ONLINE APPENDICES
DON'T FEAR THE METER: HOW LONGER TIME LIMITS BIAS MANAGERS TO
PREFER HIRING WITH FLAT FEE COMPENSATION

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Online Appendix A: Study Stimuli

Study 1, Phase 1 (15 minutes condition is shown)

We will ask you to solve a jigsaw puzzle. Clicking on the thumbnail icon below will take you to the puzzle, and will start the timer.

Before you begin please make note of the following instructions:

1. You will have to arrange the jigsaw pieces to get a complete picture which will be shown to you on the left.

2. If the pieces are adjacent and they fit together, you will hear a 'snap' sound.

3. Once you are ready just start **moving the jigsaw pieces** and the system will automatically record your time.

4. **You will have a total time of 15 minutes** from the moment you start working. This means 15 minutes from the time you move your first piece. You will be paid 25 cents per minute for the time you spend doing this task.

5. Once you are done the timer clock will automatically stop. PLEASE DO NOT CLOSE THE POP-UP. The experimenter will record your time at the end of the study.

6. If 15 minutes are over and if you are not done with solving the puzzle, the experimenter will ask you to stop and proceed to the followup questions. If you are done solving the puzzle before 15 minutes, you can immediately proceed to the followup questions.

7. As soon as you are done with this study (the puzzle task along with the followup questions), you can move on to participate in another study or go home, as you wish.

If you have read and understood the instructions, please click on the icon below to begin.

CLICK THE SUNGLASSES BELOW TO BEGIN:

Study 1, Phase 2 (15 minutes condition is shown)

In this survey, you will play a game, from which you can get REAL monetary rewards, based on your decisions. In the game, you are an employer making choices about how to compensate workers.

In the game, your "company" would be paid $4.00 for a completed jigsaw puzzle.

From that $4.00, however, you need to deduct the cost of having a worker complete the puzzle for you. **The remaining money, after paying for the worker, will be yours to keep, and you will receive that money for real via Mechanical Turk**, after the study is over.

The job your worker needs to do for you is to complete the 20 piece digital jigsaw puzzle shown below.

GETTING A WORKER TO SOLVE YOUR PUZZLE

Please read the following information carefully - this will be important to the choice you make, and we will check your recall at the end of the survey.

The workers are actual participants in a research lab in downtown Chicago, primarily students at local commuter colleges. Workers are given the puzzle, and are **randomly assigned** a maximum of **either 5 minutes or 15 minutes** to solve it.

You are only going to use workers who are given a **maximum of 15 minutes** to solve the puzzle. In the past, all the workers have been able to solve it in the time provided.

Workers are compensated for the time they spend on solving the puzzle. As an employer you will choose the contract which determines how the worker is paid.

The workers are told before they begin exactly how they will be paid (either per minute or a fixed fee).

Workers work on their own pace and solve the puzzle. As soon as a worker finishes the puzzle, that worker is paid the amount due based on the time it took, and then could either leave or participate in other unrelated paid studies in that lab.

Each worker does only one puzzle, and the workers have not done any jigsaw puzzle studies in this lab before.

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HOW WORKERS SOLVE THE PUZZLE

The interface the workers used looked similar to the picture below. (The initial layout of the puzzle pieces was random and differed for each person).

When matching pieces are moved next to each other, they join together with a 'snap' sound. As a result it was clear to the workers when a puzzle piece had been put in the right location.

The time taken to solve the puzzle was automatically measured by the timer on the left hand panel. As soon as the last piece was put into place, the timer stopped, and it could not be reset or changed by the worker.
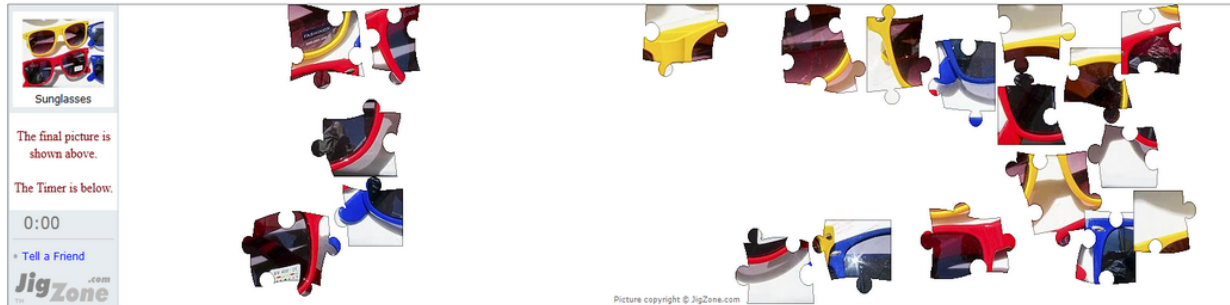
CHOOSING YOUR WORKER'S PAYMENT

IMPORTANT: THE FOLLOWING CHOICE IS YOUR DECISION IN THE GAME AND WILL DETERMINE YOUR **REAL** PAYMENT.

Remember, your "company" will be paid $4.00 for the completed puzzle, but from that the cost of having the worker complete the puzzle for you will be deducted. The remaining profit will be yours, and you will receive that amount via Mechanical Turk, after the survey (within three days).

Also remember that the worker has a maximum of 15 minutes to solve the puzzle.

Now, you need to choose the kind of contract you want to have with the worker.

AVAILABLE CONTRACTS:

OPTION A: FLAT FEE
You would **pay the worker a $1.50 flat fee**. If you choose this, your cost will be $1.50.
So, you will make $4.00 minus $1.50, which comes to $2.50.

OPTION B: PER-MINUTE FEE
You would **pay 25 cents for each minute** the worker takes to solve the puzzle. If you choose this, your cost will be 25 cents for each minute the worker spends, **rounded UP to the nearest minute**.
So, you will make $4.00 minus the cost of the person's time (25 cents per minute times the number of minutes, between $0.25 and $3.75). So, you can make anywhere between $4.00 minus $0.25 to $4.00 minus $3.75 i.e. between $3.75 to $0.25.

Remember that the workers know exactly how they will be paid (either per minute or a fixed fee) before they start working.

One of the actual workers who was randomly assigned to do the job based on the contract option you chose will be picked for you **completely at random**. Your cost of hiring the worker will be calculated based on that specific worker's time and the terms of the contract you chose.

Study 2, Phase 1 (A sample of the easy proofreading task on the left and the difficult proofreading task on the right are shown. The list of words were displayed as images to prevent workers from simply copying and pasting them into the textboxes)

Please type in the correct spelling of each of the words. If you think the word is spelled correctly, just retype it. If you think it is spelled incorrectly, please type in the correct spelling.

1) didn't
2) arround
3) allways
4) tride
5) finaly
6) meny
7) people
8) children

Correct spelling:

1
2
3
4
5
6
7
8

Please type in the correct spelling of each of the words. If you think the word is spelled correctly, just retype it. If you think it is spelled incorrectly, please type in the correct spelling.

1) embarrass
2) bellweather
3) discipline
4) twelfth
5) miniture
6) memento
7) medeval
8) firey

Correct spelling:

1
2
3
4
5
6
7
8

Study 2, Phase 2 (15 minutes and Easy proofreading task condition is shown)

1) didn't (87%)	9) somtimes (92%)	17) asked (91%)
2) arround (92%)	10) prety (94%)	18) because (91%)
3) allways (91%)	11) animals (93%)	19) wile (92%)
4) tride (71%)	12) recieved (74%)	20) intresting (91%)
5) finaly (92%)	13) boght (92%)	21) again (94%)
6) meny (95%)	14) mony (91%)	22) once (92%)
7) people (92%)	15) when (89%)	23) untill (93%)
8) children (93%)	16) said (94%)	24) thought (92%)

YOUR REVENUE AND PROFITS

Please read the following information carefully - this will be important to the choice you make, and we will check your recall at the end of the survey.

In the game, your "company" starts out with a budget of $3.70 for completing an entire proofreading task. You will hire a worker who will do the proofreading for you.

Your company will earn 10 cents for each of the 24 tasks the worker does correctly (i.e., for every word for which the correct spelling is identified by the worker). Therefore the maximum revenue your company can potentially earn is $3.70 + $2.40, or $6.10. Of course, the revenue would depend on the number of spelling tasks that your worker gets correct.

From that revenue, however, you need to deduct the cost of having the worker do the proofreading task for you, as discussed next. The remaining money, after paying for the worker, will be yours to keep (as net profit), and you will receive this net profit for real via Mechanical Turk, after the study is over.

Please read the following information carefully - this will be important to the choice you make, and we will check your recall at the end of the survey.

The workers are actual Amazon MTurk participants. Workers are given the task, and have a **maximum of 15 minutes** to finish it. In the past, most workers have been able to finish the task in the time provided.

Workers are compensated for the task. As an employer you will choose the contract which determines how the worker is paid (either paid per minute based on the total time spent or paid a fixed fee). All workers are told before they begin exactly how they will be paid.

Workers work at their own pace to finish the task. As soon as a worker finishes the task and answers a few questions, the worker is done.

The actual time taken to finish the task is accurately recorded by the computer.

CHOOSING YOUR WORKER'S PAYMENT

IMPORTANT: THE FOLLOWING CHOICE IS YOUR DECISION IN THE GAME AND WILL DETERMINE YOUR **BONUS payment**.

Now, you need to choose the kind of contract you want to have with the worker.   This will determine your cost and profits.

AVAILABLE CONTRACTS:

OPTION A: FLAT FEE
You **pay the worker a $1.50 flat fee,** plus an **additional 50 cents fee** (by the "employment agency"). If you choose this, your cost will be $1.50 +0.50 = $2.00.

OPTION B: PER-MINUTE FEE
You **pay 25 cents for each minute** the worker takes to finish the task. If you choose this, your cost will be variable -- 25 cents for each minute the worker spends to complete the task, **rounded up to the nearest minute**. If you choose this, your cost will be between $0.25 to $3.75.

Remember that the workers know exactly how they will be paid (either per minute or a fixed fee) before they start working, and has a maximum of 15 minutes to complete the task. Also, your "company" can earn a maximum revenue of $3.70 + $2.40, or $6.10 from a completed proofreading task, from which you have to pay the cost.

A group of MTurk workers were already given this task to complete and were randomly assigned to one of the contracts. One of the actual workers who was randomly assigned to do the job based on the contract option you chose will be picked for you **completely at random**. Your cost of hiring the worker will be calculated based on that specific worker's time and the terms of the contract you chose.

Study 3

Basic instructions (5 minutes condition for a task shown).

In this survey, you will play a hiring game. In the game, you will be a manager deciding on how to hire workers to get a task done.

Below, we will describe a few scenarios that requires hiring a worker. Please read carefully and answer the questions that follow.

In all scenarios, assume the job is temporary, and you will not need to build a long-term relationship with the hired worker.

The kind of task for which you will need to hire a worker is shown below.
(NOTE: this is an example and is not the actual task for which you will be hiring).

Here are the rules for finishing the task:

1. Every box in the grid is identified using a box# shown on the top left-hand corner. The content of each box is a decimal number shown in a bold-faced blue-colored letter.

2. In the numbers grid, there are EIGHT unique pairs of boxes that contain numbers that add up to 10.

3. An example of a valid pair in the grid is (box# 6, box# 21) that contains 8.25 and 1.75 which add up to 10 (the two boxes are shown below using red markers).

4. The workers' task is to search for FIVE such unique valid pairs (out of the EIGHT), from a similar numbers grid, and note the box numbers. That's all.

1 6.89	2 7.69	3 6.50	4 4.29	5 7.00
6 8.25	7 2.70	8 3.30	9 5.30	10 8.87
11 3.31	12 5.35	13 1.13	14 3.00	15 8.51
16 3.22	17 9.71	18 7.45	19 2.34	20 4.65
21 1.75	22 1.49	23 9.66	24 8.30	25 4.00

Below is another task for which you will need to hire a worker. This is a different numbers grid from what you saw earlier.

1	2	3	4	5
6.78	3.69	5.50	1.29	7.31
6	7	8	9	10
2.89	8.70	2.30	1.30	8.87
11	12	13	14	15
6.31	3.35	7.11	3.50	7.50
16	17	18	19	20
3.22	9.71	5.45	7.34	4.55
21	22	23	24	25
1.13	1.50	2.66	5.55	4.45

Following are additional details about the hiring situation. PLEASE READ VERY CAREFULLY.

1. You will need to hire just one worker for getting the task done.

2. The worker will get a maximum of 5 minutes to finish the task. This time limit was randomly selected between two options (5 minutes and 15 minutes), based on a coin toss.

3. In the past, most workers could complete the task in the assigned time limit.

4. The completed task sells for $4.00. So, this is your revenue. From this, you will need to subtract the cost of hiring a worker to compute your profit. As a manager, your objective is to maximize profit.

5. For hiring a worker, you have two options: (a) pay the worker a flat fee of $1.00. (b) pay the worker @ 25 cents per minute worked (rounded to the nearest integer) up to a maximum of the time limit.

6. Therefore, if you choose option (a) your profit is fixed at $3.00 ($4.00 - $1.00). If you choose option (b) your profit can vary between $2.75 ($4.00 - $1.25) and $3.75 ($4.00 - $0.25) depending on the time taken by the worker.

7. Workers know only about their assigned time limit, and the terms of hiring (flat fee or per-minute fee) before starting their work.

Which option would you choose to hire a worker for this task?

○ Option A - I will pay a flat rate of $1.00

○ Option B - I will pay the rate of 25 cents per minute for a maximum of 5 (five) minutes

Follow-up questions used in the Study 3 (a particular order of Task 1 and Task 2, along with a few illustrative examples provided)

Recall that you made hiring decisions about these two tasks.

Task 1					Task 2				
1 7.23	2 8.22	3 5.51	4 7.55	5 1.78	1 6.78	2 3.69	3 5.50	4 1.29	5 7.31
6 4.77	7 8.30	8 5.23	9 4.87	10 9.50	6 2.89	7 8.70	8 2.30	9 1.30	10 8.87
11 3.72	12 3.62	13 6.23	14 1.70	15 5.57	11 6.31	12 3.35	13 7.11	14 3.50	15 7.50
16 6.38	17 5.25	18 5.77	19 6.11	20 4.75	16 3.22	17 9.71	18 5.45	19 7.34	20 4.55
21 5.13	22 5.47	23 4.43	24 8.99	25 2.45	21 1.13	22 1.50	23 2.66	24 5.55	25 4.45

Task 1
Maximum Random Time Limit = 15 mins
Revenue = $4
Flat Fee = $1.50
Per Minute Fee = $0.25 per min.

Task 2
Maximum Random Time Limit = 5 mins
Revenue = $4
Flat Fee = $1
Per Minute Fee = $0.25 per min.

For which task, did you feel, workers would take more time to complete?

1. Task 1 would take more time	2	3	4. Task 1 and Task 2 would take similar time	5	6	7. Task 2 would take more time
●	○	○	○	○	○	○

For which task, did you feel, workers would be more likely to intentionally take more time than necessary to complete it?

1. For Task 1	2	3	4. Neither for Task 1 nor for Task 2	5	6	7. For Task 2
○	○	○	○	○	○	○

Which task, did you feel, workers would find more interesting and enjoyable?

1. Task 1 was more interesting and enjoyable	2	3	4. Task 1 and Task 2 were equally interesting and enjoyable	5	6	7. Task 2 was more interesting and enjoyable
○	○	○	○	○	○	○

Recall that you made hiring decisions about these two tasks.

7.23	8.22	5.51	7.55	1.78	6.78	3.69	5.50	1.29	7.31
4.77	8.30	5.23	4.87	9.50	2.89	8.70	2.30	1.30	8.87
3.72	3.62	6.23	1.70	5.57	6.31	3.35	7.11	3.50	7.50
6.38	5.25	5.77	6.11	4.75	3.22	9.71	5.45	7.34	4.55
5.13	5.47	4.43	8.99	2.45	1.13	1.50	2.66	5.55	4.45

Task 1
Maximum Random Time Limit = 15 mins
Revenue = $4
Flat Fee = $1.50
Per Minute Fee = $0.25 per min.

Task 2
Maximum Random Time Limit = 5 mins
Revenue = $4
Flat Fee = $1
Per Minute Fee = $0.25 per min.

According to you, "how much work" is there in Task 1? Please drag the bar below to indicate your answer (1=A Little Work; 100= A Lot of Work).

	1	11	21	31	41	51	60	70	80	90	100

Task 1

Recall that you made hiring decisions about these two tasks.

7.23	8.22	5.51	7.55	1.78	6.78	3.69	5.50	1.29	7.31
4.77	8.30	5.23	4.87	9.50	2.89	8.70	2.30	1.30	8.87
3.72	3.62	6.23	1.70	5.57	6.31	3.35	7.11	3.50	7.50
6.38	5.25	5.77	6.11	4.75	3.22	9.71	5.45	7.34	4.55
5.13	5.47	4.43	8.99	2.45	1.13	1.50	2.66	5.55	4.45

Task 1
Maximum Random Time Limit = 15 mins
Revenue = $4
Flat Fee = $1.50
Per Minute Fee = $0.25 per min.

Task 2
Maximum Random Time Limit = 5 mins
Revenue = $4
Flat Fee = $1
Per Minute Fee = $0.25 per min.

When you made your contract choice for Task 1, were you worried that workers would take longer than necessary to complete the task to make more money at your expense?

○ Yes

○ No

○ Don't know/Did not think about it

Study 4, Phase 1

In this survey, you will be asked to complete a simple math task. The math task does not require any advanced skills beyond simple addition and counting.

After you're done with the task you will be finished with this survey and you can submit the HIT and move on to your other work.

- Page Break -

On the next screen, you will see the instructions for the task along with an example.

PLEASE READ THE INSTRUCTIONS SLOWLY AND CAREFULLY!

In the actual task, you will see a number grid like this.

1 6.89	2 7.69	3 6.50	4 4.29	5 7.00
6 8.25	7 2.70	8 3.30	9 5.30	10 8.87
11 3.31	12 5.35	13 1.13	14 3.00	15 8.51
16 3.22	17 9.71	18 7.45	19 2.34	20 4.65
21 1.75	22 1.49	23 9.66	24 8.30	25 4.00

HERE ARE THE INSTRUCTIONS. PLEASE READ CAREFULLY.

1. Every box in the grid is identified using a box# shown on the top left-hand corner.
2. The content of each box is a decimal number shown in a bold-faced blue-colored letter.
3. In the grid, **there are several pairs of boxes that contain numbers that add up to 10.**
4. Each such pair is unique; the same box# is NOT part of any two valid pairs.
5. Your task is to **find a certain number of such pairs in a similar number grid.**

For example, a pair containing two numbers that add up to 10 is shown below.

1 6.89	2 7.69	3 6.50	4 4.29	5 7.00
6 8.25	7 2.70	8 3.30	9 5.30	10 8.87
11 3.31	12 5.35	13 1.13	14 3.00	15 8.51
16 3.22	17 9.71	18 7.45	19 2.34	20 4.65
21 1.75	22 1.49	23 9.66	24 8.30	25 4.00

NOTE: THIS IS AN EXAMPLE AND NOT THE REAL TASK.

Once you identify such a pair, you indicate your answer by entering the box numbers, as shown below. Here box numbers 6 and 21 comprise a valid pair.

	box# 1	box# 2
Pair 1	6	21
Pair 2		
...		
...		
Pair N		

NOTE THE FOLLOWING:

1. The order of the box numbers in a pair is not important.
2. The same box# is NOT part of any two valid pairs, so every valid pair is unique.
3. In the actual task, you will have to find several such valid pairs in a number grid.

On the next page, your actual task will be presented.

Please work at your own pace to complete the task as soon as you can and finish working on this HIT.

In the number grid shown below, **there are eight pairs of boxes** that contain numbers that add up to 10.

Your task is to find <u>SIX out these EIGHT pairs of boxes</u> from this grid.

1 6.78	2 3.69	3 5.50	4 1.29	5 7.31
6 2.89	7 8.70	8 2.30	9 1.30	10 8.87
11 6.31	12 3.35	13 7.11	14 3.50	15 7.50
16 3.22	17 9.71	18 5.45	19 7.34	20 4.55
21 1.13	22 1.50	23 2.66	24 5.55	25 4.45

Please indicate the box number pairs (box# 1 and box# 2) below. The box numbers could be in any order.

Remember: <u>Every box number pair is unique. In other words, the same box# is NOT part of any two valid pairs</u>.

|	box# 1	box# 2
Pair 1	☐	☐
Pair 2	☐	☐
Pair 3	☐	☐
Pair 4	☐	☐
Pair 5	☐	☐
Pair 6	☐	☐

After you have entered all the answers, please click on the button below to check if they are correct. You will be taken to the next page if everything is okay.

CHECK ANSWERS

Study 4, Phase 2 (15 minutes time-limit condition is shown)

In this survey, you will play a hiring game, in which you can get REAL monetary rewards, based on your decisions. **These rewards will be paid as bonuses via the Amazon Mechanical Turk platform within a week.**

In the game, **you are a manager** deciding on how to hire a **worker** from an **agency** to get a task done.

Manager   Agency   Workers
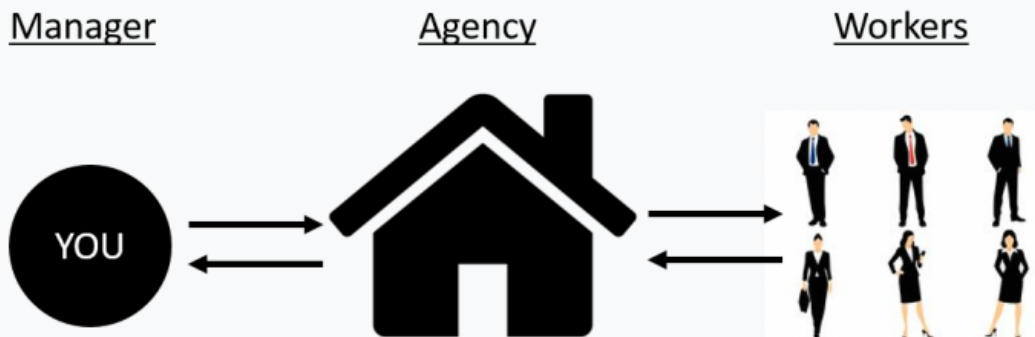
On the next screen you will learn more about the agency and the workers.

PLEASE READ CAREFULLY TO FIND OUT HOW YOU CAN MAKE MONEY IN THIS GAME.

THE HIRING GAME

As a Manager, you know the following about the Agency and the Workers.

1. The agency employs multiple workers and pays all of them the same fixed amount (i.e., a fixed salary).

2. The workers are recruits from Amazon Mechanical Turk, just like you.

3. At the agency, the workers work on a task at their own pace and complete it. There are no time limits imposed on the workers when they are working on a task.

4. However, for its own records, the agency measures the time workers take to complete a task. Workers are not informed about the time they have taken and simply work at their own pace.

5. You will need to hire only one worker from the agency to get a task done.

On the next screen, you will learn more about the task.

PLEASE CONTINUE TO READ CAREFULLY.

| Manager | Agency | Workers |

As a Manager, you know the following about the Task.

1. The task your worker needs to do for you is a math problem and the **exact task is shown below**. The task for the worker is to search six unique pairs of boxes that contain numbers that add up to 10.

2. Every box in the grid is identified using a box# shown on the top left-hand corner. The content of each box is a decimal number shown in a bold-faced blue-colored letter.

3. An example of a valid pair in the grid is (box# 24, box# 25) that contains 5.55 and 4.45 which add up to 10. The grid contains eight such valid pairs, of which the workers only need to search six.

4. Assume that this is a one-time transaction, and as a manager, you will not be hiring workers from this agency for any other tasks.

1	2	3	4	5
6.78	3.69	5.50	1.29	7.31
6	7	8	9	10
2.89	8.70	2.30	1.30	8.87
11	12	13	14	15
6.31	3.35	7.11	3.50	7.50
16	17	18	19	20
3.22	9.71	5.45	7.34	4.55
21	22	23	24	25
1.13	1.50	2.66	5.55	4.45

On the next screen, you will learn more about how you can hire a worker to get the task done and how you can earn bonuses based on the decisions you make as a Manager.

PLEASE CONTINUE TO READ CAREFULLY.

THE HIRING GAME: YOUR BONUS

In the game, your "company" would be paid $6.50 for a completed task (i.e., 6 valid pairs that contains numbers that add up to 10 in the grid below).

From that $6.50, however, you need to deduct the cost of hiring. **The remaining money, after paying for the worker, will be yours to keep,** and you will receive that money for real (as a bonus) via Mechanical Turk after the study is over (within a week).

