

Monetary and non-monetary incentives in real-effort tournaments

Online Appendix

Appendix A: Experimental instructions

This section contains the instructions. Task 1 is the risk task which was common to all treatments. Task 2 is the contest task which differed between treatments. We provide the instructions for Task 2 which were used in treatments B, ED, P, and A1A2. Instructions for the other treatments were appropriately adjusted and are available from the authors upon request.

Instructions

Thank you for agreeing to take part in this study which is funded by the Australian Research Council. Please read the following instructions carefully. A clear understanding of the instructions will help you make better decisions and increase your earnings from the experiment.

The experiment consists of two separate tasks: Task 1 and Task 2. You will receive detailed instructions about each of the tasks before you participate in them. Note that the tasks are independent of each other. Your earnings will depend on the decisions you make in one of the two tasks. In other words, you will be paid for the decisions you make in either Task 1 or Task 2. This implies that you should carefully consider all of the decisions you make in both tasks in the experiment as they may determine your earnings. Whether you will be paid for Task 1 or Task 2 will be randomly determined at the end of the experiment using a coin toss. Your final payment in today's experiment will also include a \$10 participation fee.

During the experiment, we will be using Experimental Currency Units (ECU). At the end of the experiment, we will convert the amount you earn into Australian Dollars (AUD) using the following conversion rate: 10 ECU = 1 AUD.

All of the decisions you make in this experiment will remain anonymous. At the end of Task 2, you will be asked to fill out a brief questionnaire asking you some general questions.

Please do not talk to one another during the experiment. If you have any questions, please raise your hand and we will come over to answer your questions privately.

Task 1

In this task, you will be given an endowment of 50 ECU. You have the opportunity to invest any portion of this amount (i.e., any amount between 0 and 50).

The investment can either fail or succeed. There is an equal chance that the investment will fail or succeed. If the investment fails, you will lose the amount you invested. If the investment succeeds, you will receive three times the amount invested. Whether an investment fails or succeeds will be determined by the computer.

You will be given an on-screen calculator that you can use to calculate the amount you would be paid if your investment is successful and if it is not. Figure 1 shows the decision screen for this task, where the calculator is on the left panel. You can submit your actual investment decision at the bottom of the screen. After you choose how much you wish to invest, please press the submit button.

Remaining time [sec]: 54

Task 1

In this task you have an endowment of 50 ECU. You have the opportunity to invest a portion of your endowment.
There is an equal chance that the investment will fail or succeed.
If the investment fails (Tails), you lose the amount you invested.
If the investment succeeds (Heads), you receive 3 times the amount invested.

You may use this calculator to see the amount you would be paid if your investment is successful or not.

How many ECU would you like to invest?

How many ECU would you like to keep without investing?

Calculate Possible Outcomes

Amount Invested	Amount Kept	Payment if HEADS	Payment if TAILS

Please enter the amount you wish to invest below. You will not be able to change this amount after your click the commit button.

How many ECU would you like to invest?

How many ECU would you like to keep without investing?

Commit Amount to Invest

Figure 1: Decision Screen for Task 1

If this task is picked for payment, the computer will determine randomly whether your investment succeeds or fails.

A3

Here are some examples:

1. Suppose you choose to invest nothing. You will get 50 ECU for sure from this task if this task is chosen for payment.
2. Suppose you choose to invest all of the endowment, i.e., 50 ECU. If the investment succeeds, you get 150 ECU. If the investment fails, you get 0.
3. Suppose you choose to invest 40 ECU. If the investment succeeds, you get 130 ECU ($40 \times 3 + 10 = 130$). If it fails, you get 10 ECU.

If you have any questions, please raise your hand. If not, please proceed to make your decision on the computer screen.

Task 2 (Treatment B)

In this task, the computer will randomly match you with one other person in the room. Hence, you will participate in Task 2 in groups of two. No one will ever be informed of the identity of the other individual in their group.

Each group member will have one of two possible roles: Player A or Player B. At the beginning of the task, you will be informed whether you have been assigned the role of Player A or Player B. Each individual in your group has an equal chance of being assigned the role of Player A or Player B.

Player A and Player B will be given the opportunity to participate in an activity. The activity is the same for both players. Player A and Player B will each be presented with a series of words. They will be asked to encode these words by substituting the letters of the alphabet with numbers using an encoding table which will be provided on their screens. Every time a word is encoded correctly, the encoding table will change.

Remaining time (sec): 596

TASK 2

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
2	1	4	3	6	5	8	7	10	9	12	11	14	13	16	15	18	17	20	19	22	21	24	23	26	25

The word you are now encoding is number 1

WORD: E L P P A

CODE:

After filling the codes, press the "OK" button to verify the codes and proceed to the next word.

You must remain seated and keep silent until the end of the task.

OK

Figure 2: Encoding Activity for Task 2

Once you encode a word correctly, the computer will prompt you with another word which you will be asked to encode. Once you encode that word, you will be given another word and so on. This process will continue for 10 minutes (600 seconds). Player A and Player B will be given the same words to encode in the same sequence.

Figure 2 shows an example of a word (ELPPA) to be encoded. The table given on the screen shows that E=6, L=11, P=15, P=15, and A=2.

There are two prizes, Prize 1 and Prize 2. These two prizes will be allocated to Player A and Player B according to the total number of words correctly encoded by the players.

The number of words encoded correctly by the players in the 10-minute period will determine who receives Prize 1. The player who does not receive Prize 1 will receive Prize 2. Prize 1 is worth 150 ECU. Prize 2 is worth 150 ECU.

Given the number of words correctly encoded by Player A and Player B, Prize 1 will be allocated in the following manner.

