**Appendix A: Experimental Materials for Instructions and knowledge tests given to participants**

*Deterministic Prisoner's Dilemma - Repeated [Precommitted], Environmental Frame*

**Instructions (pg 1 of 5)**

Your choices will determine the payment you receive for participating. Therefore, you should pay careful attention to the instructions which follow.

Scenario: Imagine you are a farmer in Indonesia. You get an annual yield of 8,500 Rupiah (Rp) from your potato crops. Both you and a neighboring farmer use the pesticide Aldicarb on your potato crops. However, using Aldicarb, which is toxic, causes groundwater contamination each year, which affects both you and your counterpart. The cost to you of cleaning the groundwater each year is 1,600 Rp. You have the option to switch to a more expensive, though safer, pesticide, at the cost of 1,400 Rp annually, to avoid groundwater contamination. However, groundwater contamination will only be completely eliminated if both you and your counterpart invest in the safer pesticide.

**Instructions (pg 2 of 5)**

This is a scenario in which the outcomes of your decisions depend not only on what you do, but also on what your counterpart does. You will be paired with other participants in the room (just like yourself) whose identities are not known to you. Over the course of 20 "years" (ie, rounds), you and your counterpart will each earn money and independently make decisions about whether or not to invest funds to avoid losses from groundwater contamination. Gains and losses will be measured in the Indonesian currency, the rupiah (or Rp). 9,673 Rp = $1.

**Instructions (pg 3 of 5)**

Here is a summary of the possible outcomes, depending on your choice and the choice of your counterpart:

- Each year, you and your counterpart will each earn a base income of 8,500 Rp (you will always receive this income, no matter what else happens).

- If both you and your counterpart choose to INVEST, then you each pay 1,400 Rp (this is the cost of the safer pesticide), and there is no groundwater contamination.

- If both you and your counterpart choose to NOT INVEST, then groundwater contamination occurs and each of you will lose 1,600 Rp to pay for the cleanup.

- If one of you INVESTS and the other does NOT INVEST, the investor must pay 1,400 Rp for the safer pesticide and 400 Rp to clean up partial groundwater contamination from his/her counterpart. The noninvestor will also have to pay for cleaning up groundwater contamination, therefore losing 1,200 Rp.

**Instructions (pg 4 of 5)**

You will play 4 sessions, of 20 years each. Each time you finish a session of 20 years, you will be randomly paired with a new counterpart. At the end of the study, we will randomly choose 1 of the 4 sessions you completed and convert the Rupiah (Rp) earned in that session to American dollars, at the rate of 9,673 Rp = $1, and pay it out for real money. This will be your payment for participating in the study. Because any session could potentially be paid out for real money, you should take all your choices seriously.

**Instructions (pg 5 of 5)**

You will play one year at a time, as will your counterpart. After each year, you will learn the decision of your counterpart, and he or she will learn your decision. After all 20 years, you will see a summary for the entire session, including your choices, your counterpart's choices, and the outcomes in each year. Then you will be randomly paired with a counterpart again for the next session.

[You will **precommit** your choices for all 20 years in the session, as will your counterpart. After you and your counterpart make your choices, all 20 years will be played out at once. Then, you will see a summary of the your choices, your counterpart's choices, and the outcomes, for the entire 20 year session. Your counterpart will see this same summary. Then you will be randomly paired with a counterpart again for the next session.]

**Summary and Comprehension Check**

No matter what, you will earn a base pay of 8,500 Rp each year. Here is a table summarizing the possible additional outcomes, depending on your decision (whether to invest or not) and the decision of your counterpart:

**Each Year**

|  |  |
| --- | --- |
|  | Your Counterpart |
| INVEST | NOT INVEST |
| You | INVEST | - You lose **1,400 Rp**.- Your counterpart loses **1,400 Rp**. | - You lose **1,800 Rp**.- Your counterpart loses **1,200 Rp**. |
| NOT INVEST | - You lose **1,200 Rp**.- Your counterpart loses **1,800 Rp**. | - You lose **1,600 Rp**.- Your counterpart loses **1,600 Rp**. |

1. If both you and your counterpart decide to invest, how many Rp would your counterpart lose?
Rp

2a. If your counterpart invests, but you do not, how many Rp would you lose?
Rp

2b. If your counterpart invests, but you do not, how many Rp would your counterpart lose?
Rp

3. If neither you nor your counterpart decide to invest, how many Rp would you lose?
Rp

*Stochastic Prisoner's Dilemma - Repeated [Precommitted], Environmental Frame*

**Instructions (pg 1 of 5)**

Your choices will determine the payment you receive for participating. Therefore, you should pay careful attention to the instructions which follow.

Scenario: Imagine you are a farmer in Indonesia. You get an annual yield of 8,500 Rupiah (Rp) from your potato crops. Both you and a neighboring farmer use the pesticide Aldicarb on your potato crops. However, there is a small risk of groundwater contamination each year from this pesticide, which is toxic. If contamination occurs, you and/or your neighboring farmer will suffer a loss of 40,000 Rp, to pay for groundwater cleanup. You have the option to switch to a more expensive, though safer, pesticide, at the cost of 1,400 Rp annually, to avoid groundwater contamination. However, you will only be fully protected if both you and your counterpart invest in the safer pesticide. The groundwater contamination has an equal chance of happening each year, regardless of whether it occurred in the previous year.

**Instructions (pg 2 of 5)**

This is a scenario in which the outcomes of your decisions depend not only on what you do, but also on what your counterpart does and on random chance. You will be paired with other participants in the room (just like yourself) whose identities are not known to you. Over the course of 20 "years" (ie, rounds), you and your counterpart will each earn money and independently make decisions about whether or not to invest funds to avoid losses from low probability negative events. Gains and losses will be measured in the Indonesian currency, the rupiah (or Rp). 9,673 Rp = $1.

**Instructions (pg 3 of 5)**

Here is a summary of the possible outcomes, depending on your choice and the choice of your counterpart:

- Each year, you and your counterpart will each earn a base income of 8,500 Rp (you will always receive this income, no matter what else happens).

- If both you and your counterpart choose to INVEST, then you must each pay 1,400 Rp (this is the cost of the safer pesticide).

- If both you and your counterpart choose to NOT INVEST, then there is a 4% chance that groundwater contamination will occur and each of you will lose 40,000 Rp and there is a 96% chance of losing 0 Rp.

- If you INVEST and your counterpart does NOT INVEST, then there is a 3% chance that groundwater contamination will occur and your counterpart will lose 40,000 Rp and you will lose 41,400 Rp, and there is a 97% chance that your counterpart will lose 0 Rp and you will lose 1,400 Rp.

- If one of you INVESTS and the other does NOT INVEST, the investor must pay 1,400 Rp and has a 1% probability of losing an additional 40,000 Rp due to groundwater contamination from his/her counterpart. In other words, the investor has a 1% probability of losing 41,400 Rp and a 99% probability of losing 1,400 Rp. The noninvestor will have a 3% probability of groundwater contamination occuring and therefore losing 40,000 Rp.

Probabilistic outcomes will be determined by a random number generator, where it is equally likely that any number between 1 and 100 is chosen. In other words, the computer fairly and randomly selects a random number. Groundwater contamination will occur if lower numbers are chosen. In other words, if there is a 4% chance ofgroundwater contamination occuring, it will occur when the number randomly chosen is a 1, 2, 3 or 4, while if there is a 1% chance, it will occur when the number randomly chosen is a 1.

**Instructions (pg 4 of 5)**

You will play 4 sessions, of 20 years each. Each time you finish a session of 20 years, you will be randomly paired with a new counterpart. At the end of the study, we will randomly choose 1 of the 4 sessions you completed and convert the Rupiah (Rp) earned in that session to American dollars, at the rate of 9,673 Rp = $1, and pay it out for real money. This will be your payment for participating in the study. Because any session could potentially be paid out for real money, you should take all your choices seriously.

Payments for the study are often in the neighborhood of $15. In the very unlikely event that you finish with negative dollars, we would ask you to stay and volunteer to complete other studies, at the rate of 25 cents a minute, to pay back what you owe. For example, if you finish the Study 1bown $5, we would ask you to stay for an additional 20 minutes.

**Instructions (pg 5 of 5)**

You will play one year at a time, as will your counterpart. After each year, you will learn the decision of your counterpart, and he or she will learn your decision. You will also learn the random number chosen by the computer, and whether the groundwater contamination occurred in that year. After all 20 years, you will see a summary for the entire session, including your choices, your counterpart's choices, and the outcomes in each year. Then you will be randomly paired with a counterpart again for the next session.

**Summary and Comprehension Check**

No matter what, you will earn a base pay of 8,500 Rp each year. Here is a table summarizing the possible additional outcomes, depending on your decision (whether to invest or not) and the decision of your counterpart:

**Each Year**

|  |  |
| --- | --- |
|  | Your Counterpart |
| INVEST | NOT INVEST |
| You | INVEST | - You definitely lose **1,400 Rp**, and have a 0% chance of groundwater contamination.- Your counterpart definitely loses **1,400 Rp**, and has a 0% chance of groundwater contamination. | - You definitely lose **1,400 Rp** and have a 1% chance of groundwater contamination occuring and losing an additional **40,000 Rp**.- Your counterpart has a 3% chance of losing **40,000 Rp** due to groundwater contamination and a 97% chance of losing **0 Rp** |
| NOT INVEST | - You have a 3% chance of losing **40,000 Rp** due to groundwater contamination and a 97% chance of losing **0 Rp**.- Your counterpart definitely loses **1,400 Rp** and has a 1% chance of groundwater contamination occuring and losing an additional **40,000 Rp**. | - You have a 4% chance of groundwater contamination occurring and losing **40,000 Rp** and a 96% chance of losing **0 Rp**.- Your counterpart has a 4% chance of groundwater contamination occurring and losing **40,000 Rp** and a 96% chance of losing **0 Rp**. |

1. If both you and your counterpart decide to invest, how many Rp would you definitely lose? (please give your answer as an integer)
Rp

2a. If your counterpart invests, but you do not, what is the percent chance that you will suffer groundwater contamination in any given year? (please give your answer as an integer)
%

2b. If your counterpart invests, but you do not, and you do suffer groundwater contamination, how many Rp would you lose? (please give your answer as an integer)
Rp

3. If neither you nor your counterpart decide to invest, what is the percent chance that your counterpart will suffer groundwater contamination in any given year? (please give your answer as an integer)
%

*Stochastic Prisoner's Dilemma - Repeated [Precommitted], Financial Frame*

**Instructions (pg 1 of 5)**

Your choices will determine the payment you receive for participating. Therefore, you should pay careful attention to the instructions which follow.

Scenario: Imagine you are an investor in Indonesia and you have a risky joint venture that earns 8,500 Rp per year. However, there is a small chance that you and/or your counterpart will suffer a loss of 40,000 Rp in a given year. You have the option to pay 1,400 Rp for a safety measure each year to protect against the possible loss. However, you will only be fully protected if both you and your counterpart invest in protection. The loss has an equal chance of happening each year, regardless of whether it occurred in the previous year.

**Instructions (pg 2 of 5)**

This is a scenario in which the outcomes of your decisions depend not only on what you do, but also on what your counterpart does and on random chance. You will be paired with other participants in the room (just like yourself) whose identities are not known to you. Over the course of 20 "years" (ie, rounds), you and your counterpart will each earn money and independently make decisions about whether or not to invest funds to avoid losses from low probability negative events. Gains and losses will be measured in the Indonesian currency, the rupiah (or Rp). 9,673 Rp = $1.

**Instructions (pg 3 of 5)**

Here is a summary of the possible outcomes, depending on your choice and the choice of your counterpart:

- Each year, you and your counterpart will each earn a base income of 8,500 Rp (you will always receive this income, no matter what else happens).

- If both you and your counterpart choose to INVEST, then you must each pay 1,400 Rp (this is the cost of protection from the negative event), and there is a 0% chance that the large loss will occur.

- If both you and your counterpart choose to NOT INVEST, then there is a 4% chance each of you will lose 40,000 Rp and there is a 96% chance of losing 0 Rp.

- If one of you INVESTS and the other does NOT INVEST, the investor must pay 1,400 Rp and has a 1% probability of losing additional 40,000 Rp. In other words, the investor has a 1% probability of losing 41,400 Rp and a 99% probability of losing 1,400 Rp. The noninvestor will have a 3% probability of losing 40,000 Rp.