1	2	3	4	5
6.78	3.69	5.50	1.29	7.31
6	7	8	9	10
2.89	8.70	2.30	1.30	8.87
11	12	13	14	15
6.31	3.35	7.11	3.50	7.50
16	17	18	19	20
3.22	9.71	5.45	7.34	4.55
21	22	23	24	25
1.13	1.50	2.66	5.55	4.45

On the next screen, you will learn about your hiring options.

THE HIRING GAME: YOUR OPTIONS

PLEASE READ CAREFULLY.

The agency gives you two options (or offers) to hire a worker.

Option 1) You could pay a flat fee of $2.25 to hire the worker.

Option 2) You could pay 40 cents per minute up to a maximum of 15 (fifteen) minutes. This means, if the worker takes longer than 15 minutes, the cost is capped at the 15-minutes cost.

Note: The 15-minutes time cap in Option 2 was chosen at random from one of two potential time caps: 5 minutes and 15 minutes.

Implementation details:

The workers work at the agency at their own pace. The agency randomly selects a worker and assigns him/her to work on your task and uses the actual time he/she takes to calculate your cost (it affects your cost only if you choose Option 2).

Here is a recap of the hiring options you have.

PLEASE MAKE SURE YOU READ THIS CAREFULLY AND UNDERSTAND THIS BEFORE PROCEEDING. THIS WILL AFFECT YOUR BONUS PAYMENT IN THIS STUDY.

1. You will earn $6.50 for the completed task, but the cost of having the worker complete the task for you will be deducted from that amount. The remaining profit will be yours, and **you will actually be paid that amount** as a bonus via Mechanical Turk, within one week of completing the survey.

2. If you choose the flat rate (hiring Option 1), your hiring cost will be $2.25. So, you will earn $6.50 minus $2.25 (i.e., $4.25), and you will be paid this $4.25 as a bonus.

3. If you choose the per-minute rate (hiring Option 2), your hiring cost will be 40 cents for each minute the worker spends, rounded up to the nearest minute, **up to a maximum of 15 minutes**. So, your cost can vary between 40 cents and $6.00. In effect, the bonus you earn will also vary. You will make between ($6.50 minus $0.40) and ($6.50 minus $6.00), i.e., between $0.50 and $6.10.

4. You will be randomly paired with an actual Mturk worker who will do the task. If you choose the per-minute rate, your cost of hiring the worker will be calculated based on the real time that specific worker took to actually complete the task, up to a maximum of 15 minutes.

NOW, YOU ARE ALL SET.

The condition when time estimates were asked before choice of compensation schemes is shown:

Before you choose your preferred hiring option, we would like to know how much time you think a specific worker, randomly picked for you, took to finish the task.

As mentioned above, workers worked at their own pace and finished the task when they could.

Please enter your best guess of the time in minutes in the box below. Enter a NUMBER only.

Now, it is time to indicate your preferred option to hire the worker.

Which option do you prefer?

○ (Option 1) I will pay the flat rate of $2.25

○ (Option 2) I will pay the rate of 40 cents per minute for a maximum of 15 (fifteen) minutes

Study 5, Phase 1

In this survey, you will be asked to complete a simple math task. The math task does not require any advanced skills beyond simple addition and counting. After you're done with the task (and a few follow-up questions) you will be finished with this survey and you can submit the HIT and move on to your other work.

Apart from the base payment, you can earn additional money for doing the task. Details about this will be provided in a short while.

In the actual task, you will see a number grid like this.

1	2	3	4	5
6.89	7.69	6.50	4.29	7.00
6	**7**	**8**	**9**	**10**
8.25	2.70	3.30	5.30	8.87
11	**12**	**13**	**14**	**15**
3.31	5.35	1.13	3.00	8.51
16	**17**	**18**	**19**	**20**
3.22	9.71	7.45	2.34	4.65
21	**22**	**23**	**24**	**25**
1.75	1.49	9.66	8.30	4.00

HERE ARE THE INSTRUCTIONS. PLEASE READ CAREFULLY.

1. Every box in the grid is identified using a box# shown on the top left-hand corner.
2. The content of each box is a decimal number shown in a bold-faced blue-colored letter.
3. In the grid, **there are several pairs of boxes that contain numbers that add up to 10**.
4. Each such pair is unique; the same box# is NOT part of any two valid pairs.
5. Your task is to **find a certain number of such pairs in a similar number grid**.

For example, a pair containing two numbers that add up to 10 is shown below.

1	2	3	4	5
6.89	7.69	6.50	4.29	7.00
6	7	8	9	10
8.25	2.70	3.30	5.30	8.87
11	12	13	14	15
3.31	5.35	1.13	3.00	8.51
16	17	18	19	20
3.22	9.71	7.45	2.34	4.65
21	22	23	24	25
1.75	1.49	9.66	8.30	4.00

NOTE: THIS IS AN EXAMPLE AND NOT THE REAL TASK.

Once you identify such a pair, you indicate your answer by entering the box numbers, as shown below. Here box numbers 6 and 21 comprise a valid pair.

	box# 1	box# 2
Pair 1	6	21
Pair 2		
...		
...		
Pair N		

NOTE THE FOLLOWING:

1. The order of the box numbers in a pair is not important.
2. The same box# is NOT part of any two valid pairs, so every valid pair is unique.
3. In the actual task, you will have to find several such valid pairs in a number grid.

You will be paid at a rate of **25 cents per minute** for completing this task.

We will multiply the total time in minutes it takes you to complete the task by 25 cents to compute your additional payment (over your base payment) for the task.

Your additional payment will be made via Amazon Mechanical Turk within 7 days after the completion of this survey.

Please confirm the additional compensation you will receive by retyping it below. Please enter ONLY a number in the box below.

When you do the task, your work will be timed by the computer. **You will not be able to work on the task after the assigned time limit expires.**

-- Page Break --

Display This Question:
If pay Is Equal to 1

You will have a time limit of 5 minutes to complete the task.

Display This Question:
If pay Is Equal to 2

You will have a time limit of 15 minutes to complete the task.

Please confirm your time limit by retyping it below. Please enter ONLY a number in the box below.

Below the 15-minute condition is shown:

This question lets you record and manage how long a participant spends on this page. This question will not be displayed to the participant.

1500

In the number grid shown below, **there are eight pairs of boxes** that contain numbers that add up to 10.

Your task is to find **SIX out these EIGHT pairs of boxes** from this grid.

1	2	3	4	5
6.78	3.69	5.50	1.29	7.31
6	**7**	**8**	**9**	**10**
2.89	8.70	2.30	1.30	8.87
11	**12**	**13**	**14**	**15**
6.31	3.35	7.11	3.50	7.50
16	**17**	**18**	**19**	**20**
3.22	9.71	5.45	7.34	4.55
21	**22**	**23**	**24**	**25**
1.13	1.50	2.66	5.55	4.45

Study 5, Phase 2

In this survey, you will play a hiring game. In the game, you will be a manager deciding on how to hire a worker to get a task done.

FIVE participants will be randomly selected and **THEY WILL WIN REAL BONUSES** in addition to their base payments. The amount of these bonuses will depend on the decisions made in this survey. You could be one of those 5 participants, and therefore, please make your choices as if the consequences are real.

Below, we will describe a job situation that requires hiring a worker. Please read carefully. There will be recall questions to check your comprehension.

Please assume the job is temporary, and you will not need to build a long-term relationship with the hired worker.

TASK INFORMATION

The kind of task for which you will need to hire a worker is shown below.
(NOTE: this is an example and is not the actual task for which you will be hiring).

Here are the rules for finishing the task:

1. Every box in the grid is identified using a box# shown on the top left-hand corner. The content of each box is a decimal number shown in a bold-faced blue-colored letter.

2. In the numbers grid, there are EIGHT unique pairs of boxes that contain numbers that add up to 10.

3. **An example of a valid pair in the grid is (box# 6, box# 21) that contains 8.25 and 1.75 which add up to 10** (the two boxes are shown below using red markers).

4. The workers' task is to search for SIX such unique valid pairs (out of the EIGHT), from a similar numbers grid, and note the box numbers. That's all.

1 6.89	2 7.69	3 6.50	4 4.29	5 7.00
6 8.25	7 2.70	8 3.30	9 5.30	10 8.87
11 3.31	12 5.35	13 1.13	14 3.00	15 8.51
16 3.22	17 9.71	18 7.45	19 2.34	20 4.65
21 1.75	22 1.49	23 9.66	24 8.30	25 4.00

NOTE: THIS IS AN EXAMPLE AND IS NOT THE ACTUAL TASK.

WORKERS' INTERFACE & INSTRUCTIONS

Workers enter their answers (i.e., 6-pairs of box-numbers) in the following interface:

	box# 1	box# 2
Pair 1	6	21
Pair 2		
Pair 3		
Pair 4		
Pair 5		
Pair 6		

Workers read the following instructions:

1. Please indicate the box number pairs (box# 1 and box# 2) below.
2. The box numbers could be in any order.
3. Every box number pair is unique. In other words, the same box# is NOT part of any two valid pairs.

GETTING A WORKER TO WORK ON THE TASK

We got actual workers to work on the task. Here are the details.

Recruited workers were **randomly divided** into three groups:

1) The first group was given a **maximum time limit of 5 minutes** to complete the task
2) The second group was given a **maximum time limit of 15 minutes** to complete the task
3) The third group had **no maximum time limit** to complete the task

Workers in all the groups were told to work at their own place to complete the task. As soon as a worker finished the task and answered a few follow-up questions, the worker was done.

However, workers in the timed conditions were stopped if the assigned time limit was over.

The actual time taken to finish the task was accurately recorded by the computer in all the conditions.

Additional details for the TIMED conditions:

As a worker started to work, a prominent countdown timer showed the time left to complete the task. The computer interface advanced to the next screen once the worker completed the task (and checked his/her answers by clicking a "CHECK ANSWERS" button), or if the assigned time limit expired.

Additional details for the UNTIMED conditions:

No countdown timer was shown and the computer interface advanced to the next screen once the worker completed the task (and checked his/her answers by clicking a "CHECK ANSWERS" button).

TWO IMPORTANT POINTS TO NOTE:

POINT 1: IN THE GAME YOU WILL PLAY, YOU ARE GOING TO HIRE A WORKER ONLY AMONG THOSE WHO WERE TIMED AND GIVEN **A MAXIMUM OF 5 MINUTES** TO COMPLETE THE TASK.

TWO IMPORTANT POINTS TO NOTE:

POINT 1: IN THE GAME YOU WILL PLAY, YOU ARE GOING TO HIRE A WORKER ONLY AMONG THOSE WHO WERE TIMED AND GIVEN **A MAXIMUM OF 15 MINUTES** TO COMPLETE THE TASK.

TWO IMPORTANT POINTS TO NOTE:

POINT 2: ONLY WORKERS WHO HAVE COMPLETED THE TASK SUCCESSFULLY IN THE ASSIGNED TIME LIMIT ARE AVAILABLE FOR YOUR HIRING.

This will make sure that you will be able to get the task done in the assigned time limit.

Below is the actual task for which you would need to hire a worker.

1	2	3	4	5
6.78	3.69	5.50	1.29	7.31
6	**7**	**8**	**9**	**10**
2.89	8.70	2.30	1.30	8.87
11	**12**	**13**	**14**	**15**
6.31	3.35	7.11	3.50	7.50
16	**17**	**18**	**19**	**20**
3.22	9.71	5.45	7.34	4.55
21	**22**	**23**	**24**	**25**
1.13	1.50	2.66	5.55	4.45

Following are details about the hiring situation AND YOUR HIRING OPTIONS. **This information will be important for your actual bonus in this survey.** SO, PLEASE READ VERY CAREFULLY.

1. You will need to hire just one worker for getting the task done.

2. As mentioned earlier, the worker will get a maximum of 5 minutes to finish the task. This time limit was randomly selected for the worker.

3. Only workers who could complete the task in the assigned time limit are available for hiring.

4. The completed task sells for $4.00. So, this is your revenue. From this, you will need to subtract the cost of hiring a worker to compute your profit. As a manager, your objective is to maximize profit.

5. For hiring a worker, you have two options: (a) pay the worker a flat fee of $1.00. (b) pay the worker @ 25 cents per minute worked (rounded to the nearest integer) up to a maximum of the time limit.

6. Therefore, if you choose option (a) your profit is fixed at $3.00 ($4.00 - $1.00). If you choose option (b) your profit can vary between $2.75 ($4.00 - $1.25) and $3.75 ($4.00 - $0.25) depending on the time taken by the worker.

7. **If you are one among the five randomly selected participants, you will be paid the earned profit for real as a bonus payment.**

8. Workers know only about their assigned time limit, and the terms of hiring (flat fee or per-minute fee) before starting their work.

Which option would you choose to hire a worker for this task?

○ Option A - I will pay a flat rate of $1.00

○ Option B - I will pay the rate of 25 cents per minute for a maximum of 5 (five) minutes

Follow-up questions asked to capture beliefs about task completion times (the questions asked if Managers chose the Flat Fee are shown for illustration):

You just decided to pay the worker a flat fee of $1.00 for the work. The worker has 5 minutes to complete the work.

As you chose a flat-fee, you will get a fixed bonus amount of $3.00 ($4.00 minus $1.00) irrespective of how much time your hired worker took to complete the task.

But, **we would still like to know how much time (in minutes) do you think your hired worker would take to complete the task.**

Please enter a NUMBER in the box below. (your answer can be a decimal number, but do not use any text such as units, etc.)

-- Page Break --------------

If, **instead**, you had decided to pay the worker 25 cents per minute taken to complete the task (i.e. IF YOU HAD CHOSEN THE OTHER HIRING OPTION), we would have picked for you at random a worker assigned to do the job in 5 minutes and paid a rate of 25 cents per minute worked, and use the actual time taken by this worker to calculate your bonus.

How much time do you think this worker, paid at a rate of 25 cents per minute worked, would have ended up taking to complete the task?

Please enter a NUMBER in the box below. (your answer can be a decimal number, but do not use any text such as units, etc.)

Completion-time Information Intervention along with the comprehension questions (asked on the same page as the information):

To help you make your hiring decision we want to give you the **actual time taken by workers who were randomly selected to do the task** <u>without any time limit</u>.

So, <u>this group had unlimited time</u>, and they were told to work at their own pace to complete the work as soon as they could.

<u>**In this scenario, each worker was paid a flat fee (i.e., a fixed lump sum amount) for this work.**</u>

There were 102 such workers and the chart below shows the count of the various time taken by each of these workers.
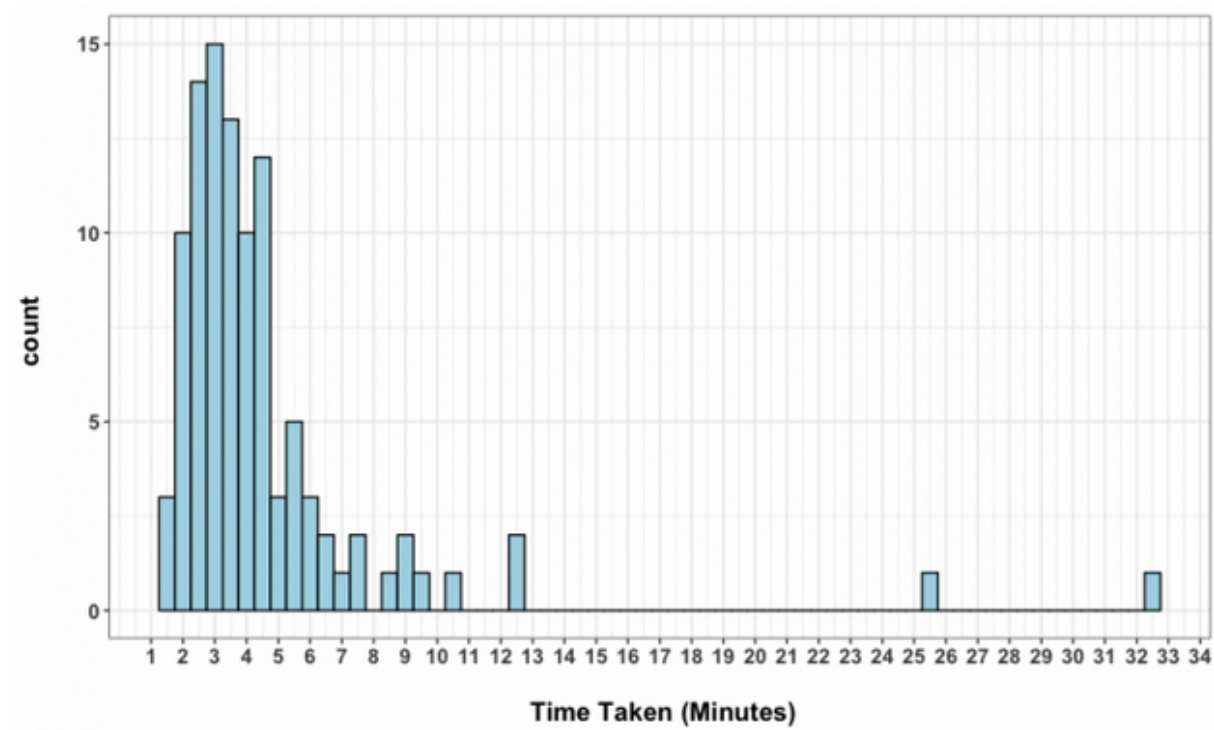
Each bar on the graph above tells you how many workers completed the task in each amount of time. A taller bar indicates that more workers completed the task in that amount of time.

Please spend a little time to browse this chart carefully and answer a few questions to indicate your comprehension.

Look at the chart. How many workers (in %) completed the task in **3 minutes or less?**

○ 85%

○ 35%

○ 5%

Look at the chart. How many workers (in %) completed the task in **5 minutes or less?**

○ 95%

○ 75%

○ 25%

Look at the chart. How many workers (in %) completed the task in **15 minutes or less?**

○ 98%

○ 88%

○ 78%

How much time limit did this group of workers have?

○ 5 Minutes

○ 15 Minutes

○ No Time Limits

How were these workers, working on the task without any time limits, paid?

○ They were paid a flat lump sum amount

○ They were paid at a certain rate per minute worked

○ Don't know/Can't Say

End of Survey Recall Questions (all participants):

Please answer a few recall questions. All the questions pertain to the **specific hiring decision you made in this survey.**

Please recall the maximum time limit a worker had to complete the task?

○ 5 Minutes

○ 15 Minutes

○ No Time Limits

Please recall how the maximum time limit was selected for a worker?

○ The time limit was selected randomly

○ The time limit was selected such that lesser skilled workers had more time

Please recall which of the following was true for the workers who were available for hire?

○ Only workers who completed the task in the assigned time limit were available for hire.

○ All workers (even those who failed to complete the task in the assigned time limit) were available for hire.

Study 6 (15 minutes time-limit condition is shown)

Imagine that as a **Manager** you are deciding on how to **hire a Worker** from an **Agency** to get a task done.
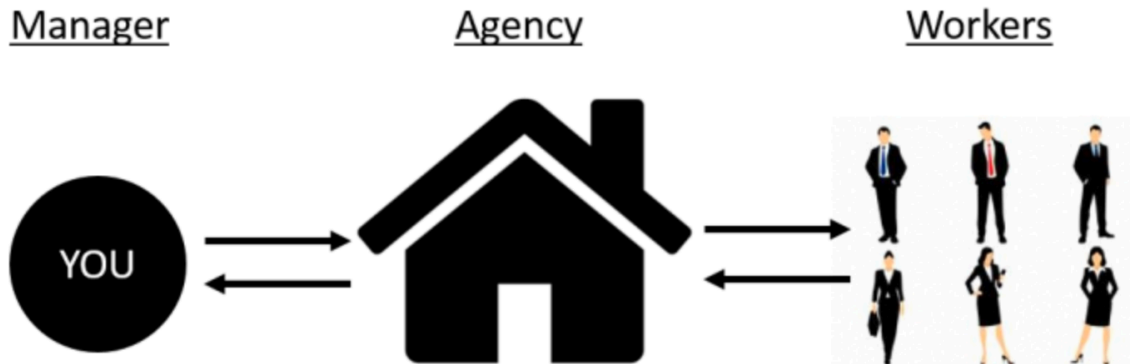
On the next screen you will learn more about the agency and the workers.

THE HIRING GAME

As a Manager, you know the following about the Agency and the Workers.

1. The agency **employs multiple workers and pays all of them the same fixed amount (i.e., a fixed salary).**

2. At the agency, **workers work on a task at their own pace and complete it.   There are no time limits imposed on the workers when they are working on a task.**

3. However, for its own records, the agency measures the time workers take to complete a task. Workers are not informed about the time they have taken and simply work at their own pace.

On the next screen, you will learn more about the task.

PLEASE READ CAREFULLY BEFORE PROCEEDING.

The kind of task for which you will need to hire a worker is shown below.
(NOTE: this is an example and is not the actual task for which you will be hiring).

Here are the rules for finishing the task:

1. Every box in the grid is identified using a box-number shown on the top left-hand corner. The content of each box is a decimal number shown in a bold-faced blue-colored font.

2. In the grid, there are **EIGHT unique pairs of boxes that contain numbers that add up to 10**.

3. An example of a valid pair in the grid is (box# 6, box# 21) that contains 8.25 and 1.75 which add up to 10 (the two boxes are shown below using red markers).

4. A worker's task is to search for **SIX such unique valid pairs (out of the EIGHT)**, from a similar grid, and note the box-numbers. That's all.

1	2	3	4	5
6.89	**7.69**	**6.50**	**4.29**	**7.00**
6	7	8	9	10
8.25	**2.70**	**3.30**	**5.30**	**8.87**
11	12	13	14	15
3.31	**5.35**	**1.13**	**3.00**	**8.51**
16	17	18	19	20
3.22	**9.71**	**7.45**	**2.34**	**4.65**
21	22	23	24	25
1.75	**1.49**	**9.66**	**8.30**	**4.00**

Following are the details of the revenue, hiring cost, and profit:

1. **A completed task sells for $6.50. So, this is your revenue per completed task**. From this, you will need to subtract the cost of hiring a worker to compute your profit. **As a manager, your objective is to maximize profit**.

2. You will need to hire only one worker from the agency. The agency gives you two options (or offers) to hire a worker.

Option 1) You could pay a **flat fee of $2.25** to hire the worker.

Option 2) You could pay **40 cents per minute up to a maximum of 15 (fifteen) minutes**. This means, if the worker takes longer than 15 minutes, the cost is capped at the 15-minutes cost.

Additional note for Option 2: The 15-minutes time cap was **chosen at random** from one of two time-caps: 5 minutes and 15 minutes. Workers, who are salaried employees at the agency, **work at their own pace and have no time limits** when they do a task. The agency randomly selects a worker and assigns him/her to work on your task, and measures the actual time he/she takes for its records. Only if the actual time taken exceeds the time cap of 15-minutes, the time cap is used to calculate the cost.

3a. If you choose Option 1) ... **your profit is fixed at $4.25** ($6.50 - $2.25).

3b. If you choose Option 2) ... **your profit can vary between $0.50** ($6.50 - $6.00) **and $6.10** ($6.50 - $0.40) depending on the time taken by the worker.

Comprehension check questions before indicating contract choices (all participants)

Please answer a few questions to indicate your comprehension. All the information required for answering these questions is there in the above instructions, so please read carefully and answer.

How much revenue does a completed task generate in USD?

Please enter ONLY A NUMBER in the box below (i.e., omit texts like $, Dollar etc.)

Consider the option of hiring a worker by paying a flat fee to the agency. **How much would this option cost you** in USD?

Please enter ONLY A NUMBER in the box below (i.e., omit texts like $, Dollar, etc.)

Consider the option of hiring a worker by using the per-minute fee option of 40 cents per minute. This option is capped at a certain time limit which determines the maximum this option would cost you.

How much is the time cap for this option?

Please enter ONLY A NUMBER in the box below (i.e., omit texts like mins, minutes, etc.)

What has been said about the **profit** that can be **earned from a completed task**?

○ The profit earned from a completed task is fixed, irrespective of the hiring option chosen by you

○ The profit earned from a completed task is fixed or variable depending on the hiring option chosen by you

How did the **actual workers get paid**?

○ The workers earned a fixed amount as salary from the agency

○ The workers earned a fixed amount or a variable amount depending on the hiring option chosen by you

What does a worker know before starting to work on your task?

○ NO time limit has been assigned to finish the task

○ A MAXIMUM time limit has been assigned to finish the task

First Choice (in the actual survey Task1 and Task 2 were counterbalanced)

Below is an actual task for which you would need to hire a worker.

1	2	3	4	5
7.23	8.22	5.51	7.55	1.78
6	**7**	**8**	**9**	**10**
4.77	8.30	5.23	4.87	9.50
11	**12**	**13**	**14**	**15**
3.72	3.62	6.23	1.70	5.57
16	**17**	**18**	**19**	**20**
6.38	5.25	5.77	6.11	4.75
21	**22**	**23**	**24**	**25**
5.13	5.47	4.43	8.99	2.45

A gist of the hiring options you have (provided as a refresher).

