummy, treatment dummies, and the interactions among them. All regressions control for task and individual fixed effects. Please refer to the notes for Tables 1 and 2 for detailed description of the variables. "TS" refers to task-switching distraction and "aud" refers to auditory distraction. Robust standard errors are clustered at the individual level and are shown in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 10: Correlations among well-being items for each task

Panel A: No distraction

Nonogram:

	Stressed	Happy	Frustrated
Stressed	1.000		
Happy	0.434	1.000	
Frustrated	0.639	0.496	1.000
Alpha	0.768		

Adding numbers:

	Stressed	Happy	Frustrated
Stressed	1.000		
Happy	0.429	1.000	
Frustrated	0.581	0.587	1.000
Alpha	0.773		

Panel B: Task-switching distraction

Nonogram:

	Stressed	Happy	Frustrated
Stressed	1.000		
Happy	0.357	1.000	
Frustrated	0.549	0.427	1.000
Alpha	0.704		

Adding numbers:

	Stressed	Happy	Frustrated
Stressed	1.000		
Happy	0.507	1.000	
Frustrated	0.623	0.572	1.000
Alpha	0.797		

Panel C: Auditory distraction

Nonogram:

	Stressed	Happy	Frustrated
Stressed	1.000		
Happy	0.415	1.000	
Frustrated	0.664	0.592	1.000
Alpha	0.792		

Adding numbers:

	Stressed	Happy	Frustrated
Stressed	1.000		
Happy	0.521	1.000	
Frustrated	0.759	0.496	1.000
Alpha	0.816		

The table reports correlations among the three items used to construct the momentary well-being measure, separately by task and treatment. The stress and frustration items are reverse coded, so that higher values indicate better well-being. Alpha denotes Cronbach's alpha for the three-item measure.

Table 11: Gender differences in willingness to pay to avoid distractions

	(1) Task-switching	(2) Auditory
Female	-4.963***	-4.441**
	(1.889)	(1.733)
Constant	14.450***	11.150***
	(1.609)	(1.579)
N	217	217

The table shows coefficients from regressions of the willingness to pay to avoid each type of distraction in terms of experimental points on a gender dummy. Robust standard errors are shown in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 12: Dimensions of distraction resilience: PCA and EFA loadings

Survey items:
Item 1: I dislike working in distracting environments.
Item 2: I can focus well in noisy environments.
Item 3: I can easily concentrate after being interrupted.
Item 4: I am good at working on several projects at the same time.
Item 5: I enjoy working on several projects at the same time.
Item 6: I have trouble limiting my phone usage.
Item 7: I constantly check my phone while studying.
Item 8: I am easily distracted.

	(1)	(2)	(3)	(4)	(5)	(6)
	PCA: varimax rotation			*EFA: promax rotation*		
	Distraction management	Environmental tolerance	Multitasking orientation	Distraction management	Environmental tolerance	Multitasking orientation
Item 1		0.710			0.764	
Item 2		0.682			0.768	
Item 3	0.342			0.430		
Item 4			0.704			0.760
Item 5			0.700			0.755
Item 6	0.545			0.748		
Item 7	0.546			0.755		
Item 8	0.531			0.745		

Columns (1) to (3) report rotated component loadings from a three-component principal component analysis with varimax rotation. Columns (4) to (6) report pattern loadings from a three-factor exploratory factor analysis using principal-factor extraction and promax rotation. Items 1, 6, 7, and 8 are reverse-coded so that higher values on all items indicate greater distraction resilience. Loadings below 0.30 in absolute value are omitted.

Table 13: Components of distraction resilience and experimental outcomes

	(1)	(2)	(3)	(4)	(5)	(6)
	Task-switching			Auditory		
	Earnings	Well-being	WTP	Earnings	Well-being	WTP
Distraction management	0.089*	0.104*	0.052	0.035	0.093*	0.044
	(0.050)	(0.061)	(0.065)	(0.053)	(0.056)	(0.061)
Environmental tolerance	-0.013	0.102*	-0.088	-0.027	0.084	-0.159**
	(0.056)	(0.061)	(0.061)	(0.048)	(0.058)	(0.063)
Multitasking orientation	-0.045	-0.049	0.056	-0.012	0.064	-0.027
	(0.050)	(0.061)	(0.060)	(0.046)	(0.061)	(0.063)
Earnings no-dist.	√		√	√		√
Well-being no-dist.		√	√		√	√
N	217	217	217	217	217	217