Probabilistic outcomes will be determined by a random number generator, where it is equally likely that any number between 1 and 100 is chosen. In other words, the computer fairly and randomly selects a random number. The large loss will occur if lower numbers are chosen. In other words, if there is a 4% chance ofthe large loss occuring, it will occur when the number randomly chosen is a 1, 2, 3 or 4, while if there is a 1% chance, it will occur when the number randomly chosen is a 1.

**Instructions (pg 4 of 5)**

You will play 4 sessions, of 20 years each. Each time you finish a session of 20 years, you will be randomly paired with a new counterpart. At the end of the study, we will randomly choose 1 of the 4 sessions you completed and convert the Rupiah (Rp) earned in that session to American dollars, at the rate of 9,673 Rp = $1, and pay it out for real money. This will be your payment for participating in the study. Because any session could potentially be paid out for real money, you should take all your choices seriously.

Payments for the study are often in the neighborhood of $15. In the very unlikely event that you finish with negative dollars, we would ask you to stay and volunteer to complete other studies, at the rate of 25 cents a minute, to pay back what you owe. For example, if you finish the Study 1bown $5, we would ask you to stay for an additional 20 minutes.

**Instructions (pg 5 of 5)**

You will play one year at a time, as will your counterpart. After each year, you will learn the decision of your counterpart, and he or she will learn your decision. You will also learn the random number chosen by the computer, and whether the large loss occurred in that year. After all 20 years, you will see a summary for the entire session, including your choices, your counterpart's choices, and the outcomes in each year. Then you will be randomly paired with a counterpart again for the next session.

[You will **precommit** your choices for all 20 years in the session, as will your counterpart. After you and your counterpart make your choices, all 20 years will be played out at once. Then, you will see a summary of the your choices, your counterpart's choices, and the outcomes, for the entire 20 year session. Your counterpart will see this same summary. Then you will be randomly paired with a counterpart again for the next session.]

**Summary and Comprehension Check**

No matter what, you will earn a base pay of 8,500 Rp each year. Here is a table summarizing the possible additional outcomes, depending on your decision (whether to invest or not) and the decision of your counterpart:

**Each Year**

|  |  |
| --- | --- |
|  | Your Counterpart |
| INVEST | NOT INVEST |
| You | INVEST | - You definitely lose **1,400 Rp**, and have a 0% chance of the large loss occurring.- Your counterpart definitely loses **1,400 Rp**, and has a 0% chance of the large loss occurring. | - You definitely lose **1,400 Rp** and have a 1% chance of losing an additional **40,000 Rp**.- Your counterpart has a 3% chance of losing **40,000 Rp** and a 97% chance of losing **0 Rp** |
| NOT INVEST | - You have a 3% chance of losing **40,000 Rp** and a 97% chance of losing **0 Rp**.- Your counterpart definitely loses **1,400 Rp** and has a 1% chance of losing an additional **40,000 Rp**. | - You have a 4% chance of losing **40,000 Rp** and a 96% chance of losing **0 Rp**.- Your counterpart has a 4% chance of losing **40,000 Rp** and a 96% chance of losing **0 Rp**. |

1. If both you and your counterpart decide to invest, how many Rp would you definitely lose? (please give your answer as an integer)
Rp

2a. If your counterpart invests, but you do not, what is the percent chance that you will suffer a loss in any given year? (please give your answer as an integer)
%

2b. If your counterpart invests, but you do not, and you do suffer a loss, how many Rp would you lose? (please give your answer as an integer)
Rp

3. If neither you nor your counterpart decide to invest, what is the percent chance that your counterpart will suffer a loss in any given year? (please give your answer as an integer)
%

*Solo Game - Repeated [Precommitted], Financial Frame*

**Instructions (pg 1 of 5)**

Your choices will determine the payment you receive for participating. Therefore, you should pay careful attention to the instructions which follow.

Scenario: Imagine you are an investor in Indonesia and you have a risky venture that earns 8,500 Rp per year. However, there is a small chance that you will suffer a loss of 40,000 Rp in a given year. You have the option to pay 1,400 Rp for a safety measure each year to protect against the possible loss. You will be fully protected if you invest in protection. The loss has an equal chance of happening each year, regardless of whether it occurred in the previous year.

**Instructions (pg 2 of 5)**

This is a scenario in which the outcomes of your decisions depend on what you do and on random chance. Over the course of 20 "years" (ie, rounds), you will earn money and then make a decision about whether or not to invest funds to avoid a loss from low probability negative events. Gains and losses will be measured in the Indonesian currency, the rupiah (or Rp). 9,673 Rp = $1.

**Instructions (pg 3 of 5)**

Here is a summary of the possible outcomes, depending on your choice:

- Each year, you will each earn a base income of 8,500 Rp (you will always receive this income, no matter what else happens).

- If you choose to INVEST, then you must pay 1,400 Rp (this is the cost of protection from the negative event), and there is a 0% chance that the large loss will occur.

- If you choose to NOT INVEST, then there is a 4% chance you will lose 40,000 Rp and there is a 96% chance of losing 0 Rp.

Probabilistic outcomes will be determined by a random number generator, where it is equally likely that any number between 1 and 100 is chosen. In other words, the computer fairly and randomly selects a random number. The large loss will occur if lower numbers are chosen. In other words, if there is a 4% chance ofthe large loss occuring, it will occur when the number randomly chosen is a 1, 2, 3 or 4, while if there is a 1% chance, it will occur when the number randomly chosen is a 1.

**Instructions (pg 4 of 5)**

You will play 4 sessions, of 20 years each. At the end of the study, we will randomly choose 1 of the 4 sessions you completed and convert the Rupiah (Rp) earned in that session to American dollars, at the rate of 9,673 Rp = $1, and pay it out for real money. This will be your payment for participating in the study. Because any session could potentially be paid out for real money, you should take all your choices seriously.

Payments for the study are often in the neighborhood of $15. In the very unlikely event that you finish with negative dollars, we would ask you to stay and volunteer to complete other studies, at the rate of 25 cents a minute, to pay back what you owe. For example, if you finish the Study 1bown $5, we would ask you to stay for an additional 20 minutes.

**Instructions (pg 5 of 5)**

You will play one year at a time. After each year, you will learn the random number chosen by the computer, and whether the large loss occurred in that year. After all 20 years, you will see a summary for the entire session, including your choices and the outcomes in each year.

[You will **precommit** your choices for all 20 years in the session. After you make your choices, all 20 years will be played out at once. You will learn the random number chosen by the computer for each year, and whether the large loss occurred in that year. Then, you will see a summary for the entire session, including your choices and the outcomes in each year.]

**Summary and Comprehension Check**

No matter what, you will earn a base pay of 8,500 Rp each year. Here is a table summarizing the possible additional outcomes, depending on your decision (whether to invest or not) and the decision of your counterpart:

**Year**

|  |  |  |
| --- | --- | --- |
| You | INVEST | - You definitely lose **1,400 Rp**, and have a 0% chance of the large loss occurring. |
| NOT INVEST | - You have a 4% chance of losing **40,000 Rp** and a 96% chance of losing **0 Rp**. |

1. If you decide to invest, how many Rp would you definitely lose? (please give your answer as an integer)
Rp

2a. If you do not invest, what is the percent chance that you will suffer a loss in any given year? (please give your answer as an integer)
%

2b. If you do not invest, and you do suffer a loss, how many Rp would this cause you lose? (please give your answer as an integer)
Rp

3. If you decide not to invest, what is the percent chance that you will **NOT** suffer a loss in any given year? (please give your answer as an integer)
%

**Appendix B: Experimental Materials for Choice Options**

*Deterministic Prisoner's Dilemma - Repeated, Environmental Frame*

No matter what, you will earn a base pay of 8,500 Rp this year. Here is a table summarizing the possible additional outcomes, depending on your decision (whether to invest or not) and the decision of your counterpart:

**Year 1**

|  |  |
| --- | --- |
|  | Your Counterpart |
| INVEST | NOT INVEST |
| You | INVEST | - You lose **1,400 Rp**.- Your counterpart loses **1,400 Rp**. | - You lose **1,800 Rp**.- Your counterpart loses **1,200 Rp**. |
| NOT INVEST | - You lose **1,200 Rp**.- Your counterpart loses **1,800 Rp**. | - You lose **1,600 Rp**.- Your counterpart loses **1,600 Rp**. |

|  |
| --- |
| **Will you invest in the safer pesticide this year?**  |
| INVEST | NOT INVEST |
|  |  |

|  |
| --- |
| **Do you think your counterpart will invest in the safer pesticide this year?** |
| DEFINITELY | PROBABLY | PROBABLY NOT | DEFINITELY NOT |
|  |  |  |  |

*Deterministic Prisoner's Dilemma - Precommitted, Environmental Frame*

No matter what, you will earn a base pay of 8,500 Rp each year. Here is a table summarizing the possible additional outcomes, depending on your decision (whether to invest or not) and the decision of your counterpart:

**Each Year**

|  |  |
| --- | --- |
|  | Your Counterpart |
| INVEST | NOT INVEST |
| You | INVEST | - You lose **1,400 Rp**.- Your counterpart loses **1,400 Rp**. | - You lose **1,800 Rp**.- Your counterpart loses **1,200 Rp**. |
| NOT INVEST | - You lose **1,200 Rp**.- Your counterpart loses **1,800 Rp**. | - You lose **1,600 Rp**.- Your counterpart loses **1,600 Rp**. |

Now you will make your choices, and predict your counterparts choices, for all 20 years:

|  |
| --- |
| **Will you invest in the safer pesticide in year 1?** |
| INVEST | NOT INVEST |
| **Do you think your counterpart will invest in the safer pesticide in year 1?** |
|

|  |  |  |  |
| --- | --- | --- | --- |
| DEFINITELY | PROBABLY | PROBABLY NOT | DEFINITELY NOT |
|  |  |  |  |

 |
|   |
|   |
| **Will you invest in the safer pesticide in year 2?** |
| INVEST | NOT INVEST |
| **Do you think your counterpart will invest in the safer pesticide in year 2?** |
|

|  |  |  |  |
| --- | --- | --- | --- |
| DEFINITELY | PROBABLY | PROBABLY NOT | DEFINITELY NOT |
|  |  |  |  |

 |
|   |
|   |
| **Will you invest in the safer pesticide in year 3?** |
| INVEST | NOT INVEST |
| **Do you think your counterpart will invest in the safer pesticide in year 3?** |
|

|  |  |  |  |
| --- | --- | --- | --- |
| DEFINITELY | PROBABLY | PROBABLY NOT | DEFINITELY NOT |
|  |  |  |  |

 |
|   |
|   |
| **Will you invest in the safer pesticide in year 4?** |
| INVEST | NOT INVEST |
| **Do you think your counterpart will invest in the safer pesticide in year 4?** |
|

|  |  |  |  |
| --- | --- | --- | --- |
| DEFINITELY | PROBABLY | PROBABLY NOT | DEFINITELY NOT |
|  |  |  |  |

 |
|   |
|   |
| **Will you invest in the safer pesticide in year 5?** |
| INVEST | NOT INVEST |
| **Do you think your counterpart will invest in the safer pesticide in year 5?** |
|

|  |  |  |  |
| --- | --- | --- | --- |
| DEFINITELY | PROBABLY | PROBABLY NOT | DEFINITELY NOT |
|  |  |  |  |

 |
|   |
|   |
| **Will you invest in the safer pesticide in year 6?** |
| INVEST | NOT INVEST |
| **Do you think your counterpart will invest in the safer pesticide in year 6?** |
|

|  |  |  |  |
| --- | --- | --- | --- |
| DEFINITELY | PROBABLY | PROBABLY NOT | DEFINITELY NOT |
|  |  |  |  |

 |
|   |
|   |
| **Will you invest in the safer pesticide in year 7?** |
| INVEST | NOT INVEST |
| **Do you think your counterpart will invest in the safer pesticide in year 7?** |
|

|  |  |  |  |
| --- | --- | --- | --- |
| DEFINITELY | PROBABLY | PROBABLY NOT | DEFINITELY NOT |
|  |  |  |  |

 |
|   |
|   |
| **Will you invest in the safer pesticide in year 8?** |
| INVEST | NOT INVEST |
| **Do you think your counterpart will invest in the safer pesticide in year 8?** |
|