1. A completed task earns $6.50. From this, the cost of having a worker complete the task for you is deducted to calculate the profit per task.

2. If you choose the flat rate (hiring Option 1), your hiring cost will be $2.25. So, the profit is $6.50 minus $2.25, i.e., $4.25.

3. If you choose the per-minute rate (hiring Option 2), your hiring cost will be 40 cents for each minute the worker spends, rounded up to the nearest minute, up to a maximum of 15 minutes. So, your cost can vary between 40 cents and $6.00. In effect, the profit will also vary between ($6.50 minus $0.40) and ($6.50 minus $5.00), i.e., between $0.50 and $6.10.

Now, please indicate your hiring decision. Which option would you choose to hire a worker for the task?

○ (Option 1) I will pay the flat rate of $2.25

○ (Option 2) I will pay the rate of 40 cents per minute for a maximum of 15 (fifteen) minutes

Second Choice:

Below is another task for which you will need to hire a worker. **This is a different numbers-grid** from what you saw earlier.

1	2	3	4	5
6.78	3.69	5.50	1.29	7.31
6	**7**	**8**	**9**	**10**
2.89	8.70	2.30	1.30	8.87
11	**12**	**13**	**14**	**15**
6.31	3.35	7.11	3.50	7.50
16	**17**	**18**	**19**	**20**
3.22	9.71	5.45	7.34	4.55
21	**22**	**23**	**24**	**25**
1.13	1.50	2.66	5.55	4.45

A gist of the hiring options you have (provided as a refresher).

1. A completed task earns $6.50. From this, the cost of having a worker complete the task for you is deducted to calculate the profit per task.

2. If you choose the flat rate (hiring Option 1), your hiring cost will be $2.25. So, the profit is $6.50 minus $2.25, i.e., $4.25.

3. If you choose the per-minute rate (hiring Option 2), your hiring cost will be 40 cents for each minute the worker spends, rounded up to the nearest minute, up to a maximum of 15 minutes. So, your cost can vary between 40 cents and $6.00. In effect, the profit will also vary between ($6.50 minus $0.40) and ($6.50 minus $5.00), i.e., between $0.50 and $6.10.

Now, please indicate your hiring decision. Which option would you choose to hire a worker for the task?

○ (Option 1) I will pay the flat rate of $2.25

○ (Option 2) I will pay the rate of 40 cents per minute for a maximum of 15 (fifteen) minutes

Additional Instructions in Scope Information Condition (before Ps indicate their second choice)

Before you indicate your hiring decision for this task, we would like to give you some additional information that will help you make your hiring decision.

In particular, on the next page we will show you the completion time recorded for 102 actual workers who worked on this task without any time limits.

Below you are given the **actual time taken (in minutes) by each of 102 workers.**

These workers were employed at the agency and were paid a fixed salary. **They worked on the task without being assigned any time limit, but nevertheless, their completion times were accurately recorded.**
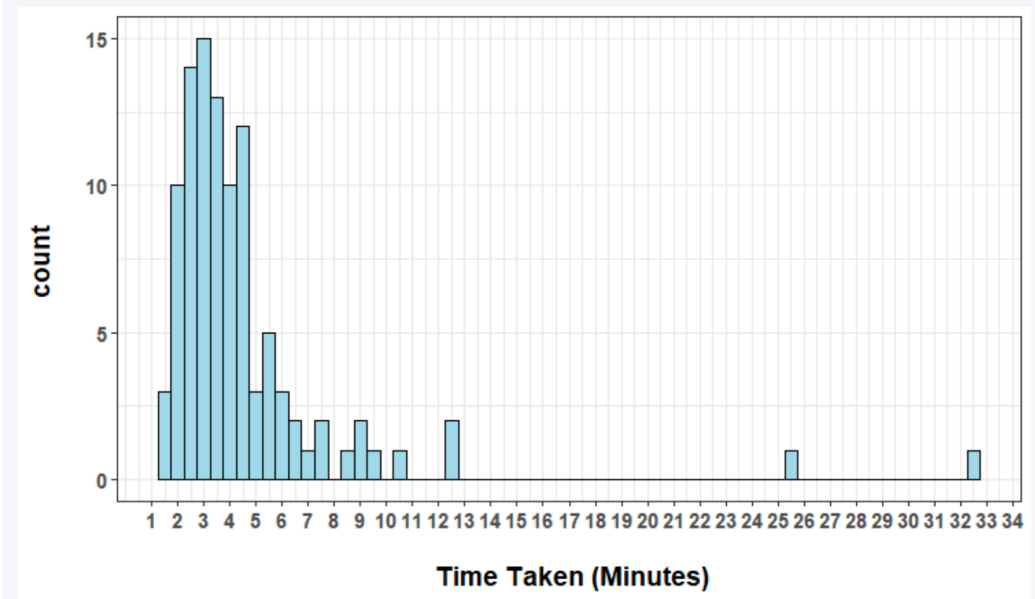
How to read this graph:

Each bar on the graph above tells you how many workers completed the task in a certain amount of time. A taller bar indicates that more workers completed the task in that amount of time.

The following information can be read from the graph. Please look at the graph and make sure you can read these yourself from the graph:

Around 35% of the 102 workers completed the task in **3 minutes or less** (sum of the heights of the bars until 3 minutes gives you the number of workers who completed the task in 3 minutes or less. This sum divided by 102 gives you the percentage)
Around 75% of the 102 workers completed the task in **5 minutes or less** (same logic as above)
Around 98% of the 102 workers completed the task in **15 minutes or less** (same logic as above)

Also, an additional information (that is not conveyed in the graph): **the average completion time** of these 102 workers **was 4.59 mins**.

PLEASE DO NOT RUSH. MAKE SURE YOU UNDERSTAND THE INFORMATION HERE.

Comprehension check questions in the scope condition before indicating second choice:

Now, please answer a few questions to indicate your comprehension.

How many workers (in %) completed the task in **3 minutes or less**?

○ 85%

○ 35%

○ 5%

How many workers (in %) completed the task in **5 minutes or less**?

○ 95%

○ 75%

○ 25%

How many workers (in %) completed the task in **15 minutes or less**?

○ 98%

○ 88%

○ 78%

How much time limit did these workers have?

○ 5 Minutes

○ 15 Minutes

○ No Time Limits

How were these workers, working on the task without any time limits, paid?

○ They were paid a fixed compensation

○ They were paid at a certain rate per minute worked

What was the average time taken (in MINUTES) by these 102 workers to complete the task?

Please enter a NUMBER in the box below. (your answer can be a decimal number, but do not use any text such as units, etc.)

Online Appendix B: Gambles to Examine Risk Aversion

Equivalent gambles from constructed from actual workers' completion time to examine the potential of risk aversion on choice of compensation contracts. Study 4 framed the gamble as an employment specific choice. Details of the gambles used are given below.

Study 1 (and Studies A1 and A2 in Online Appendix D): Examining general risk aversion

Condition	Option A	Option B
Time Limit = 15 minutes (Longer)	A fixed amount of $2.50 for sure	Exactly one of the following amounts: 33% chance of winning $3.50, or 26% chance of winning $3.25, or 15% chance of winning $3.00, or 7% chance of winning $2.50, or 11% chance of winning $2.25, or 4% chance of winning $2.00, or 4% chance of winning 25 cents
Time Limit = 5 minutes (Shorter)	A fixed amount of $1 for sure	Exactly one of the following amounts: 29% chance of winning $1.50, or 32% chance of winning $1.25, or 14% chance of winning $1.00, or 25% chance of winning 75 cents

Study 2: Examining general risk aversion

Time Limit = 5 minutes (Shorter), Type = Easy		Time Limit = 5 minutes (Shorter), Type = Difficult	
Option A	**Option B**	**Option A**	**Option B**
56% chance of winning $2.30, or 22% chance of winning $2.20, or 14% chance of winning $2.10, or 2% chance of winning $2.00, or 2% chance of winning $1.80, or 3% chance of winning $1.20, or 2% chance of winning 10c	10% chance of winning $3.40, or 18% chance of winning $3.30, or 16% chance of winning $3.20, or 8% chance of winning $3.10, or 18% chance of winning $3.00, or 6% chance of winning $2.60, or 14% chance of winning $2.40, or 8% chance of winning $2.30, or 2% chance of winning $1.60	9% chance of winning $2.50, or 2% chance of winning $2.40, or 7% chance of winning $2.30, or 9% chance of winning $2.20, or 4% chance of winning $2.10, or 11% chance of winning $2.00, or 16% chance of winning $1.90, or 2% chance of winning $1.80, or 2% chance of winning $1.70, or 5% chance of winning $1.60, or 9% chance of winning $1.50, or 9% chance of winning $1.40, or 2% chance of winning $1.30, or 2% chance of winning $1.20, or 5% chance of winning $1.10, or 2% chance of winning 80c, or 2% chance of winning 70c, or 2% chance of winning 30c	2% chance of winning $3.20, or 4% chance of winning $2.90, or 4% chance of winning $2.80, or 2% chance of winning $2.70, or 5% chance of winning $2.60, or 5% chance of winning $2.50, or 16% chance of winning $2.40, or 9% chance of winning $2.30, or 7% chance of winning $2.20, or 11% chance of winning $2.10, or 5% chance of winning $2.00, or 7% chance of winning $1.90, or 4% chance of winning $1.80, or 2% chance of winning $1.60, or 2% chance of winning $1.50, or 2% chance of winning $1.40, or 2% chance of winning $1.30, or 4% chance of winning $1.20, or 2% chance of winning $1.00, or 4% chance of winning 90c, or 4% chance of winning 70c, or 2% chance of winning 5c

Time Limit = 15 minutes (Shorter), Type = Easy		Time Limit = 15 minutes (Shorter), Type = Difficult	
Option A	**Option B**	**Option A**	**Option B**
51% chance of winning $4.10, or 26% chance of winning $4.00, or 8% chance of winning $3.90, or 11% chance of winning $3.80, or 2% chance of winning $3.10, or 2% chance of winning $2.40	2% chance of winning $6.00, or 2% chance of winning $5.90, or 15% chance of winning $5.80, or 17% chance of winning $5.70, or 11% chance of winning $5.60, or 7% chance of winning $5.50, or 4% chance of winning $5.40, or 7% chance of winning $5.30, or 7% chance of winning $5.20, or 2% chance of winning $5.10, or 2% chance of winning $5.00, or 2% chance of winning $4.80, or 2% chance of winning $4.60, or 2% chance of winning $4.30, or 2% chance of winning $3.60, or 2% chance of winning $3.50, or 2% chance of winning $2.80, or 9% chance of winning $2.40, or 2% chance of winning $2.10	8% chance of winning $4.20, or 14% chance of winning $4.10, or 14% chance of winning $4.00, or 4% chance of winning $3.90, or 8% chance of winning $3.80, or 2% chance of winning $3.70, or 14% chance of winning $3.60, or 4% chance of winning $3.50, or 4% chance of winning $3.40, or 6% chance of winning $3.30, or 8% chance of winning $3.10, or 2% chance of winning $2.90, or 4% chance of winning $2.80, or 6% chance of winning $2.60, or 2% chance of winning $2.50	5% chance of winning $5.40, or 2% chance of winning $5.30, or 2% chance of winning $5.20, or 2% chance of winning $5.10, or 3% chance of winning $5.00, or 7% chance of winning $4.90, or 12% chance of winning $4.80, or 14% chance of winning $4.70, or 3% chance of winning $4.60, or 5% chance of winning $4.50, or 5% chance of winning $4.40, or 3% chance of winning $4.30, or 8% chance of winning $4.20, or 3% chance of winning $4.10, or 5% chance of winning $4.00, or 2% chance of winning $3.90, or 2% chance of winning $3.00, or 2% chance of winning $2.70, or 3% chance of winning $2.60, or 2% chance of winning $2.50, or 3% chance of winning $2.40, or 2% chance of winning $2.30, or 2% chance of winning $2.20, or 3% chance of winning $2.10

Study 4: Examining employment-specific risk aversion

Common Information

Imagine a new scenario, where you are again making a hiring decision to recruit a worker. In this situation, you have a choice between a certain option where the cost of hiring is fixed and an uncertain option where different costs of hiring are possible.

Shorter time limit, Version 1

From a fixed revenue of $2.50, this incurred cost will be deducted to compute your profit.

In the table below, the probability of each cost outcomes is listed.

Option A	Option B
	A variable cost which will be one of the following amounts:
Incurring a fixed cost of $1.75	41% chance of incurring a cost of $2.00, or
	24% chance of incurring a cost of $1.60, or
	28% chance of incurring a cost of $1.20, or
	7% chance of incurring a cost of 80 cents.

Shorter time limit, Version 2

From a fixed revenue of $6.00, this incurred cost will be deducted to compute your profit.

In the table below, the probability of each cost outcomes is listed.

Option A	Option B
	A variable cost which will be one of the following amounts:
Incurring a fixed cost of $1.75	41% chance of incurring a cost of $2.00, or
	24% chance of incurring a cost of $1.60, or
	28% chance of incurring a cost of $1.20, or
	7% chance of incurring a cost of 80 cents.

Longer time limit

From a fixed revenue of $6.50, this incurred cost will be deducted to compute your profit.

In the table below, the probability of each cost outcomes is listed.

Option A	Option B
	A variable cost which will be one of the following amounts:
	2% chance of incurring a cost of $6.00, or
	2% chance of incurring a cost of $5.20, or
	1% chance of incurring a cost of $4.40, or
	1% chance of incurring a cost of $4.00, or
Incurring a fixed cost of $2.25	3% chance of incurring a cost of $3.60, or
	3% chance of incurring a cost of $3.20, or
	2% chance of incurring a cost of $2.80, or
	9% chance of incurring a cost of $2.40, or
	19% chance of incurring a cost of $2.00, or
	24% chance of incurring a cost of $1.60, or
	28% chance of incurring a cost of $1.20, or
	7% chance of incurring a cost of 80 cents.

Online Appendix C: Additional Analyses

Study 1, Phase 1

Distribution of actual time taken by pre-minute workers (means indicated with red dots). In the 5-mins. condition, there were three workers who took more time to complete the task than the time limit. Their completion times are not edited in this distribution.
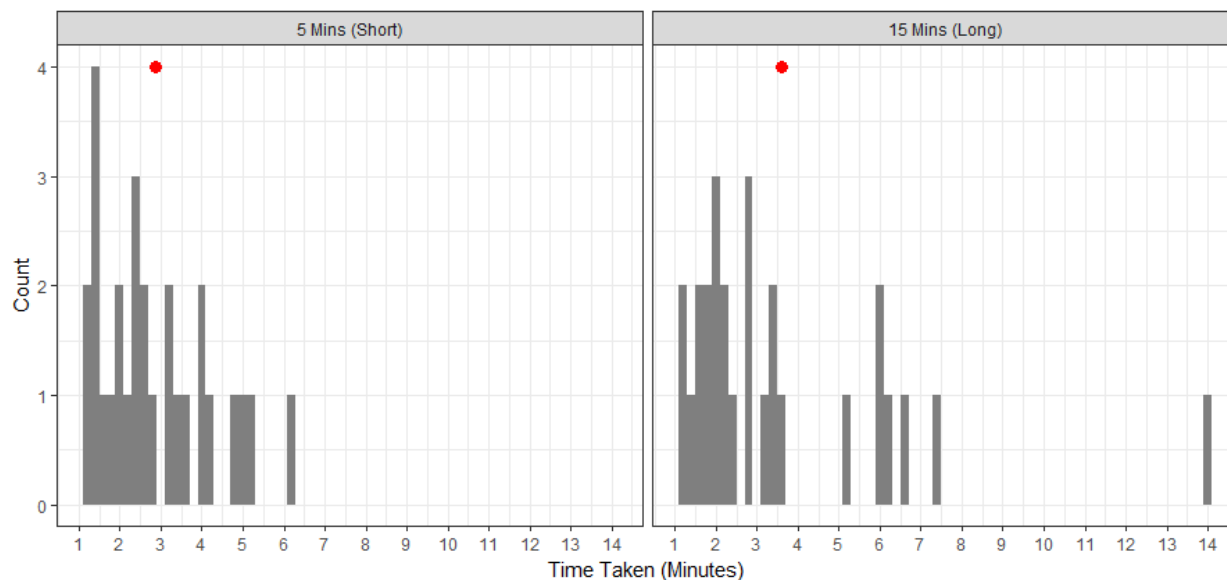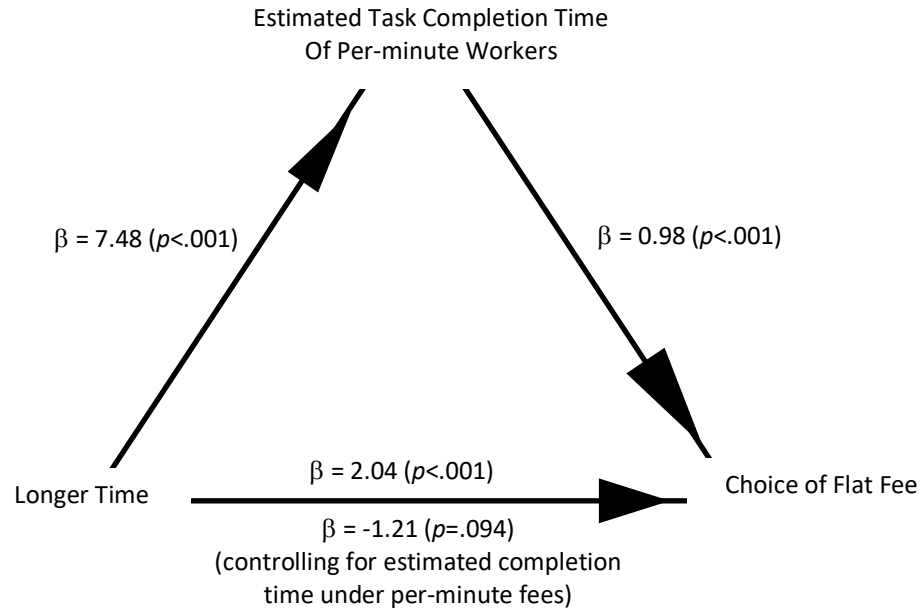

Results without truncating time-taken for three workers:

Three workers took over 5 minutes in the shorter time-limit condition, and their time taken was truncated to 5 minutes in the analysis reported in the paper. We find the same results without editing the data as shown here:

Workers took only a little longer to solve the puzzle when time limits were longer, a non-significant difference (M$_{Shorter}$= 2.87 vs. M$_{Long}$= 3.59, t(53)=1.23, p=.224) . As a result, there was no significant difference in the workers' earnings between the two time limits; even though the workers with longer time limits could have earned more, if they had used all the available time.

Study 1, Phase 2

Mediation of the choice of flat fees by managers' estimated completion time for per-minute workers:

Estimated Task Completion Time
Of Per-minute Workers

β = 7.48 (*p*<.001) β = 0.98 (*p*<.001)

β = 2.04 (*p*<.001)

Longer Time   Choice of Flat Fee

β = -1.21 (*p*=.094)
(controlling for estimated completion
time under per-minute fees)

Potential moderators (Managers' choices):

Table 1: Moderation of Flat Fee Choices by Time Spent Reading Instructions

	β	SE	z	p	
(Intercept)	0.514	0.336	1.531	0.126	
Time Taken to Read Instructions	0.003	0.003	0.999	0.318	
Time Limit = 15 mins	2.347	0.607	3.869	<.001	***
Time Limit * Time Taken	-0.003	0.003	-1.005	0.315	

*** <.001, **<.01, *<.05

Table 2: Moderation of Flat Fee Choices by Time Spent Making Choices

	β	SE	z	p	
(Intercept)	0.319	0.476	0.669	0.503	
Time Taken to Make Choices	0.005	0.005	1.050	0.294	
Time Limit = 15 mins	4.278	1.083	3.950	<.001	***
Time Limit * Time Taken	-0.019	0.008	-2.513	0.012	*

*** <.001, **<.01, *<.05

The interaction from the regression in Table 2 is shown below. As the time taken to make choices

increased, the choice of flat fees decreased when time limits were longer, but not when time limits were

shorter. While significant in this study, we did not consistently replicate this pattern of results in the other studies that captured time taken.
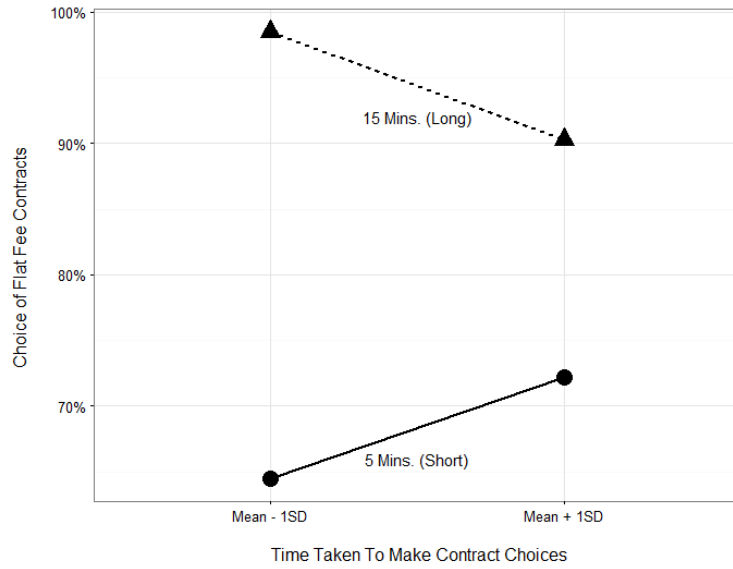
Table 3: Moderation of Flat Fee Choices by Time Spent Making Equivalent Gamble Choices

	β	SE	z	p	
(Intercept)	0.205	0.419	0.489	0.625	
Time Taken to Choose Gambles	0.025	0.017	1.514	0.130	
Time Limit = 15 mins	2.514	0.734	3.423	0.001	***
Time Limit * Time Taken	-0.022	0.022	-1.022	0.307	

*** <.001, **<.01, *<.05

Table 4: Moderation of Flat Fee Choices by Depth of Processing (measured using CRT)

	β	SE	z	p	
(Intercept)	0.511	0.387	1.321	0.186	
CRT Score	0.166	0.198	0.839	0.402	
Time Limit = 15 mins	2.095	0.875	2.394	0.017	*
Time Limit * CRT Score	-0.038	0.442	-0.087	0.931	

*** <.001, **<.01, *<.05

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Table 5: Moderation of Flat Fee Choices by Knowledge of Jigsaw Puzzles

	β	SE	z	p	
(Intercept)	0.180	0.788	0.229	0.819	
Knowledge of Jigsaw Puzzles	0.196	0.250	0.786	0.432	
Time Limit = 15 mins	4.284	1.908	2.245	0.025	*
Time Limit * Knowledge	-0.715	0.556	-1.285	0.199	

*** <.001, **<.01, *<.05

Table 6: Moderation of Flat Fee Choices by Frequency of Playing Jigsaw Puzzles (proxy for Experience)

	β	SE	z	p
(Intercept)	1.063	0.774	1.374	0.170
Frequency of playing Jigsaw	-0.121	0.312	-0.387	0.699
Time Limit = 15 mins	1.247	1.717	0.726	0.468
Time Limit * Frequency	0.347	0.732	0.475	0.635

*** <.001, **<.01, *<.05

Results with Only Managers Who Passed the Comprehension Check (Robustness Check):

In Study 1, managers were informed about the two time limits and told that workers were randomly assigned to one of the conditions. This was done to eliminate any information leaked from a particular time limit. To ensure that this aspect of the experimental design worked as expected, we confirmed that managers understood that workers were randomly assigned to one of two possible time limits. In this analysis, we examine the robustness of our finding by limiting the analysis to only managers who passed the comprehension check conducted after the key dependent measures were recorded.

Eighty-four percent of the participants (N=150) in the study, acting as managers, understood that workers were randomly assigned to one of two time-limit conditions. In the analysis below, we use only use these managers who passed the manipulation check to examine robustness of the reported results.

Managers were more likely to choose flat fee in the longer time-limit condition than in the shorter time-limit condition (93% vs. 72%, $\chi^2(1) = 11.40, p<.001$). These choices were costly and resulted in

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directionally higher losses, and more so in the longer time-limit condition ($M_{\text{Longer time limit}}$ = \$0.35, $M_{\text{Shorter time limit}}$ = \$0.08; $t(24)$=1.55, p=.134). Managers who choose a flat fee estimated a longer completion time for per-minute workers for shorter time limits ($M_{\text{Chose Flat Fee}}$ = 4.76 vs. $M_{\text{Chose Per-minute Fee}}$ =2.71; $t(74)$=13.96, p<.001) and even more so for longer time limits ($M_{\text{Chose Flat Fee}}$ = 12.16 vs. $M_{\text{Chose Per-minute Fee}}$ =7.60; $t(72)$=2.93, p=.004; difference $F(1,146)$=3.93, p=.049). Most managers' choices were consistent with their estimated times (97% of in the shorter time-limit condition; 90% in the longer time-limit condition), and the estimated time for per-minute workers mediated the effect of deadlines on compensation scheme choices (indirect effect bootstrapped 95% CI= [0.36,0.79]).