The table reports OLS estimates from regressions of experimental outcomes under each distraction treatment on the three components from the principal component analysis reported in Table 12. Higher values indicate greater distraction management, environmental tolerance, and multitasking orientation, respectively. For definitions of all other variables, see the notes to Tables 1 and 3. Columns (1) and (4) control for earnings in the no-distraction treatment, columns (2) and (5) control for momentary well-being in the no-distraction treatment, and columns (3) and (6) control for both. All dependent and independent variables are standardized. Robust standard errors are shown in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 14: Correlations between distraction resilience and other preference measures and personality traits (LISS panel)

	Dist.	Risk	Comp.	Extr.	Agr.	Cons.	Neuro.	Open.
Distraction	1.000							
Risk tolerance	-0.102	1.000						
Competitiveness	-0.050	0.545	1.000					
Extraversion	0.241	-0.033	0.036	1.000				
Agreeableness	0.105	-0.187	-0.205	0.344	1.000			
Conscientiousness	0.261	-0.216	-0.128	0.155	0.311	1.000		
Neuroticism	-0.421	0.207	0.150	-0.281	-0.105	-0.290	1.000	
Openness	0.246	0.004	0.068	0.310	0.290	0.274	0.182	1.000

The table shows correlations between distraction resilience, risk preference, competitiveness, extraversion, agreeableness, conscientiousness, neuroticism, and openness.

Table 15: Relationship between distraction resilience and labor market outcomes (detailed)

	(1) Monthly income	(2) Supervisory position	(3) Job satisfaction
Distraction	0.089***	0.016**	0.111***
	(0.023)	(0.008)	(0.030)
Risk tolerance	-0.021	0.005	-0.010
	(0.024)	(0.009)	(0.030)
Competitiveness	0.115***	0.027***	0.010
	(0.026)	(0.009)	(0.027)
Extraversion	0.070***	0.025***	0.042
	(0.022)	(0.007)	(0.027)
Agreeableness	0.016	0.003	0.046
	(0.022)	(0.008)	(0.030)
Conscientiousness	0.030	0.001	0.037
	(0.021)	(0.008)	(0.028)
Neuroticism	-0.072***	-0.014*	-0.170***
	(0.021)	(0.007)	(0.030)
Openness	-0.004	0.002	0.009
	(0.023)	(0.008)	(0.030)
Gender, age	√	√	√
Education level	√	√	√
Work sector	√	√	√
Observations	1,843	1,970	1,732

The table reports OLS estimates from regressions of gross monthly income, whether holding a supervisory position, and job satisfaction on distraction resilience and personality traits and preferences, controlling for gender, age, education level, and work sector. Please refer to the notes for Table 5 for detailed description of the variables. The sample consists of all respondents who are between 25 and 65 years old and for whom all variables are available. Robust standard errors are shown in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Appendix B: Pre-Analysis Plan

In this section, I reproduce the pre-analysis plan (as registered on the AEA registry at https://www.socialscienceregistry.org/trials/12534). Note that the pre-analysis plan only applies to the analysis of the online laboratory experiment, and not the analysis of the nationally representative survey.

Main goal of the study

1. To study the effect of different types of distractions on performance in a cognitive task
2. To study individual heterogeneity in ability to handle distractions
3. To elicit willingness to pay to avoid being distracted

Sample restrictions

We will exclude participants based on the following criteria for our main analysis:

1. Dropping out of the experiment partway through.
2. Finishing all three games in the baseline round before time runs out (this is to remove those who are very good at this game).
3. Finishing at least one round with a very low negative final score (this is to remove those who randomly click through the experiment).
4. Questionnaire variables: participants who select the same option (e.g., "Strongly Agree") for all questions on a particular questionnaire page.

Analysis

a) Analysis of average effect

We will use data from the first three rounds to estimate the average impact of distractions on performance of the main cognitive task. We will regress the number of points participants receive in each round on distraction-type dummies controlling for subject dummies and game number dummies, with standard errors clustered at the participant level.

We will then check whether the effect is due to change in percentage of games attempted or change in number of mistakes made by looking at other outcome variables like total number of correct squares, wrong squares, and attempted squares.

We will also look at the impact of distractions on the speed of solving the games. To do so, we will make use of the time taken between the two moves before and after interruption and the time taken between the equivalent moves in the no distraction round and the auditory distraction round. (For example, if the interruption happens after the 10th move, we will use the time between the 9th and 10th moves and that between the 10th and 11th moves. Similarly, we will take the time between the 9th and 10th moves and that between the 10th and 11th moves in the no distraction and auditory distraction round.) We will regress the time taken between moves on distraction-type dummy, controlling for subject and game fixed effects with standard errors clustered at the participant level.

b) Individual heterogeneity in ability to handle distractions

Before playing the games, participants will fill out a questionnaire that measures their personality traits. We will add multiple items on their attitudes towards being interrupted while working and their attitudes towards multitasking. We will regress performance measures in the rounds with interruptions on the questionnaire measures at the subject level, controlling for personality traits and their performance without distractions.