|  |  |  |  |
| --- | --- | --- | --- |
| DEFINITELY | PROBABLY | PROBABLY NOT | DEFINITELY NOT |
|  |  |  |  |

 |
|   |
|   |
| **Will you invest in the safer pesticide in year 9?** |
| INVEST | NOT INVEST |
| **Do you think your counterpart will invest in the safer pesticide in year 9?** |
|

|  |  |  |  |
| --- | --- | --- | --- |
| DEFINITELY | PROBABLY | PROBABLY NOT | DEFINITELY NOT |
|  |  |  |  |

 |
|   |
|   |
| **Will you invest in the safer pesticide in year 10?** |
| INVEST | NOT INVEST |
| **Do you think your counterpart will invest in the safer pesticide in year 10?** |
|

|  |  |  |  |
| --- | --- | --- | --- |
| DEFINITELY | PROBABLY | PROBABLY NOT | DEFINITELY NOT |
|  |  |  |  |

 |
|   |
|   |
| **Will you invest in the safer pesticide in year 11?** |
| INVEST | NOT INVEST |
| **Do you think your counterpart will invest in the safer pesticide in year 11?** |
|

|  |  |  |  |
| --- | --- | --- | --- |
| DEFINITELY | PROBABLY | PROBABLY NOT | DEFINITELY NOT |
|  |  |  |  |

 |
|   |
|   |
| **Will you invest in the safer pesticide in year 12?** |
| INVEST | NOT INVEST |
| **Do you think your counterpart will invest in the safer pesticide in year 12?** |
|

|  |  |  |  |
| --- | --- | --- | --- |
| DEFINITELY | PROBABLY | PROBABLY NOT | DEFINITELY NOT |
|  |  |  |  |

 |
|   |
|   |
| **Will you invest in the safer pesticide in year 13?** |
| INVEST | NOT INVEST |
| **Do you think your counterpart will invest in the safer pesticide in year 13?** |
|

|  |  |  |  |
| --- | --- | --- | --- |
| DEFINITELY | PROBABLY | PROBABLY NOT | DEFINITELY NOT |
|  |  |  |  |

 |
|   |
|   |
| **Will you invest in the safer pesticide in year 14?** |
| INVEST | NOT INVEST |
| **Do you think your counterpart will invest in the safer pesticide in year 14?** |
|

|  |  |  |  |
| --- | --- | --- | --- |
| DEFINITELY | PROBABLY | PROBABLY NOT | DEFINITELY NOT |
|  |  |  |  |

 |
|   |
|   |
| **Will you invest in the safer pesticide in year 15?** |
| INVEST | NOT INVEST |
| **Do you think your counterpart will invest in the safer pesticide in year 15?** |
|

|  |  |  |  |
| --- | --- | --- | --- |
| DEFINITELY | PROBABLY | PROBABLY NOT | DEFINITELY NOT |
|  |  |  |  |

 |
|   |
|   |
| **Will you invest in the safer pesticide in year 16?** |
| INVEST | NOT INVEST |
| **Do you think your counterpart will invest in the safer pesticide in year 16?** |
|

|  |  |  |  |
| --- | --- | --- | --- |
| DEFINITELY | PROBABLY | PROBABLY NOT | DEFINITELY NOT |
|  |  |  |  |

 |
|   |
|   |
| **Will you invest in the safer pesticide in year 17?** |
| INVEST | NOT INVEST |
| **Do you think your counterpart will invest in the safer pesticide in year 17?** |
|

|  |  |  |  |
| --- | --- | --- | --- |
| DEFINITELY | PROBABLY | PROBABLY NOT | DEFINITELY NOT |
|  |  |  |  |

 |
|   |
|   |
| **Will you invest in the safer pesticide in year 18?** |
| INVEST | NOT INVEST |
| **Do you think your counterpart will invest in the safer pesticide in year 18?** |
|

|  |  |  |  |
| --- | --- | --- | --- |
| DEFINITELY | PROBABLY | PROBABLY NOT | DEFINITELY NOT |
|  |  |  |  |

 |
|   |
|   |
| **Will you invest in the safer pesticide in year 19?** |
| INVEST | NOT INVEST |
| **Do you think your counterpart will invest in the safer pesticide in year 19?** |
|

|  |  |  |  |
| --- | --- | --- | --- |
| DEFINITELY | PROBABLY | PROBABLY NOT | DEFINITELY NOT |
|  |  |  |  |

 |
|   |
|   |
| **Will you invest in the safer pesticide in year 20?** |
| INVEST | NOT INVEST |
| **Do you think your counterpart will invest in the safer pesticide in year 20?** |
|

|  |  |  |  |
| --- | --- | --- | --- |
| DEFINITELY | PROBABLY | PROBABLY NOT | DEFINITELY NOT |
|  |  |  |  |

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|   |
|   |

*Stochastic Prisoner's Dilemma - Repeated, Environmental Frame*

No matter what, you will earn a base pay of 8,500 Rp this year. Here is a table summarizing the possible additional outcomes, depending on your decision (whether to invest or not) and the decision of your counterpart:

**Year 1**

|  |  |
| --- | --- |
|  | Your Counterpart |
| INVEST | NOT INVEST |
| You | INVEST | - You definitely lose **1,400 Rp**, and have a 0% chance of groundwater contamination.- Your counterpart definitely loses **1,400 Rp**, and has a 0% chance of groundwater contamination. | - You definitely lose **1,400 Rp** and have a 1% chance of groundwater contamination occuring and losing an additional **40,000 Rp**.- Your counterpart has a 3% chance of losing **40,000 Rp** due to groundwater contamination and a 97% chance of losing **0 Rp** |
| NOT INVEST | - You have a 3% chance of losing **40,000 Rp** due to groundwater contamination and a 97% chance of losing **0 Rp**.- Your counterpart definitely loses **1,400 Rp** and has a 1% chance of groundwater contamination occuring and losing an additional **40,000 Rp**. | - You have a 4% chance of groundwater contamination occurring and losing **40,000 Rp** and a 96% chance of losing **0 Rp**.- Your counterpart has a 4% chance of groundwater contamination occurring and losing **40,000 Rp** and a 96% chance of losing **0 Rp**. |

|  |
| --- |
| **Will you invest in the safer pesticide this year?**  |
| INVEST | NOT INVEST |
|  |  |

|  |
| --- |
| **Do you think your counterpart will invest in the safer pesticide this year?** |
| DEFINITELY | PROBABLY | PROBABLY NOT | DEFINITELY NOT |
|  |  |  |  |

*Stochastic Prisoner's Dilemma - Precommitted, Environmental Frame*

No matter what, you will earn a base pay of 8,500 Rp each year. Here is a table summarizing the possible additional outcomes, depending on your decision (whether to invest or not) and the decision of your counterpart:

**Each Year**

|  |  |
| --- | --- |
|  | Your Counterpart |
| INVEST | NOT INVEST |
| You | INVEST | - You definitely lose **1,400 Rp**, and have a 0% chance of groundwater contamination.- Your counterpart definitely loses **1,400 Rp**, and has a 0% chance of groundwater contamination. | - You definitely lose **1,400 Rp** and have a 1% chance of groundwater contamination occuring and losing an additional **40,000 Rp**.- Your counterpart has a 3% chance of losing **40,000 Rp** due to groundwater contamination and a 97% chance of losing **0 Rp** |
| NOT INVEST | - You have a 3% chance of losing **40,000 Rp** due to groundwater contamination and a 97% chance of losing **0 Rp**.- Your counterpart definitely loses **1,400 Rp** and has a 1% chance of groundwater contamination occuring and losing an additional **40,000 Rp**. | - You have a 4% chance of groundwater contamination occurring and losing **40,000 Rp** and a 96% chance of losing **0 Rp**.- Your counterpart has a 4% chance of groundwater contamination occurring and losing **40,000 Rp** and a 96% chance of losing **0 Rp**. |

Now you will make your choices, and predict your counterparts choices, for all 20 years:

|  |
| --- |
| **Will you invest in the safer pesticide in year 1?** |
| INVEST | NOT INVEST |
| **Do you think your counterpart will invest in the safer pesticide in year 1?** |
|

|  |  |  |  |
| --- | --- | --- | --- |
| DEFINITELY | PROBABLY | PROBABLY NOT | DEFINITELY NOT |
|  |  |  |  |

 |
|   |
|   |
| **Will you invest in the safer pesticide in year 2?** |
| INVEST | NOT INVEST |
| **Do you think your counterpart will invest in the safer pesticide in year 2?** |
|

|  |  |  |  |
| --- | --- | --- | --- |
| DEFINITELY | PROBABLY | PROBABLY NOT | DEFINITELY NOT |
|  |  |  |  |

 |
|   |
|   |
| **Will you invest in the safer pesticide in year 3?** |
| INVEST | NOT INVEST |
| **Do you think your counterpart will invest in the safer pesticide in year 3?** |
|

|  |  |  |  |
| --- | --- | --- | --- |
| DEFINITELY | PROBABLY | PROBABLY NOT | DEFINITELY NOT |
|  |  |  |  |

 |
|   |
|   |
| **Will you invest in the safer pesticide in year 4?** |
| INVEST | NOT INVEST |
| **Do you think your counterpart will invest in the safer pesticide in year 4?** |
|

|  |  |  |  |
| --- | --- | --- | --- |
| DEFINITELY | PROBABLY | PROBABLY NOT | DEFINITELY NOT |
|  |  |  |  |

 |
|   |
|   |
| **Will you invest in the safer pesticide in year 5?** |
| INVEST | NOT INVEST |
| **Do you think your counterpart will invest in the safer pesticide in year 5?** |
|

|  |  |  |  |
| --- | --- | --- | --- |
| DEFINITELY | PROBABLY | PROBABLY NOT | DEFINITELY NOT |
|  |  |  |  |

 |
|   |
|   |
| **Will you invest in the safer pesticide in year 6?** |
| INVEST | NOT INVEST |
| **Do you think your counterpart will invest in the safer pesticide in year 6?** |
|

|  |  |  |  |
| --- | --- | --- | --- |
| DEFINITELY | PROBABLY | PROBABLY NOT | DEFINITELY NOT |
|  |  |  |  |

 |
|   |
|   |
| **Will you invest in the safer pesticide in year 7?** |
| INVEST | NOT INVEST |
| **Do you think your counterpart will invest in the safer pesticide in year 7?** |
|

|  |  |  |  |
| --- | --- | --- | --- |
| DEFINITELY | PROBABLY | PROBABLY NOT | DEFINITELY NOT |
|  |  |  |  |

 |
|   |
|   |
| **Will you invest in the safer pesticide in year 8?** |
| INVEST | NOT INVEST |
| **Do you think your counterpart will invest in the safer pesticide in year 8?** |
|

|  |  |  |  |
| --- | --- | --- | --- |
| DEFINITELY | PROBABLY | PROBABLY NOT | DEFINITELY NOT |
|  |  |  |  |

 |
|   |
|   |
| **Will you invest in the safer pesticide in year 9?** |
| INVEST | NOT INVEST |
| **Do you think your counterpart will invest in the safer pesticide in year 9?** |
|

|  |  |  |  |
| --- | --- | --- | --- |
| DEFINITELY | PROBABLY | PROBABLY NOT | DEFINITELY NOT |
|  |  |  |  |

 |
|   |
|   |
| **Will you invest in the safer pesticide in year 10?** |
| INVEST | NOT INVEST |
| **Do you think your counterpart will invest in the safer pesticide in year 10?** |
|

|  |  |  |  |
| --- | --- | --- | --- |
| DEFINITELY | PROBABLY | PROBABLY NOT | DEFINITELY NOT |
|  |  |  |  |

 |
|   |
|   |
| **Will you invest in the safer pesticide in year 11?** |
| INVEST | NOT INVEST |
| **Do you think your counterpart will invest in the safer pesticide in year 11?** |
|

|  |  |  |  |
| --- | --- | --- | --- |
| DEFINITELY | PROBABLY | PROBABLY NOT | DEFINITELY NOT |
|  |  |  |  |

 |
|   |
|   |
| **Will you invest in the safer pesticide in year 12?** |
| INVEST | NOT INVEST |
| **Do you think your counterpart will invest in the safer pesticide in year 12?** |
|