Contrary to a risk aversion explanation, managers were more likely to choose the flat fee than the certain outcome in the equivalent gamble, in both the longer time limit (93% vs. 57%, McNemar's $\chi^2(1)$ = 23.52, p<.001) and shorter time-limit conditions (72% vs. 46%, McNemar's $\chi^2(1)$ = 12.50, p<.001). Likewise, CRT and knowledge of or experience with jigsaw puzzles did not moderate the results.

Therefore, we successfully replicated all the results reported in the paper using only those managers who passed the comprehension check. This further suggests that the observed preference for flat fees in the longer (vs. the shorter) time-limit condition was not on account of any information conveyed through the externally imposed time limits.
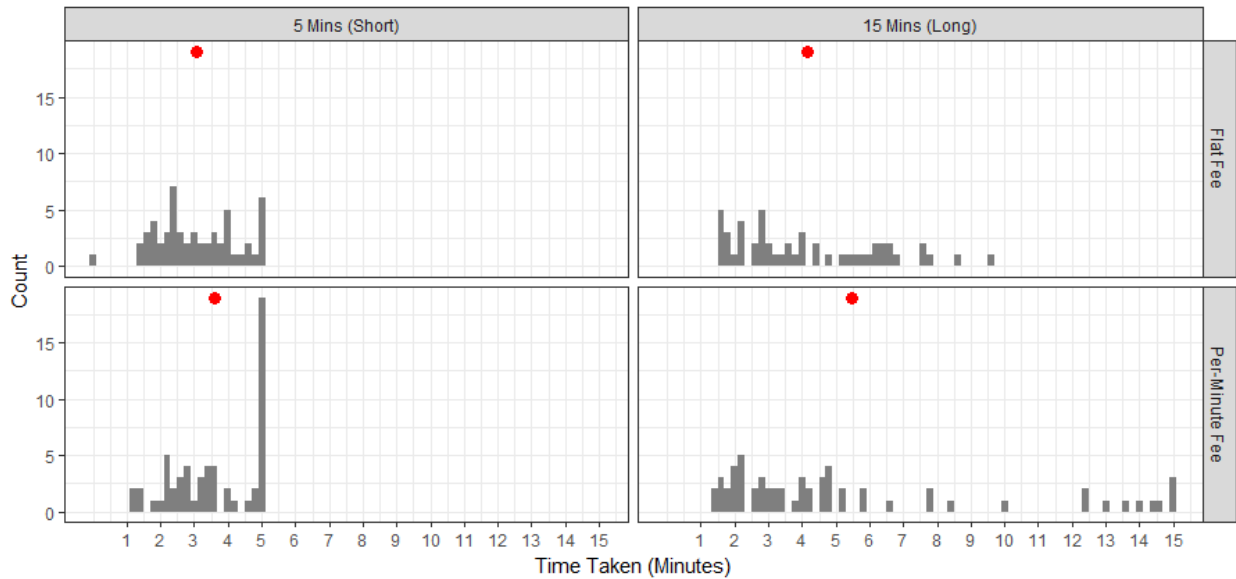
Study 2 (Phase 1):

Distribution of actual time taken by workers

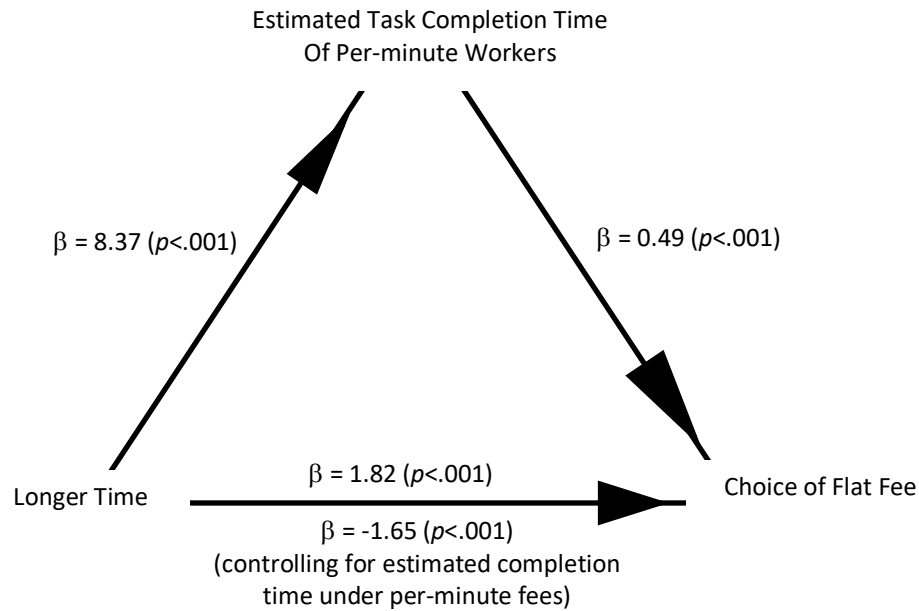**Easy Proofreading Task** (means indicated with red dots)
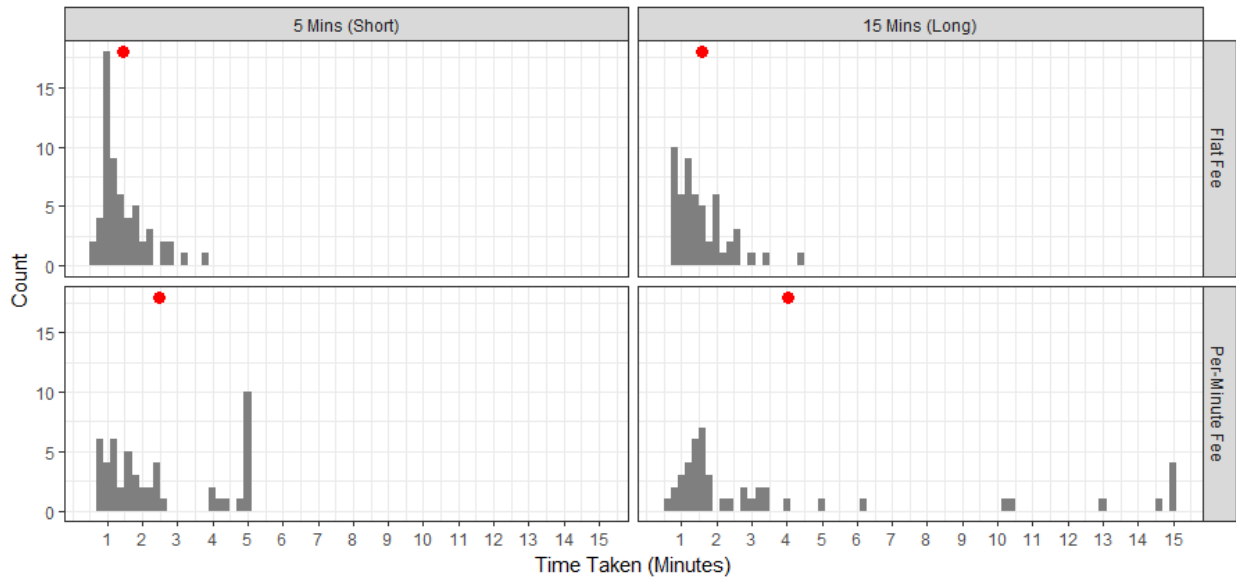
Hard Proofreading Task (means indicated with red dots)

Study 2 (Phase 2):

Mediation of the choice of flat fees by managers' estimated completion time for per-minute workers:

Estimated Task Completion Time
Of Per-minute Workers

β = 8.37 (*p*<.001) β = 0.49 (*p*<.001)

Longer Time β = 1.82 (*p*<.001)   Choice of Flat Fee
              β = -1.65 (*p*<.001)
          (controlling for estimated completion
              time under per-minute fees)

Potential moderators (Managers' choices):

Table 7: Moderation of Flat Fee Choices by Time Spent Reading Instructions

	β	SE	z	p	
(Intercept)	-0.417	0.176	-2.370	0.018	
Time Limit = 15 mins	1.548	0.385	4.020	<.001	***
Time Taken to Read Instructions	0.003	0.002	1.330	0.182	
Time Limit * Time Taken	0.007	0.007	1.000	0.319	

*** <.001, **<.01, *<.05

Table 8: Moderation of Flat Fee Choices by Time Spent Making Choices

	β	SE	z	p	
(Intercept)	-0.054	0.242	-0.220	0.823	
Time Limit = 15 mins	1.619	0.434	3.730	<.001	***
Time Taken to Make Choices	-0.002	0.002	-0.950	0.340	
Time Limit * Time Taken	0.002	0.004	0.570	0.567	

*** <.001, **<.01, *<.05

Table 9: Moderation of Flat Fee Choices by Time Spent Making Equivalent Gamble Choices

	β	SE	z	p	
(Intercept)	-0.264	0.210	-1.250	0.210	
Time Limit = 15 mins	1.239	0.394	3.140	0.002	**
Time Taken to Choose Gambles	0.00003	0.004	0.080	0.938	
Time Limit * Time Taken	0.017	0.009	1.770	0.076	

*** <.001, **<.01, *<.05

Table 10: Moderation of Flat Fee Choices by Knowledge about English Spelling

	β	SE	z	p
(Intercept)	0.445	0.601	0.740	0.459
Time Limit = 15 mins	1.795	1.036	1.730	0.083
Knowledge of Jigsaw Puzzles	-0.185	0.156	-1.190	0.235
Time Limit * Knowledge	0.014	0.259	0.050	0.958

*** <.001, **<.01, *<.05

Table 11: Moderation of Flat Fee Choices by Frequency of Doing Proofreading Tasks (proxy for Experience)

	β	SE	z	p	
(Intercept)	-0.962	0.496	-1.940	0.052	
Time Limit = 15 mins	2.481	0.851	2.910	0.004	**
Frequency of playing Jigsaw	0.254	0.170	1.500	0.135	
Time Limit * Frequency	-0.238	0.290	-0.820	0.413	

*** <.001, **<.01, *<.05

Study 3:

Mid-point tests of follow-up measures

Measures	Mean*	Results (vs. m=0)
Task assigned to 15-mins more difficult	-0.314	$t(139)= 2.35$, $p= 0.019$
Task assigned to 15-mins more interesting and enjoyable	0.100	$t(139)= 0.807$, $p= 0.421$
Task assigned to 15-mins more motivating to achieve	0.085	$t(139)= 0.607$, $p= 0.544$

*positive values indicate that the task assigned to 15 minutes was perceived to have more of the corresponding measure

The mid-point test results show that judges perceived the task assigned to a 5-minutes (vs. 15-minutes) time limit as more difficult. Perceptions of task difficulty could be a valid input into beliefs about task scope in which case we should have expected to see a higher value of this measure for the task assigned to 15 minutes. Indeed, as reported in the manuscript, when task scope was directly elicited (e.g., "how much work is there in Task 1") using a slider (1= a little work; 100= a lot of work), managers reported a significantly higher perceived scope of work for the task that was assigned a random time limit of 15 minutes (M_5= 60.32 vs. M_{15} = 65.54; paired $t(139)=3.01$, $p=.003$), which was consistent with inferring the scope of work from the deadline.

The above apparent inconsistency might have arisen because the shorter time limit could have drawn participants' attention to ways in which completing a Math task under a demanding deadline would be challenging, beyond the scope. In particular, participants might have thought that working under a shorter deadline would entail working harder and require more effort to meet the deadline, even for a task with less scope (e.g., the perceived amount of work in the task).

Table 12: Effect of the order of Time Limits in W/S choice of compensation schemes

	β	SE	z	p	
(Intercept)	0.871	0.277	3.148	0.002	
Time Limit = 15 mins	0.707	0.406	1.740	0.082	
First Time Limit = 15 mins	-0.902	0.376	-2.399	0.016	*
Time Limit * First Time Limit	0.894	0.579	1.544	0.123	

*** <.001, **<.01, *<.05

Table 13: Effect of the order of which Task (Task 1 or Task 2) was assigned to Shorter vs. Longer time limit

	β	SE	z	p	
(Intercept)	0.572	0.255	2.248	0.025	
Time Limit = 15 mins	1.016	0.400	2.539	0.011	*
Task with 5 mins = Task 2	-0.320	0.358	-0.895	0.371	
Time Limit * Task with 5 mins	0.278	0.569	0.490	0.624	

*** <.001, **<.01, *<.05

Table 14: Moderation of Flat Fee Choices by beliefs about whether Task with 15-mins took longer to complete

	β	SE	z	p	
(Intercept)	0.375	0.197	1.904	0.057	
Time Limit = 15 mins	1.166	0.319	3.653	<.001	***
Took more time in 15-mins	0.066	0.117	0.563	0.573	
Time Limit * Took more time	-0.024	0.185	-0.132	0.895	

*** <.001, **<.01, *<.05

Table 15: Moderation of Flat Fee Choices by beliefs about whether workers worked slower on the Task with 15-mins

	β	SE	z	p	
(Intercept)	0.321	0.202	1.584	0.113	
Time Limit = 15 mins	1.049	0.318	3.300	0.001	**
Workers slow in 15-min-Task	0.096	0.101	0.945	0.345	
Time Limit * Workers slow	0.139	0.161	0.860	0.390	

*** <.001, **<.01, *<.05

Table 16: Moderation of Flat Fee Choices by beliefs about whether workers found Task with 15-mins more difficult

	β	SE	z	p	
(Intercept)	0.467	0.190	2.452	0.014	
Time Limit = 15 mins	1.089	0.300	3.626	<.001	***
Task difficult in 15 mins	0.131	0.116	1.132	0.258	
Time Limit * Task difficult	-0.210	0.183	-1.145	0.252	

*** <.001, **<.01, *<.05

Table 17: Moderation of Flat Fee Choices by beliefs about whether workers found Task with 15-mins more interesting and enjoyable

	β	SE	z	p	
(Intercept)	0.409	0.183	2.228	0.026	
Time Limit = 15 mins	1.167	0.299	3.904	<.001	***
Task interesting in 15 mins	0.154	0.124	1.237	0.216	
Time Limit * Task interesting	-0.189	0.195	-0.967	0.334	

*** <.001, **<.01, *<.05

Table 18: Moderation of Flat Fee Choices by beliefs about whether workers found Task with 15-mins more motivating to achieve

	β	SE	z	p	
(Intercept)	0.413	0.184	2.243	0.025	
Time Limit = 15 mins	1.164	0.299	3.896	<.001	***
Task motivating in 15 mins	0.156	0.110	1.413	0.158	
Time Limit * Task motivating	-0.189	0.173	-1.094	0.274	

*** <.001, **<.01, *<.05

Table 19: Moderation of Flat Fee Choices by beliefs about Task scope (1= a little work; 100= a lot of work).

	β	SE	z	p
(Intercept)	0.008	0.537	0.014	0.988
Time Limit = 15 mins	0.882	0.880	1.002	0.316
Task scope	0.007	0.008	0.802	0.422
Time Limit * Task scope	0.004	0.014	0.264	0.792

*** <.001, **<.01, *<.05

Table 20: Moderation of Flat Fee Choices by beliefs about whether workers would slack (No, Yes)

	β	SE	z	p
(Intercept)	0.172	0.240	0.716	0.474
Time Limit = 15 mins	0.927	0.474	1.957	0.050
Worried about slacking=Yes	0.375	0.360	1.042	0.298
Time Limit * Worried	0.354	0.616	0.574	0.566

*** <.001, **<.01, *<.05

Table 21: Moderation of Flat Fee Choices by individual differences in managers' Perspective Taking scores (Davis, 1983)

	β	SE	z	p
(Intercept)	0.690	0.605	1.141	0.254
Time Limit = 15 mins	0.776	0.947	0.820	0.412
Perspective Taking	-0.104	0.220	-0.472	0.637
Time Limit * Perspective Taking	0.144	0.349	0.414	0.679

*** <.001, **<.01, *<.05

Examining mediation using bootstrapping:

Approach: The bootstrapping code runs the following models for 500 times and computes $(b - b')$ in each iteration. This difference in coefs. are saved and sorted to compute the 95% CI. Hierarchical regressions are used in all cases, and X donotes the covariate whose mediating effect is being studied.

Base model: $compensation\ scheme\ choice = a_0 + b * Time\ Limit$
Mediation model: $compensation\ scheme\ choice = a_1 + b' * Time\ Limit + c * X$

The table shows the 95% CI for each of the mediating covariates.

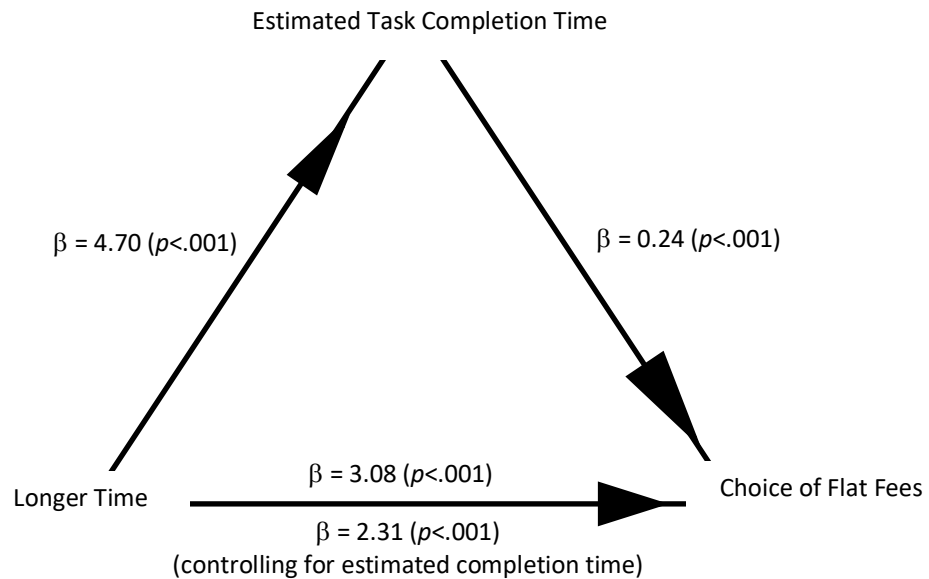| Mediating Covariate	Indirect Effect (bootstrapped 95% CI)
beliefs about whether Task with 15-mins took longer to complete	[-0.264, 0.168]
beliefs about whether workers intentionally worked slower on the Task with 15-mins	[-0.202, 0.323]
beliefs about whether workers found Task with 15-mins more difficult	[-0.020, 0.151]
beliefs about whether workers found Task with 15-mins more interesting and enjoyable	[-0.107, 0.011]
beliefs about whether workers found Task with 15-mins more motivating to achieve	[-0.121, 0.015]
beliefs about Task scope	[-0.024, 0.115]
beliefs about whether workers would slack	[-0.205, 0.217]

Study 4 (Phase 1):

Distribution of actual time taken by workers (the mean is indicated with a red dot)
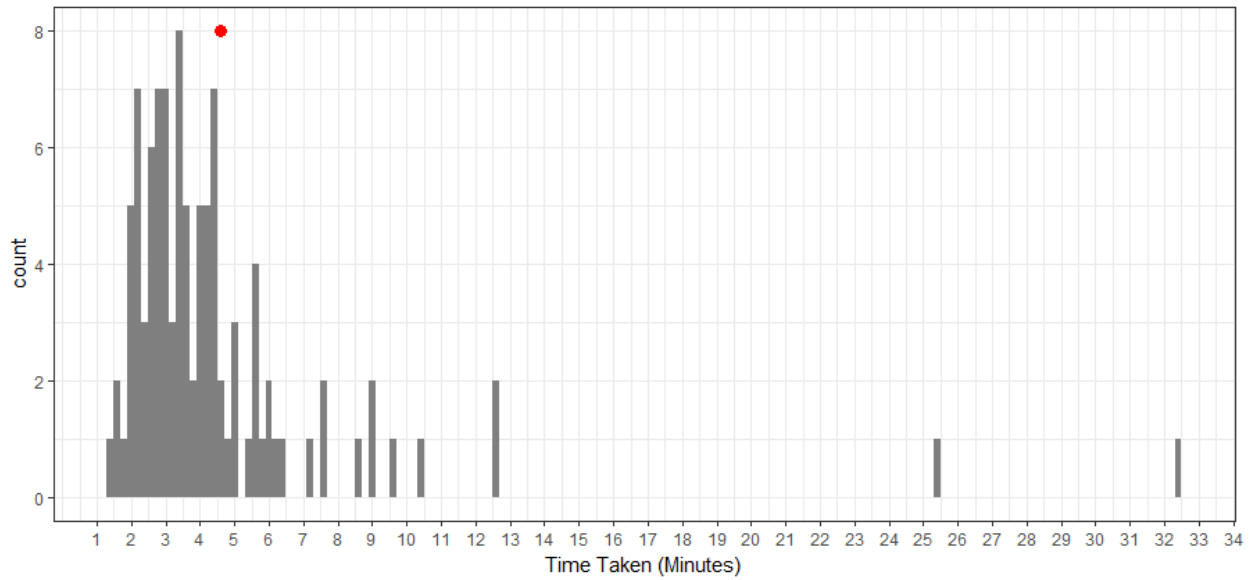

Study 4 (Phase 2)

Mediation of the choice of flat fees by managers' estimated completion time for per-minute workers:

Estimated Task Completion Time

β = 4.70 (*p*<.001)

β = 0.24 (*p*<.001)

β = 3.08 (*p*<.001)

Longer Time

β = 2.31 (*p*<.001)
(controlling for estimated completion time)

Choice of Flat Fees

Same mediation model as above, but only using managers who made completion time estimates *before* choosing compensation schemes (so estimates are not ex-post rationalizations of their earlier choices).
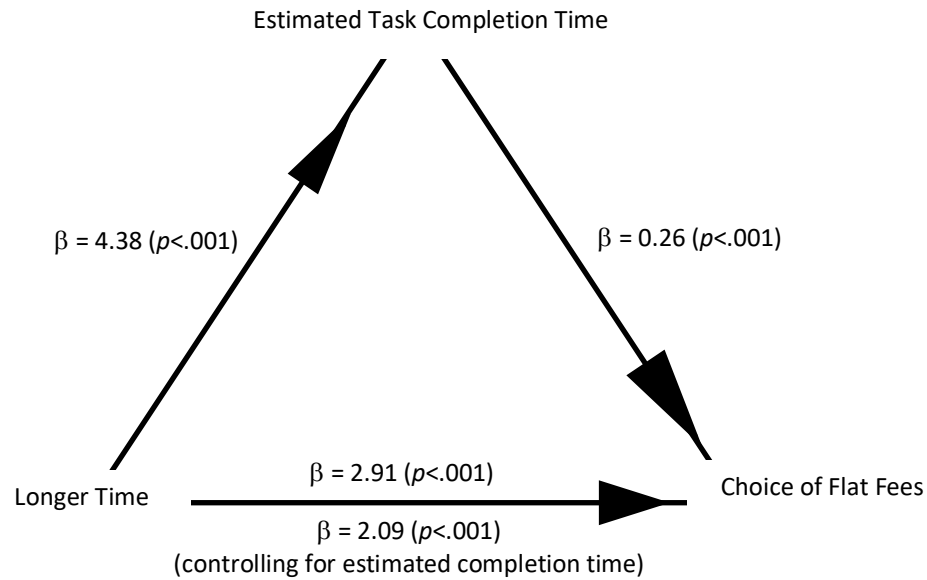
Examining the potential moderating role of order of elicitation of completion time estimates (i.e., before vs. after choice of compensation schemes) on choice of flat fee (DV: workers' completion time estimates)

Table 22: Effect of the order of elicitation in 5-mins, version 1 condition

	β	SE	z	p
(Intercept)	3.233	0.316	10.231	<.001
Choice of Flat fee	0.910	0.727	1.252	0.215
Choice LATER	0.338	0.493	0.686	0.495
Choice of Flat fee * Choice LATER	1.119	0.985	1.136	0.260

*** <.001, **<.01, *<.05

Table 23: Effect of the order of elicitation in 5-mins, version 2 condition

	β	SE	z	p
(Intercept)	4.409	0.587	7.514	<.001
Choice of Flat fee	0.091	0.904	0.101	0.920
Choice LATER	-1.201	0.812	-1.478	0.144
Choice of Flat fee * Choice LATER	2.117	1.328	1.594	0.115

*** <.001, **<.01, *<.05

Table 24: Effect of the order of elicitation in 5-mins condition (two versions combined)

	β	SE	z	p
(Intercept)	3.731	0.322	11.604	<.001
Choice of Flat fee	0.661	0.581	1.138	0.257
Choice LATER	-0.353	0.472	-0.748	0.456
Choice of Flat fee * Choice LATER	1.462	0.837	1.746	0.083

*** <.001, **<.01, *<.05

Table 25: Effect of the order of elicitation in 15-mins condition

	β	SE	z	p
(Intercept)	5.400	2.033	2.656	0.009
Choice of Flat fee	3.900	2.116	1.843	0.067
Choice LATER	1.600	2.592	0.617	0.538
Choice of Flat fee * Choice LATER	-2.275	2.711	-0.839	0.403

*** <.001, **<.01, *<.05

Other Potential moderators (on Managers' choices):

Table 26: Moderation of Flat Fee Choices by Time Spent Reading Instructions

	β	SE	z	p	
(Intercept)	-0.846	0.211	-4.020	<.001	
Time Limit = 15 mins	2.832	0.503	5.633	<.001	***
Time Taken to Read Instructions	0.0003	0.000	0.730	0.466	
Time Limit * Time Taken	0.001	0.002	0.648	0.517	

*** <.001, **<.01, *<.05

Table 27: Moderation of Flat Fee Choices by Time Spent Making Choices

	β	SE	z	p	
(Intercept)	-0.866	0.245	-3.535	<.001	
Time Limit = 15 mins	2.857	0.488	5.849	<.001	***
Time Taken to Make Choices	0.003	0.005	0.598	0.550	
Time Limit * Time Taken	0.010	0.016	0.657	0.511	

*** <.001, **<.01, *<.05

Table 28: Moderation of Flat Fee Choices by Time Spent Making Equivalent Employment Gamble Choices

	β	SE	z	p	
(Intercept)	-0.273	0.337	-0.811	0.417	
Time Limit = 15 mins	2.338	0.586	3.992	<.001	***
Time Taken to Choose Gambles	-0.019	0.012	-1.616	0.106	
Time Limit * Time Taken	0.025	0.016	1.601	0.109	

*** <.001, **<.01, *<.05

Table 29: Moderation of Flat Fee Choices by Gender

	β	SE	z	p	
(Intercept)	-0.719	0.280	-2.570	0.010	
Time Limit = 15 mins	2.871	0.549	5.228	<.001	***
Gender=Male	-0.048	0.367	-0.131	0.896	
Time Limit * Gender=Male	0.306	0.703	0.435	0.664	

*** <.001, **<.01, *<.05

Results with Only Managers Who Passed the Recall Check that all Workers were paid a Flat Fee (Robustness Check):

In Study 4, managers were accurately informed that all workers earned a flat fee from the agency. This was done to eliminate any concerns about some workers' delaying task completion to earn more. After managers indicated their compensation scheme choice and estimated the time they believed workers took to finish the math task (counter-balanced), we asked managers a recall question to confirm their understanding (e.g., how did the agency pay the workers: all were paid a fixed amount, some were paid fixed others a variable amount, don't know/can't say). Of the managers who indicated they knew the answer to this question, 63% (N=166) correctly recalled that all workers were paid a fixed amount. In the analysis below, we use only use the managers who passed this manipulation check to examine robustness of the reported results.