You can never guarantee yourself Prize 1. However, by encoding more words correctly, you can increase your chance of receiving Prize 1. The more words you encode relative to the other player, the greater your chance of receiving Prize 1. The more words the other player encodes, the less likely you are to receive Prize 1. Specifically, your chance of receiving Prize 1 is given by the following expression.

$$\begin{aligned} &\text{Your chance of receiving Prize 1} \\ &= \frac{\text{\# words you encode correctly}}{\text{\# words you encode correctly} + \text{\# words the other player encodes correctly}} \end{aligned}$$

You can think of it in the following way. For example, if you encode 10 words correctly in total and the other player encodes 20 words correctly in total, then you will receive 10 lottery tickets while the other participant will receive 20 lottery tickets. At the end of Task 2, the computer randomly draws one of the 30 lottery tickets received by you and the other player. The owner of the drawn ticket receives Prize 1. In this example, your chance of receiving Prize 1 is $10 / (10 + 20) = 0.33$ and the other participant's chance of receiving Prize 1 is $20 / (10 + 20) = 0.67$. Hence, your chance of receiving Prize 1 depends on the number of lottery tickets received by you and the other participant. The player who does not receive Prize 1 will receive Prize 2. If both Player A and Player B encode the same number of words correctly, then the computer will allocate the two prizes randomly. Each player has the same chance of receiving Prize 1.

If you have any questions, please raise your hand. Otherwise, please proceed to answer the questions on the next page. The purpose of these questions is to make sure that you understand the task. Any unclear points will be explained by the experimenter. Once you have answered all the questions, please raise your hand and one of the experimenters will come to check your answers. We will proceed with the task after checking everyone's answers.

Practice Questions for Task 2

(Please note that the numbers in the following questions are for illustration purposes only. The questions aim to help you understand the task in a better way and should not be used as a guide for decision-making in the experiment.)

1. Assume that you encode 1 word and your opponent encodes 9 words. What is your chance of receiving Prize 1?

- (a) $1 / 9$
- (b) $1 / 10$
- (c) $1 / 8$
- (d) $8 / 9$
- (e) $9 / 10$

2. Assume that you encode 9 words and your opponent encodes 1 word. What is your chance of receiving Prize 1?

- (a) $1 / 9$
- (b) $1 / 10$
- (c) $8 / 9$
- (d) $9 / 10$
- (e) $9 / 9$

3. Assume that Player A encodes 45 words. State whether each of the following statements is true or false.

- (i) If Player B encodes 0 words, then Player B will definitely receive Prize 2 which is worth 150 ECU.
- (ii) If Player B encodes 1 word, then Player B will definitely receive Prize 2 which is worth 150 ECU.
- (iii) If Player B encodes 45 words, then each player will receive Prize 2 which is worth 150 ECU.

Important summary information:

- Task 2 is played in groups of two. The matchings are anonymous. You will not be told which of the participants in this room are assigned to which group.
- Player A and Player B will be given the opportunity to participate in an activity to encode words using the codes given on the screen.
- There are two prizes in this task – Prize 1 and Prize 2. You can never guarantee yourself Prize 1. However, by encoding more words correctly, you can increase your chance of receiving Prize 1. The player who does not receive Prize 1 receives Prize 2. Prize 1 is worth 150 ECU. Prize 2 is worth 150 ECU.

If you have no further questions, we will now begin a practice round of the activity. The practice round will last for 3 minutes (180 seconds). The purpose of the practice round is for you to familiarise yourself with the activity. The number of words you encode during this practice round will not affect your payment in today's experiment.

Once you have completed the practice round, the computer will reveal the information about your assigned role for Task 2. Task 2 will then begin.

Task 2 (Treatment ED)

In this task, the computer will randomly match you with one other person in the room. Hence, you will participate in Task 2 in groups of two. No one will ever be informed of the identity of the other individual in their group.

Each group member will have one of two possible roles: Player A or Player B. At the beginning of the task, you will be informed whether you have been assigned the role of Player A or Player B. Each individual in your group has an equal chance of being assigned the role of Player A or Player B.

Player A and Player B will be given the opportunity to participate in an activity. The activity is the same for both players. Player A and Player B will each be presented with a series of words. They will be asked to encode these words by substituting the letters of the alphabet with numbers using an encoding table which will be provided on their screens. Every time a word is encoded correctly, the encoding table will change.

Remaining time (sec): 595

TASK 2 Finish Experiment

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
2	1	4	3	6	5	8	7	10	9	12	11	14	13	16	15	18	17	20	19	22	21	24	23	26	25

The word you are now encoding is number 1

WORD: E L P P A

CODE:

After filling the codes, press the "OK" button to verify the codes and proceed to the next word.

At any time during the experiment, if you wish to finish the experiment, you can press the button at the top right-hand corner of the screen.

Figure 2: Encoding Activity for Task 2

Once you encode a word correctly, the computer will prompt you with another word which you will be asked to encode. Once you encode that word, you will be given another word and so on. This process will continue for 10 minutes (600 seconds). Player A and Player B will be given the same words to encode in the same sequence.

Figure 2 shows an example of a word (ELPPA) to be encoded. The table given on the screen shows that E=6, L=11, P=15, P=15, and A=2.

There are two prizes, Prize 1 and Prize 2. These two prizes will be allocated to Player A and Player B according to the total number of words correctly encoded by the players.

The number of words encoded correctly by the players in the 10-minute period will determine who receives Prize 1. The player who does not receive Prize 1 will receive Prize 2. Prize 1 is worth 150 ECU. Prize 2 is worth 150 ECU.

Given the number of words correctly encoded by Player A and Player B, Prize 1 will be allocated in the following manner.

You can never guarantee yourself Prize 1. However, by encoding more words correctly, you can increase your chance of receiving Prize 1. The more words you encode relative to the other player, the greater your chance of receiving Prize 1. The more words the other player encodes, the less likely you are to receive Prize 1. Specifically, your chance of receiving Prize 1 is given by the following expression.

$$\text{Your chance of receiving Prize 1} = \frac{\text{\# words you encode correctly}}{\text{\# words you encode correctly} + \text{\# words the other player encodes correctly}}$$

You can think of it in the following way. For example, if you encode 10 words correctly in total and the other player encodes 20 words correctly in total, then you will receive 10 lottery tickets while the other participant will receive 20 lottery tickets. At the end of Task 2, the computer randomly draws one of the 30 lottery tickets received by you and the other player. The owner of the drawn ticket receives Prize 1. In this example, your chance of receiving Prize 1 is $10 / (10 + 20) = 0.33$ and the other participant's chance of receiving Prize 1 is $20 / (10 + 20) = 0.67$. Hence, your chance of receiving Prize 1 depends on the number of lottery tickets received by you and the other participant. The player who does not receive Prize 1 will receive Prize 2. If both Player A and Player B encode the same number of words correctly, then the computer will allocate the two prizes randomly. Each player has the same chance of receiving Prize 1.