|  |  |  |  |
| --- | --- | --- | --- |
| DEFINITELY | PROBABLY | PROBABLY NOT | DEFINITELY NOT |
|  |  |  |  |

 |
|   |
|   |
| **Will you invest in the safer pesticide in year 13?** |
| INVEST | NOT INVEST |
| **Do you think your counterpart will invest in the safer pesticide in year 13?** |
|

|  |  |  |  |
| --- | --- | --- | --- |
| DEFINITELY | PROBABLY | PROBABLY NOT | DEFINITELY NOT |
|  |  |  |  |

 |
|   |
|   |
| **Will you invest in the safer pesticide in year 14?** |
| INVEST | NOT INVEST |
| **Do you think your counterpart will invest in the safer pesticide in year 14?** |
|

|  |  |  |  |
| --- | --- | --- | --- |
| DEFINITELY | PROBABLY | PROBABLY NOT | DEFINITELY NOT |
|  |  |  |  |

 |
|   |
|   |
| **Will you invest in the safer pesticide in year 15?** |
| INVEST | NOT INVEST |
| **Do you think your counterpart will invest in the safer pesticide in year 15?** |
|

|  |  |  |  |
| --- | --- | --- | --- |
| DEFINITELY | PROBABLY | PROBABLY NOT | DEFINITELY NOT |
|  |  |  |  |

 |
|   |
|   |
| **Will you invest in the safer pesticide in year 16?** |
| INVEST | NOT INVEST |
| **Do you think your counterpart will invest in the safer pesticide in year 16?** |
|

|  |  |  |  |
| --- | --- | --- | --- |
| DEFINITELY | PROBABLY | PROBABLY NOT | DEFINITELY NOT |
|  |  |  |  |

 |
|   |
|   |
| **Will you invest in the safer pesticide in year 17?** |
| INVEST | NOT INVEST |
| **Do you think your counterpart will invest in the safer pesticide in year 17?** |
|

|  |  |  |  |
| --- | --- | --- | --- |
| DEFINITELY | PROBABLY | PROBABLY NOT | DEFINITELY NOT |
|  |  |  |  |

 |
|   |
|   |
| **Will you invest in the safer pesticide in year 18?** |
| INVEST | NOT INVEST |
| **Do you think your counterpart will invest in the safer pesticide in year 18?** |
|

|  |  |  |  |
| --- | --- | --- | --- |
| DEFINITELY | PROBABLY | PROBABLY NOT | DEFINITELY NOT |
|  |  |  |  |

 |
|   |
|   |
| **Will you invest in the safer pesticide in year 19?** |
| INVEST | NOT INVEST |
| **Do you think your counterpart will invest in the safer pesticide in year 19?** |
|

|  |  |  |  |
| --- | --- | --- | --- |
| DEFINITELY | PROBABLY | PROBABLY NOT | DEFINITELY NOT |
|  |  |  |  |

 |
|   |
|   |
| **Will you invest in the safer pesticide in year 20?** |
| INVEST | NOT INVEST |
| **Do you think your counterpart will invest in the safer pesticide in year 20?** |
|

|  |  |  |  |
| --- | --- | --- | --- |
| DEFINITELY | PROBABLY | PROBABLY NOT | DEFINITELY NOT |
|  |  |  |  |

 |
|   |
|   |

*Stochastic Prisoner's Dilemma - Repeated, Financial Frame*

No matter what, you will earn a base pay of 8,500 Rp this year. Here is a table summarizing the possible additional outcomes, depending on your decision (whether to invest or not) and the decision of your counterpart:

**Year 1**

|  |  |
| --- | --- |
|  | Your Counterpart |
| INVEST | NOT INVEST |
| You | INVEST | - You definitely lose **1,400 Rp**, and have a 0% chance of the large loss occurring.- Your counterpart definitely loses **1,400 Rp**, and has a 0% chance of the large loss occurring. | - You definitely lose **1,400 Rp** and have a 1% chance of losing an additional **40,000 Rp**.- Your counterpart has a 3% chance of losing **40,000 Rp** and a 97% chance of losing **0 Rp** |
| NOT INVEST | - You have a 3% chance of losing **40,000 Rp** and a 97% chance of losing **0 Rp**.- Your counterpart definitely loses **1,400 Rp** and has a 1% chance of losing an additional **40,000 Rp**. | - You have a 4% chance of losing **40,000 Rp** and a 96% chance of losing **0 Rp**.- Your counterpart has a 4% chance of losing **40,000 Rp** and a 96% chance of losing **0 Rp**. |

|  |
| --- |
| **Will you invest in protection this year?**  |
| INVEST | NOT INVEST |
|  |  |

|  |
| --- |
| **Do you think your counterpart will invest in protection this year?** |
| DEFINITELY | PROBABLY | PROBABLY NOT | DEFINITELY NOT |
|  |  |  |  |

*Stochastic Prisoner's Dilemma - Precommitted, Financial Frame*

No matter what, you will earn a base pay of 8,500 Rp each year. Here is a table summarizing the possible additional outcomes, depending on your decision (whether to invest or not) and the decision of your counterpart:

**Each Year**

|  |  |
| --- | --- |
|  | Your Counterpart |
| INVEST | NOT INVEST |
| You | INVEST | - You definitely lose **1,400 Rp**, and have a 0% chance of the large loss occurring.- Your counterpart definitely loses **1,400 Rp**, and has a 0% chance of the large loss occurring. | - You definitely lose **1,400 Rp** and have a 1% chance of losing an additional **40,000 Rp**.- Your counterpart has a 3% chance of losing **40,000 Rp** and a 97% chance of losing **0 Rp** |
| NOT INVEST | - You have a 3% chance of losing **40,000 Rp** and a 97% chance of losing **0 Rp**.- Your counterpart definitely loses **1,400 Rp** and has a 1% chance of losing an additional **40,000 Rp**. | - You have a 4% chance of losing **40,000 Rp** and a 96% chance of losing **0 Rp**.- Your counterpart has a 4% chance of losing **40,000 Rp** and a 96% chance of losing **0 Rp**. |

Now you will make your choices, and predict your counterparts choices, for all 20 years:

|  |
| --- |
| **Will you invest in protection in year 1?** |
| INVEST | NOT INVEST |
| **Do you think your counterpart will invest in protection in year 1?** |
|

|  |  |  |  |
| --- | --- | --- | --- |
| DEFINITELY | PROBABLY | PROBABLY NOT | DEFINITELY NOT |
|  |  |  |  |

 |
|   |
|   |
| **Will you invest in protection in year 2?** |
| INVEST | NOT INVEST |
| **Do you think your counterpart will invest in protection in year 2?** |
|

|  |  |  |  |
| --- | --- | --- | --- |
| DEFINITELY | PROBABLY | PROBABLY NOT | DEFINITELY NOT |
|  |  |  |  |

 |
|   |
|   |
| **Will you invest in protection in year 3?** |
| INVEST | NOT INVEST |
| **Do you think your counterpart will invest in protection in year 3?** |
|

|  |  |  |  |
| --- | --- | --- | --- |
| DEFINITELY | PROBABLY | PROBABLY NOT | DEFINITELY NOT |
|  |  |  |  |

 |
|   |
|   |
| **Will you invest in protection in year 4?** |
| INVEST | NOT INVEST |
| **Do you think your counterpart will invest in protection in year 4?** |
|

|  |  |  |  |
| --- | --- | --- | --- |
| DEFINITELY | PROBABLY | PROBABLY NOT | DEFINITELY NOT |
|  |  |  |  |

 |
|   |
|   |
| **Will you invest in protection in year 5?** |
| INVEST | NOT INVEST |
| **Do you think your counterpart will invest in protection in year 5?** |
|

|  |  |  |  |
| --- | --- | --- | --- |
| DEFINITELY | PROBABLY | PROBABLY NOT | DEFINITELY NOT |
|  |  |  |  |

 |
|   |
|   |
| **Will you invest in protection in year 6?** |
| INVEST | NOT INVEST |
| **Do you think your counterpart will invest in protection in year 6?** |
|

|  |  |  |  |
| --- | --- | --- | --- |
| DEFINITELY | PROBABLY | PROBABLY NOT | DEFINITELY NOT |
|  |  |  |  |

 |
|   |
|   |
| **Will you invest in protection in year 7?** |
| INVEST | NOT INVEST |
| **Do you think your counterpart will invest in protection in year 7?** |
|

|  |  |  |  |
| --- | --- | --- | --- |
| DEFINITELY | PROBABLY | PROBABLY NOT | DEFINITELY NOT |
|  |  |  |  |

 |
|   |
|   |
| **Will you invest in protection in year 8?** |
| INVEST | NOT INVEST |
| **Do you think your counterpart will invest in protection in year 8?** |
|

|  |  |  |  |
| --- | --- | --- | --- |
| DEFINITELY | PROBABLY | PROBABLY NOT | DEFINITELY NOT |
|  |  |  |  |

 |
|   |
|   |
| **Will you invest in protection in year 9?** |
| INVEST | NOT INVEST |
| **Do you think your counterpart will invest in protection in year 9?** |
|

|  |  |  |  |
| --- | --- | --- | --- |
| DEFINITELY | PROBABLY | PROBABLY NOT | DEFINITELY NOT |
|  |  |  |  |

 |
|   |
|   |
| **Will you invest in protection in year 10?** |
| INVEST | NOT INVEST |
| **Do you think your counterpart will invest in protection in year 10?** |
|

|  |  |  |  |
| --- | --- | --- | --- |
| DEFINITELY | PROBABLY | PROBABLY NOT | DEFINITELY NOT |
|  |  |  |  |

 |
|   |
|   |
| **Will you invest in protection in year 11?** |
| INVEST | NOT INVEST |
| **Do you think your counterpart will invest in protection in year 11?** |
|

|  |  |  |  |
| --- | --- | --- | --- |
| DEFINITELY | PROBABLY | PROBABLY NOT | DEFINITELY NOT |
|  |  |  |  |

 |
|   |
|   |
| **Will you invest in protection in year 12?** |
| INVEST | NOT INVEST |
| **Do you think your counterpart will invest in protection in year 12?** |
|

|  |  |  |  |
| --- | --- | --- | --- |
| DEFINITELY | PROBABLY | PROBABLY NOT | DEFINITELY NOT |
|  |  |  |  |

 |
|   |
|   |
| **Will you invest in protection in year 13?** |
| INVEST | NOT INVEST |
| **Do you think your counterpart will invest in protection in year 13?** |
|

|  |  |  |  |
| --- | --- | --- | --- |
| DEFINITELY | PROBABLY | PROBABLY NOT | DEFINITELY NOT |
|  |  |  |  |

 |
|   |
|   |
| **Will you invest in protection in year 14?** |
| INVEST | NOT INVEST |
| **Do you think your counterpart will invest in protection in year 14?** |
|

|  |  |  |  |
| --- | --- | --- | --- |
| DEFINITELY | PROBABLY | PROBABLY NOT | DEFINITELY NOT |
|  |  |  |  |

 |
|   |
|   |
| **Will you invest in protection in year 15?** |
| INVEST | NOT INVEST |
| **Do you think your counterpart will invest in protection in year 15?** |
|

|  |  |  |  |
| --- | --- | --- | --- |
| DEFINITELY | PROBABLY | PROBABLY NOT | DEFINITELY NOT |
|  |  |  |  |

 |
|   |
|   |
| **Will you invest in protection in year 16?** |
| INVEST | NOT INVEST |
| **Do you think your counterpart will invest in protection in year 16?** |
|

|  |  |  |  |
| --- | --- | --- | --- |
| DEFINITELY | PROBABLY | PROBABLY NOT | DEFINITELY NOT |
|  |  |  |  |

 |
|   |
|   |
| **Will you invest in protection in year 17?** |
| INVEST | NOT INVEST |
| **Do you think your counterpart will invest in protection in year 17?** |
|

|  |  |  |  |
| --- | --- | --- | --- |
| DEFINITELY | PROBABLY | PROBABLY NOT | DEFINITELY NOT |
|  |  |  |  |

 |
|   |
|   |
| **Will you invest in protection in year 18?** |
| INVEST | NOT INVEST |
| **Do you think your counterpart will invest in protection in year 18?** |
|

|  |  |  |  |
| --- | --- | --- | --- |
| DEFINITELY | PROBABLY | PROBABLY NOT | DEFINITELY NOT |
|  |  |  |  |

 |
|   |
|   |
| **Will you invest in protection in year 19?** |
| INVEST | NOT INVEST |
| **Do you think your counterpart will invest in protection in year 19?** |
|

|  |  |  |  |
| --- | --- | --- | --- |
| DEFINITELY | PROBABLY | PROBABLY NOT | DEFINITELY NOT |
|  |  |  |  |

 |
|   |
|   |
| **Will you invest in protection in year 20?** |
| INVEST | NOT INVEST |
| **Do you think your counterpart will invest in protection in year 20?** |
|

|  |  |  |  |
| --- | --- | --- | --- |
| DEFINITELY | PROBABLY | PROBABLY NOT | DEFINITELY NOT |
|  |  |  |  |

 |
|   |
|   |

*Solo Game - Repeated, Financial Frame*

No matter what, you will earn a base pay of 8,500 Rp this year. Here is a table summarizing the possible additional outcomes, depending on your decision (whether to invest or not):