Preference for flat fees differed across the three experimental conditions ($\chi^2(2)$=64.29, p<.001). In the two shorter time-limit conditions, fewer participants chose the flat fee than the per-minute fee, at similar rates (24% and 36%; $\chi^2(1)$=1.61, p=.205). In contrast, when the time limit was longer, an

overwhelming majority (90%) of managers chose the sub-optimal flat-fee option, and this rate of choosing flat fees was significantly higher than in the two shorter time-limit conditions ($\chi^2(1)$=62.88, $p<.001$). Taken together, the pattern of choices rules out an aversion to complexity account. In particular, if the preference for flat fees was driven by a motivation to avoid the cognitive cost of processing the metered-fee option when the sure bonus amount was high, the proportion of flat fee choices should have been similar in the version of the shorter time limit and the longer time limit that had the same high expected sure bonus amount (i.e., $4.25). However, these proportions were significantly different ($\chi^2(1)$=39.88, $p<.001$).

Given that there was an expected payoff advantage of choosing the per-minute fee particularly in the longer time-limit condition, when managers were matched to a random worker, the difference in realized less profits were comparable to the results reported in the manuscript in all the conditions (Longer time limit: $M_{\text{Per-minute Fee}}$ = $4.70, $M_{\text{Flat Fee}}$ = $4.25; Δ = -$0.45; Shorter time-limit condition, version 1: $M_{\text{Per-minute Fee}}$ = $0.825, $M_{\text{Flat Fee}}$ = $0.75; Δ = -$0.075; Shorter time-limit condition, version 1: $M_{\text{Per-minute Fee}}$ = $4.40, $M_{\text{Flat Fee}}$ = $4.25; Δ = -$0.15). However, because of small sample sizes (e.g., very few choosing flat fee in longer time-limit condition in absolute terms) the statistical tests were low-powered and yielded directional results (ps .245, .296, and .062 respectively).

The suboptimal choices are largely explained by the managers' estimates of task completion time. Managers who chose a flat fee estimated a longer task completion time in all the conditions (Shorter time limit, version 1: $M_{\text{Chose Flat Fee}}$ = 5.20 vs. $M_{\text{Chose Per-minute Fee}}$ =3.15; $t(40)$=4.54, $p<.001$; Shorter time limit, version 2: $M_{\text{Chose Flat Fee}}$ = 5.33 vs. $M_{\text{Chose Per-minute Fee}}$ =3.31; $t(39)$=2.23, p=.031; Longer time limit: $M_{\text{Chose Flat Fee}}$ = 9.00 vs. $M_{\text{Chose Per-minute Fee}}$ =6.12; $t(81)$=1.76, p=.081). This was not significantly affected by order of elicitation (before vs. after choice of compensation scheme) for any of the conditions (interaction ps > .104), suggesting that workers' time completion estimates were not due to *ex-post* rationalization by managers of their preceding choices.

Indeed, managers' choices were largely rationalized by their estimates of workers' completion times. Most participants chose the option that would have provided a higher profit had their time

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estimates been correct (80% in the shorter time-limit conditions; 78% in the longer time-limit condition). Furthermore, the estimated time for per-minute workers mediated the effect of deadlines on managers' choices (indirect effect bootstrapped 95% CI= [0.09, 0.41]).

In the shorter time-limit conditions, there was no difference in the likelihood of choosing the per-minute fee or risk-equivalent uncertain employment cost (70% vs. 64%; McNemar's $\chi^2(1)$ = 1.31, p=.251). However, in the longer time-limit condition, managers were much less likely to choose the per-minute fee than the equivalent uncertain employment cost (10% vs. 41%; McNemar's $\chi^2(1)$ = 24.14, p<.001). This strongly suggests that the observed compensation scheme preferences cannot be explained by managers' risk aversion when facing a choice between certain and variable employment cost outcomes, and is instead explained by mis-estimation of those outcomes.

Therefore, overall, we successfully replicated all the results reported in the paper using only those managers who passed this recall check.

Results with Only Managers Who Passed the Recall Check that the Maximum Time Limit was Random (Robustness Check 2):

In Study 4, managers were informed that time cap was randomly selected between one of two time limits: 5 minutes and 15 minutes. This was done to eliminate any information that the limits might signal. After managers indicated their compensation scheme choice and estimated the time they believed workers took to finish the math task (counter-balanced), we asked managers a recall question to confirm their understanding (e.g., for the hiring option that earned you a variable bonus, how was the time cap set: randomly, based on workers' actual completion times, don't know/can't say). Of the managers who indicated they knew the answer to this question, 70% (N=183) correctly recalled that the time limit was random. In the analysis below, we use only the managers who passed this manipulation check to examine robustness of the reported results.

Preference for flat fees differed across the three experimental conditions ($\chi^2(2)$=100.44, p<.001). In the two shorter time-limit conditions, fewer participants chose the flat fee than the per-minute fee, at

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similar rates (20% and 26%; $\chi^2(1)=0.53$, $p=.465$). In contrast, when the time limit was longer, an

overwhelming majority (96%) of managers chose the sub-optimal flat-fee option, and this rate of

choosing flat fees was significantly higher than in the two shorter time-limit conditions ($\chi^2(1)=100.05$,

$p<.001$). Taken together, the pattern of choices rules out an aversion to complexity account. In

particular, if the preference for flat fees was driven by a motivation to avoid the cognitive cost of

processing the metered-fee option when the sure bonus amount was high, the proportion of flat fee

choices should have been similar in the version of the shorter time limit and the longer time limit that had

the same high expected sure bonus amount (i.e., $4.25).   However, these proportions were significantly

different ($\chi^2(1)=76.53$, $p<.001$).

Given that there was an expected payoff advantage of choosing the per-minute fee particularly in

the longer time-limit condition, when managers were matched to a random worker, the difference in

realized less profits were comparable to the results reported in the manuscript in all the conditions

(Longer time limit: $M_{\text{Per-minute Fee}}$ = $4.60, $M_{\text{Flat Fee}}$ = $4.25; Δ = -$0.35; Shorter time-limit condition,

version 1: $M_{\text{Per-minute Fee}}$ = $0.95, $M_{\text{Flat Fee}}$ = $0.75; Δ = -$0.20; Shorter time-limit condition, version 1: $M_{\text{Per-minute Fee}}$ = $4.38, $M_{\text{Flat Fee}}$ = $4.25; Δ = -$0.13). However, because of small sample sizes (e.g., very few

choosing flat fee in longer time limit condition in absolute terms) the statistical tests were low-powered

and yielded directional results at times (ps .327, .009, and .078 respectively).

The suboptimal choices are largely explained by the managers' estimates of task completion time.

Managers who chose a flat fee estimated a longer task completion time in all the conditions (Shorter time

limit, version 1: $M_{\text{Chose Flat Fee}}$ = 5.75 vs. $M_{\text{Chose Per-minute Fee}}$ =3.15; $t(39)=4.79$, $p<.001$; Shorter time limit,

version 2: $M_{\text{Chose Flat Fee}}$ = 6.38 vs. $M_{\text{Chose Per-minute Fee}}$ =3.89; $t(48)=2.48$, $p=.017$; Longer time limit: $M_{\text{Chose Flat Fee}}$ = 8.68 vs. $M_{\text{Chose Per-minute Fee}}$ =4.75; $t(90)=1.92$, $p=.058$). The time estimates were not on account of *ex-post* rationalization (i.e., managers' estimates of completion times being based on their preceding

compensation scheme choices). In the longer time limit condition there was no effect of order of

elicitation (interaction p = .543), while for the two shorter time-limit conditions, managers who chose flat

fees estimated higher completion times when estimates were made *before* (vs. after) these choices were indicated (interaction *ps* .021 and .022 for version 1 and version 2 respectively).

Managers' choices were largely rationalized by their estimates of workers' completion times. Most participants chose the option that would have provided a higher profit had their time estimates been correct (88% in the shorter time-limit conditions; 76% in the longer time-limit condition). Furthermore, the estimated time for per-minute workers mediated the effect of deadlines on managers' choices (indirect effect bootstrapped 95% CI= [0.01, 0.38]).

In the shorter time-limit conditions, there was a smaller difference in the likelihood of choosing the per-minute fee or risk-equivalent uncertain employment cost (77% vs. 68%; McNemar's $\chi^2(1) = 3.56$, $p=.059$). However, in the longer time-limit condition, managers were much less likely to choose the per-minute fee than the equivalent uncertain employment cost (4% vs. 42%; McNemar's $\chi^2(1) = 35.00$, $p<.001$). This strongly suggests that the observrved compensation scheme preferences cannot be explained by managers' risk aversion when facing a choice between certain and variable employment cost outcomes, and is instead explained by mis-estimation of those outcomes.

Therefore, overall, we successfully replicated all the results reported in the paper using only those managers who passed this recall check.

Study 5 (Phase 1):

Distribution of actual time taken by workers (the mean is indicated with a red dot)
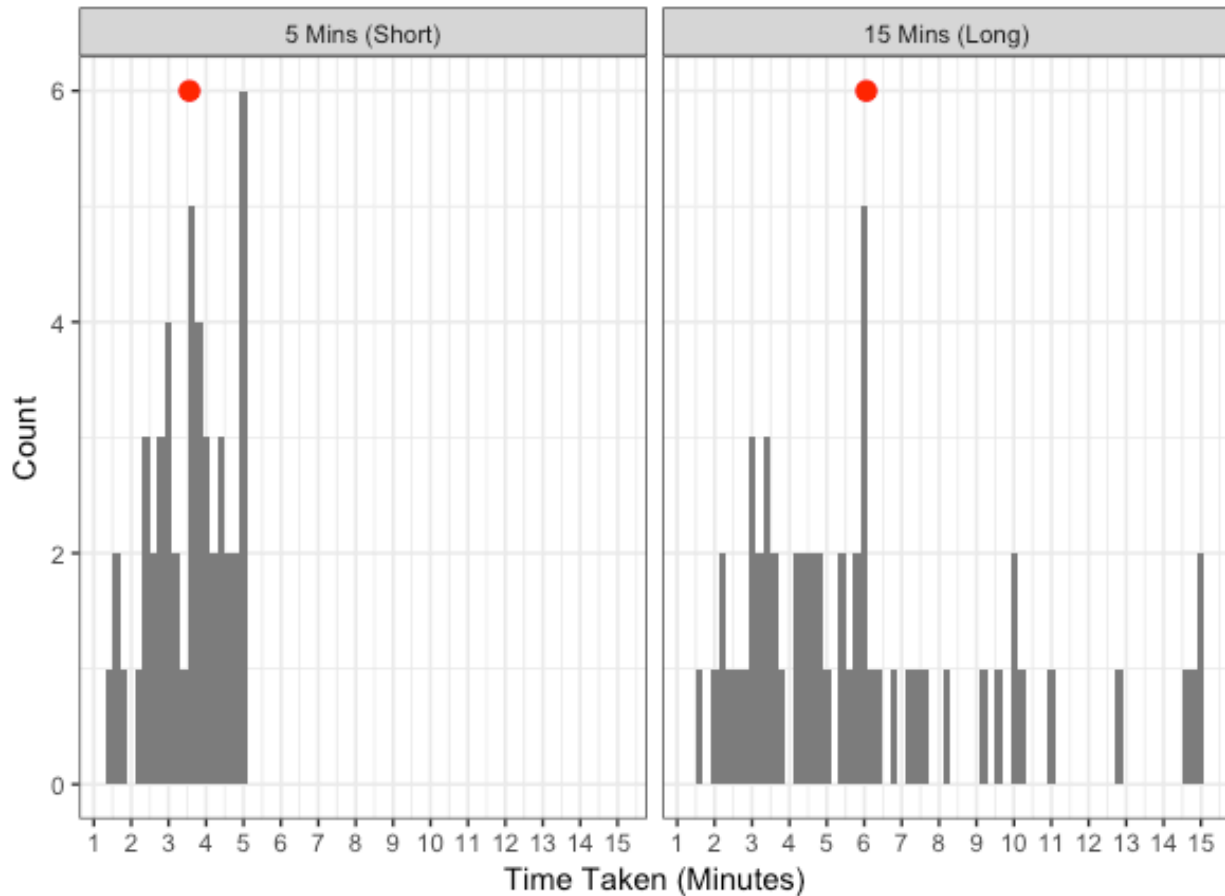
Study 5 (Phase 2): Additional Analysis

How did completion-time information affect managers' completion time estimations? Irrespective of compensation scheme choices, when no completion-time information was available, managers estimated a longer completion time for per-minute workers when the time limit was longer than when it was shorter (M_{Long} = 10.57 vs. $M_{Shorter}$ = 4.21, Δ=+6.36; $t(262)$=17.69, $p<.001$). When completion-time information was provided, the difference in completion time estimates of per-minute workers reduced, but was not eliminated (M_{Long} = 9.03 vs. $M_{Shorter}$ = 4.03, Δ=+5.00; $t(280)$=12.31, $p<.001$; interaction: β=1.36, t=2.49, p= .013). Therefore, beliefs about completion times, particularly when time-based compensation is used, reduced but persisted when information defining the scope of work was

provided. This is consistent with a multiple-accounts explanation underlying the observed misestimations.

To confirm that managers' estimates represented a systematic bias it is important to compare them with time taken by actual workers. Managers, irrespective of the choices made, overestimated the expected time per-minute workers would take, compared to the actual time taken (shorter time limit: 4.21 vs. 3.56, $t(180)=3.72$, $p<.001$; longer time limit: 10.57 vs. 6.05, $t(182)=7.21$, $p<.001$; difference: $\beta=0.38$, $t=5.79$, $p< .001$). Likewise, when information was provided, the misestimation persisted and reduced only directionally (shorter time limit: 4.03 vs. 3.56, $t(184)=2.64$, $p=.008$; longer time limit: 9.03 vs. 6.05, $t(196)=4.28$, $p<.001$; difference: $\beta=2.50$, $t=3.34$, $p< .001$). Accordingly, the three-way interaction of role (worker, manager), time limit, and scope-information on time taken was not significant ($p=.177$).

Did these misestimations of per-minute workers' completion time drive the biased compensation scheme choices, even when completion-time information was available? Replicating earlier findings, when no completion-time information was provided, managers who chose a flat fee estimated a longer completion time for per-minute workers both in the shorter ($M_{\text{Chose Flat Fee}} = 4.50$ vs. $M_{\text{Chose Per-minute Fee}}$ $=3.77$; $t(133)=4.15$, $p<.001$) and longer time-limit conditions ($M_{\text{Chose Flat Fee}} = 11.28$ vs. $M_{\text{Chose Per-minute Fee}}$ $=8.10$; $t(127)=3.94$, $p<.001$), but more so when the external time limits were longer ($F(1,260)=10.49$, $p=.001$). However, even when completion-time information was available, the results persisted (Shorter time limit: $M_{\text{Chose Flat Fee}} = 4.35$ vs. $M_{\text{Chose Per-minute Fee}}$ $=3.63$; $t(137)=4.14$, $p<.001$; Longer time limit: $M_{\text{Chose Flat Fee}} = 10.61$ vs. $M_{\text{Chose Per-minute Fee}}$ $=5.69$; $t(141)=6.73$, $p<.001$; interaction: $F(1,278)=32.18$, $p=.001$). Indeed, the three way interaction of completion-time information, time limit, and flat fee choice on estimates of per-minute workers' completion times was not statistically significant ($p=.103$). Managers who chose flat fees, also overestimated the expected time per-minute workers would take compared to the actual time taken by workers.

Like in previous studies, managers' choices were largely rationalized by their estimates of workers' completion times. When no completion-time information was provided, most participants chose the option that would have provided a higher profit had their time estimates been correct (82% in the

shorter time condition; 79% in the longer time condition). These proportions remained similar when completion-time information was provided (83% in the shorter time condition; 77% in the longer time condition). Furthermore, the estimated time for per-minute workers completely mediated the effect of deadlines on managers' compensation scheme choices, when no completion-time information was provided (indirect effect bootstrapped 95% CI= [0.17, 0.47]), and partially so in the completion-time information condition (indirect effect bootstrapped 95% CI= [0.22, 0.41]). This provides further confirmation that managers' choice under different time limits was driven by their biased beliefs about task completion times, and the information intervention did little to attenuate this effect.

Results with Only Managers Who Passed All the Chart-Comprehension Questions (Robustness Check 1):

Participants in the scope-information condition answered five comprehension questions related to the information displayed on the chart. The questions were asked on the same page as the chart. The first three questions asked them to select what percentage of workers finished the task in 3-minutes or less, 5-minutes or less, and 15-minutes or less (three options presented). The last two questions asked how much time limit the group of workers shown had (5-minutes, 15-minutes, No time limit), and how these workers were paid (paid a flat lump sum, paid at a certain rate per minute worked, don't know/can't say). In this section, we examine the key results of Study 5 only among participants who passed all these chart-comprehension questions. Therefore, in effect, the sample in this analysis includes everyone in the no-scope-information condition, and a subset of those in scope-information condition who passed these checks.

In total, 72% of the participants (N=391) correctly answered all the three recall questions. When no scope information was provided, the results were the same as reported in the manuscript (i.e., 77% vs 60%; $\chi^2(1) = 8.59$, $p= .003$). This is because the group of participants assigned to no-information condition did not attenuate on account of the filter used in this robustness check.

In the scope information conditions, the preference towards flat fees in the longer time-limit condition was marginally higher than that in the shorter time-limit condition (64% in longer vs. 51% in shorter, $\chi^2(1) =1.77$, $p=.182$) but this was not significantly different from the no-scope information conditions (interaction $\beta=0.286$, $z=0.629$, $p=.529$). As a result of the higher-expected value advantage of metered fees, managers choosing flat fees earned directionally less in the longer time-limit condition ($M_{Per-minute\ Fee} = \$2.23$, $M_{Flat\ Fee} = \$2.00$; $\Delta = -\$0.23$, $t(31)=1.17$, $p=.253$), but this loss was statistically similar to the loss in earnings in the shorter time-limit condition ($t(52)=1.06$, $p=.291$). In fact, the two-way interaction of time limits and completion-time information on bonuses earned was not significant ($\beta=0.137$, $t=0.73$, $p= .464$), suggesting, overall, the additional information regarding the scope of work did not attenuate the effect of longer time limit on flat fee choices. Therefore, we substantively replicated the main findings with participants who passed all the chart-comprehension questions.

Results with Only Managers Who Passed All the Recall Checks at the end of survey (Robustness Check 2):

All participants answered three questions at the end of the survey. The first two asked about the maximum time limit that the worker had in his/her case (5-minutes, 15-minutes, no time limit), and how this maximum time limit was selected for the worker (randomly, such that lesser skilled workers had more time). Finally, they were asked to indicate which one of the two statements was true: only workers who completed the task in the assigned time limit were available for hire or all workers were available for hire. In this section, we examine the key results of Study 5 only among participants who correctly answered all the three recall questions.

In total, 73% of the participants (N=399) correctly answered all the three recall questions. When no scope information was provided, managers were significantly more likely to choose the flat fee under the longer time limit (81%) than the shorter time-limit (66%; $\chi^2(1) = 4.83$, $p = .028$). Accordingly, managers who chose to pay a flat fee left more money on the table (based on realized profits after being matched to a random per-minute worker) which was directionally significant in the longer time limit

condition ($M_{\text{Per-minute Fee}}$ = \$2.24, $M_{\text{Flat Fee}}$ = \$2.00; Δ = -\$0.24, $t(18)$=1.33, p=.271; difference vs. shorter time limit: $t(54)$=1.25, p=.215).

In the scope information conditions, the biased preference towards flat fees in the longer time-limit condition attenuated (66% in longer vs. 63% in shorter, $\chi^2(1)$ <1), however, this was not significantly different from the no-scope information conditions (interaction β=0.652, z=1.46, p= .143). Indeed, even when scope information was provided, managers choosing flat fees earned significantly less in the longer time-limit condition ($M_{\text{Per-minute Fee}}$ = \$2.43, $M_{\text{Flat Fee}}$ = \$2.00; Δ = -\$0.43, $t(31)$=3.57, p=.001), although there were no difference in the shorter time-limit condition (p=.443). Therefore, providing information about scope did not arrest the loss in managers' earnings when time limits were longer compared to when lime limits were shorter ($t(65)$=3.16, p=.002). In fact, the two-way interaction of time limits and completion-time information on bonuses earned was not significant (β=0.190, t=0.95, p= .346). This suggests that overall the additional information regarding the scope of work did not attenuate the effect of longer time limit on flat fee choices. Therefore, the main results were substantively similar when we only included participants who passed all the end-of-survey recall questions.