The task is scheduled for 10 minutes. However, if you wish to stop the task early and leave the experiment, you can. At any time during the experiment, if you wish to end the task before the 10 minutes are over, you can press the "Finish Experiment" button at the top right-hand corner of the screen displayed in Figure 2. Once you press the button, the encoding task is blocked and you cannot continue working on the task. Figure 3 shows the screen which will be displayed when you press the "Finish Experiment" button. You will be asked to confirm whether you want to leave the experiment early or to resume the task.

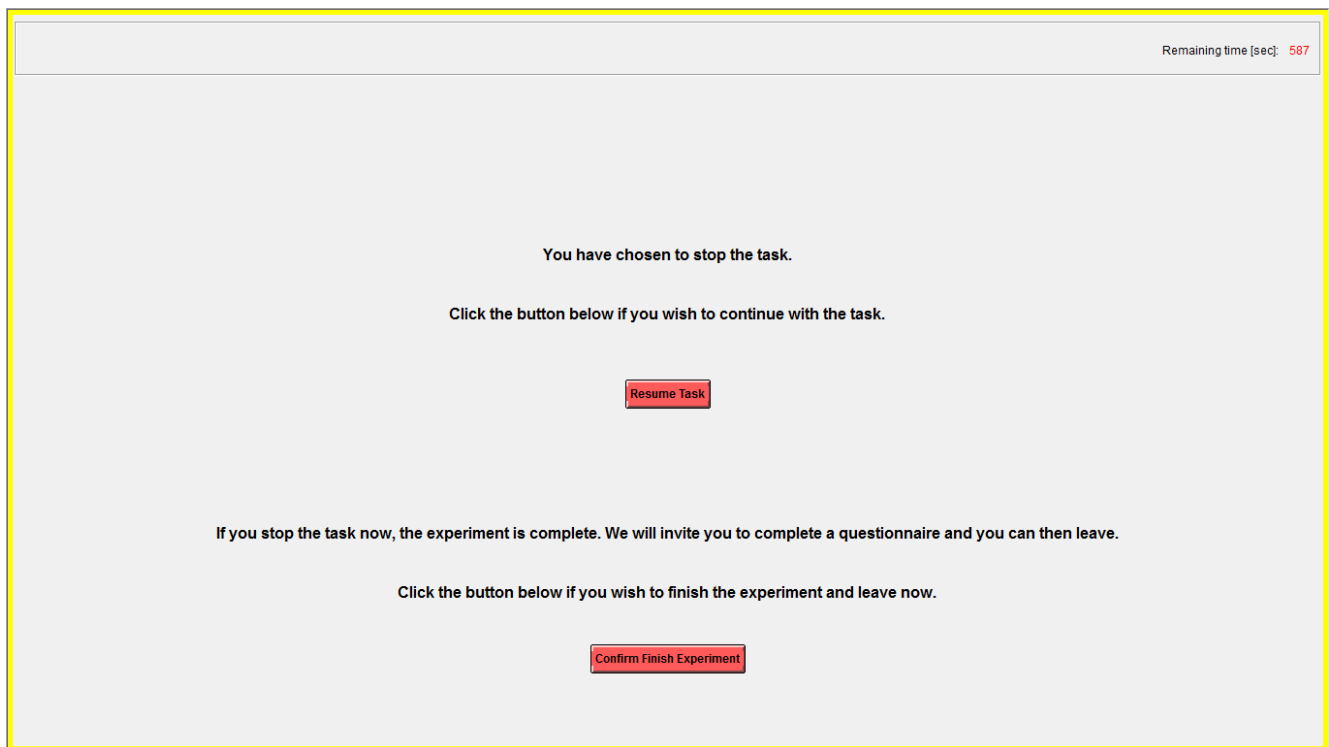


Figure 3: Confirmation Screen for Task 2

If you choose to leave the experiment early, you will be shown your payment summary for today's experiment. Remember that the computer will randomly determine which of Task 1 or Task 2 you will be paid for. If Task 2 is chosen for payment, you will receive 150 ECU for this task since Prize 1 and Prize 2 are equal. However, you will not be told whether you have received Prize 1 or Prize 2. Once you have finished reviewing your payment summary, please raise your hand and wait for an experimenter to activate the questionnaire for you to complete. After you have completed the questionnaire, please raise your hand and wait for the experimenter to call you to receive your payment.

If you have any questions, please raise your hand. Otherwise, please proceed to answer the questions on the next page. The purpose of these questions is to make sure that you understand the task. Any unclear points will be explained by the experimenter. Once you have answered all the questions, please raise your hand and one of the experimenters will come to check your answers. We will proceed with the task after checking everyone's answers.

Practice Questions for Task 2

(Please note that the numbers in the following questions are for illustration purposes only. The questions aim to help you understand the task in a better way and should not be used as a guide for decision-making in the experiment.)

1. Assume that you encode 1 word and your opponent encodes 9 words. What is your chance of receiving Prize 1?

- (a) $1 / 9$
- (b) $1 / 10$
- (c) $1 / 8$
- (d) $8 / 9$
- (e) $9 / 10$

2. Assume that you encode 9 words and your opponent encodes 1 word. What is your chance of receiving Prize 1?

- (a) $1 / 9$
- (b) $1 / 10$
- (c) $8 / 9$
- (d) $9 / 10$
- (e) $9 / 9$

3. Assume that Player A encodes 45 words. State whether each of the following statements is true or false.

- (i) If Player B encodes 0 words, then Player B will definitely receive Prize 2 which is worth 150 ECU.
- (ii) If Player B encodes 1 word, then Player B will definitely receive Prize 2 which is worth 150 ECU.
- (iii) If Player B encodes 45 words, then each player will receive Prize 2 which is worth 150 ECU.