**Year 1**

|  |  |  |
| --- | --- | --- |
| You | INVEST | - You definitely lose **1,400 Rp**, and have a 0% chance of the large loss occurring. |
| NOT INVEST | - You have a 4% chance of losing **40,000 Rp** and a 96% chance of losing **0 Rp**. |

**Will you invest in protection this year?**

INVEST DO NOT INVEST

*Solo Game - Precommitted, Financial Frame*

No matter what, you will earn a base pay of 8,500 Rp this year. Here is a table summarizing the possible additional outcomes, depending on your decision (whether to invest or not):

**Each Year**

|  |  |  |
| --- | --- | --- |
| You | INVEST | - You definitely lose **1,400 Rp**, and have a 0% chance of the large loss occurring. |
| NOT INVEST | - You have a 4% chance of losing **40,000 Rp** and a 96% chance of losing **0 Rp**. |

Top of Form

|  |
| --- |
| **Will you invest in protection in year 1?** |
| INVEST | NOT INVEST |
|   |
|   |
| **Will you invest in protection in year 2?** |
| INVEST | NOT INVEST |
|   |
|   |
| **Will you invest in protection in year 3?** |
| INVEST | NOT INVEST |
|   |
|   |
| **Will you invest in protection in year 4?** |
| INVEST | NOT INVEST |
|   |
|   |
| **Will you invest in protection in year 5?** |
| INVEST | NOT INVEST |
|   |
|   |
| **Will you invest in protection in year 6?** |
| INVEST | NOT INVEST |
|   |
|   |
| **Will you invest in protection in year 7?** |
| INVEST | NOT INVEST |
|   |
|   |
| **Will you invest in protection in year 8?** |
| INVEST | NOT INVEST |
|   |
|   |
| **Will you invest in protection in year 9?** |
| INVEST | NOT INVEST |
|   |
|   |
| **Will you invest in protection in year 10?** |
| INVEST | NOT INVEST |
|   |
|   |
| **Will you invest in protection in year 11?** |
| INVEST | NOT INVEST |
|   |
|   |
| **Will you invest in protection in year 12?** |
| INVEST | NOT INVEST |
|   |
|   |
| **Will you invest in protection in year 13?** |
| INVEST | NOT INVEST |
|   |
|   |
| **Will you invest in protection in year 14?** |
| INVEST | NOT INVEST |
|   |
|   |
| **Will you invest in protection in year 15?** |
| INVEST | NOT INVEST |
|   |
|   |
| **Will you invest in protection in year 16?** |
| INVEST | NOT INVEST |
|   |
|   |
| **Will you invest in protection in year 17?** |
| INVEST | NOT INVEST |
|   |
|   |
| **Will you invest in protection in year 18?** |
| INVEST | NOT INVEST |
|   |
|   |
| **Will you invest in protection in year 19?** |
| INVEST | NOT INVEST |
|   |
|   |
| **Will you invest in protection in year 20?** |
| INVEST | NOT INVEST |
|   |
|   |

**Appendix C: Experimental Materials for Round by Round Feedback and Summary Feedback**

*Deterministic Prisoner's Dilemma - Repeated, Environmental Frame*

**Year 1 Results**

|  |  |
| --- | --- |
| **Your choice:** | NOT INVEST |
| **Your counterpart's choice:** | INVEST |
| **Result:** | You lost 1,200 Rp, and your counterpart lost 1,800 Rp |

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

You've finished the 20 years of the session. Here's a year by year summary of what happened:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Year #** | **Your Choice** | **Counterpart's Choice** | **Your Payout** | **Counterpart's Payout** | **Your Cumulative Payout** |
| 1 | not invest | invest | 7,300 | 6,700 | 7,300 |
| 2 | invest | invest | 7,100 | 7,100 | 14,400 |
| 3 | invest | invest | 7,100 | 7,100 | 21,500 |
| 4 | not invest | invest | 7,300 | 6,700 | 28,800 |
| 5 | invest | invest | 7,100 | 7,100 | 35,900 |
| 6 | invest | invest | 7,100 | 7,100 | 43,000 |
| 7 | invest | invest | 7,100 | 7,100 | 50,100 |
| 8 | invest | invest | 7,100 | 7,100 | 57,200 |
| 9 | invest | invest | 7,100 | 7,100 | 64,300 |
| 10 | invest | invest | 7,100 | 7,100 | 71,400 |
| 11 | invest | invest | 7,100 | 7,100 | 78,500 |
| 12 | not invest | invest | 7,300 | 6,700 | 85,800 |
| 13 | invest | invest | 7,100 | 7,100 | 92,900 |
| 14 | invest | invest | 7,100 | 7,100 | 100,000 |
| 15 | invest | invest | 7,100 | 7,100 | 107,100 |
| 16 | invest | invest | 7,100 | 7,100 | 114,200 |
| 17 | invest | invest | 7,100 | 7,100 | 121,300 |
| 18 | invest | invest | 7,100 | 7,100 | 128,400 |
| 19 | invest | invest | 7,100 | 7,100 | 135,500 |
| 20 | not invest | not invest | 6,900 | 6,900 | 142,400 |

*Deterministic Prisoner's Dilemma - Precommitted, Environmental Frame*

**Year 1 Results**

|  |  |
| --- | --- |
| **Your choice:** | NOT INVEST |
| **Your counterpart's choice:** | INVEST |
| **Result:** | You lost 1,200 Rp, and your counterpart lost 1,800 Rp |

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You've finished the 20 years of the session. Here's a year by year summary of what happened:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Year #** | **Your Choice** | **Counterpart's Choice** | **Your Payout** | **Counterpart's Payout** | **Your Cumulative Payout** |
| 1 | invest | not invest | 6,700 | 7,300 | 6,700 |
| 2 | invest | invest | 7,100 | 7,100 | 13,800 |
| 3 | invest | invest | 7,100 | 7,100 | 20,900 |
| 4 | invest | invest | 7,100 | 7,100 | 28,000 |
| 5 | invest | invest | 7,100 | 7,100 | 35,100 |
| 6 | invest | invest | 7,100 | 7,100 | 42,200 |
| 7 | invest | invest | 7,100 | 7,100 | 49,300 |
| 8 | not invest | invest | 7,300 | 6,700 | 56,600 |
| 9 | invest | invest | 7,100 | 7,100 | 63,700 |
| 10 | invest | invest | 7,100 | 7,100 | 70,800 |
| 11 | not invest | invest | 7,300 | 6,700 | 78,100 |
| 12 | invest | invest | 7,100 | 7,100 | 85,200 |
| 13 | invest | invest | 7,100 | 7,100 | 92,300 |
| 14 | invest | invest | 7,100 | 7,100 | 99,400 |
| 15 | invest | invest | 7,100 | 7,100 | 106,500 |
| 16 | invest | invest | 7,100 | 7,100 | 113,600 |
| 17 | invest | invest | 7,100 | 7,100 | 120,700 |
| 18 | invest | invest | 7,100 | 7,100 | 127,800 |
| 19 | invest | invest | 7,100 | 7,100 | 134,900 |
| 20 | invest | invest | 7,100 | 7,100 | 142,000 |

*Stochastic Prisoner's Dilemma - Repeated, Environmental Frame*

**Year 1 Results**

|  |  |
| --- | --- |
| **Your choice:** | INVEST |
| **Your counterpart's choice:** | INVEST |
| **The random number was:** | 22 |
| *This Means* |
| **For you, the groundwater contamination:** | **did not occur** |
| **For your counterpart, the groundwater contamination:** | **did not occur** |
| **Result:** | You lost 1,400 Rp, and your counterpart lost 1,400 Rp |

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You've finished the 20 years of the session. Here's a year by year summary of what happened:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Year #** | **Your Choice** | **Counterpart's Choice** | **Random Number** | **Groundwater Contamination** | **Your Payout** | **Counterpart's Payout** | **Your Cumulative Payout** |
| 1 | invest | invest | 22 | Did not occur to you. Did not occur to your counterpart. | 7,100 | 7,100 | 7,100 |
| 2 | not invest | not invest | 80 | Did not occur to you. Did not occur to your counterpart. | 8,500 | 8,500 | 15,600 |
| 3 | not invest | not invest | 83 | Did not occur to you. Did not occur to your counterpart. | 8,500 | 8,500 | 24,100 |
| 4 | not invest | not invest | 98 | Did not occur to you. Did not occur to your counterpart. | 8,500 | 8,500 | 32,600 |
| 5 | not invest | not invest | 99 | Did not occur to you. Did not occur to your counterpart. | 8,500 | 8,500 | 41,100 |
| 6 | not invest | not invest | 94 | Did not occur to you. Did not occur to your counterpart. | 8,500 | 8,500 | 49,600 |
| 7 | not invest | not invest | 22 | Did not occur to you. Did not occur to your counterpart. | 8,500 | 8,500 | 58,100 |
| 8 | not invest | not invest | 41 | Did not occur to you. Did not occur to your counterpart. | 8,500 | 8,500 | 66,600 |
| 9 | not invest | not invest | 90 | Did not occur to you. Did not occur to your counterpart. | 8,500 | 8,500 | 75,100 |
| 10 | not invest | not invest | 75 | Did not occur to you. Did not occur to your counterpart. | 8,500 | 8,500 | 83,600 |
| 11 | not invest | not invest | 66 | Did not occur to you. Did not occur to your counterpart. | 8,500 | 8,500 | 92,100 |
| 12 | not invest | not invest | 8 | Did not occur to you. Did not occur to your counterpart. | 8,500 | 8,500 | 100,600 |
| 13 | not invest | not invest | 17 | Did not occur to you. Did not occur to your counterpart. | 8,500 | 8,500 | 109,100 |
| 14 | not invest | not invest | 88 | Did not occur to you. Did not occur to your counterpart. | 8,500 | 8,500 | 117,600 |
| 15 | not invest | not invest | 13 | Did not occur to you. Did not occur to your counterpart. | 8,500 | 8,500 | 126,100 |
| 16 | not invest | not invest | 25 | Did not occur to you. Did not occur to your counterpart. | 8,500 | 8,500 | 134,600 |
| 17 | not invest | not invest | 34 | Did not occur to you. Did not occur to your counterpart. | 8,500 | 8,500 | 143,100 |
| 18 | not invest | not invest | 38 | Did not occur to you. Did not occur to your counterpart. | 8,500 | 8,500 | 151,600 |
| 19 | not invest | not invest | 32 | Did not occur to you. Did not occur to your counterpart. | 8,500 | 8,500 | 160,100 |
| 20 | not invest | not invest | 21 | Did not occur to you. Did not occur to your counterpart. | 8,500 | 8,500 | 168,600 |

*Stochastic Prisoner's Dilemma - Precommitted, Environmental Frame*

**Year 5 Results**

|  |  |
| --- | --- |
| **Your choice:** | NOT INVEST |
| **Your counterpart's choice:** | NOT INVEST |
| **The random number was:** | 4 |
| *This Means* |
| **For you, the groundwater contamination:** | **occurred** |
| **For your counterpart, the groundwater contamination:** | **occurred** |
| **Result:** | You lost 40,000 Rp, and your counterpart lost 40,000 Rp |