Study 6

Regressions:

Table 30: Interaction of Choice Number (2 vs. 1) and Time Limit (15 vs. 5) in the Additional Scope Information Condition

	β	SE	z	p	
(Intercept)	0.07	0.23	0.30	.761	
Choice Number =2	-0.33	0.31	-1.06	.287	
Time Limit = 15 mins	1.26	0.37	3.43	<.001	***
Time = 15 mins * Choice 2	-1.61	0.48	-3.36	<.001	***

*** <.001, **<.01, *<.05

Table 31: Interaction of Choice Number (2 vs. 1) and Time Limit (15 vs. 5) in the No Scope Information Condition

	β	SE	z	p	
(Intercept)	-6.02	1.14	-5.29	<.001	***
Choice Number =2	-0.92	0.63	-1.44	0.149	
Time Limit = 15 mins	14.11	2.05	6.88	<.001	***
Time = 15 mins * Choice 2	-0.05	0.95	-0.05	0.960	

*** <.001, **<.01, *<.05

Table 32: Second Choice of Contracts controlling for First Choice and Interaction of Time Limit and Scope Information

	β	SE	z	p	
(Intercept)	-1.42	0.27	-5.30	<.001	***
First Choice	1.88	0.26	7.36	<.001	***
Time Limit = 15 mins	1.07	0.34	3.16	0.002	**
Scope Information = Yes	0.18	0.32	0.56	0.577	
Time = 15 mins * Scope = Yes	-1.88	0.46	-4.07	<.001	***

*** <.001, **<.01, *<.05

Potential Moderators:

Table 33: Does Gender moderate the relationship between Time Limit and Scope Information

	β	SE	z	p	
(Intercept)	-1.15	0.32	-3.61	<.001	***
First Choice	1.85	0.26	7.17	<.001	***
Time Limit = 15 mins	0.84	0.42	1.98	.048	*
Scope Information = Yes	-0.11	0.42	-0.26	.792	
Gender = Female	-0.66	0.49	-1.35	.177	
Time = 15 mins * Scope = Yes	-2.26	0.62	-3.66	<.001	***
Time = 15 mins * Female	0.60	0.71	0.85	.397	
Scope = Yes * Female	0.66	0.67	0.98	.329	
Time = 15 mins * Scope = Yes * Female	0.69	0.97	0.72	.473	

*** <.001, **<.01, *<.05

Table 34: Does Education moderate the relationship between Time Limit and Scope Information. Education was captured as one of seven options (1=Less than high school, 7=Doctorate). We used Education as a metric measure in this regression.

	β	SE	z	p	
(Intercept)	-1.59	0.85	-1.87	.061	
First Choice	1.96	0.26	7.44	<.001	***
Time Limit = 15 mins	1.19	1.26	0.95	.343	
Scope Information = Yes	-1.36	1.17	-1.16	.247	
Education	0.03	0.18	0.16	.875	
Time = 15 mins * Scope = Yes	0.27	1.70	0.16	.874	
Time = 15 mins * Education	-0.03	0.27	-0.11	.914	
Scope = Yes * Education	0.35	0.25	1.38	.166	
Time = 15 mins * Scope = Yes * Education	-0.49	0.37	-1.34	.180	

*** <.001, **<.01, *<.05

Table 35: Does Time Taken to Read Instructions moderate the relationship between Time Limit and Scope Information

	β	SE	z	p	
(Intercept)	-1.834	0.402	-4.56	<.001	***
First Choice	1.888	0.257	7.35	<.001	***
Time Limit = 15 mins	1.742	0.640	2.72	.006	**
Scope Information = Yes	0.569	0.605	0.94	.347	
Time Taken to Read	0.001	0.001	1.39	.166	
Time = 15 mins * Scope = Yes	-2.440	0.899	-2.71	.007	**
Time = 15 mins * Time to Read	-0.002	0.002	-1.23	.219	
Scope = Yes * Education	-0.001	0.002	-0.67	.501	
Time = 15 mins * Scope = Yes * Read Time	0.002	0.003	0.66	.509	

*** <.001, **<.01, *<.05

Table 36: Does Time Taken to Make the Second Contract Choice moderate the relationship between Time Limit and Scope Information

	β	SE	z	p	
(Intercept)	-1.89	0.39	-4.88	<.001	***
First Choice	1.92	0.26	7.33	<.001	***
Time Limit = 15 mins	2.08	0.55	3.76	<.001	***
Scope Information = Yes	0.99	0.47	2.11	.035	*
Time Taken to Choose	0.02	0.01	1.74	.081	
Time = 15 mins * Scope = Yes	-3.50	0.71	-4.94	<.001	***
Time = 15 mins * Time to Choose	-0.05	0.02	-2.35	.019	*
Scope = Yes * Education	-0.04	0.02	-2.33	.020	*
Time = 15 mins * Scope = Yes * Time to Ch	0.08	0.03	3.04	.002	**

*** <.001, **<.01, *<.05

In order to interpret this interaction, we looked as two separate interactions: one for the subset when additional scope information is absent, and one when it is present. Also, for the ease of predicting the probabilities from the logistic regression, we left out the First Choice covariate from the models. The results did not differ substantively when this covariate is included.

Table 36a: When additional scope information is not present:

	β	SE	z	p	
(Intercept)	-0.81	0.32	-2.52	.012	*
Time Limit = 15 mins	2.46	0.52	4.77	<.001	**
Time Taken to Choose	0.01	0.01	1.18	.240	
Time = 15 mins * Time to Ch	-0.05	0.02	-2.38	.017	*

*** <.001, **<.01, *<.05

Table 36b: When additional scope information is present:

|	β	SE	z	p	
(Intercept)	0.11	0.28	0.39	.699	
Time Limit = 15 mins	-0.81	0.40	-2.05	.040	*
Time Taken to Choose	-0.02	0.01	-1.54	.123	
Time = 15 mins * Time to Ch	0.03	0.01	1.86	.063	

*** <.001, **<.01, *<.05

Interpretation: When additional scope information was not present and the time taken to make the second choice was high (i.e., mean + 1SD), 45% of the Ps choose Flat Fee in the shorter time limit condition and 56% did so in the longer time limit condition. When the time taken to answer was low (i.e., mean – 1SD), the corresponding choices in the shorter and longer time limits were 30% and 85% respectively. So, the bias was exaggerated when the time taken to answer reduced.

When additional scope information was provided, there was a directional bias in favor of flat fees when the time limit was longer and when respondents took more time to answer (i.e., mean + 1SD): Shorter time limit: 35%, Longer time limit: 42%. However, when respondents answered quicker (i.e., mean – 1SD), they indicated a lower preference for flat fee in the longer time limit condition: Shorter time limit: 54%, Longer time limit: 33%.

Results with only managers who correctly recalled that all workers earned a flat payment (Robustness Check 1):

Below, we plot the choices of flat fees for the subset of managers who satisfied this condition (N=230). The figure indicates that the results reported in the manuscript are robust and held for this subset of participants.
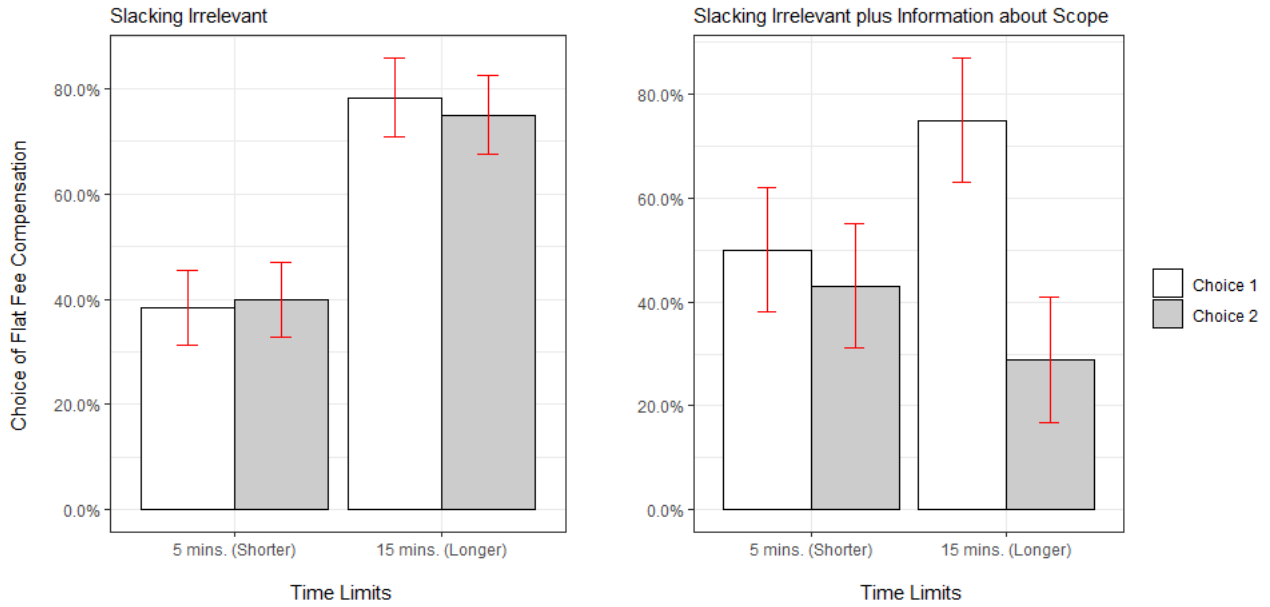
Results with only managers who correctly recalled that workers did not have a time limit (Robustness Check 2):

Below, we plot the choices of flat fees for the subset of managers who satisfied this condition (N=361). The figure indicates that the results reported in the manuscript are robust and held for this subset of participants.
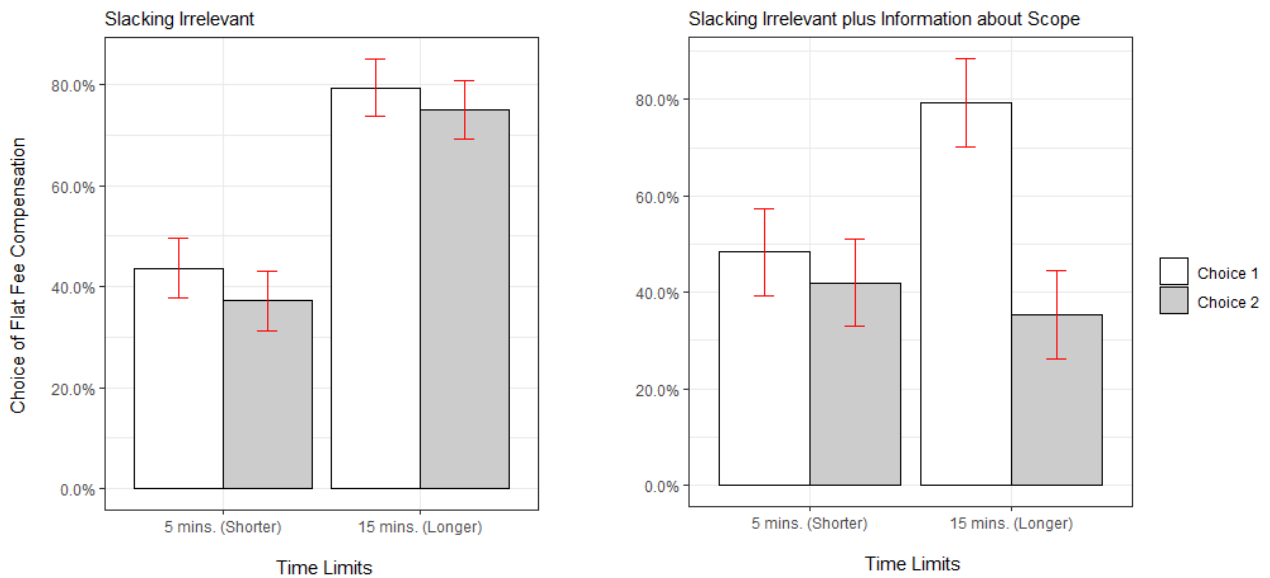
Online Appendix D: Additional Studies

Study A1: The Effect of Deadlines on Contract Choices and Earnings

Method

An adult online sample (N=171) recruited from Amazon Mechanical Turk played the role of managers. Managers were allotted a lump sum budget for getting a jigsaw puzzle completed, but they needed to "hire" and pay a worker to do the task for them. They could choose between hiring a per-minute worker or a flat-fee worker. When a manager opted for a flat-fee worker, the cost of hiring was fixed. However, if the manager opted for a per-minute worker, a real worker from phase 1 was randomly picked and paired with the manager, and the manager's cost of hiring the worker was based on the worker's actual time to complete the task. The remaining money, after deducting the cost of hiring from the allotted budget, was paid to the manager as their profit.

Managers were randomly assigned to one of the time-limit conditions (shorter=5 minutes vs. longer=15 minutes). We also varied whether the flat-rate contract included a "recruiting fee" or not (which was included to equalize the minimum potential earnings between choices of compensation schemes to address a potential confound). Thus, the study had a 2(time limit: shorter = 5 minutes vs. longer = 15 minutes) x 2(recruiting fee for flat-rate workers: present, absent) full-factorial design. Managers were informed that actual workers only did one task during the allotted time, and the workers were free to leave as soon as they completed the work. Managers were shown the exact puzzle interface instructions (including two pictures of the exact puzzle) that the workers had seen. Since the software only allowed correct solutions, managers also knew that there was only one way of completing the task and therefore the quality of the outcome could not vary with the type of compensation scheme chosen.

The cost of hiring workers (and the resulting potential profit) in each condition is shown below:

Time Limit	Terms	If Flat Fee Selected:		If Per-minute Fee Selected:	
		Cost of hiring worker	Profit earned by manager (fixed)	Cost of hiring worker	Profit earned by manager (variable)
No Recruiting Fee Conditions:					
5 minutes (shorter time limit)	Budget = $2; Flat Fee = $1; Per-Unit-Time rate = $0.25/min	$1	$1	25¢ per minute worked	$0.75 to $1.75
15 minutes (longer time limit)	Budget = $4; Flat Fee = $1.50; Per-Unit-Time rate = $0.25/min	$1.50	$2.50		$0.25 to $3.75
Recruiting Fee Conditions:					
5 minutes (shorter time limit)	Budget = $2.10; Flat Fee = $1.10 (including $.10 recruiting fee); Per-Unit-Time rate = $0.25/min	$1.10	$1	25¢ per minute worked	$0.85 to $1.85
15 minutes (longer time limit)	Budget = $4.60; Flat Fee = $2.10 (including $.60 recruiting fee); Per-Unit-Time rate = $0.25/min	$2.10	$2.50		$0.85 to $4.35

The total budget available to the managers was either $2.00 (shorter time limit) or $4.00 (longer time limit). The cost of hiring a worker with a per-minute plan was the same in all four conditions: 25 cents per minute, rounded up to the nearest minute, for the time taken by the worker to solve the puzzle. Therefore, the total cost of hiring a per-minute worker ranged from $0.25 to $1.25 in the shorter time-limit condition, and from $0.25 to $3.75 in the longer time-limit condition.

The cost of hiring a flat-fee worker varied by condition. In the two no-recruiting-fee conditions, the cost for hiring a flat fee worker was either $1.50 (longer time limit) or $1 (shorter time limit). Thus, managers in these conditions faced a tradeoff between a known fixed amount of profit if they chose the flat fee, or an unknown variable profit if they chose the per-minute fee. The profit from paying per-minute compensation could be either higher or lower than that from paying a flat fee, depending on how long the per-minute worker took to complete the task.

In the no-recruiting-fee conditions, the minimum potential earning from per-minute compensation was less in the longer time-limit condition than in the shorter time-limit condition ($0.25 vs. $0.75). This introduces a "worst-case-scenario" confound, which was addressed in the recruiting-fee conditions. In the recruiting-fee conditions, the budgets were increased to either $2.10 (shorter time limit) or $4.60 (longer

time limit), and either a $0.60 (longer time limit) or $0.10 (shorter time limit) recruiting fee for flat fee workers was added. As a result, the minimum profit from hiring a per-minute worker was the same for both longer and shorter time limits (85 cents) in the recruiting fee conditions.

To ensure comprehension of their hiring options, managers were prompted to re-enter three crucial pieces of information before indicating their choice: the total time limit available, the total cost of hiring a flat fee worker, and the cost per minute of hiring a per-minute worker. Managers then indicated whether they chose to pay flat fee or per minute compensation. After choosing, all managers (irrespective of the hiring option chosen) estimated the worker's completion time, both under the option they had chosen, as well as under the unchosen alternative compensation scheme.

After these questions, managers were presented with a hypothetical choice between a sure amount (equal to their profit from choosing the flat-fee option) and a gamble which, unbeknownst to them, was constructed from the actual time taken by workers in order to match the actual distribution of profits under the per-minute compensation. Lastly, they answered a few questions measuring risk attitude, cognitive ability, and knowledge of jigsaw puzzles.

Results

We found no main effects of the recruiting fee manipulation and the manipulation did not interact with any other factors. Therefore, we conclude that hiring-option choices were not sensitive to the worst-case per-minute cost, and we collapsed across these conditions in the remaining analyses.

Based on the actual completion times of workers paid per-minute in phase 1, unknown to the managers, the expected value of managers' earnings was significantly higher for choosing per-minute compensation than the fixed earnings from flat fee compensation, in both the shorter time-limit ($M_{\text{Per-minute Fee}}$ = $1.21 vs. $1.00 flat fee; Δ = $0.21; $t(27)=3.84$, $p<.001$) and the longer time-limit conditions ($M_{\text{Per-minute Fee}}$ = $3.27 vs. $2.50 flat fee; Δ = 0.77, $t(26)=5.58$, $p<.001$)[1]. Furthermore, the expected advantage of per-

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[1] These calculations are based on averaging bonuses from both the two possible budgets (with and without recruitment fee) for a particular time limit.

minute compensation was significantly higher in the longer time-limit condition (t(53)=3.82, p<.001). Thus, well-calibrated managers would be expected to choose to pay per-minute compensation, particularly in the longer time-limit condition.

Nevertheless, close to three-fourth of the managers (71%), chose the lower expected-value flat fee compensation. In particular, even though the expected payoff disadvantage of choosing the flat fee was higher in the longer time-limit condition, managers were more likely to choose the flat fee under the longer time-limit (89%) than the shorter time-limit (51%), a highly significant difference ($\chi 2$(1) = 30.18, p < .001).

Given that managers were less likely to choose the optimal per-minute option in the longer time-limit condition, they actually left significantly more money on the table (based on realized profits after being matched to a random per-minute worker) in the longer time-limit condition ($M_{\text{Per-minute Fee}}$ = $3.74, $M_{\text{Flat Fee}}$ = $2.50; Δ = -$1.24, t(9)=9.26, p<.001), compared to the shorter time-limit condition ($M_{\text{Per-minute Fee}}$ = $1.18, $M_{\text{Flat Fee}}$ = $1.00; Δ = -$0.18; t(39)=4.08, p<.001); difference t(48)=9.52, p<.001).

The suboptimal compensation scheme choices are largely explained by the managers' estimates of completion time. Managers who chose to pay a flat fee estimated a longer completion time for per-minute workers both in the shorter ($M_{\text{Chose Flat Fee}}$ = 4.41 vs. $M_{\text{Chose Per-minute Fee}}$ =3.26; t(79)=6.17, p<.001) and longer time-limit conditions ($M_{\text{Chose Flat Fee}}$ = 12.86 vs. $M_{\text{Chose Per-minute Fee}}$ =5.45; t(88)=6.79, p<.001), but more so when the external time limits were longer (F(1,167)=41.05, p<.001). In particular, the managers who chose flat fees overestimated the expected time per-minute workers would take, compared to the actual time taken (shorter time limit: 4.41 vs. 2.81, t(67)=6.11, p<.001; longer time limit: 12.86 vs. 3.59, t(105)=13.27, p<.001).

In fact, managers' choices were largely rationalized by their estimates of workers' completion times. Most participants chose the option that would have provided a higher profit had their time estimates been correct (84% in the shorter time condition; 91% in the longer time condition). Furthermore, controlling for managers' estimates of the time taken by per-minute workers, the effect of

time limits on compensation scheme choices was no longer significant. The estimated time for per-minute workers completely mediated the effect of deadlines on managers' compensation scheme choices (indirect effect bootstrapped 95% CI= $[0.39, 0.76]$). This provides further confirmation that managers' choices under different time limits were driven by their biased beliefs about task completion times.

Managers were less likely to choose the risk-free option in the gamble than the equivalent flat fee in both the time-limit conditions. In the shorter time-limit condition, managers were somewhat less likely to opt for the certain amount in the risky choice than to select the equivalent flat fee in the compensation scheme choice (37% vs.51%; McNemar's $\chi2(1) = 4.17, p=.041$). In the longer time-limit condition, managers were much less likely to choose the certain amount than to make the equivalent choice of the flat fee (61% vs. 89%; $\chi2(1) = 21.55, p<.001$). A logit model confirmed that managers' stronger preference for flat fees under the longer time limit than the shorter time limit still held ($\beta=1.89, z=4.51$, $p<.001$) controlling for measured risk preferences (e.g., the equivalent gamble chosen; $\beta =1.51, z=3.64$, $p<.001$). This suggests that the hiring-choice findings are not explained by managers' general risk aversion when facing a choice between certain and variable outcomes.

The preference for flat fees in the longer time limit condition was not moderated by time spent reading instructions, time spent making contract choices, time spent making equivalent gamble choices, depth of processing as measured using CRT, self-reported knowledge about jigsaw puzzles, and self-reported frequency of playing jigsaw puzzles.

Sensitivity of Relative Costs of Flat vs. Per-minute Fees on Managers' Choices:

We investigate a boundary condition that moderates managers' choice of flat fees in the longer time-limit condition. In an additional pair of conditions (n=83), we tested a flat fee of $3.00 (i.e. doubling the cost of hiring flat fee workers) in the longer time-limit condition (with and without the additional $0.60 recruiting fee), and found that only 29% of managers chose the flat fee, significantly less than the 89% reported above when the flat fee was lower ($\chi^2(1) = 64.77, p<.001$). In fact, comparing the choice of

these costly flat fees in the longer time-limit condition with the choice of the regular-priced flat fees in the shorter time-limit condition (i.e., $1 with and without the additional recruitment fee), we find that managers chose the costly flat fees significantly less in the longer time-limit condition (29% in longer time limit vs. 51% in shorter time limit, $\chi^2(1) = 8.07$, $p=.004$) therefore essentially reversing the reported bias. This suggests that managers' choices were not based on a generalized preference for flat fee, but were instead based on approximately maximizing payoffs, conditional on their biased time estimates. Once the cost-disparity was high enough that the flat fee was less profitable even under their biased time estimates, managers showed a preference for per-minute compensation schemes.

Study A2: The Effect of Deadlines on Multiple-worker Compensation Scheme Choices

Instructions used in Study A1 (15 minutes condition is shown)

Method

THE EMPLOYER GAME

In this survey, you will play a game, from which you can get REAL monetary rewards, based on your decisions. In the game, you are an employer making choices about how to compensate workers.

In the game, your "company" would be paid $4.00 for each completed jigsaw puzzle. **The company will hire 50 workers and each worker will separately work to solve the same puzzle.**

From that $4.00, however, you need to deduct the cost of having the worker complete the puzzle for you. **The remaining money, after paying for the workers, will be company's profit. TWO percent (2%) of this profit will be yours to keep as a performance bonus, and you will receive that money for real via Mechanical Turk, after the study is over.**

Online adult survey participants (N=146) recruited from Amazon Mechanical Turk participated as managers in a consequential economic game, using the same 2 (time limit: shorter = 5 minutes vs. longer = 15 minutes) x 2 (recruiting fee for flat-rate workers: present, absent) full-factorial design and phase 1 worker data as in Study 1a. However, unlike Study 1a, managers were told that they were hiring 50 workers, all under the same terms, and that the manager would receive 2% of the profit that remained after paying the workers.

Results

The results when choosing compensation schemes for hiring 50 workers replicated the Study 1a findings for hiring a single worker. Overall, the majority of managers (67%) chose the lower expected-profit flat fee. Managers were particularly likely to choose the flat fee in the longer time-limit condition, compared to those in the shorter time-limit condition (86% vs. 49%, $\chi^2(1) = 22.12$, $p<.001$), even though the expected profit advantage of the per-minute fee, taking into account the workers' actual performance, was significantly higher in the longer time-limit condition ($\Delta_{\text{Longer time limit}} = \$0.90$, $\Delta_{\text{Shorter time limit}} = \$0.35$; interaction bootstrapped $p < .001$). Consequently, managers left significantly more money on the table in

their actual earnings (based on randomly matching 50 workers' actual times to finish the task) when time limits were longer ($\Delta_{\text{Longer time limit}}$ = -$1.15, $\Delta_{\text{Shorter time limit}}$ = -$0.35; $t(46)$= 22.76, p<.001).

As in Study 1a, managers who chose a flat fee estimated a longer completion time for per-minute workers for shorter time limits ($M_{\text{Chose Flat Fee}}$ = 4.54 vs. $M_{\text{Chose Per-minute Fee}}$ =3.36; $t(72)$=5.73, p<.001) and even more so for longer time limits ($M_{\text{Chose Flat Fee}}$ = 12.13 vs. $M_{\text{Chose Per-minute Fee}}$ =6.40; $t(69)$=5.34, p<.001; difference $F(1,141)$=23.28, p<.001). Most participants chose the option that would have been more profitable based on their time estimate (84% in the shorter time condition; 87% in the longer time condition), and the estimated time for per-minute workers mediated the effect of deadlines on compensation scheme choice (indirect effect bootstrapped 95% CI= [0.45, 0.67]). We also find, as in the prior study, that measured general risk aversion does not explain the results.