4. Assume that you choose to end the task after 3 minutes. What would be the total payment you receive for this task?

- (a) 0 ECU
- (b) 45 ECU
- (c) 75 ECU
- (d) 105 ECU
- (e) 150 ECU

Important summary information:

- Task 2 is played in groups of two. The matchings are anonymous. You will not be told which of the participants in this room are assigned to which group.
- Player A and Player B will be given the opportunity to participate in an activity to encode words using the codes given on the screen.
- There are two prizes in this task – Prize 1 and Prize 2. You can never guarantee yourself Prize 1. However, by encoding more words correctly, you can increase your chance of receiving Prize 1. The player who does not receive Prize 1 receives Prize 2. Prize 1 is worth 150 ECU. Prize 2 is worth 150 ECU.
- In addition, you have the opportunity to end the experiment and leave at any time during the task. If Task 2 is chosen for payment, you will receive 150 ECU for this task even if you choose to end the task before the 10 minutes are over. However, you will not be told whether you have received Prize 1 or Prize 2.

If you have no further questions, we will now begin a practice round of the activity. The practice round will last for 3 minutes (180 seconds). The purpose of the practice round is for you to familiarise yourself with the activity. The number of words you encode during this practice round will not affect your payment in today's experiment. You are also not allowed to leave the experiment early during the practice round.

Once you have completed the practice round, the computer will reveal the information about your assigned role for Task 2. Task 2 will then begin.

Task 2 (Treatment P)

In this task, the computer will randomly match you with one other person in the room. Hence, you will participate in Task 2 in groups of two. No one will ever be informed of the identity of the other individual in their group.

Each group member will have one of two possible roles: Player A or Player B. At the beginning of the task, you will be informed whether you have been assigned the role of Player A or Player B. Each individual in your group has an equal chance of being assigned the role of Player A or Player B.

Player A and Player B will be given the opportunity to participate in an activity. The activity is the same for both players. Player A and Player B will each be presented with a series of words. They will be asked to encode these words by substituting the letters of the alphabet with numbers using an encoding table which will be provided on their screens. Every time a word is encoded correctly, the encoding table will change.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
2	1	4	3	6	5	8	7	10	9	12	11	14	13	16	15	18	17	20	19	22	21	24	23	26	25

The word you are now encoding is number 1

WORD: E L P P A

CODE:

After filling the codes, press the "OK" button to verify the codes and proceed to the next word.

At any time during the experiment, if you wish to take a break, you can press the "time-out" button at the top right-hand corner of the screen.

You must remain seated and keep silent until the end of the task.

OK

Figure 2: Encoding Activity for Task 2

Once you encode a word correctly, the computer will prompt you with another word which you will be asked to encode. Once you encode that word, you will be given another word and so on. This process will continue for 10 minutes (600 seconds). Player A and Player B will be given the same words to encode in the same sequence.

Figure 2 shows an example of a word (ELPPA) to be encoded. The table given on the screen shows that E=6, L=11, P=15, P=15, and A=2.

There are two prizes, Prize 1 and Prize 2. These two prizes will be allocated to Player A and Player B according to the total number of words correctly encoded by the players.

The number of words encoded correctly by the players in the 10-minute period will determine who receives Prize 1. The player who does not receive Prize 1 will receive Prize 2. Prize 1 is worth 150 ECU. Prize 2 is worth 150 ECU.

Given the number of words correctly encoded by Player A and Player B, Prize 1 will be allocated in the following manner.

You can never guarantee yourself Prize 1. However, by encoding more words correctly, you can increase your chance of receiving Prize 1. The more words you encode relative to the other player, the greater your chance of receiving Prize 1. The more words the other player encodes, the less likely you are to receive Prize 1. Specifically, your chance of receiving Prize 1 is given by the following expression.

$$\begin{aligned} &\text{Your chance of receiving Prize 1} \\ &= \frac{\text{\# words you encode correctly}}{\text{\# words you encode correctly} + \text{\# words the other player encodes correctly}} \end{aligned}$$

You can think of it in the following way. For example, if you encode 10 words correctly in total and the other player encodes 20 words correctly in total, then you will receive 10 lottery tickets while the other participant will receive 20 lottery tickets. At the end of Task 2, the computer randomly draws one of the 30 lottery tickets received by you and the other player. The owner of the drawn ticket receives Prize 1. In this example, your chance of receiving Prize 1 is $10 / (10 + 20) = 0.33$ and the other participant's chance of receiving Prize 1 is $20 / (10 + 20) = 0.67$. Hence, your chance of receiving Prize 1 depends on the number of lottery tickets received by you and the other participant. The player who does not receive Prize 1 will receive Prize 2. If both Player A and Player B encode the same number of words correctly, then the computer will allocate the two prizes randomly. Each player has the same chance of receiving Prize 1.

At any time during the experiment, if you wish to take a break, you can press the “time-out” button at the top right-hand corner of the screen displayed in Figure 2. During the time-out, the encoding task is blocked and you cannot continue working on the task. Figure 3 shows the screen which will be displayed when you take a time-out. If you wish to continue with the task, you can click the “resume” button in the middle of the screen. You can take as many time-outs as you want during the task.