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You've finished the 20 years of the session. Here's a year by year summary of what happened:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Year #** | **Your Choice** | **Counterpart's Choice** | **Random Number** | **Groundwater Contamination** | **Your Payout** | **Counterpart's Payout** | **Your Cumulative Payout** |
| 1 | invest | not invest | 47 | Did not occur to you. Did not occur to your counterpart. | 7,100 | 8,500 | 7,100 |
| 2 | not invest | not invest | 69 | Did not occur to you. Did not occur to your counterpart. | 8,500 | 8,500 | 15,600 |
| 3 | not invest | not invest | 37 | Did not occur to you. Did not occur to your counterpart. | 8,500 | 8,500 | 24,100 |
| 4 | not invest | not invest | 92 | Did not occur to you. Did not occur to your counterpart. | 8,500 | 8,500 | 32,600 |
| 5 | not invest | not invest | 4 | Occurred to you. Occurred to your counterpart. | -31,500 | -31,500 | 1,100 |
| 6 | not invest | not invest | 76 | Did not occur to you. Did not occur to your counterpart. | 8,500 | 8,500 | 9,600 |
| 7 | not invest | not invest | 64 | Did not occur to you. Did not occur to your counterpart. | 8,500 | 8,500 | 18,100 |
| 8 | not invest | not invest | 41 | Did not occur to you. Did not occur to your counterpart. | 8,500 | 8,500 | 26,600 |
| 9 | not invest | not invest | 4 | Occurred to you. Occurred to your counterpart. | -31,500 | -31,500 | -4,900 |
| 10 | not invest | not invest | 99 | Did not occur to you. Did not occur to your counterpart. | 8,500 | 8,500 | 3,600 |
| 11 | not invest | not invest | 14 | Did not occur to you. Did not occur to your counterpart. | 8,500 | 8,500 | 12,100 |
| 12 | not invest | not invest | 44 | Did not occur to you. Did not occur to your counterpart. | 8,500 | 8,500 | 20,600 |
| 13 | not invest | not invest | 100 | Did not occur to you. Did not occur to your counterpart. | 8,500 | 8,500 | 29,100 |
| 14 | not invest | not invest | 26 | Did not occur to you. Did not occur to your counterpart. | 8,500 | 8,500 | 37,600 |
| 15 | not invest | not invest | 49 | Did not occur to you. Did not occur to your counterpart. | 8,500 | 8,500 | 46,100 |
| 16 | not invest | not invest | 93 | Did not occur to you. Did not occur to your counterpart. | 8,500 | 8,500 | 54,600 |
| 17 | not invest | not invest | 83 | Did not occur to you. Did not occur to your counterpart. | 8,500 | 8,500 | 63,100 |
| 18 | not invest | not invest | 26 | Did not occur to you. Did not occur to your counterpart. | 8,500 | 8,500 | 71,600 |
| 19 | not invest | not invest | 70 | Did not occur to you. Did not occur to your counterpart. | 8,500 | 8,500 | 80,100 |
| 20 | not invest | not invest | 60 | Did not occur to you. Did not occur to your counterpart. | 8,500 | 8,500 | 88,600 |

*Stochastic Prisoner's Dilemma - Repeated, Financial Frame*

**Year 1 Results**

|  |  |
| --- | --- |
| **Your choice:** | INVEST |
| **Your counterpart's choice:** | INVEST |
| **The random number was:** | 44 |
| *This Means* |
| **For you, the large loss:** | **did not occur** |
| **For your counterpart, the large loss:** | **did not occur** |
| **Result:** | You lost 1,400 Rp, and your counterpart lost 1,400 Rp |

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You've finished the 20 years of the session. Here's a year by year summary of what happened:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Year #** | **Your Choice** | **Counterpart's Choice** | **Random Number** | **Large Loss** | **Your Payout** | **Counterpart's Payout** | **Your Cumulative Payout** |
| 1 | invest | invest | 44 | Did not occur to you. Did not occur to your counterpart. | 7,100 | 7,100 | 7,100 |
| 2 | not invest | not invest | 84 | Did not occur to you. Did not occur to your counterpart. | 8,500 | 8,500 | 15,600 |
| 3 | not invest | not invest | 88 | Did not occur to you. Did not occur to your counterpart. | 8,500 | 8,500 | 24,100 |
| 4 | not invest | not invest | 76 | Did not occur to you. Did not occur to your counterpart. | 8,500 | 8,500 | 32,600 |
| 5 | not invest | not invest | 5 | Did not occur to you. Did not occur to your counterpart. | 8,500 | 8,500 | 41,100 |
| 6 | not invest | not invest | 96 | Did not occur to you. Did not occur to your counterpart. | 8,500 | 8,500 | 49,600 |
| 7 | not invest | not invest | 92 | Did not occur to you. Did not occur to your counterpart. | 8,500 | 8,500 | 58,100 |
| 8 | not invest | not invest | 82 | Did not occur to you. Did not occur to your counterpart. | 8,500 | 8,500 | 66,600 |
| 9 | not invest | invest | 53 | Did not occur to you. Did not occur to your counterpart. | 8,500 | 7,100 | 75,100 |
| 10 | not invest | not invest | 43 | Did not occur to you. Did not occur to your counterpart. | 8,500 | 8,500 | 83,600 |
| 11 | not invest | invest | 57 | Did not occur to you. Did not occur to your counterpart. | 8,500 | 7,100 | 92,100 |
| 12 | not invest | not invest | 77 | Did not occur to you. Did not occur to your counterpart. | 8,500 | 8,500 | 100,600 |
| 13 | not invest | not invest | 30 | Did not occur to you. Did not occur to your counterpart. | 8,500 | 8,500 | 109,100 |
| 14 | not invest | not invest | 82 | Did not occur to you. Did not occur to your counterpart. | 8,500 | 8,500 | 117,600 |
| 15 | not invest | not invest | 51 | Did not occur to you. Did not occur to your counterpart. | 8,500 | 8,500 | 126,100 |
| 16 | not invest | not invest | 70 | Did not occur to you. Did not occur to your counterpart. | 8,500 | 8,500 | 134,600 |
| 17 | not invest | not invest | 43 | Did not occur to you. Did not occur to your counterpart. | 8,500 | 8,500 | 143,100 |
| 18 | not invest | not invest | 100 | Did not occur to you. Did not occur to your counterpart. | 8,500 | 8,500 | 151,600 |
| 19 | not invest | not invest | 61 | Did not occur to you. Did not occur to your counterpart. | 8,500 | 8,500 | 160,100 |
| 20 | not invest | not invest | 61 | Did not occur to you. Did not occur to your counterpart. | 8,500 | 8,500 | 168,600 |

*Stochastic Prisoner's Dilemma - Precommitted, Financial Frame*

**Year 1 Results**

|  |  |
| --- | --- |
| **Your choice:** | INVEST |
| **Your counterpart's choice:** | INVEST |
| **The random number was:** | 78 |
| *This Means* |
| **For you, the large loss:** | **did not occur** |
| **For your counterpart, the large loss:** | **did not occur** |
| **Result:** | You lost 1,400 Rp, and your counterpart lost 1,400 Rp |

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You've finished the 20 years of the session. Here's a year by year summary of what happened:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Year #** | **Your Choice** | **Counterpart's Choice** | **Random Number** | **Large Loss** | **Your Payout** | **Counterpart's Payout** | **Your Cumulative Payout** |
| 1 | invest | invest | 78 | Did not occur to you. Did not occur to your counterpart. | 7,100 | 7,100 | 7,100 |
| 2 | not invest | not invest | 9 | Did not occur to you. Did not occur to your counterpart. | 8,500 | 8,500 | 15,600 |
| 3 | not invest | not invest | 30 | Did not occur to you. Did not occur to your counterpart. | 8,500 | 8,500 | 24,100 |
| 4 | not invest | not invest | 94 | Did not occur to you. Did not occur to your counterpart. | 8,500 | 8,500 | 32,600 |
| 5 | not invest | not invest | 1 | Occurred to you. Occurred to your counterpart. | -31,500 | -31,500 | 1,100 |
| 6 | not invest | not invest | 43 | Did not occur to you. Did not occur to your counterpart. | 8,500 | 8,500 | 9,600 |
| 7 | not invest | not invest | 76 | Did not occur to you. Did not occur to your counterpart. | 8,500 | 8,500 | 18,100 |
| 8 | not invest | not invest | 66 | Did not occur to you. Did not occur to your counterpart. | 8,500 | 8,500 | 26,600 |
| 9 | not invest | not invest | 85 | Did not occur to you. Did not occur to your counterpart. | 8,500 | 8,500 | 35,100 |
| 10 | not invest | not invest | 96 | Did not occur to you. Did not occur to your counterpart. | 8,500 | 8,500 | 43,600 |
| 11 | not invest | not invest | 35 | Did not occur to you. Did not occur to your counterpart. | 8,500 | 8,500 | 52,100 |
| 12 | not invest | not invest | 50 | Did not occur to you. Did not occur to your counterpart. | 8,500 | 8,500 | 60,600 |
| 13 | not invest | not invest | 23 | Did not occur to you. Did not occur to your counterpart. | 8,500 | 8,500 | 69,100 |
| 14 | not invest | not invest | 18 | Did not occur to you. Did not occur to your counterpart. | 8,500 | 8,500 | 77,600 |
| 15 | not invest | not invest | 25 | Did not occur to you. Did not occur to your counterpart. | 8,500 | 8,500 | 86,100 |
| 16 | not invest | not invest | 73 | Did not occur to you. Did not occur to your counterpart. | 8,500 | 8,500 | 94,600 |
| 17 | not invest | not invest | 25 | Did not occur to you. Did not occur to your counterpart. | 8,500 | 8,500 | 103,100 |
| 18 | not invest | not invest | 75 | Did not occur to you. Did not occur to your counterpart. | 8,500 | 8,500 | 111,600 |
| 19 | not invest | not invest | 55 | Did not occur to you. Did not occur to your counterpart. | 8,500 | 8,500 | 120,100 |
| 20 | not invest | not invest | 7 | Did not occur to you. Did not occur to your counterpart. | 8,500 | 8,500 | 128,600 |

*Solo Game - Repeated, Financial Frame*

**Year 1 Results**

|  |  |
| --- | --- |
| **Your choice:** | INVEST |
| **The random number was:** | 96, so the large loss **did not occur** |
| **Result:** | You lost 1,400 Rp |

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You've finished the 20 years of the session. Here's a year by year summary of what happened:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Year #** | **Your Choice** | **Random Number** | **Large Loss** | **Your Payout** | **Cumulative Payout** |
| 1 | invest | 96 | did not occur | 7,100 | 7,100 |
| 2 | not invest | 12 | did not occur | 8,500 | 15,600 |
| 3 | not invest | 25 | did not occur | 8,500 | 24,100 |
| 4 | not invest | 7 | did not occur | 8,500 | 32,600 |
| 5 | not invest | 2 | occurred | -31,500 | 1,100 |
| 6 | not invest | 4 | occurred | -31,500 | -30,400 |
| 7 | not invest | 20 | did not occur | 8,500 | -21,900 |
| 8 | not invest | 1 | occurred | -31,500 | -53,400 |
| 9 | not invest | 98 | did not occur | 8,500 | -44,900 |
| 10 | not invest | 86 | did not occur | 8,500 | -36,400 |
| 11 | not invest | 99 | did not occur | 8,500 | -27,900 |
| 12 | not invest | 100 | did not occur | 8,500 | -19,400 |
| 13 | not invest | 91 | did not occur | 8,500 | -10,900 |
| 14 | not invest | 19 | did not occur | 8,500 | -2,400 |
| 15 | not invest | 13 | did not occur | 8,500 | 6,100 |
| 16 | not invest | 5 | did not occur | 8,500 | 14,600 |
| 17 | not invest | 45 | did not occur | 8,500 | 23,100 |
| 18 | not invest | 88 | did not occur | 8,500 | 31,600 |
| 19 | not invest | 54 | did not occur | 8,500 | 40,100 |
| 20 | not invest | 40 | did not occur | 8,500 | 48,600 |

*Solo Game - Precommitted, Financial Frame*

**Year 1 Results**

|  |  |
| --- | --- |
| **Your choice:** | INVEST |
| **The random number was:** | 86, so the large loss **did not occur** |
| **Result:** | You lost 1,400 Rp |

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You've finished the 20 years of the session. Here's a year by year summary of what happened:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Year #** | **Your Choice** | **Random Number** | **Large Loss** | **Your Payout** | **Cumulative Payout** |
| 1 | invest | 86 | did not occur | 7,100 | 7,100 |
| 2 | not invest | 33 | did not occur | 8,500 | 15,600 |
| 3 | not invest | 54 | did not occur | 8,500 | 24,100 |
| 4 | not invest | 79 | did not occur | 8,500 | 32,600 |
| 5 | not invest | 85 | did not occur | 8,500 | 41,100 |
| 6 | not invest | 55 | did not occur | 8,500 | 49,600 |
| 7 | not invest | 20 | did not occur | 8,500 | 58,100 |
| 8 | not invest | 56 | did not occur | 8,500 | 66,600 |
| 9 | not invest | 75 | did not occur | 8,500 | 75,100 |
| 10 | not invest | 81 | did not occur | 8,500 | 83,600 |
| 11 | not invest | 45 | did not occur | 8,500 | 92,100 |
| 12 | not invest | 10 | did not occur | 8,500 | 100,600 |
| 13 | not invest | 33 | did not occur | 8,500 | 109,100 |
| 14 | not invest | 89 | did not occur | 8,500 | 117,600 |
| 15 | not invest | 80 | did not occur | 8,500 | 126,100 |
| 16 | not invest | 52 | did not occur | 8,500 | 134,600 |
| 17 | not invest | 45 | did not occur | 8,500 | 143,100 |
| 18 | not invest | 28 | did not occur | 8,500 | 151,600 |
| 19 | not invest | 27 | did not occur | 8,500 | 160,100 |
| 20 | not invest | 95 | did not occur | 8,500 | 168,600 |

**Appendix D: Study 1b: precommitment in a stochastic prisoner’s dilemma -- with a financial frame**

*Study 1b: Participants and Design Overview*

60 participants were drawn from the same pool as Study 1 and had similar demographics. Participants were randomly assigned to a SPD-rep or SPD-pre condition. These were different from the Study 1 conditions in that a purely financial cover story was used for the scenario instead of an environmental cover story.