We will also look at gender differences in the impact of the two types of distractions.

c) Individual preferences for working under distractions

We are interested in participants' average preferences for working under distractions, whether they are averse to or prefer distractions in their work. We are also interested in which types of participants are averse to and which types prefer distractions. We will construct a choice measure by taking the switching point in the price list for the two types of distractions (the number of points that a participant is willing to give up to switch from being distracted to not being distracted). The preference measure will be constructed from the choice measure by subtracting the switching point just mentioned from the switching point that would maximize expected payoff based on

performance in the first three rounds.

To study individual heterogeneity in preferences for working under different types of distractions, we will regress the choice measure and the preference measure on performance under the specific type of distraction, questionnaire measures (attitudes towards working under distractions), and personality traits at the subject level, controlling for performance under no distractions. We will also study gender differences in the willingness to pay to avoid distractions and preferences for working under distractions.

Power calculations

We can calculate the minimum sample size using the one-sample mean test. In a pilot experiment to test for level of difficulty of the games, to have a 5% change in points earned in part (a) where we are interested in the effect of distractions on performance, a sample size of 200 is required for a power level of 0.8.

Appendix C: Experimental Instructions

The experiment was programmed with oTree (Chen et al., 2016) and conducted in the communication lab of the CREED laboratory using the subject pool from the University of Amsterdam in November and December 2023. There were 29 sessions with a total of 217 participants, of whom 117 are female and 100 are male. Below are the instructions used for the experiment.

Introduction

Thank you for taking part in this study. It will take approximately an hour. You will receive a €7 participation fee with a chance to earn additional money during the study depending on your performance.

If you have any questions, please press the button on the wall on your left.

The study starts with a short questionnaire followed by a main part in which you will play a game for 4 rounds. One of the 4 rounds will be randomly selected for payment. The study ends with a survey in which you can earn additional money.

If you are unable to make it to the end of the study, you will only receive the €7 participation fee.

You will not be asked for any personal information. The data we collect is fully anonymous. In case you have any questions regarding the data we collect, please contact the university's Data Protection Officer at fg@uva.nl.

This study complies with the General Data Protection Regulation (GDPR).

Please click "Next" if you consent to proceed with the study.

Payment Registration

Before continuing with the study, we need to ask you to provide your IBAN, which we will use to send you your earnings for the study.

Please double-check to make sure that the IBAN you provide is the correct one. You will not be able to change this at a later point. If you fail to provide the correct IBAN, we will not be able to send you your payment. If you provide the correct IBAN, we will transfer your earnings to you within 5 business days. We will delete this number after making the payment.

Please enter your IBAN number here:



Questionnaire

Before we explain how you can earn money in the study, we ask you to fill out a short questionnaire. For each item, please select the option that fits you the best.

Questionnaire Page 1/4

How well do the following statements describe your personality?

Question 1

I see myself as someone who gets nervous easily.

Question 2

I dislike working in distracting environments.

Question 3

I see myself as someone who is sometimes rude to others.

Question 4

I am good at working on several projects at the same time.

Question 5

I see myself as someone who does a thorough job.

Question 6

I see myself as someone who enjoys working under time pressure.

Questionnaire Page 2/4

How well do the following statements describe your personality?

Question 7

I see myself as someone who remains calm in tense situations.

Question 8

I can focus well in noisy environments.

Question 9

I see myself as someone who is outgoing, sociable.

Question 10

I see myself as someone who has an active imagination.

Question 11

I enjoy working on several projects at the same time.

Question 12

I see myself as someone who is productive under time pressure.

Questionnaire Page 3/4

How well do the following statements describe your personality?

Question 13

I see myself as someone who worries a lot.

Question 14

I can easily concentrate after being interrupted.

Question 15

I see myself as someone who is reserved.

Question 16

I see myself as someone who is original, comes up with new ideas.

Question 17

I have trouble limiting my phone usage.

Question 18

I see myself as someone who is considerate and kind to almost anyone.

Question 19

I see myself as someone who is competitive.

Questionnaire Page 4/4

How well do the following statements describe your personality?

Question 20

I see myself as someone who is talkative.

Question 21

I see myself as someone who values artistic, aesthetic experiences.

Question 22

I see myself as someone who has a forgiving nature.

Question 23

I constantly check my phone while studying.

Question 24

I see myself as someone who tends to be lazy.

Question 25

I see myself as someone who does things efficiently.

Question 26

I see myself as someone who is willing to take risks.

Question 27

I am easily distracted.

[Seven options were given for each question: "Strongly Disagree", "Disagree", "Slightly Disagree", "Neutral", "Slightly Agree", "Agree", and "Strongly Agree".]