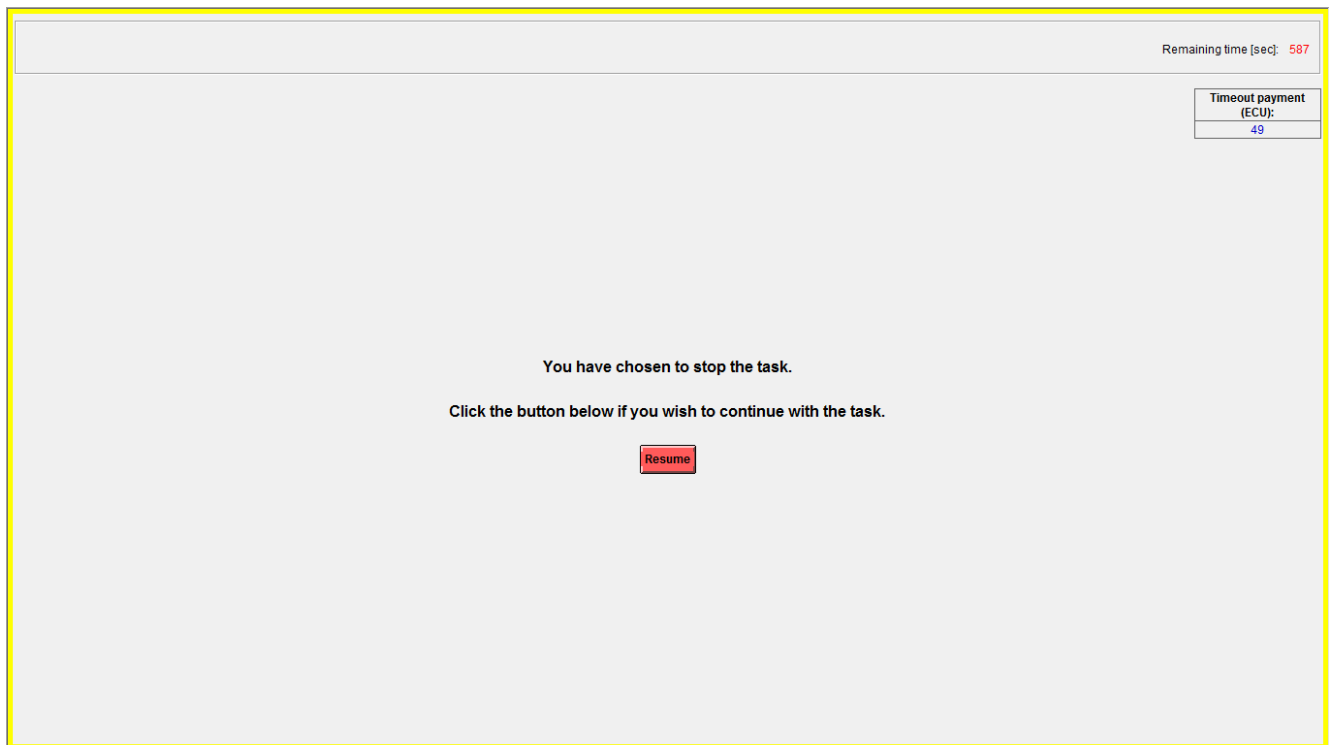


Figure 3: Time-Out Screen for Task 2

In addition to receiving either Prize 1 or Prize 2, for every minute you spend in time-out, you will earn 5 ECU. Hence, if you spend all of the 10 minutes on the “time-out” screen, you will receive 50 ECU. This means that for every second you spend on the encoding task, a proportional amount will be deducted from the total possible sum of 50 ECU. At any point during the task, you can see the amount you would receive if you click the time-out button and stay out for the remainder of the task displayed at the top right-hand corner of the screen (as shown in Figures 2 and 3).

If you have any questions, please raise your hand. Otherwise, please proceed to answer the questions on the next page. The purpose of these questions is to make sure that you understand the task. Any unclear points will be explained by the experimenter. Once you have answered all the questions, please raise your hand and one of the experimenters will come to check your answers. We will proceed with the task after checking everyone’s answers.

Practice Questions for Task 2

(Please note that the numbers in the following questions are for illustration purposes only. The questions aim to help you understand the task in a better way and should not be used as a guide for decision-making in the experiment.)

1. Assume that you encode 1 word and your opponent encodes 9 words. What is your chance of receiving Prize 1?

- (a) 1 / 9
- (b) 1 / 10
- (c) 1 / 8
- (d) 8 / 9
- (e) 9 / 10

2. Assume that you encode 9 words and your opponent encodes 1 word. What is your chance of receiving Prize 1?

- (a) 1 / 9
- (b) 1 / 10
- (c) 8 / 9
- (d) 9 / 10
- (e) 9 / 9

3. Assume that Player A encodes 45 words. State whether each of the following statements is true or false.

- (i) If Player B encodes 0 words, then Player B will definitely receive Prize 2 which is worth 150 ECU.
- (ii) If Player B encodes 1 word, then Player B will definitely receive Prize 2 which is worth 150 ECU.
- (iii) If Player B encodes 45 words, then each player will receive Prize 2 which is worth 150 ECU.

4. Assume that you spend 3 minutes on the encoding task and the remaining time on the “time-out” screen. What would be the total payment you receive for this task?

- (a) 150 ECU
- (b) 153 ECU
- (c) 165 ECU
- (d) 185 ECU
- (e) 200 ECU

Important summary information:

- Task 2 is played in groups of two. The matchings are anonymous. You will not be told which of the participants in this room are assigned to which group.
- Player A and Player B will be given the opportunity to participate in an activity to encode words using the codes given on the screen. If, at any point during the activity, you prefer not to participate in it, then you can press the “time-out” button.
- There are two prizes in this task – Prize 1 and Prize 2. You can never guarantee yourself Prize 1. However, by encoding more words correctly, you can increase your chance of receiving Prize 1. The player who does not receive Prize 1 receives Prize 2. Prize 1 is worth 150 ECU. Prize 2 is worth 150 ECU.
- In addition, your payment depends on how much time you spend on the “time-out” screen. For every minute you spend in time-out, you will earn 5 ECU. Hence, if you spend all of the 10 minutes on the “time-out” screen, you will receive 50 ECU.

If you have no further questions, we will now begin a practice round of the activity. The practice round will last for 3 minutes (180 seconds). The purpose of the practice round is for you to familiarise yourself with the activity. The number of words you encode during this practice round will not affect your payment in today’s experiment. There is also no time-out payment to receive from this practice round.

Once you have completed the practice round, the computer will reveal the information about your assigned role for Task 2. Task 2 will then begin.

Task 2 (Treatment A1A2)

In this task, each player will have a choice between two activities: Activity 1 or Activity 2. You may choose to do only one, both, or none of the activities. At any time during the task, you can switch between the two activities as many times as you want. Your payment from this task will be equal to the total earnings that you receive from both Activity 1 and Activity 2. You will be given 10 minutes (600 seconds) to participate in both activities.

A screenshot of both activities is shown in Figure 2. Activity 1 is located in the top panel with a blue frame, while Activity 2 is located in the bottom panel with a red frame.