*Study 1b: Methods*

Overall, the procedure was almost exactly the same as Study 1. During the introduction, however, the participants were told to imagine being investors with a risky joint venture that earned 8,500 Rp a year. They learned they could pay 1,400 Rp for a safety measure to protect against the possibility of a large (40,000 Rp) loss, but they would only be fully protected if both counterparts invested in protection. The payoff matrix, choice options, and feedback were also all changed to use financial language rather than the environmental frame in Study 1 (the complete text of the differences can be found in the appendices).

*Study 1b: Results*

As can be seen in Figure 5, the results from this study replicated those of Study 1. While investment rates in the stochastic prisoner's dilemma were low (averaging 31%), precommitment raised investment rates (to an average of 45%), *t*(58)=1.71, one-tailed *p*<.05.[[1]](#footnote-1) Because there were no statistically significant differences between Study 1 and this study, all future analyses will group the environmental and financial frames together.

*Figure 5: Mean investment proportion in the* financially *framed repeated or precommitted stochastic prisoner's dilemma conditions (SPD-rep F and SPD-pre F) in this study, as compared with the* environmentally *framed stochastic prisoner's dilemma (SPD-rep E and SPD-pre E) data from Study 1.*



*Study 1b: Discussion*

 Framing the stochastic social dilemmas with a purely financial (as opposed to environmental) cover story did not have a significant effect on investment rates. Perhaps this is not surprising, as both Study 1 and this study offered real *financial* consequences for participant's choices, but no real environmental consequences.[[2]](#footnote-2)

 The precommitment effect observed in Study 1 was replicated in this study: participants who were forced to precommit their choices for 20 rounds at a time invested in protection more often than those who made their choices round by round. We hypothesize that this happens because precommitment increases the time horizon of participants, making the probabilistic loss subjectively more likely, thereby increasing the attractiveness of investment.

**Appendix E: Experimental Materials for Study 4**

Solo Game – Loss frame [Gain frame]

**Instructions (pg 1 of 5)**

Your choices will determine the payment you receive for participating. Therefore, you should pay careful attention to the instructions which follow.

Scenario: Imagine you own a mining company in Indonesia and you extract minerals from different regions each month. You receive a base income of 8,500 Rp [5,500 Rp] income per month, regardless of your choice of region. You must [may] also pay an [receive an additional] amount each month, depending on which region you choose.

You must decide between investing in the “Known” regions or in the “Unknown” regions. In the Known regions, the conditions are stable, and you will pay a fixed amount of 1,400 Rp for maintenance [receive a fixed amount of 1,400 from extraction] that month. In the Unknown regions, the conditions are uncertain. There is a 4% chance that you will pay 40,000 Rp for maintenance [receive 40,000 Rp from extraction] that month, otherwise you will pay[receive] nothing that month.

**Instructions (pg 2 of 5)**

This is a scenario in which the outcomes of your decisions depend on what you do and on random chance. Over the course of 20 "months" (ie, rounds), you will earn money and then make a decision about whether to invest in the Known region or in the Unknown one. Gains and losses will be measured in the Indonesian currency, the rupiah (or Rp). Exchange rate: 13632 Rp. = $1.

**Instructions (pg 3 of 5)**

Here is a summary of the possible outcomes, depending on your choice:

- Each month, you will each earn a base income of 8,500 Rp [5,500 Rp] (you will always receive this income, no matter what else happens).

- If you choose the Known region, then you must pay 1,400 Rp [will earn 1,400 Rp], and there is a 0% chance that the large loss [gain] will occur.

- If you choose the Unknown region, then there is a 4% chance you will lose [earn] 40,000 Rp and there is a 96% chance of losing [earning] 0 Rp.

Probabilistic outcomes will be determined by a random number generator, where it is equally likely that any number between 1 and 100 is chosen. In other words, the computer fairly and randomly selects a random number. The large loss [gain] will occur if lower numbers are chosen. In other words, if there is a 4% chance of the large loss [gain] occurring, it will occur when the number randomly chosen is a 1, 2, 3 or 4.

**Instructions (pg 4 of 5)**

You will play 4 sessions, of 20 months each. At the end of the study, we will randomly choose 1 of the 4 sessions you completed and convert the Rupiah (Rp) earned in that session to Canadian dollars, at the rate of 13632 Rp = $1, and pay it out for real money. This will be your payment for participating in the study. Because any session could potentially be paid out for real money, you should take all your choices seriously.

Payments for the study are often in the neighborhood of $10. In the very unlikely event that you finish with negative dollars, we would ask you to stay and volunteer to complete other studies, at the rate of 25 cents a minute, to pay back what you owe. For example, if you finish the Study 1bown $5, we would ask you to stay for an additional 20 minutes.

**Instructions (pg 5 of 5)**

*Choice decision: Repeated / Choice display: Separate*: You will play one month at a time. After each month, you will learn the random number chosen by the computer, and whether the large loss [gain] occurred in that month. After all 20 months, you will see a summary for the entire session, including your choices and the outcomes in each month.

*Choice decision: Repeated / Choice display: aggregate*: You will see the decision options for all 20 months of the session, but you will play only one month at a time. After each month, you will learn the random number chosen by the computer, and whether the large loss [gain] occurred in that month. Then, you will be re-directed to the choice table and make your decision for next month. After all 20 months, you will see a summary for the entire session, including your choices and the outcomes in each month.

*Choice decision: Precommitted/ Choice display: aggregated*: You will see the decision options for all 20 months of the session and you will precommit your choices for all 20 months in the session. After you make your choices, all 20 months will be played out at once. You will learn the random number chosen by the computer for each month, and whether the large loss [gain] occurred in that month. Then, you will see a summary for the entire session, including your choices and the outcomes in each month.

*Choice decision: Precommitted/ Choice display: separate*: You will precommit your choices for all 20 months in the session, one choice on each screen. After you make your choices, all 20 months will be played out at once. You will learn the random number chosen by the computer for each month separately, and whether the large loss [gain] occurred in that month. Then, you will see a summary for the entire session, including your choices and the outcomes in each month.

**Summary and Comprehension Check**

No matter what, you will earn a base pay of 8,500 Rp [5,500 Rp.] each month. Here is a table summarizing the possible additional outcomes, depending on your decision (whether to mine the Known region or the Unknown region):

Month

|  |  |
| --- | --- |
| Known region | You definitely lose 1,400 Rp, and have a 0% chance of the large loss occurring.[You definitely receive 1,400 Rp, and have a 0% chance of the large gain occurring.] |
| Unknown region | **You have a 4% chance of losing 40,000 Rp and a 96% chance of losing 0 Rp.****[You have a 4% chance of receiving 40,000 Rp and a 96% chance of receiving 0 Rp.]** |

1. If you decide to mine the Known region, how many Rp would you definitely lose [receive]? (please give your answer as an integer)

\*Text entry box\*

2a. If you mine the Unknown region, what is the percent chance that you will suffer a big loss [receive a big gain] in any given month? (please give your answer as an integer)

\*Text entry box\*

2b. If you mine the Unknown region, and you do suffer a loss [receive the big gain], how many Rp would this cause you lose [to receive]? (please give your answer as an integer)

\*Text entry box\*

3. If you decide to mine the Unknown region, what is the percent chance that you will NOT suffer a big loss [receive a big gain] in any given month? (please give your answer as an integer)

\*Text entry box\*

**Experimental Materials for Choice Options**

*Solo Game – Choice decision: Repeated / Choice display: Separate*

No matter what, you will earn a base pay of 8,500 Rp [5,500 Rp.] each month. Here is a table summarizing the possible additional outcomes, depending on your decision (whether to mine the Known region or the Unknown region):

Month 1

|  |  |
| --- | --- |
| Known region | You definitely lose 1,400 Rp, and have a 0% chance of the large loss occurring.[You definitely receive 1,400 Rp, and have a 0% chance of the large gain occurring.] |
| Unknown region | **You have a 4% chance of losing 40,000 Rp and a 96% chance of losing 0 Rp.****[You have a 4% chance of receiving 40,000 Rp and a 96% chance of receiving 0 Rp.]** |

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**How worried [hopeful] are you that the large loss [gain] would occur? Slider or a 1-10 horizontal multiple choice with labels. 0=not at all to 10=extremely)**

**How likely do you feel it is that the large loss [gain] occurs? Slider or a 1-10 horizontal multiple choice with labels. 0=not at all to 10=extremely)**

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Which region will you choose for this month?

Known region - Unknown region

*Solo Game – Choice decision: Repeated / Choice display: aggregate*

No matter what, you will earn a base pay of 8,500 Rp [5,500 Rp.] each month. Here is a table summarizing the possible additional outcomes, depending on your decision (whether to mine the Known region or the Unknown region):

Month 1

|  |  |
| --- | --- |
| Known region | You definitely lose 1,400 Rp, and have a 0% chance of the large loss occurring.[You definitely receive 1,400 Rp, and have a 0% chance of the large gain occurring.] |
| Unknown region | **You have a 4% chance of losing 40,000 Rp and a 96% chance of losing 0 Rp.****[You have a 4% chance of receiving 40,000 Rp and a 96% chance of receiving 0 Rp.]** |

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**How worried [hopeful] are you that the large loss [gain] would occur? Slider or a 1-10 horizontal multiple choice with labels. 0=not at all to 10=extremely)**

**How likely do you feel it is that the large loss [gain] occurs? Slider or a 1-10 horizontal multiple choice with labels. 0=not at all to 10=extremely)**

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Month1

Which region will you choose for this month?

Known region - Unknown region

Month2

Which region will you choose for this month?

Known region - Unknown region

.

.

.

Month20

Which region will you choose for this month?

Known region - Unknown region

*Solo Game – Choice decision: Precommitted/ Choice display: aggregated*

No matter what, you will earn a base pay of 8,500 Rp [5,500 Rp.] each month. Here is a table summarizing the possible additional outcomes, depending on your decision (whether to mine the Known region or the Unknown region):

Each Month

|  |  |
| --- | --- |
| Known region | You definitely lose 1,400 Rp, and have a 0% chance of the large loss occurring.[You definitely receive 1,400 Rp, and have a 0% chance of the large gain occurring.] |
| Unknown region | **You have a 4% chance of losing 40,000 Rp and a 96% chance of losing 0 Rp.****[You have a 4% chance of receiving 40,000 Rp and a 96% chance of receiving 0 Rp.]** |

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**How worried [hopeful] are you that the large loss [gain] would occur? Slider or a 1-10 horizontal multiple choice with labels. 0=not at all to 10=extremely)**

**How likely do you feel it is that the large loss [gain] occurs? Slider or a 1-10 horizontal multiple choice with labels. 0=not at all to 10=extremely)**

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Which region will you choose for month 1?