Instructions

Thank you for filling out the questionnaire. We will now explain the instructions of the games. You will be paid for your performance.

You will play two types of games. We will explain the instructions of the first game and give you a practice game followed by the second game.

The first type of game is called Nonogram. The game consists of a 10 by 10 grid and each square in the grid must be colored either green or gray.

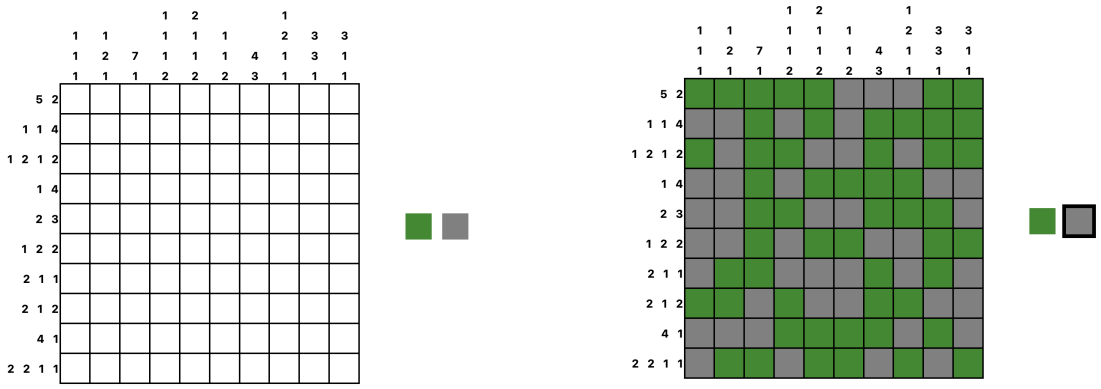
The number of consecutively colored green squares in any given row or column must be in the order of the numbers at the side and on the top.

There has to be at least one gray square in between two sets of green squares.

To color a square, you need to first click on your preferred color for this square on the right. If you color a square wrongly, the square will flash red and then change to the correct color.

Below is an example of a game. A clue of "5 2" means that there are sets of five and two green squares, in this order, with at least one gray square between the two sets. In total there should be three gray squares in this row or column. There is only one unique solution to each game.

You have 10 minutes for the practice game. You will proceed to the next page after you complete the game or the time runs out.



Before we explain how you can earn money in this study, we will give you a practice game for you to familiarize yourself with this game.

Please press the "Next" button to proceed to the practice game.

Instructions

The second type of game is called adding numbers game. Every game consists of a board with nine different numbers. Your task is to find the two numbers (out of the nine) that jointly add up to a "target number". You can select a number by clicking it. Once clicked, the number will turn green. To deselect a number, you can simply click it again.

You have 60 seconds for each game. You will move on after you have selected the correct two numbers or the time runs out.

Here is an example of a game. The two selected numbers (52 and 27) add up to the target number of 79. There is only one unique solution to each game.

44	12	34
21	52	13
27	57	68

Target Number:

79

0:51

We will give you three practice games for you to familiarize yourself with this game.

Please press the "Next" button to proceed to the practice games.

Instructions

You are now almost ready to start playing the games. You will play the games for 4 rounds.

As in the practice games, you will have 10 minutes in each round to play Nonogram and 60 seconds for each adding numbers game. We will now explain how you can earn money in the games.

For Nonogram, you will earn 1 point for each correctly colored square. If you color a square wrongly, 5 points will be deducted. As in the practice game, the square will flash red and then change to the correct color.

If you finish a Nonogram, a new one will appear, in which you can continue earning points. There is no additional bonus for finishing a game. Only the final points matter for your payment.

For the adding numbers games, you will not be rewarded with points for solving the game. However, if you cannot solve a game within 60 seconds, 5 points will be deducted. You will move on after solving the game or when the time runs out. You will solve 10 adding numbers games in each round.

At the end of each round, the final score will be converted to money at a rate of 10 points to €1. If the final score for a round is negative, your earnings will be 0 for that round.

At the end of the study, 1 of the 4 rounds will be randomly selected for payment. You will receive the earnings for that round.

Please press the "Next" button to continue.

Round 1-3

[The treatment in Rounds 1-3 are randomized. The following screenshots show the rounds with the treatment order: task-switching distraction, no distraction, and auditory distraction. The result and survey pages are shown after each round.]

Round 1

You are now in Round 1.