Remaining time [sec]: 596

Activity 1:

The word you are now encoding is number 1

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
2	1	4	3	6	5	8	7	10	9	12	11	14	13	16	15	18	17	20	19	22	21	24	23	26	25

WORD: E L P P A

CODE:

OK

Activity 2:

The word you are now encoding is number 1

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
26	1	24	3	22	5	20	7	18	9	16	11	14	13	12	15	10	17	8	19	6	21	4	23	2	25

WORD: R E P A P

CODE:

OK

Figure 2: Encoding Activities for Task 2

Activity 1

To participate in Activity 1, the computer will randomly match you with one other person in the room. No one will ever be informed of the identity of the other individual in their group. Each group member will have one of two possible roles: Player A or Player B. At the beginning of the task, you will be informed whether you have been assigned the role of Player A or Player B. Each individual in your group has an equal chance of being assigned the role of Player A or Player B.

Player A and Player B will each be presented with a series of words in the same order. They will be asked to encode these words by substituting the letters of the alphabet with numbers using an encoding table which will be provided on their screens. Every time a word is encoded correctly, the encoding table will change.

As an example, Figure 2 shows that in Activity 1, the word to be encoded is ELPPA, and the table given on the screen shows that E=6, L=11, P=15, P=15, and A=2.

Once you encode a word correctly, the computer will prompt you with another word which you will be asked to encode. Once you encode that word, you will be given another word and so on.

There are two prizes, Prize 1 and Prize 2. These two prizes will be allocated to Player A and Player B according to the total number of words correctly encoded by the players.

The number of words encoded correctly by the players in the 10-minute period will determine who receives Prize 1. The player who does not receive Prize 1 will receive Prize 2 in Activity 1. Prize 1 is worth 150 ECU. Prize 2 is worth 150 ECU.

Given the number of words correctly encoded by Player A and Player B in Activity 1, Prize 1 will be allocated in the following manner.

You can never guarantee yourself Prize 1. However, by encoding more words correctly in Activity 1, you can increase your chance of receiving Prize 1. The more words you encode relative to the other player, the greater your chance of receiving Prize 1. The more words the other player encodes, the less likely you are to receive Prize 1. Specifically, your chance of receiving Prize 1 is given by the following expression.

$$\text{Your chance of receiving Prize 1 in Activity 1} = \frac{\# \text{ words you encode in Activity 1}}{\# \text{ words you encode in Activity 1} + \# \text{ words the other player encodes in Activity 1}}$$

You can think of it in the following way. For example, if you encode 10 words correctly in total and the other player encodes 20 words correctly in total, then you will receive 10 lottery tickets while the

other participant will receive 20 lottery tickets. At the end of Task 2, the computer randomly draws one of the 30 lottery tickets received by you and the other player. The owner of the drawn ticket receives Prize 1. In this example, your chance of receiving Prize 1 is $10 / (10 + 20) = 0.33$ and the other participant's chance of receiving Prize 1 is $20 / (10 + 20) = 0.67$. Hence, your chance of receiving Prize 1 depends on the number of lottery tickets received by you and the other participant. The player who does not receive Prize 1 will receive Prize 2. If both Player A and Player B encode the same number of words correctly, then the computer will allocate the two prizes randomly. Each player has the same chance of receiving Prize 1.

Activity 2

The task in Activity 2 is the same. However, you participate in this activity individually and your payment is determined differently.

Specifically, in Activity 2, you will receive 1.25 ECU for each word that you encode correctly. Hence, if you encode 4 words correctly in Activity 2, then you will receive 5 ECU from this activity.

In both Activity 1 and Activity 2, all participants will be given the same encoding tables and the same words in the same order. However, the encoding tables and the sequence of words will be different between the two activities. As an example, Figure 2 shows that while the word is ELPPA in Activity 1, it is REPAP in Activity 2. The table given on the screen shows that R=17, E=22, P=15, A=26, and P=15.

At the end of the experiment, if Task 2 is picked for payment, then you will receive:

Payment for Task 2 = (Prize 1 or Prize 2) + (number of words you encode in Activity 2 x 1.25 ECU).

If you have any questions, please raise your hand. Otherwise, please proceed to answer the questions on the next page. The purpose of these questions is to make sure that you understand the task. Any unclear points will be explained by the experimenter. Once you have answered all the questions, please raise your hand and one of the experimenters will come to check your answers. We will proceed with the task after checking everyone's answers.

Practice Questions for Task 2

(Please note that the numbers in the following questions are for illustration purposes only. The questions aim to help you understand the task in a better way and should not be used as a guide for decision-making in the experiment.)

1. In Activity 1, assume that you encode 1 word and your opponent encodes 9 words. What is your chance of receiving Prize 1?

- (a) $1 / 9$
- (b) $1 / 10$
- (c) $1 / 8$
- (d) $8 / 9$
- (e) $9 / 10$

2. In Activity 1, assume that you encode 9 words and your opponent encodes 1 word. What is your chance of receiving Prize 1?

- (a) $1 / 9$
- (b) $1 / 10$
- (c) $8 / 9$
- (d) $9 / 10$
- (e) $9 / 9$

3. In Activity 1, assume that Player A encodes 45 words. State whether each of the following statements is true or false.

- (i) If Player B encodes 0 words in Activity 1, then Player B will definitely receive Prize 2 which is worth 150 ECU.
- (ii) If Player B encodes 1 word in Activity 1, then Player B will definitely receive Prize 2 which is worth 150 ECU.
- (iii) If Player B encodes 45 words in Activity 1, then each player will receive Prize 2 which is worth 150 ECU.

4. Suppose you encode 20 words correctly in Activity 1, and 40 words correctly in Activity 2. Suppose also that Player B encodes 20 words correctly in Activity 1. What would be the total payment you can receive from this task?

- (a) 40 ECU
- (b) 60 ECU
- (c) 75 ECU
- (d) 150 ECU
- (e) 200 ECU

[Please turn over.]

5. Suppose you encode 0 words correctly in Activity 1, and 40 words correctly in Activity 2. Suppose also that Player B encodes 20 words correctly in Activity 1. What would be the total payment you can receive from this task?