Known region - Unknown region

Which region will you choose for month2?

Known region - Unknown region

Which region will you choose for month3?

Known region - Unknown region

Which region will you choose for month4?

Known region - Unknown region

Which region will you choose for month5?

Known region - Unknown region

 Which region will you choose for month6?

Known region - Unknown region

Which region will you choose for month7?

Known region - Unknown region

Which region will you choose for month8?

Known region - Unknown region

Which region will you choose for month9?

Known region - Unknown region

Which region will you choose for month10?

Known region - Unknown region

Which region will you choose for month11?

Known region - Unknown region

Which region will you choose for month12?

Known region - Unknown region

Which region will you choose for month13?

Known region - Unknown region

Which region will you choose for month14?

Known region - Unknown region

Which region will you choose for month15?

Known region - Unknown region

Which region will you choose for month16?

Known region - Unknown region

Which region will you choose for month17?

Known region - Unknown region

Which region will you choose for month18?

Known region - Unknown region

Which region will you choose for month19?

Known region - Unknown region

Which region will you choose for month20?

Known region - Unknown region

*Solo Game – Choice decision: Precommitted/ Choice display: separate*

No matter what, you will earn a base pay of 8,500 Rp [5,500 Rp.] each month. Here is a table summarizing the possible additional outcomes, depending on your decision (whether to mine the Known region or the Unknown region):

Each Month

|  |  |
| --- | --- |
| Known region | You definitely lose 1,400 Rp, and have a 0% chance of the large loss occurring.[You definitely receive 1,400 Rp, and have a 0% chance of the large gain occurring.] |
| Unknown region | **You have a 4% chance of losing 40,000 Rp and a 96% chance of losing 0 Rp.****[You have a 4% chance of receiving 40,000 Rp and a 96% chance of receiving 0 Rp.]** |

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**How worried [hopeful] are you that the large loss [gain] would occur? Slider or a 1-10 horizontal multiple choice with labels. 0=not at all to 10=extremely)**

**How likely do you feel it is that the large loss [gain] occurs? Slider or a 1-10 horizontal multiple choice with labels. 0=not at all to 10=extremely)**

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Which region will you choose for month 1?

Known region - Unknown region

<<<<Page break>>>>

Which region will you choose for month2?

Known region - Unknown region

<<<<Page break>>>>

Which region will you choose for month3?

Known region - Unknown region

<<<<Page break>>>>

Which region will you choose for month4?

Known region - Unknown region

 <<<<Page break>>>>

Which region will you choose for month5?

Known region - Unknown region

 <<<<Page break>>>>

 Which region will you choose for month6?

Known region - Unknown region

 <<<<Page break>>>>

Which region will you choose for month7?

Known region - Unknown region

<<<<Page break>>>>

Which region will you choose for month8?

Known region - Unknown region

<<<<Page break>>>>

Which region will you choose for month9?

Known region - Unknown region

<<<<Page break>>>>

Which region will you choose for month10?

Known region - Unknown region

<<<<Page break>>>>

Which region will you choose for month11?

Known region - Unknown region

<<<<Page break>>>>

Which region will you choose for month12?

Known region - Unknown region

 <<<<Page break>>>>

Which region will you choose for month13?

Known region - Unknown region

Which region will you choose for month14?

Known region - Unknown region

 <<<<Page break>>>>

Which region will you choose for month15?

Known region - Unknown region

 <<<<Page break>>>>

Which region will you choose for month16?

Known region - Unknown region

 <<<<Page break>>>>

Which region will you choose for month17?

Known region - Unknown region

 <<<<Page break>>>>

Which region will you choose for month18?

Known region - Unknown region

 <<<<Page break>>>>

Which region will you choose for month19?

Known region - Unknown region

<<<<Page break>>>>

Which region will you choose for month20?

Known region - Unknown region

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**[All conditions]**

**Demographic questions block:**

**What is your gender? [choice] Male/Female/Other**

**What is your age? [text entry box]**

**What is your ethnicity? [choice] White / Hispanic or Latino / Black or African American / Native American or American Indian /Asian or Pacific Islander / Other**

**What is your major? [text entry box]**

**How comfortable you feel with mathematics? 1-not at all to 7-very**

**Appendix E: Experimental materials for study 5 (short-format)[[3]](#footnote-3)**

**Instructions (pg 1 of 3)**

Please carefully read the following instructions.

Scenario: Imagine you own a mining company in Indonesia and you extract minerals from different regions each month. You receive a base income of 8,500 Rupiah (Rp is the Indonesian currency) income per month, regardless of your choice of region. You must also pay an amount each month, depending on which region you choose.

You must decide between investing in the "Known" regions or in the "Unknown" regions. In the Known regions, the conditions are stable, and you will pay a fixed amount of 1,400 Rp for maintenance that month. In the Unknown regions, the conditions are uncertain. There is a 4% [20% vs. 50%] chance that you will pay 40,000 [8000 vs. 3200] Rp for maintenance that month, otherwise you will pay nothing that month.

**Instructions (pg 2 of 3)**

Here is a summary of the possible outcomes, depending on your choice:

- Each month, you will earn a base income of 8,500 Rp (you will always receive this income, no matter what else happens).

- If you choose the Known region, then you must pay 1,400 Rp, and there is a 0% chance that the large loss will occur.

- If you choose the Unknown region, then there is a 4% [20% vs. 80%] chance you will lose 40,000 [8000 vs. 3200] Rp and there is a 96% [80% vs. 50%] chance of losing 0 Rp.

Probabilistic outcomes will be determined by a random number generator, where it is equally likely that any number between 1 and 100 is chosen. In other words, the computer fairly and randomly selects a random number. The large loss will occur if lower numbers are chosen. For example, if there is a 5% chance of the large loss occurring, it will occur when the number randomly chosen is a 1, 2, 3, 4 or 5 (out of 100).

**Instructions (pg 3 of 3)**

You will play one month at a time. After each month, you will learn the random number chosen by the computer, and whether the large loss occurred in that month. After all 20 months, you will see a summary for the entire session, including your choices and the outcomes in each month.

[You will see the decision options for all 20 months of the session and you will precommit your choices for all 20 months in the session. After you make your choices, all 20 months will be played out at once. You will learn the random number chosen by the computer for each month, and whether the large loss occurred in that month. Then, you will see a summary for the entire session, including your choices and the outcomes in each month. ]

**Appendix F: Subjective probability measures used in studies 4 and 5[[4]](#footnote-4).**

Please answer the following questions about your decision making during the game.

How much do you agree with the following statement?
"I only focused on the present choice when making decisions for any given choice."

1=Not at all to 10= Extremely

How much do you agree with the following statement?
"I focused on all the 20 choices when making decisions for any given choice."
1=Not at all to 10= Extremely

Looking foward to the next session, how worried are you that the large loss could occur at some point?
1=Not at all to 10= Extremely

Looking foward to the next session, how likely do you feel it is that the large loss could occur at some point?

1=Not at all to 10= Extremely

**Appendix G: Precommitment in a “solo” game with future and present primes**

If we assume that precommitment increases the time-horizon of people and in turn leads to more investments in the safer option, then same would happen in the repeated condition if we prime people with a future mindset. In this study, we tested the effect of future vs. present mindset primes on precommitment’s effect.

*Study F: Design overview and participants*

The study had a 2 (mindset prime: present versus future) by 2 (choice structure: precommited versus repeated) between-subjects design. Two hundred and fifty users of Amazon’s Mechanical Turk were recruited for this for a fixed monetary compensation.

*Study F: Methods*

Participants learned that they will be doing two studies. The first study included the priming task adopted from Sheffer et al. (2016)[[5]](#footnote-5) such that the participants first read and were told to write down 10 words either priming present or future mindsets. Then, they were told to write ten different sentences describing themselves containing at least one of the words they saw. Finally, the participants wrote a paragraph describing themselves using those ten words and without using the sentences they wrote in the previous task. The choice structure study was a similar solo game to those used in previous studies. After that, participants filled out the same decision-making process measures, as well as a Consideration of Future Consequences (CFC) scale and some demographic questions.

*Study F: Results*

We used the first two of decision-making process measures (see appendix E) to check our manipulation for mindset prime. Although it was directional, results revealed that our manipulation for mindset prime had failed. A 2 by 2 by 4 repeated-measures (blocks) was used to test the experimental effects. The effect of precommitment on choice of investment option was once again replicated F(1,246)=11.70, p<.001 such that those participants in the precommited conditions invested more in the safer option (Mpre = .55, SE= .03) than those in the repeated conditions (Mrep = .41, SE= .03). However, neither the mindset prime’s main effect nor its interaction with the choice structure factor became significant (both Fs <.1). We ran a Process Model 1 to test the moderating effect of CFC scores (12-item measure, alpha =.87) on the Precommitment effect. Although higher CFC scores result in higher investments in the safer option (B= .09, SE= .04, p<.05), these scores did not moderate the effect of precommitment on investment decisions (p *ns*).

*Study F: Discussion*

The effect of precommitment was replicated in this study. However, the mindset primes used in this study failed to apply the intended manipulation and therefore it did not have the expected effect on the investment decisions.

Future researchers can further test this possibility via other future mindset priming methods.

**Appendix H: Experimental Material for Study 6**

The experimental materials for the repeated and precommited conditions were the same as previous studies. The experimental materials for the non-binding precommitment condition are as follows:

Instructions (page 1 of 3)

Scenario: Imagine you own a mining company in Indonesia and you extract minerals from different regions each month. You receive a base income of 8,500 Rupiah (Rp is the Indonesian currency) income per month, regardless of your choice of region. You must also pay an amount each month, depending on which region you choose.

You must decide between investing in the "Known" regions or in the "Unknown" regions. In the Known regions, the conditions are stable, and you will pay a fixed amount of 1,400 Rp for maintenance that month. In the Unknown regions, the conditions are uncertain. There is a 4% chance that you will pay 40,000 Rp for maintenance that month, otherwise you will pay nothing that month.

Instructions (page 2 of 3)

Here is a summary of the possible outcomes, depending on your choice:

- Each month, you will earn a base income of 8,500 Rp (you will always receive this income, no matter what else happens).

- If you choose the Known region, then you must pay 1,400 Rp, and there is a 0% chance that the large loss will occur.

- If you choose the Unknown region, then there is a 4% chance you will lose 40,000 Rp and there is a 96% chance of losing 0 Rp.

Probabilistic outcomes will be determined by a random number generator, where it is equally likely that any number between 1 and 100 is chosen. In other words, the computer fairly and randomly selects a random number. The large loss will occur if lower numbers are chosen. For example, if there is a 5% chance of the large loss occurring, it will occur when the number randomly chosen is a 1, 2, 3, 4 or 5 (out of 100).

Instructions (page 3 of 3)

You will see the decision options for all 20 months of the session and you will precommit your choices for all 20 months in the session. After the first month is played, you will return to the choice page and have the option to change your choices for months 2-20 if you wish (or stay with your original choices). Same goes for after second month is played till the end. You will learn the random number chosen by the computer for each month, and whether the large loss occurred in that month as well as a summary for the entire session once all 20 months are played.[[6]](#footnote-6)

1. Although the two-tailed test is only marginally significant (.09), a one-tailed test is appropriate because we had a specific, directional hypothesis based on the results of Study 1. [↑](#footnote-ref-1)
2. It is possible that a comparison of two hypothetical scenarios, one with financial outcomes and another with environmental outcomes but no financial consequences, might yield differences [↑](#footnote-ref-2)
3. Not including the parts identical to study 4. [↑](#footnote-ref-3)
4. Only the last two measures were used in study 4 whereas all four were used in study 5. Neither of these significantly explained the effect of precommitment. [↑](#footnote-ref-4)
5. Sheffer, C. E., Mackillop, J., Fernandez, A., Christensen, D., Bickel, W. K., Johnson, M. W., ... & Mathew, M. (2016). Initial examination of priming tasks to decrease delay discounting. Behavioural processes, 128, 144-152. [↑](#footnote-ref-5)
6. The comprehension check and choice tasks were identical to previous studies. Participants in the non-binding precommitment condition were redirected to the choice page after each month where they could change their choices if they wanted to. [↑](#footnote-ref-6)