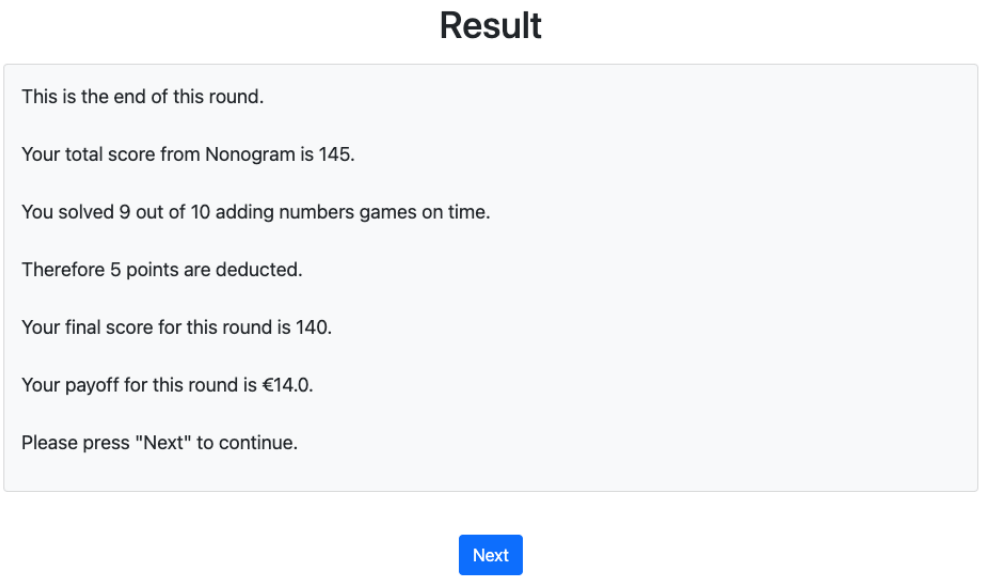
In this round, you will play Nonogram for 10 minutes and 10 adding numbers games for 60 seconds each.

The adding numbers games will interrupt Nonogram at random moments. The timer for Nonogram will pause while you solve the adding numbers games.

Nonogram will resume once you solve the adding numbers game within 60 seconds. If you cannot solve it within 60 seconds, Nonogram will still resume but 5 points will be deducted.

Please press "Next" to continue.

[The following result page is shown after each round.]



Survey

How well do the following statements describe you while playing the games?

Question 1

I felt stressed while playing Nonogram.

Question 2

I felt happy while playing Nonogram.

Question 3

I felt frustrated while playing Nonogram.

Question 4

I felt stressed while playing the adding numbers games.

Question 5

I felt happy while playing the adding numbers games.

Question 6

I felt frustrated while playing the adding numbers games.

[Seven options were given for each question: "Strongly Disagree", "Disagree", "Slightly Disagree", "Neutral", "Slightly Agree", "Agree", and "Strongly Agree".]

Round 2 of 4

You are now in Round 2.

In this round, you will first play Nonogram for 10 minutes. After that, you will play 10 adding numbers games for 60 seconds each. 5 points will be deducted if you cannot solve an adding numbers game within 60 seconds.

Please press "Next" to continue.

Round 3 of 4

You are now in Round 3.

In this round, you will play Nonogram for 10 minutes followed by 10 adding numbers games for 60 seconds each. 5 points will be deducted if you cannot solve an adding numbers game within 60 seconds.

A conversation will be played over the speakers while you play Nonogram. The volume is already set. Please do not press any buttons on the computer.

Please press "Next" to continue.

Round 4 of 4

You have now arrived at the final round (Round 4). In this round, you will still play Nonogram for 10 minutes and 10 adding numbers games for 60 seconds each. The difference compared to previous rounds is that this time you will be able to choose the format of the games.

In particular, you will be asked to make several decisions between two payment options. Depending on the decision, the first option in each decision is either to play Nonogram with adding numbers games interrupting at random moments (this option will be called "Interruptions" hereafter) or to play Nonogram with a conversation playing in the background (this option will be called "Conversation" hereafter).

The second option is to play Nonogram for 10 minutes followed by 10 adding numbers games for 60 seconds each (this option will be called "Sequential" hereafter).

If you choose the second option, you will have a certain number of points deducted from the final score. The number of points deducted varies across the decisions.