- (a) 40 ECU
- (b) 60 ECU
- (c) 75 ECU
- (d) 150 ECU
- (e) 200 ECU

Important summary information:

- In Task 2, there are two activities. You may choose to do only one, both, or none of the activities. At any time during the task, you can switch between the two activities as many times as you want.
- Activity 1 is played in groups of two. The matchings are anonymous. You will not be told which of the participants in this room are assigned to which group.
- Activity 2 is played individually.
- In each activity, you will be asked to encode words using the codes given on the screen.
- Your payment from this task will be equal to the total earnings that you receive from both Activity 1 and Activity 2.
- In Activity 1, there are two prizes– Prize 1 and Prize 2. You can never guarantee yourself Prize 1. However, by encoding more words correctly, you can increase your chance of receiving Prize 1. The player who does not receive Prize 1 receives Prize 2. Prize 1 is worth 150 ECU. Prize 2 is worth 150 ECU.
- In Activity 2, you will receive 1.25 ECU for each word that you encode correctly.

If you have no further questions, we will now begin a practice round of the activities. The practice round will last for 3 minutes (180 seconds). The purpose of the practice round is for you to familiarise yourself with both activities. The number of words you encode in both activities during this practice round will not affect your payment in today's experiment.

Once you have completed the practice round, the computer will reveal the information about your assigned role for Task 2. Task 2 will then begin.

Appendix B: Additional analysis

In this section, we present the analysis including three additional treatments: (i) Slider (S); (ii) 20-Minute (20-Min); and (iii) Effort Choice (EC). We show that the main results in the paper continue to hold after the inclusion of the data from these treatments.

Table B1 presents a summary of all the treatments including these three additional treatments. Figure B1 presents histograms of the distribution of effort in these additional treatments.

Data from these three treatments are pooled together with the data from Experiment 2, and Table B2 presents the participation rate and average effort per minute conditional on participation in these treatments. Table B3 presents the results of OLS and quantile (median) regressions of participation (column 1) and effort per minute (columns 2 and 3) for Experiment 2 including these additional treatments.

A comparison of treatments S and 20-Min to treatment B reveals that, in the absence of monetary incentives, both participation and effort per minute remain very high even when a different task is used or when the duration of the task is increased. 94% and 92% of the subjects exert positive effort in treatments S and 20-Min, respectively. These participation rates are not significantly different from that in treatment B (Fisher's exact tests, B vs. S: p-value = 0.678; B vs. 20-Min: p-value = 0.433). The average effort per minute in treatment 20-Min is 4.22, which is also not significantly different to that in treatment B (Wilcoxon rank-sum test, B vs. 20-Min: p-value = 0.959).¹ The regression estimates in Table B3 are also consistent with these findings.

Finally, we find that the behavior of the subjects in treatment EC is largely similar to that in Activity 1 of treatment A1A2. 36% of subjects exert positive effort in treatment EC, and

¹ We do not compare the average effort per minute between treatments B and S since the tasks used in these treatments are different.

this is not statistically different to that in treatment A1A2 (Fisher's exact test, A1A2 vs. EC: $p\text{-value} = 1.000$). This suggests that competitiveness is a key driver of effort for some subjects who choose to exert effort even in the absence of monetary prizes. This result is also consistent with Sheremeta (2010).

Figure B1: Overall effort choices by treatment (S, 20-Min, and EC)

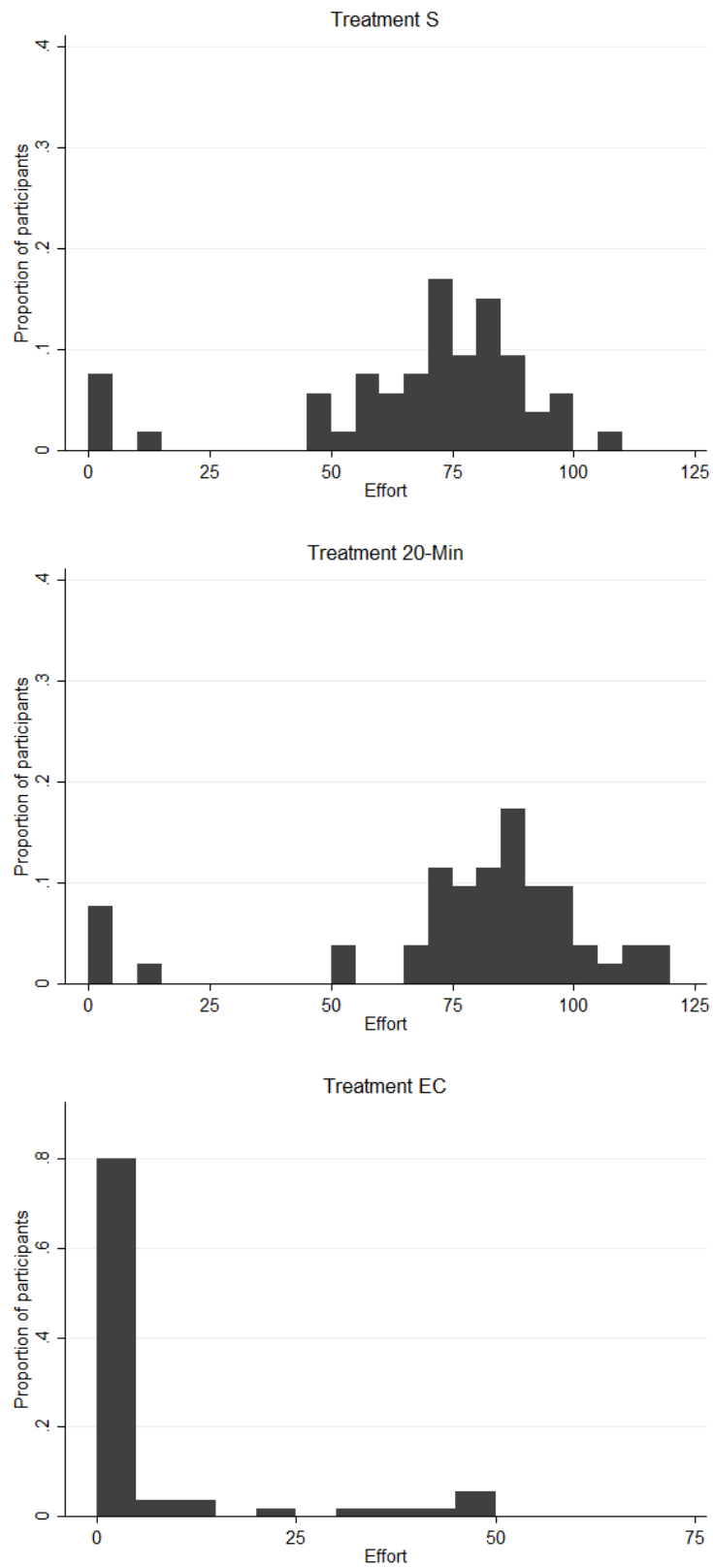


Table B1: Summary of experimental treatments (including treatments S, 20-Min, and EC)