The results of this study generalizes the results of Study 1a to compensation scheme choices for hiring multiple workers and thus provides further evidence that the biased preference for flat fees is driven by a deadline-induced time misestimation process rather than by risk preferences.

Study A3: Compensation Scheme Choices for a Fixed-Quality Task by Experienced Managers

Method

We conducted a brief survey with MBA students (N=92) at a large mid-western university, who all had at least some managerial experience (4.76 average years of work experience, 63% with hiring experience).

As in Study 1a, managers played a consequential hiring game based on the Study 1a workers, choosing between a flat fee and a per-minute fee to hire multiple workers (all under the same scheme) under either the 5 minute or 15 minute time limit (between-subjects). The costs were the same as in the no-recruiting-fee condition of Study 1a: $1.50 (longer time-limit condition) or $1 (shorter time-limit condition) for flat fees; 25 cents per minute for a per-minute fee.

In this study, managers could earn a lump sum ($2 in the shorter time-limit condition, and $4 in the longer time-limit condition) for each completed jigsaw puzzle. Managers had a chance to receive the total profit earned after paying all the workers (50 workers in the shorter time-limit condition; 20 workers in the longer time-limit condition) in the form of an Amazon gift card (given to 5 students based on a lottery). Different numbers of workers were used in the different time-limit conditions to make sure that the profit earned using the flat fee ($50) was the same in the two experimental conditions[2].

Results

Based on the Study 1a workers' times, the flat fee had lower expected profit, both in the shorter time-limit ($M_{\text{Per-minute Fee}} = \$64.84$, $M_{\text{Flat Fee}} = \$50.00$; $\Delta = -\$14.84$; bootstrapped $p < .001$ [3]), and in the longer time-limit condition ($M_{\text{Per-minute Fee}} = \$62.07$, $M_{\text{Flat Fee}} = \$50.00$; $\Delta = -\$12.07$; bootstrapped $p < .001$). There was no significant difference in the expected-profit advantage of the per-minute fee, between the longer and shorter time-limit conditions (interaction bootstrapped $p > .250$).

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[2] 5 minutes: 50*($2-$1) = $50; 15 minutes: 20*($4-$1.50) =$50.
[3] See Online Appendix C (Additional Analysis for Study 1b) for details about the bootstrapping process

Nevertheless, we replicated the preference for flat fees under longer time limits with experienced managers. Like in previous studies, managers showed a higher preference for the lower expected-profit flat fee (overall, 64%), more so when time limits were longer (77% vs. 52%; $\chi^2(1) = 5.44$, $p = .019$).

Like lay participants playing the role of managers, participants with managerial experience who chose a flat fee also estimated a longer completion time under per-minute fee (Shorter Time Limit: $M_{\text{Chose Flat Fee}} = 4.39$ vs. $M_{\text{Chose Per-minute Fee}} = 3.32$; $t(41) = 4.75$, $p < .001$; Longer Time Limit: $M_{\text{Chose Flat Fee}} = 11.67$ vs. $M_{\text{Chose Per-minute Fee}} = 6.61$; $t(37) = 3.69$, $p < .001$; difference $F(1,78) = 10.42$, $p = .002$). Most managers chose the option that maximized the expected payoffs based on their own time estimates (91% in the shorter time-limit condition, 89% in the longer time-limit condition). As in the previous studies, the estimated time for per-minute workers mediated the effect of deadlines on compensation scheme choices (indirect effect bootstrapped 95% CI= [0.30, 0.64]).

The experienced managers' choices were not explained by risk aversion, as managers were less likely to choose the certain amount in the risky choice than to select the equivalent flat fee in the longer time-limit (43% vs. 77%; McNemar's $\chi^2(1) = 9.80$, $p = .002$) condition. Likewise, fewer experienced managers in the shorter time-limit condition chose the fixed amount, compared to the equivalent flat fee (28% vs. 52% vs.; McNemar's $\chi^2(1) = 7.14$, $p = .008$). Years of job experience, first-hand experience with hiring or compensation decisions, measured risk aversion, and gender did not moderate these results.

Study A4: Online Managers Hiring Workers for Spelling Task

Method

We ran a replication of Study 2 with online managers (N=185) randomly assigned to hiring workers for either easy or difficult proofreading tasks. The study used results from the same workers as in Study 2 and the information provided to managers was similar. However, the payoff structure and costs were different from Study 2, and are shown below:

Time Limit	Task Difficulty	Budget	Cost of hiring worker	
			Flat Fee Selected	Per-min. Fee Selected
15 mins. (longer time)	Easy	Lump sum: $3.00	$1.50 plus 50c recruitment fee	
		Variable: 10c for every correct		
15 mins. (longer time)	Difficult	spelling (24 words in total)	$1.50 plus 30c recruitment fee	25c per minute worked
5 mins. (shorter time)	Easy	Lump sum: $0.50		
		Variable: 10c for every correct	$1.00 plus 10c recruitment fee	
5 mins. (shorter time)	Difficult	spelling (24 words in total)		

There was an expected profit advantage of choosing per-minute fees in the longer time-limit condition over those in the shorter time limit for difficult tasks (Shorter: $M_{\text{Per-minute Fee}}$ = $1.41 vs. $1.23 flat fee, $t(20)$=0.89, p=.383; Longer: $M_{\text{Per-minute Fee}}$ = $3.72 vs. $2.76 flat fee, $t(19)$=2.95, p=.008; difference $F(1,39)$=4.19, p=.047). Likewise, for easy tasks, there was an expected profit advantage of choosing per-minute workers in both shorter ($M_{\text{Per-minute Fee}}$ = $2.32 vs. $1.77 flat fee, $t(19)$=6.07, p<.001) and longer time limits ($M_{\text{Per-minute Fee}}$ = $4.19 vs. $3.26 flat fee, $t(27)$=3.06, p=.005; difference $F(1,46)$=1.00, p=.322).

Results

Managers were more likely to choose the flat fee in the longer time-limit condition than in the shorter time-limit condition (79% vs. 55%, $\chi^2(1)$ =12.57, p<.001). The preference for flat fees in the longer time-limit condition held when the task was easy (76% vs. 48%, $\chi^2(1)$ =7.39, p=.007), as well as

when the task was difficult (83% vs. 62%; $\chi^2(1) =5.32$, $p=.021$). There was no significant difference in the preference for flat fees under longer time limits based on task difficulty ($\beta = 0.108$, $p=.872$).

For easy tasks, like in previous studies, managers who chose flat fees earned significantly lower profits, both in the shorter time-limit condition ($M_{Per-minute\ Fee} = \$2.29$, $M_{Flat\ Fee} = \$1.76$; $\Delta = \$0.53$; $t(44)=7.27$, $p<.001$), and even more so in the longer time-limit condition ($M_{Per-minute\ Fee} = \$4.29$, $M_{Flat\ Fee} = \$3.30$; $\Delta = \$0.99$, $t(43)=5.90$, $p=.444$; difference $F(1,87)=7.05$, $p=.009$). With difficult tasks, the profits earned by the managers on account of choosing flat fees was directionally smaller in the shorter time-limit condition ($M_{Per-minute\ Fee} = \$1.49$ $M_{Flat\ Fee} = \$1.40$; $\Delta = \$0.09$; $t(45)<1$, $p=.443$), but significantly so in the longer time-limit condition ($M_{Per-minute\ Fee} = \$3.51$, $M_{Flat\ Fee} = \$2.85$; $\Delta = \$0.66$, $t(45)=2.95$, $p=.005$; $F(1,90)=5.59$, $p=.020$).

Consistent with the previous studies, across task types, after the managers indicated their choice of compensation scheme for the given time limit, those who choose a flat fee estimated a longer completion time for workers under per-minute fee for shorter limits ($M_{Chose\ Flat\ Fee} = 4.76$ vs. $M_{Chose\ Per-minute\ Fee} =4.03$; $t(91)=4.85$, $p<.001$) and even more so for longer time limits ($M_{Chose\ Flat\ Fee} = 13.97$ vs. $M_{Chose\ Per-minute\ Fee} =7.53$; $t(90)=11.49$, $p<.001$; difference $F(1,181)=113.72$, $p<.001$). Most managers' choices were consistent with selecting the option that provided the higher payoff based on their own time estimates (73% in the shorter time-limit condition, 93% in the longer time-limit condition). Finally, as in the previous studies, the estimated time for per-minute workers mediated the effect of deadlines on choices (indirect effect bootstrapped 95% CI= [.55, .70]).

Across task types, there were no significant differences in the estimated accuracy of per-minute workers between those managers who chose per-minute fees versus flat fees for both shorter ($M_{Chose\ Per-minute\ Fee} =19.50$ vs. $M_{Chose\ Flat\ Fee} = 18.47$; $t(91)=1.11$, $p=.268$) and longer time limits ($M_{Chose\ Per-minute\ Fee} =20.79$ vs. $M_{Chose\ Flat\ Fee} =19.73$; $t(90)=1.01$, $p=.314$; difference $F(1,181)<1$, $p=.981$). The results are similar if we look at easy and difficult proofreading tasks separately.

Managers' choices were also not explained by risk aversion, as managers were more likely to choose the certain option equivalent to the flat fee over the gamble equivalent to the per-minute fee, in the longer time-limit condition (79% vs. 36%, McNemar's $\chi^2(1) =30.76$, $p<.001$). There was similar difference in the shorter time-limit condition as well (55% vs. 16%, McNemar's $\chi^2(1) =27.00$, $p<.001$). The results were similar for both easy and difficult proofreading tasks. Time spent to read instructions ($p=.827$), to make choices ($p=.957$), knowledge of proofreading ($p=.245$) and experience with proofreading tasks ($p=.498$) did not moderate the results.

We replicated the managers' findings of Study 2. This suggests that our results are robust to using various payment and cost structures for hiring temporary workers.

Study A5: Online Managers Hiring Workers for Spelling Task without Workers' Accuracy Information

Method

Mturk participants (N=189), acting as managers, hired either a per-minute worker or a flat fee worker to get a proofreading task (easy vs difficult, varied between subjects) done under a certain time limit (shorter vs. longer, varied between subjects). Managers' payoffs and costs were the same as that used in Study A4. The only difference between this study and Study A4 was that the managers were *not* provided with workers' accuracy information for the proofreading words, as shown below:

Easy Proofreading Words   Difficult Proofreading Words

1) didn't	9) somtimes	17) asked
2) arround	10) prety	18) because
3) allways	11) animals	19) wile
4) tride	12) recieved	20) intresting
5) finaly	13) boght	21) again
6) meny	14) mony	22) once
7) people	15) when	23) untill
8) children	16) said	24) thought

1) embarrass	9) innoculate	17) resteraunt
2) bellweather	10) harass	18) existance
3) discipline	11) imediate	19) guage
4) twelfth	12) questionnaire	20) playwright
5) miniture	13) noticeable	21) believe
6) memento	14) concensus	22) personell
7) medeval	15) reference	23) conscience
8) firey	16) amature	24) foreign

Results

Overall, managers were little more likely to choose the flat fee in the longer time-limit condition than in the shorter time-limit condition (79% vs. 60%, $\chi^2(1)$ =7.79, p=.005). The results were similar for easy tasks (81% vs. 64%, $\chi^2(1)$ =3.45, p=.063), as well as when the proofreading task was difficult (76% vs. 56%; $\chi^2(1)$ =4.55, p=.033). In fact, there were no difference in the choices of compensation schemes for different time limits between easy and difficult tasks (logistic regression interaction β= -0.019, p=.976).

For easy tasks, like in the other previous studies, managers who chose flat fees earned significantly lower profits, both in the shorter time-limit condition ($M_{\text{Per-minute Fee}}$ = $2.35, $M_{\text{Flat Fee}}$ = $1.76; Δ = $0.59; $t(45)$=10.24, p<.001), and even more so in the longer time-limit condition ($M_{\text{Per-minute Fee}}$ = $4.63, $M_{\text{Flat Fee}}$ = $3.30; Δ = $1.33, $t(41)$=16.19, p=.444; difference $F(1,86)$=56.20, p<.001). With difficult

tasks, the profits earned by the managers on account of choosing flat fees was not different in the shorter time-limit condition ($M_{Per-minute Fee}$ = \$1.23 $M_{Flat Fee}$ = \$1.25; Δ = - \$0.02; $t(46)<1$, $p=.867$), but earned significantly lower profits on account of choosing flat fees in the longer time-limit condition ($M_{Per-minute Fee}$ = \$3.86, $M_{Flat Fee}$ = \$2.81; Δ = \$1.05, $t(49)=5.44$, $p<.001$; $F(1,95)=20.80$, $p<.001$).

Consistent with the previous studies, across task types, after the managers indicated their choice of compensation scheme for the given time limit, those who choose a flat fee estimated a longer completion time for workers under per-minute fee for shorter limits ($M_{Chose Flat Fee}$ = 4.86 vs. $M_{Chose Per-minute Fee}$ =3.89; $t(93)=6.66$, $p<.001$) and even more so for longer time limits ($M_{Chose Flat Fee}$ = 13.91 vs. $M_{Chose Per-minute Fee}$ =8.55; $t(92)=8.15$, $p<.001$; difference $F(1,185)=49.39$, $p<.001$). Most managers' choices were consistent with the maximizing expected payoffs condition on their own time estimates (84% in the shorter time-limit condition, 87% in the longer time-limit condition). Finally, as in the previous studies, the estimated time for per-minute workers mediated the effect of deadlines on choices (indirect effect bootstrapped 95% CI= [0.46, 0.66]).

After the managers indicated their hiring preference, they also indicated their beliefs about workers' accuracy – both for the type they selected as well as for the one they did not select.   Across task types, there were no significant differences in the estimated accuracy of per-minute workers between those managers who chose per-minute fees versus flat fees for both shorter ($M_{Chose Per-minute Fee}$ =20.29 vs. $M_{Chose Flat Fee}$ = 19.49; $t(93)=1.03$, $p=.303$) and longer time limits ($M_{Chose Per-minute Fee}$ =20.20 vs. $M_{Chose Flat Fee}$ =20.74; $t(92)<1$, $p=.599$; difference $F(1,185)=1.07$, $p=.294$). The results are similar if we look at easy and difficult proofreading tasks separately.

The experienced managers' choices were not explained by risk aversion, as managers were more likely to choose the flat fee than the certain outcome in the equivalent gamble in the longer time limit (79% vs. 29%, McNemar's $\chi^2(1)$ =40.16, $p<.001$). There was similar difference in the shorter time-limit condition as well (60% vs. 21%, McNemar's $\chi^2(1)$ =27.94, $p<.001$). The results were similar for both

easy and difficult proofreading tasks. Time spent to read instructions (p=.666) or make choices (p =.829), knowledge of (p =.196) or experience with (p =.315) proofreading tasks did not moderate the results.

Therefore, the results replicated prior findings even when managers did not have information about workers' success rate for the proofreading task. This suggests that providing workers' accuracy information did not change the nature of the qualitative task for the managers. Managers continued to show a preference for flat fees when their profits were dependent on the quality of the final output, even when that quality was more difficult to judge, as in this study.

Study A6: Compensation Scheme Choices for a Variable-Quality Task by Experienced Managers

Method

We recruited MBA students of a large mid-western university (N=62), who all had prior managerial experience. About half (52%) had prior experience specifically in making hiring or compensation decisions. The methods were similar to the "difficult proofreading task" managers' choice conditions (varying shorter vs. longer time limits) in Study 2, except that the incentives were probabilistic. Participants had a chance to receive twenty times the money remaining after paying the worker, in the form of an Amazon gift card (given to three participants, who were chosen by lottery).

The managers' budget and costs were structured based on the performance of the workers in phase 1, such that, like in Study 2, there was an expected advantage of around 30 cents from choosing per-minute (vs. flat fee) compensation schemes in the longer time-limit condition. Managers' potential revenue and costs are shown in the table below:

Time Limit	Task Difficulty	Budget	Cost of hiring worker	
			Flat Fee Selected	**Per-min. Fee Selected**
15 mins. (longer time limit)	Difficult	Lump sum: $3.00 Variable: 10¢ for every correct spelling (24 words in total)	$1.50 plus 30¢ recruitment fee	25¢ per minute worked
5 mins. (shorter time limit)	Difficult	Lump sum: $0.50 Variable: 10¢ for every correct spelling (24 words in total)	$1.00 plus 10¢ recruitment fee	

Results

Based on workers' performance, the expected profits were directionally higher for the per-minute fee (vs. flat fee) option in the shorter time-limit condition ($M_{Per-minute Fee}$ = $1.41 vs. $M_{Flat Fee}$ = $1.23, $t(20)$=0.89, p=.383), but were significantly higher for the per-minute fee (vs. flat fee) option in the longer

time-limit condition ($M_{\text{Per-minute Fee}}$ = \$3.72 vs. $M_{\text{Flat Fee}}$ = \$2.76, $t(19)$=2.95, p=.008). As in Study 2, the expected profit advantage of the flat fee was higher under the longer time limit (interaction $F(1,39)$=4.19, p=.047).

However, many experienced managers chose the flat fee, particularly when time limits were longer (85% vs. 51%; $\chi^2(1)$ = 7.75, p=.005), consistent with the findings in Study 2. Experienced managers' preference for flat fees was driven by their beliefs about the time workers would take. Managers who chose a flat fee estimated a longer completion time for workers under the per-minute fee both for shorter ($M_{\text{Chose Flat Fee}}$ = 4.71 vs. $M_{\text{Chose Per-minute Fee}}$ =3.80; $t(33)$=3.09, p=.004) and longer ($M_{\text{Chose Flat Fee}}$ = 12.89 vs. $M_{\text{Chose Per-minute Fee}}$ =7.00; $t(24)$=2.68, p=.013) time-limit conditions, but significantly more so when the time limits were longer ($F(1,57)$=8.34, p=.005). Most managers chose the option that maximized their payoffs based on their own time estimates (83% in the shorter time-limit condition, 85% in the longer time-limit condition). Indeed, as in the previous studies, managers' estimated time for per-minute workers mediated the effect of deadlines on their choices (indirect effect bootstrapped 95% CI= [0.13, 0.64]).

As in the prior studies, the preference for flat fees under longer time limits was not explained by risk aversion. Experienced managers were less likely to select the less risky option in the gamble choice than the equivalent flat fee in the longer time limit (15% vs. 85%; McNemar's $\chi^2(1)$=19.00, p<.001) as well as in the shorter time-limit conditions (6% vs. 51%; McNemar's $\chi^2(1)$=16.00, p<.001). The results did not differ based on whether managers had prior experience in making specifically hiring and compensation decisions or not.

We generalized the effect of time limits on choices to situations in which experienced managers have an incentive to maintain quality, not just cut costs. Managers remained biased towards flat fees, particularly under longer time limits, due to their overestimation of the time workers would take. This bias resulted in suboptimal choices by the experienced managers, as in the previous studies.

Study A7: Hypothetical Choice of Compensation Schemes for both Time Limits

Method

The design was very similar to Study 3. Online participants (N=179) played the role of managers. Managers were shown hiring game scenarios and decided which compensation to use for hiring a worker to complete a simple math task. Managers made two hiring decisions for two different tasks, one for each worker time limit (5 vs. 15 minutes; manipulated within-subjects, counterbalanced). The same two math tasks (assignment to time limits counter-balanced) as in Study 3 were used, and the terms of the hiring were also the same. Managers were informed that the game would only be played once and they would not need to build a long-term relationship with the hired worker. Finally, managers were also told that workers only knew about their own hiring terms (i.e., time limit and flat fee or per-minute fee) before starting their work.

After making compensation choices for both time limits, managers answered a series of follow-up questions on 7-point bipolar scales indicating for which of the two tasks the workers took more time to complete, worked harder, did a more thorough job, invested more effort to get the right answer, worked slow intentionally, delayed completion to make more money, found more interesting and enjoyable, and inspired a higher achievement motivation. After the managers answered these questions, they were asked to choose a statement that reflected what influenced their compensation scheme choice the most. The question was asked separately for each of the two tasks (assigned to different time limits). The options were: the possibility that the worker would intentionally delay completion to earn more, the possibility that the worker would work slowly to do a thorough job, the possibility that the worker would find it difficult and need to take their time to get it right, the possibility that the worker would rush to complete it, and none of these. Details of both the tasks (e.g., time limits, revenue, cost of flat fee and per-minute fee) were displayed on the same screen as the follow-up questions. Finally, managers also answered a 7-item empathy scale that captured individual differences in perspective taking (Davis, 1983).

Results

Estimates from a hierarchical regression strongly replicated the effect of external time limits on compensation decisions. More participants (84%) preferred the flat fee in the longer time-limit condition than in the shorter time-limit condition (61%; $\beta = 1.17$, $z = 4.37$, $p<.001$). The results were not moderated by the order of time limits or by the order of the two math tasks used in the study. Mid-point tests revealed that managers perceived the two tasks differently. Managers strongly believed that workers would require more time to complete the 15-minute deadline task than the 5-minute deadline task ($M=+1.25$, $t(178) = 10.73$, $p<.001$), a belief consistent with the time mis-estimation results in the prior studies. Thus, we replicate the prior findings in a within-subjects study, even when managers evaluated both time limits in the same study and did not make numerical estimates of the time taken before making choices. This again suggests that biased compensation scheme choices on facing longer deadlines is unlikely to be because of implicit anchoring on time limits.

Managers were more concerned about workers slacking in the 15-minute condition. They thought that in the 15-minute task workers would be more likely to intentionally work slower and take longer than necessary ($M=+ 1.05$, $t(178) = 8.26$, $p<.001$), and delay completion to make more money ($M=+ 0.78$, $t(178) = 5.82$, $p<.001$). Indeed, when asked to indicate which factor was most important to make compensation choice decisions, a significantly larger portion of managers indicated a concern for workers' intentionally delaying completion to earn more in the longer compared to the shorter time-limit condition (44% vs. 27%, McNemar's $\chi^2(1) = 16.49$, $p<.001$).

Managers thought workers worked harder ($M= -0.36$, $t(178) = 2.63$, $p=.009$) and invested more effort ($M= -0.26$, $t(178) = 2.12$, $p=.035$) when the time limits were shorter, but did a more thorough job when time limits were longer ($M= +0.61$, $t(178) = 4.91$, $p<.001$). Consistent with this, a significantly higher proportion of judges in the shorter time-limit condition indicated that the possibility that workers would feel rushed to complete the task affected their decision (21% vs 10% in longer time limit; McNemar's $\chi^2(1) = 8.80$, $p<.001$). Therefore, as such, workers self-reports indicated mixed feelings about task scope as a function of external time limits.

There was no difference in managers' judgments of workers' intrinsic motivation (M= +0.08, t(178) <1) as a function of time limits. Managers also felt that workers would be directionally more motivated to achieve in the shorter time limit condition (M= -0.21, t(178) =1.62, p=.106). Finally, individual differences in perspective taking did not moderate the effect of time limits on compensation scheme choices in a hierarchical regression model (p= 0.426).

Study A8: Choice for both Time Limits with Extra Questions to Probe Task-Scope Beliefs

Method

The design was very similar to Study 3 and A7, but we used a larger sample size (N=398) to make sure we have enough power to detect differences in self-reports. After making compensation choices for both time limits, managers answered the same follow-up questions as Study A7, including a 7-item empathy scale that captured individual differences in perspective taking.

In addition to the above questions, managers were prompted to think about a new scenario involving the same tasks they saw earlier, but where workers *did not have* any time limits. Using a similar 7-point bipolar scale, managers were asked to indicate which of the two tasks (i.e., the task they saw associated with a shorter or with a longer time limit) the workers would take longer to complete, would find more difficult, and would invest more effort to complete. These three questions were included to investigate how external time limit affect beliefs about task scope. All judges were required to confirm (using customized validation) that the new scenario involved no time limits before answering these three questions.

Results

Estimates from a hierarchical regression strongly replicated the effect of external time limits on compensation decisions. More participants (86%) preferred the flat fee in the longer time-limit condition than in the shorter time-limit condition (68%; $\beta= 1.08$, $z= 5.79$, $p<.001$). In this study there was a marginally significant moderation by the order of time limits ($p=.066$). In particular, when managers saw the shorter time limit first, 72% choose the flat fee which increased to 84% when they made a subsequent choice for the task with the longer time limit. A similar proportion chose the flat fee (87%) when the longer time limit was presented first, but revised their choices to a greater extent when they made a subsequent choice for the task with the shorter time limit (65%). Unlike other studies, the order of the two math tasks used also had a marginally significant moderating effect ($p=.072$).