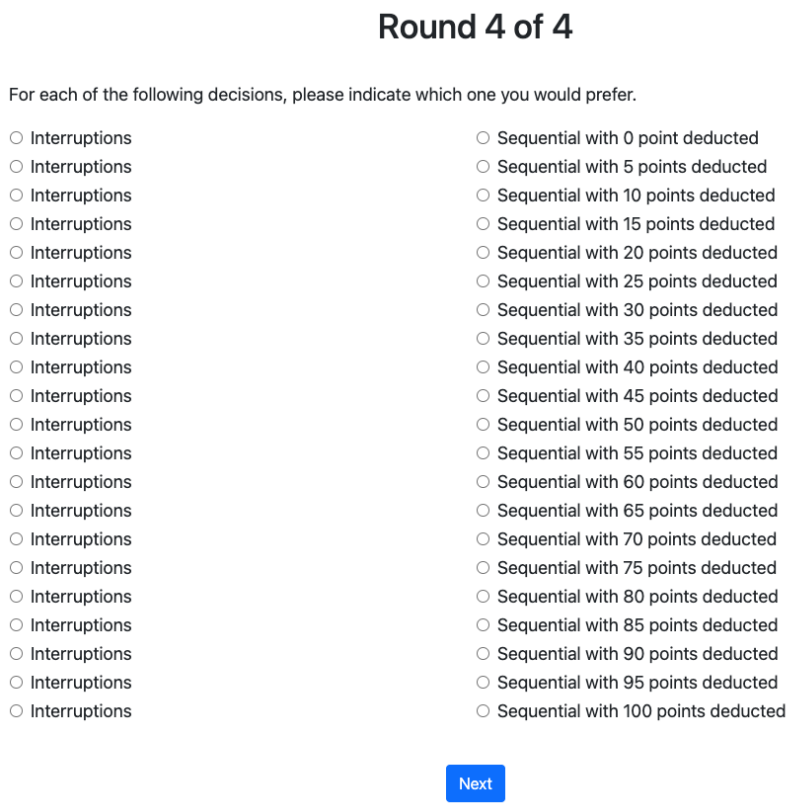
After you have made all decisions, one decision will be randomly selected. Your payment in Round 4 will then be determined according to the payment option you chose in this decision. As before, 5 points will be deducted for each wrongly labeled square in Nonogram and 5 points will be deducted for each adding numbers game that is not solved within 60 seconds.

Please press the "Next" button to proceed to making the decisions.

Round 4 of 4

On the following page, you will choose between playing Nonogram with adding numbers games interrupting at random moments ("**Interruptions**") and playing Nonogram followed by the adding numbers games ("**Sequential**") but with points deducted from the final score.

Please press the "Next" button to proceed to making the decisions.



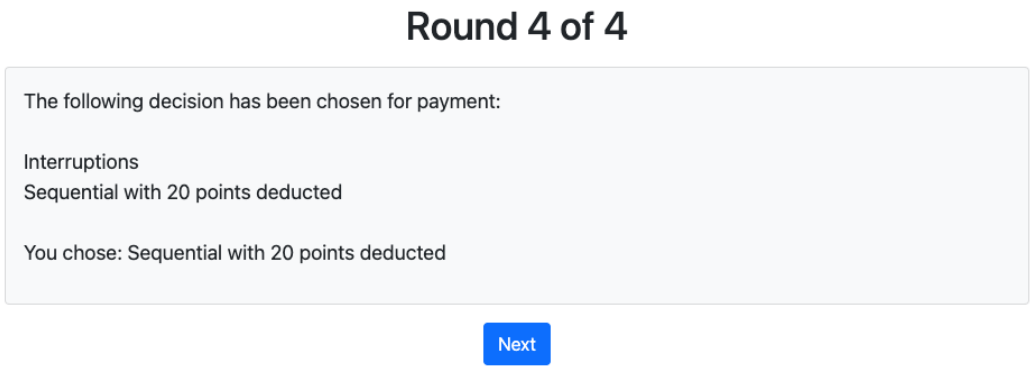
Round 4 of 4

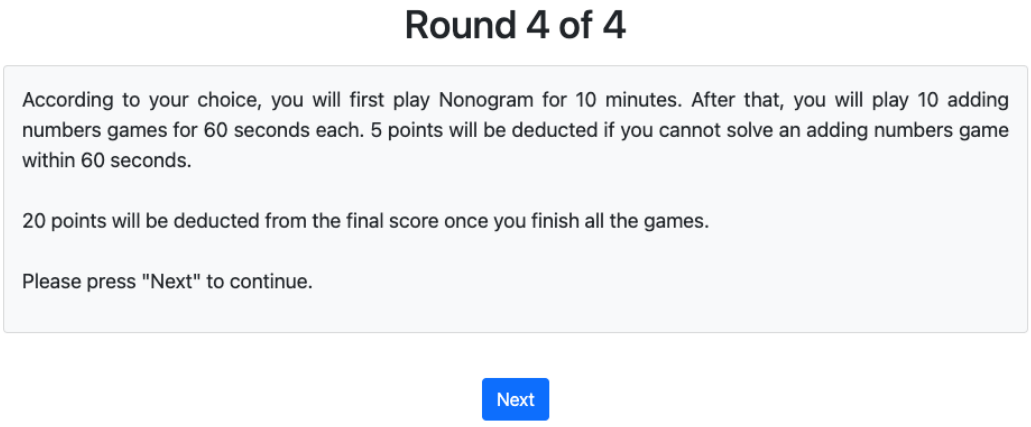
On the next page, you will choose between playing Nonogram with a conversation playing in the background followed by adding numbers games ("**Conversation**") and playing Nonogram without a conversation playing in the background followed by adding numbers games ("**Sequential**") but with points deducted from the final score.