Treatment	No. of subjects	Value of Prize 1	Value of Prize 2	Features
(a) Experiment 1				
Baseline (B)	54	150 ECU	150 ECU	Baseline treatment with no incentives
Baseline – Low (BL)	50	250 ECU	150 ECU	Baseline treatment with low incentives
Baseline – High (BH)	52	600 ECU	150 ECU	Baseline treatment with high incentives
(b) Experiment 2				
Baseline (B)	54	150 ECU	150 ECU	Baseline treatment
Early Departure (ED)	50	150 ECU	150 ECU	Outside option: Can leave experiment early
Pause (P)	56	150 ECU	150 ECU	Outside option: Timeout payment
Activity 1/2 (A1A2)	56	150 ECU	150 ECU	Outside option: Same activity with piece rate
Slider (S)	54	150 ECU	150 ECU	Slider task used
20-Minute (20-Min)	56	150 ECU	150 ECU	Longer duration
Effort Choice (EC)	56	150 ECU	150 ECU	No real-effort task
(c) Experiment 3				
Activity 1/2 (A1A2)	56	150 ECU	150 ECU	A1A2 treatment with no incentives
Activity 1/2 – Low (A1A2-L)	56	250 ECU	150 ECU	A1A2 treatment with low incentives
Activity 1/2 – High (A1A2-H)	52	600 ECU	150 ECU	A1A2 treatment with high incentives

Table B2: Summary statistics (including treatments S, 20-Min, and EC)

Treatment	# of subjects^(a)	Participation rate	Average effort per minute^(b)
(a) Experiment 1			
Baseline (B)	54	0.96 [0.19]	4.22 [0.81]
Baseline – Low (BL)	50	1.00 [0.00]	4.49 [0.56]
Baseline – High (BH)	52	1.00 [0.00]	4.33 [0.86]
(b) Experiment 2			
Baseline (B)	54	0.96 [0.19]	4.22 [0.81]
Early Departure (ED)	50	0.82 [0.39]	3.27 [1.56]
Pause (P)	56	0.54 [0.50]	0.94 [1.12]
Activity 1/2 (A1A2)	53	0.38 [0.49]	0.54 [0.88]
Slider (S)	53	0.94 [0.23]	7.18 [1.92]
20-Minute (20-Min)	52	0.92 [0.27]	4.22 [0.91]
Effort Choice (EC)	55	0.36 [0.49]	. [.]
(c) Experiment 3			
Activity 1/2 (A1A2)	53	0.38 [0.49]	0.54 [0.88]
Activity 1/2 – Low (A1A2-L)	56	0.98 [0.13]	2.52 [1.74]
Activity 1/2 – High (A1A2-H)	52	0.96 [0.19]	3.27 [1.44]

Sample means given. Standard deviations in brackets.

For treatments A1A2, A1A2-L, and A1A2-H, we report the participation rate and average effort per minute in Activity 1.

^(a) We discovered that nine subjects (three in treatment A1A2; one in treatment S; four in treatment 20-Min; and one in treatment EC) had previously participated in the same experiment. Hence, we drop these subjects in our analysis.

^(b) We only consider the average effort per minute for those subjects who exerted a positive level of effort.

Table B3: Regression results for Experiment 2 (including treatments S, 20-Min, and EC)

Variables	Participation =1 if Effort > 0 (OLS)	Effort per minute given Effort > 0 (OLS)	Effort per minute given Effort > 0 (Quantile)
	(1)	(2)	(3)
Early Departure (ED)	-0.161** (0.076)	-0.940*** (0.237)	-0.581*** (0.191)
Pause (P)	-0.431*** (0.073)	-3.255*** (0.252)	-4.002*** (0.203)
Activity 1/2 (A1A2)	-0.590*** (0.074)	-3.720*** (0.296)	-4.156*** (0.238)
20-Minute (20-Min)	-0.042 (0.074)	0.032 (0.220)	0.014 (0.177)
Slider (S)	-0.041 (0.074)		
Effort Choice (EC)	-0.605*** (0.074)		
% invested in risk task	-0.174** (0.072)	-0.278 (0.297)	0.096 (0.239)
Age	-0.002 (0.005)	0.003 (0.020)	-0.008 (0.016)
Female	0.013 (0.041)	0.342** (0.167)	0.121 (0.135)
Economics major	-0.021 (0.063)	-0.137 (0.263)	-0.185 (0.212)
Undergraduate student	0.087 (0.136)	0.835 (0.559)	0.773* (0.450)
Graduate student	0.146 (0.128)	0.910* (0.535)	0.829* (0.431)
Australian	-0.132*** (0.043)	0.049 (0.181)	0.079 (0.146)
# previous experiments	-0.001 (0.011)	0.045 (0.044)	0.017 (0.036)
Constant	1.064*** (0.209)	3.215*** (0.818)	3.556*** (0.659)
Observations	373	191	191
R-squared	0.342	0.658	-

Ordinary least squares estimates given in (1) and (2), and quantile (median) regression estimates given in (3).

Standard errors in parentheses. For all regressions, treatment B is the reference treatment.

In all regressions, the controls are treatment variables and subjects' characteristics, which include the percentage of the endowment invested in the risk task, age, gender, study level at University, whether the subject is pursuing a major in economics, whether the subject is Australian, and previous experience with economic experiments.

For treatment A1A2, we consider participation and effort per minute in Activity 1.

***, **, * denote statistical significance at the 1%, 5%, and 10% levels, respectively.