Like the previous studies, managers strongly believed that workers would require more time to complete the 15-minute deadline task than the 5-minute deadline task (M=+0.91, $t(397) = 10.76$, $p<.001$), a belief consistent with the time mis-estimation results in the prior studies. Thus, we replicate the prior findings in a within-subjects study, even when managers evaluated both time limits in the same study and did not make numerical estimates of the time taken before making choices. This again suggests that biased compensation scheme choices on facing longer deadlines is unlikely to be because of implicit anchoring on time limits.

Managers were more concerned about workers slacking in the 15-minute condition. They thought that in the 15-minute task workers would be more likely to intentionally work slower and take longer than necessary (M=+ 1.15, $t(397) = 12.71$, $p<.001$), and delay completion to make more money (M=+ 0.94, $t(397) = 10.62$, $p<.001$).

However, there was also evidence consistent with a scope perception belief. Longer time limit made managers believe that workers did a more thorough job even when the quality of the task was fixed (M=+ 0.59, $t(397) = 6.97$, $p<.001$). More importantly, when answering questions about their beliefs in the new untimed setting, judges responses to the three questions (completion time, task difficulty, effort required) lent support to scope perception beliefs. The three measures were internally consistent (Cronbach's $\alpha = 0.71$) and were combined into a task-scope variable. Mid-point test revealed that the task associated with a longer time limit was perceived to have a great scope (M=+ 0.16, $t(397) = 3.02$, $p=.003$).

Like the previous studies, managers did not perceive a difference in intrinsic motivation (M= - 0.08, $t(397) =1.14$, $p=.253$) or achievement motivation (M= -0.13, $t(397) =1.14$, $p=.128$) as a function of time limits. Finally, individual differences in perspective taking did not moderate the effect of time limits on choices in a hierarchical regression model ($p= 0.466$).

Therefore, all the various versions of Study 3, taken together, suggest that longer time limits influenced managers' beliefs both about the extent of slacking and about the perceived "scope" of work.

Study A9: Managers' Compensation Scheme Choices for the Math task with Scope Information

Method

A sample of online participants (N=632) played the role of managers in a pre-registered study (http://aspredicted.org/blind.php?x=kv6an6). The design of the study was similar to that of Study 5, except for a few small changes.   Specifically, the comprehension on all the chart-information questions were enforced and respondents could not proceed without answering them correctly. Likewise, managers were required to correctly recall the maximum time limit workers had before proceeding to make their choices.

Results

Based on the actual completion times of workers operating under a per-minute fee in phase 1, there was an expected-value advantage of choosing to pay per-minute in the longer time limit ($M_{\text{Per-minute Fee}}$ = \$2.35 vs. \$2.00 flat fee; Δ = \$0.35, $t(54)$=3.01, p=.004), a significant difference by time limit in the incentive to choose the per-minute fee ($t(100)$=2.65, p=.009).

When no scope information was provided, managers choose flat fee directionally more under the longer time limit (74% vs. 69%; $\chi^2(1)$ = 1.80, p = .179). Based on these pattern of choices and the expected-value differences, managers who chose to pay a flat fee left more money on the table both when the time limit was longer ($M_{\text{Per-minute Fee}}$ = \$2.73, $M_{\text{Flat Fee}}$ = \$2.00; Δ = -\$0.73, $t(34)$=8.24, p<.001) as well as when the time limit was shorter ($M_{\text{Per-minute Fee}}$ = \$3.08, $M_{\text{Flat Fee}}$ = \$3.00; Δ = -\$0.08, $t(59)$=2.04, p=.045), with the incurred loss being higher when the time limit was longer ($t(93)$=8.13, p<.001). Therefore, we strongly replicated the results of the prior studies when managers made compensation scheme choices without any additional task-scope information.

When scope information was provided, the difference was attenuated (68% vs. 64%; $\chi^2(1)$ <1), but this change was not significant compared to the no-scope-information condition (interaction β=0.562, z=1.61, p= .107). Managers who chose to pay a flat fee left significantly more money on the table when

the time limit was longer ($M_{\text{Per-minute Fee}}$ = \$2.28, $M_{\text{Flat Fee}}$ = \$2.00; Δ = -\$0.28, $t(63)$=2.65, p=010), but there was no difference in earning when the time limit was shorter. Taken together, managers lost significantly more money on account of their sub-optimal preference for flat fee in the longer time limit ($t105$)=2.11, p=.037). A two-way interaction of time limits and completion-time information on bonuses earned suggested that scope-information significantly reduced (although did not eliminate) this loss in earning from a preference for flat fees (β=0.379, t=2.32, p= .021).

Irrespective of compensation scheme choices, when no completion-time information was available, managers estimated a longer completion time for per-minute workers when the time limit was longer than when it was shorter (M_{Long} = 10.75 vs. M_{Shorter} = 4.32, Δ=+6.43; $t(316)$=18.73, p<.001). When completion-time information was provided, the difference in completion time estimates of per-minute workers reduced, but was not eliminated (M_{Long} = 9.14 vs. M_{Shorter} = 4.15, Δ=+4.99; $t(312)$=12.14, p<.001; interaction: β=1.44, t=2.69, p= .007).   Therefore, beliefs about completion times, particularly when time-based compensation is used, reduced but persisted when information defining the scope of work was provided. This is consistent with a multiple-accounts explanation underlying the observed misestimations.

Did these misestimations of per-minute workers' completion time drive the biased compensation scheme choices, even when completion-time information was available? Replicating earlier findings, when no completion-time information was provided, managers who chose a flat fee estimated a longer completion time for per-minute workers both in the shorter ($M_{\text{Chose Flat Fee}}$ = 4.59 vs. $M_{\text{Chose Per-minute Fee}}$ =3.78; $t(179)$=6.39, p<.001) and in the longer time-limit conditions ($M_{\text{Chose Flat Fee}}$ = 11.64 vs. $M_{\text{Chose Per-minute Fee}}$ =8.17; $t(135)$=4.16, p<.001), but more so when the external time limits were longer ($F(1,314)$=13.67, p<.001). Moreover, even when completion-time information was available, the results persisted (Shorter time limit: $M_{\text{Chose Flat Fee}}$ = 4.33 vs. $M_{\text{Chose Per-minute Fee}}$ =3.77; $t(134)$=2.98, p=.003; Longer time limit: $M_{\text{Chose Flat Fee}}$ = 10.83 vs. $M_{\text{Chose Per-minute Fee}}$ =6.13; $t(176)$=7.28, p<.001; interaction: $F(1,310)$=28.81, p<.001). Indeed, the three-way interaction of completion-time information, time limit, and flat fee choice on estimates of per-minute workers' completion times was not statistically significant

(p=.162). Managers who chose flat fees, also overestimated the expected time per-minute workers would take compared to the actual time taken by workers.

Like in previous studies, managers' choices were largely rationalized by their estimates of workers' completion times. When no completion-time information was provided, most participants chose the option that would have provided a higher profit had their time estimates been correct (86% in the shorter time condition; 76% in the longer time condition). These proportions remained similar when completion-time information was provided (82% in the shorter time condition; 76% in the longer time condition). The striking similarity of results in the no-scope-information and the scope-information condition suggests that the information intervention alone did little to attenuate our observed effect. Indeed, if our observed effects are determined by beliefs about slacking when time limits are longer and the compensation scheme is time-based, providing information about flat-fee workers under an untimed condition should do little to attenuate the observed behavior. This is indeed what we find in this study. Therefore, the findings of this study indicate that information about task scope alone could eliminate the biases preference for flat fees under longer time limit conditions, and that a joint-mechanism based on both beliefs about slacking and beliefs about task scope is potentially responsible for the observed bias.

Online Appendix E: Pre-registrations

Study 4:

(http://aspredicted.org/blind.php?x=as83nb)

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Contract Choice Study (#14676)

Created: 10/03/2018 01:51 PM (PT)
Shared: 10/09/2018 07:30 PM (PT)

This pre-registration is not yet public. This anonymized copy (without author names) was created by the author(s) to use during peer-review. A non-anonymized version (containing author names) will become publicly available only if an author makes it public. Until that happens the contents of this pre-registration are confidential.

1) Have any data been collected for this study already?
No, no data have been collected for this study yet.

2) What's the main question being asked or hypothesis being tested in this study?
Do longer (vs. shorter) time limits cause managers to choose suboptimal flat-fee contracts over time-metered contracts?

3) Describe the key dependent variable(s) specifying how they will be measured.
A) Manager's Contract Choice (flat-fee vs. per-minute)
B) Manager's estimates of Worker's task completion time
C) Managers Contract Choice (flat-fee vs. per-minute) for a separate hypothetical situation where they are provided with the distribution of costs (with likely probability), This distribution, unbeknownst to managers, will be constructed from the distribution of actual time taken by the workers in Phase 1.

4) How many and which conditions will participants be assigned to?
The study has two phases.

Phase1: Workers work under an Agent who pays them a flat fee of $1.50 (like salary) to complete a math task. The workers work at their own pace to complete the task, but the Agent also records the time spent. Therefore, the worker's study is a simple 1-condition study.

Phase 2: Managers take part in a "budgeting game." In the game, the Agent negotiates with a Manager who needs a worker to get a math task done. The agent offers the manager two different contracts to hire a worker: a flat-fee contract and a per-minute contract, with a fixed metered-fee. For the metered-fee, the total cost is capped at a maximum of 5-minutes (15-minutes).

In effect, the manager's study is a 2 condition between-subjects design:
Condition 1: Choice between a flat-fee or a per minute payment up to a maximum time limit of 5 minutes
Condition 2: Choice between a flat-fee or a per minute payment up to a maximum time limit of 15 minutes

Additional Details:
The Manager knows that all workers were working under the same flat payment with the contractor (therefore, contract type does not affect their behavior) and that the workers had no time limits (so, time limits cannot affect their behavior). The manager also knows details about the math and that there is only one way of solving it (and therefore, there cannot be any quality difference in output among workers).

Managers either first make their choice of contracts and then estimate how much time the worker will take to complete the task or the other way round (i.e., decisions counter-balanced).

In the game, Managers are allotted a fixed lump sum budget and their profits (paid as real bonuses after the study) is inversely related to the cost of hiring workers. Therefore making a sub-optimal contract choice has direct consequences on the bonuses earned by the managers.

5) Specify exactly which analyses you will conduct to examine the main question/hypothesis.
1. Based on the actual completion times of workers, the expected value of managers' earnings under flat fee and per minute fee contracts will be conducted and t-tests will be used to examine any difference.

2. Chi-Square tests will be used to examine the difference in % of managers choosing flat fee contracts in the conditions.

3. The actual choices will be used to compute the profits under the rules of the same, and differences in the actual profits earned will be examined using t-tests.

4. The task completion time estimates will be compared for the two counter-balanced conditions using t-tests.

5. Mediation analysis will be used to examine if time esitmates mediate the choice of contacts in the two conditions.

Verify authenticity: http://aspredicted.org/blind.php?x=as83nb
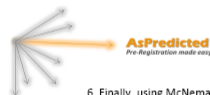
Version of AsPredicted Questions: 2.00

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6. Finally, using McNemar's Chi-Square test we will examine the within-manager difference in choice of contract types between the consequential contract choice and the hypothetical choice where distribution of costs were provided.

6) Describe exactly how outliers will be defined and handled, and your precise rule(s) for excluding observations.
In both phases, responses from duplicate IPs will be excluded prior to analyzing the data.

In Phase 2, an attention check question will be administered at the end of the survey. Those failing this test will be excluded prior to analyzing the data.

7) How many observations will be collected or what will determine sample size? No need to justify decision, but be precise about exactly how the number will be determined.
Phase 1: We will target a sample of 100 Workers on the Mturk platform.
Phase 2: We will target a sample of 300 Managers on the Mturk platform.

8) Anything else you would like to pre-register? (e.g., secondary analyses, variables collected for exploratory purposes, unusual analyses planned?)
None.

(http://aspredicted.org/blind.php?x=wm6wx3)

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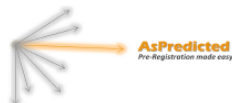
Contract Choice Study: Details of Managers' Study (#15563)

Created: 10/25/2018 06:30 AM (PT)
Shared: 10/25/2018 06:57 AM (PT)

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1) Have any data been collected for this study already?
No, no data have been collected for this study yet.

2) What's the main question being asked or hypothesis being tested in this study?
Do longer (vs. shorter) time limits cause managers to choose suboptimal flat-fee contracts over time-metered contracts?

3) Describe the key dependent variable(s) specifying how they will be measured.
A) Manager's Contract Choice (flat-fee vs. per-minute)
B) Manager's estimate of Worker's task completion time
C) Manager's Contract Choice (flat-fee vs. per-minute) for a separate hypothetical situation where they are provided with the distribution of costs (with likely probability). This distribution, unbeknownst to managers, will be constructed from the distribution of actual time taken by the workers in a separate study (see Phase 1 of pre-registered study # Contract Choice Study #14676 at aspredicted.org)

4) How many and which conditions will participants be assigned to?
This pre-registration is an addendum to the Phase 2 of Study #14676 at aspredicted.org and contain details of the hiring game that the Managers will play in Phase 2. Also, in the revised Phase 2 design, there are three conditions, as follows:

Condition 1a details: Managers are given a budget of $2.50. They can hire a worker under a flat-fee contract (cost $1.75) or metered rate of 40 cents/min with the total cost is capped at a maximum of 5-minute. This means the bonus (budget - cost of hiring) that a manager can earn is either $0.75 (when choosing fixed fee) or can range between [$0.50, $2.10] (when choosing metered fee)

Condition 1b details: Managers are given a budget of $6.00. They can hire a worker under a flat-fee contract (cost $1.75) or metered rate of 40 cents/min with the total cost is capped at a maximum of 5-minute. This means the bonus (budget - cost of hiring) that a manager can earn is either $4.25 (when choosing fixed fee) or can range between [$4, $5.60] (when choosing metered fee)

Condition 2 details: Managers are given a budget of $6.50. They can hire a worker under a flat-fee contract (cost $2.25) or metered rate of 40 cents/min with the total cost is capped at a maximum of 15-minute. This means the bonus (budget - cost of hiring) that a manager can earn is either $4.25 (when choosing fixed fee) or can range between [$0.50, $6.10] (when choosing metered fee)

In conditions 1a and 2, per-minute worst case scenario is the same (50 cents). Conditions 1b and 2 are matched on the attractiveness of the flat fee contract (both can earn $4.25) and therefore will help us examine if flat fee preference is on account of confusion with per-minute earnings.

Additional study design information provided under 'Additional Details' in Pre-registered Study #14676 is still valid.

5) Specify exactly which analyses you will conduct to examine the main question/hypothesis.
Analysis plan is the same as Pre-registered Study #14676. Copying here for completeness.

Selecting a pair at a time among conditions 1a, 1b, and 2, we will conduct the following analysis.

1. Based on the actual completion times of workers, the expected value of managers' earnings under flat fee and per minute fee contracts will be conducted and t-tests will be used to examine any difference.
2. Chi-Square tests will be used to examine the difference in % of managers choosing flat fee contracts in the conditions.
3. The actual choices will be used to compute the profits under the rules of the same, and differences in the actual profits earned will be examined using t-tests.
4. The task completion time estimates will be compared for the two counter-balanced conditions (manager choose contract time and then estimate completion time, or the other way round) using t-tests.
5. Mediation analysis will be used to examine if time esitmates mediate the choice of contacts in the two conditions.
6. Finally, using McNemar's Chi-Square test we will examine the within-manager difference in choice of contract types between the consequential contract choice and the hypothetical choice where distribution of costs were provided.

6) Describe exactly how outliers will be defined and handled, and your precise rule(s) for excluding observations.

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Version of AsPredicted Questions: 2.00

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Pre-Registration made easy

No change from Pre-registered Study #14676. Copying here for completeness.

a) Responses from duplicate IPs will be excluded prior to analyzing the data.
b) In the managers' study, an attention check question will be administered at the end of the survey. Those failing this test will be excluded prior to analyzing the data.

7) How many observations will be collected or what will determine sample size? No need to justify decision, but be precise about exactly how the number will be determined.
As mentioned in pre-registered Study #14676, we will target a sample of 300 Managers on the Mturk platform. We will assign 150 people in the 15-min condition (condition 2) and split the other 150 between the two 5-min conditions (conditions 1a and 1b).

8) Anything else you would like to pre-register? (e.g., secondary analyses, variables collected for exploratory purposes, unusual analyses planned?)
None

Study 5:

(http://aspredicted.org/blind.php?x=qm4es5)

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MathTask_Workers_PerMinuteFees (#25972)

Created: 07/19/2019 03:20 PM (PT)
Shared: 08/20/2019 07:53 AM (PT)

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1) Have any data been collected for this study already?
No, no data have been collected for this study yet.

2) What's the main question being asked or hypothesis being tested in this study?
Ps work on a simple math task under varying external time limits (5 mins or 15 mins). They are paid at a rate of 25 cents per minute for completing this task (additional bonus over a nominal base participation fee).

We want to look at the distribution of workers' actual time to complete a simple math task under the different time limits.

3) Describe the key dependent variable(s) specifying how they will be measured.
Task completion time and money earned.

4) How many and which conditions will participants be assigned to?
One condition: Time limit (5, 15 mins; b/s).

5) Specify exactly which analyses you will conduct to examine the main question/hypothesis.
We would also look at the difference in the average completion times (t-tests) in the two time limit conditions. We expect the completion times in 15 mins to be either statistically greater or not-different from that in the 5 mins condition. We would compare these actual completion times with prediction of Judges (separate study) and look at the difference in respective time limits (t-test) as well as an interaction (F-test). Based on this study and the separate Judges study, we expect to see a significant interaction driven by judges' overestimation of completion times, particularly in the 15-mins condition.

6) Describe exactly how outliers will be defined and handled, and your precise rule(s) for excluding observations.
Ps with duplicate IPs, incomplete surveys, and those who fail an end-of-survey attention check question will be excluded prior to analysis.

7) How many observations will be collected or what will determine sample size? No need to justify decision, but be precise about exactly how the number will be determined.
We are going to aim for 120 Mturk participants.

8) Anything else you would like to pre-register? (e.g., secondary analyses, variables collected for exploratory purposes, unusual analyses planned?)
None

(http://aspredicted.org/blind.php?x=nr4py6)

Managers Math Task Distb Info (#26133)

Created: 07/24/2019 05:24 PM (PT)
Shared: 08/20/2019 09:40 AM (PT)

1) Have any data been collected for this study already?
No, no data have been collected for this study yet.

2) What's the main question being asked or hypothesis being tested in this study?
We are looking at the effect of external time limits on choices between flat fee and metered contracts to hire a temporary worker to complete a given task. Our prior results show that judges show a biased preference for flat fee contracts when the time limit is longer, even when they are told that the time limits are random.

We want to continue investigation of the same hypothesis in a situation where judges are given complete distribution of time taken by real workers to complete the task when no time limits are imposed and paid a flat fee. The idea is to replicate the basic effect and then investigate the extent to which the choices are determined by a concern that workers delay completion under metered fees (e.g., gold-bricking) or workers' perception of the amount of work (e.g., work scope) changes according to the time limit to complete the work.

Given that judges have full information about the scope of the work, any difference in choices in the two time limits would be on account of concerns that workers would intentionally take more time to complete when the time limit is longer (and therefore become more expensive under metered fees).

3) Describe the key dependent variable(s) specifying how they will be measured.
Choice of Flat Fee (vs. Per-Minute of Metered Fee). Judges will indicate their choice by answering a dichotomous question.

After they indicate their choice, Ps are asked to indicate their beliefs about the completion time both under their chosen compensation scheme, and under the alternative scheme.

4) How many and which conditions will participants be assigned to?
The study will use a 2(Distribution Info: Yes, No) x 2(Time Limits: 5 Mins, 15 Mins) b/s design.

5) Specify exactly which analyses you will conduct to examine the main question/hypothesis.
When no distribution information is provided, we expect to replicate our basic finding (Chi-Sq test of proportion choosing Flat Fee in different time limit conditions). When distribution information is provided, we will examine using Chi-Sq test how the choices look like in the different time limit conditions. We will also do an interaction test to see if there is a difference in choices (longer vs shorter time limits) when additional distribution information is provided vs. withheld.

Using elicited beliefs about completion times, we will examine if such beliefs mediate the effect of time limits on contract choices (using logistic regression in the joint regression).

6) Describe exactly how outliers will be defined and handled, and your precise rule(s) for excluding observations.
Incomplete surveys, surveys from Ps with duplicate IPs and those who fail a basic attention check question will be excluded from the analysis.   The basic attention check question used is:

People vary in the amount they pay attention to these kinds of surveys. Some take them seriously and read each question, whereas others go very quickly and barely read the questions at all. If you have read this question carefully, please write the word yes in the blank Other box below.

The options are:
1 (Not al all), 2, 3,4,5 (A great deal), Other _____

Robustness checks will be done by excluding Ps who fail (a) comprehension questions to interpret the data depicted in the distribution of completion time chart (b) recall questions at the end of the study.

7) How many observations will be collected or what will determine sample size? No need to justify decision, but be precise about exactly how the number will be determined.
We plan to run the study on Amazon Mechanical Turk, and request 600 HITS.

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8) Anything else you would like to pre-register? (e.g., secondary analyses, variables collected for exploratory purposes, unusual analyses planned?)
None

Study 6:

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Contract Choice: Debiasing Slack and Scope (#46025)

Created: 08/10/2020 05:57 PM (PT)
Shared: 09/02/2020 08:17 AM (PT)

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1) Have any data been collected for this study already?
No, no data have been collected for this study yet.

2) What's the main question being asked or hypothesis being tested in this study?
We examine the perception of task-scope on contract choices for hiring a temporary worker (who has no incentive to intentionally take longer) when there is a randomly determined cap on the billable time (short 5 mins or long 15 mins) for a counting task. We hypothesize that in the additional-scope-information condition, preference for flat fee contract will decrease (and preference for time-metered contract will increase) in the second task after the scope information is presented and more so when the external time limit is longer.

3) Describe the key dependent variable(s) specifying how they will be measured.
They key DV is contract choice between a flat fee and a time-metered fee to hire a worker. Each participant makes two such contract choices for the same assigned time limit: either 5 mins or 15 minutes.

4) How many and which conditions will participants be assigned to?
The study has a 2(Time Cap: Short:5 mins, Long: 15 mins) x 2 (Additional Scope Information: No, Yes) between-subjects design.

Participants acting as managers are told that they would need to hire a temporary worker from an agency to get a task done. Workers are employed at the agency and earn a fixed salary. The agency records the time a worker takes to complete a task for its own record. If managers choose a time-metered variable fee, the agency calculates the cost of hiring based on actual time taken by the worker. If the time taken exceeds the assigned time cap, the time cap is used to compute the cost of hiring. Managers know that the time cap is randomly determined.

All participants make two contract choices for two different counting tasks but for the same assigned time cap. Before the second contract choice, participants in the additional-scope-information conditions are shown the distribution of actual completion times of past workers.

5) Specify exactly which analyses you will conduct to examine the main question/hypothesis.
We will analyze the data from the control (i.e., no additional scope information) and the treatment condition separately, and then combined. We will code choice_num as 1 for the first choice made and 2 for the second choice made. In the control condition, we expect to see similar preferences of flat fee contracts in the two choices for each of the two time-cap conditions. But, we expect to see a stronger preference for flat fee contracts in the longer time cap condition compared to the shorter time cap condition. We will test these differences using Chi-square tests and examine the repeated-measures interaction using a mixed model.

glmer(Choice of Flat Fee contracts ~ time_cap * choice_num + (1|Id), data=data_long)

For the participants in the additional-scope-information conditions, using Chi-square tests we expect to see a decrease in the choice of flat fee contracts in the second choice. We also expect this difference to be larger for the longer time cap condition and will examine the interaction using the same specification as above.

The first contract choice in additional scope conditions should be similar to the respective choices in the control condition for the matched time cap. We plan to confirm this using chi-square tests.

We also plan to do a "difference-in-difference" analysis where we subtract the baseline preference for a task in the corresponding time cap condition (i.e., choice 1) from that in choice 2 and using this revised "choice 2" estimates examine the interaction of time cap (short, long) and additional scope information (no, yes).

6) Describe exactly how outliers will be defined and handled, and your precise rule(s) for excluding observations.
We plan to remove duplicate responses (based on IP), incomplete responses, and participants who fail an end-of-survey attention check prior to analyzing the data.

All participants answer a few comprehension check questions on the hiring options and participants in the Additional Scope Information condition also answer a set of questions to indicate their comprehension of the distribution of workers' completion times. We plan to report the entire data in the manuscript and report exploratory analysis in the online appendix by excluding Ps who fail these tests.

7) How many observations will be collected or what will determine sample size? No need to justify decision, but be precise about exactly how the number will be determined.

The total sample will include 400 Mturk participants via Turk Prime

8) Anything else you would like to pre-register? (e.g., secondary analyses, variables collected for exploratory purposes, unusual analyses planned?)

None