The conversation that will be played is not related to the conversation in the past rounds.

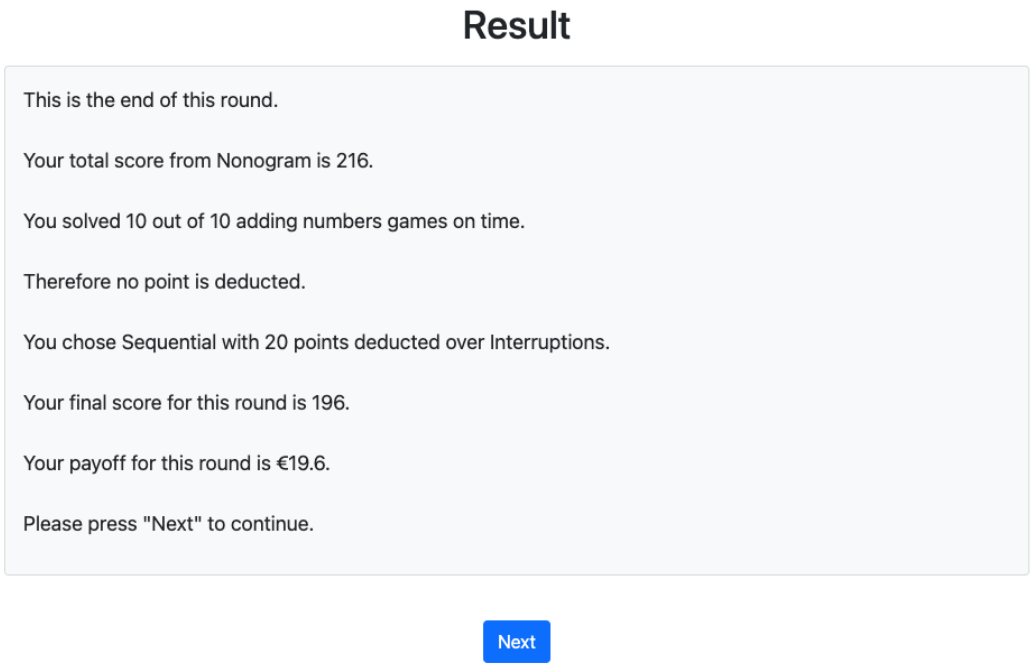
Please press the "Next" button to proceed to making the decisions.

[The experimental page looks similar to the previous screenshot with "Conversation" shown on the lefthand side. The following screenshots are shown after the participants have made their choices.]





[The following result page is shown after this round.]



Survey

This is almost the end of the study. We now ask you to fill out a short survey in which you have the chance to earn additional money.

Survey

On the next page, you will make 11 decisions between a sure amount of €4 and a random lottery between €2 and €6 with changing probabilities.

After you have made all decisions, one decision will be randomly selected. Your additional earnings will then be determined according to the option you chose in this decision.

Survey

For each of the following decisions, please indicate which one you would prefer.

○ Receiving €4 for sure	○ 0% probability of receiving €6 and 100% probability of receiving €2
○ Receiving €4 for sure	○ 10% probability of receiving €6 and 90% probability of receiving €2
○ Receiving €4 for sure	○ 20% probability of receiving €6 and 80% probability of receiving €2
○ Receiving €4 for sure	○ 30% probability of receiving €6 and 70% probability of receiving €2
○ Receiving €4 for sure	○ 40% probability of receiving €6 and 60% probability of receiving €2
○ Receiving €4 for sure	○ 50% probability of receiving €6 and 50% probability of receiving €2
○ Receiving €4 for sure	○ 60% probability of receiving €6 and 40% probability of receiving €2
○ Receiving €4 for sure	○ 70% probability of receiving €6 and 30% probability of receiving €2
○ Receiving €4 for sure	○ 80% probability of receiving €6 and 20% probability of receiving €2
○ Receiving €4 for sure	○ 90% probability of receiving €6 and 10% probability of receiving €2
○ Receiving €4 for sure	○ 100% probability of receiving €6 and 0% probability of receiving €2

Next

Survey

What is your age?

What is your gender?

What is your nationality?

What is your first language?

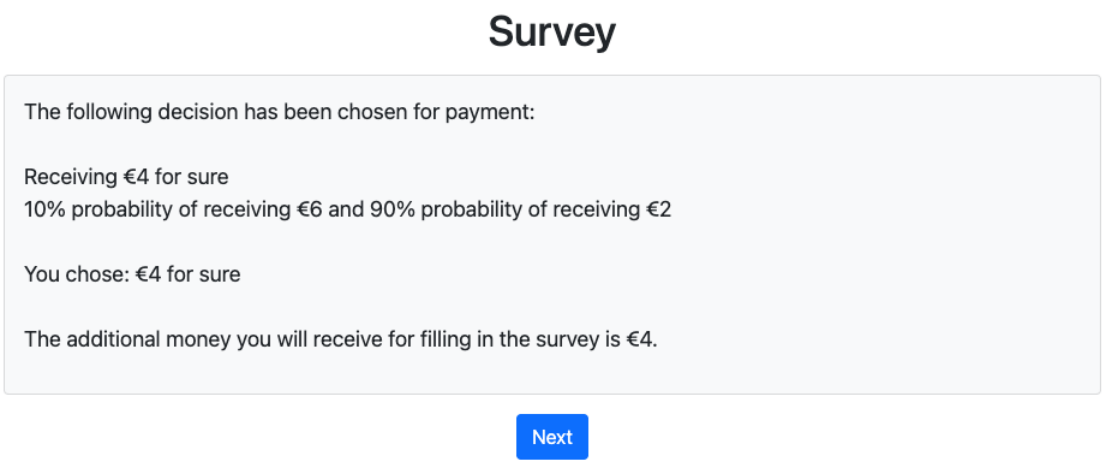
What is your current education level?

What is the language of your study program?

Have you played Nonogram before?

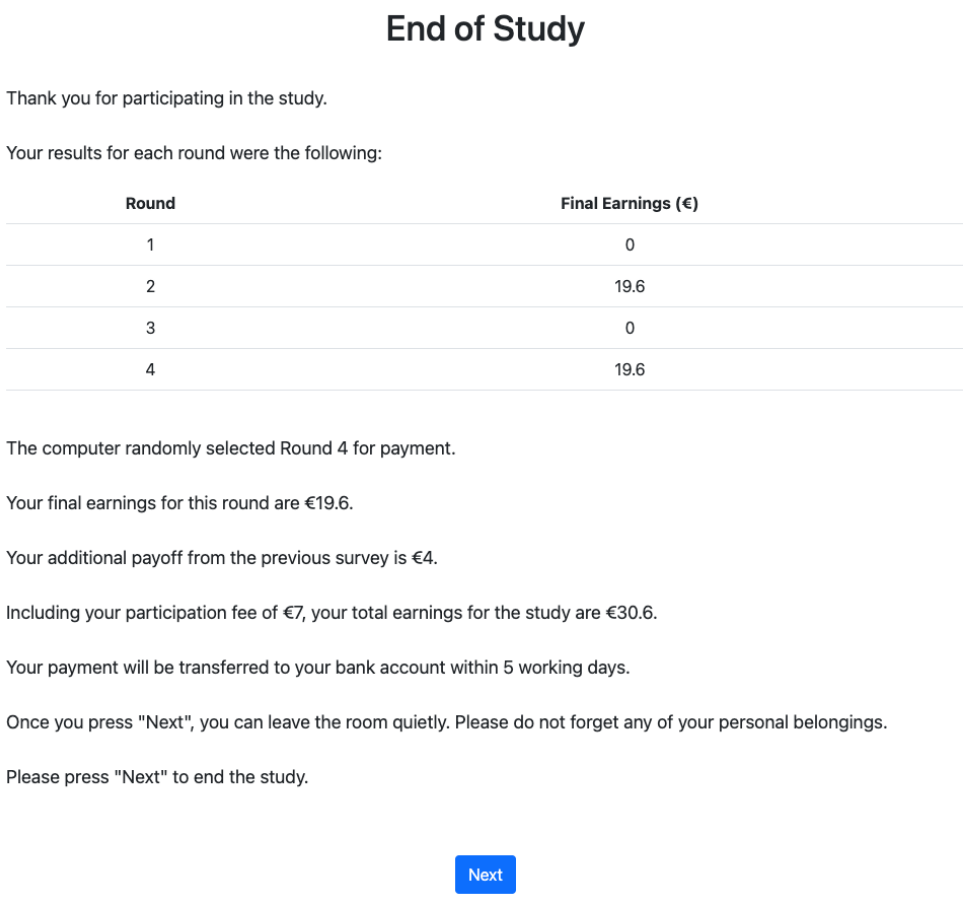
Have you played other similar puzzle games before, for example, Sudoku?

Next



End of Study

You have now finished the study. Please click "Next" to see your payment.





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Economics

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