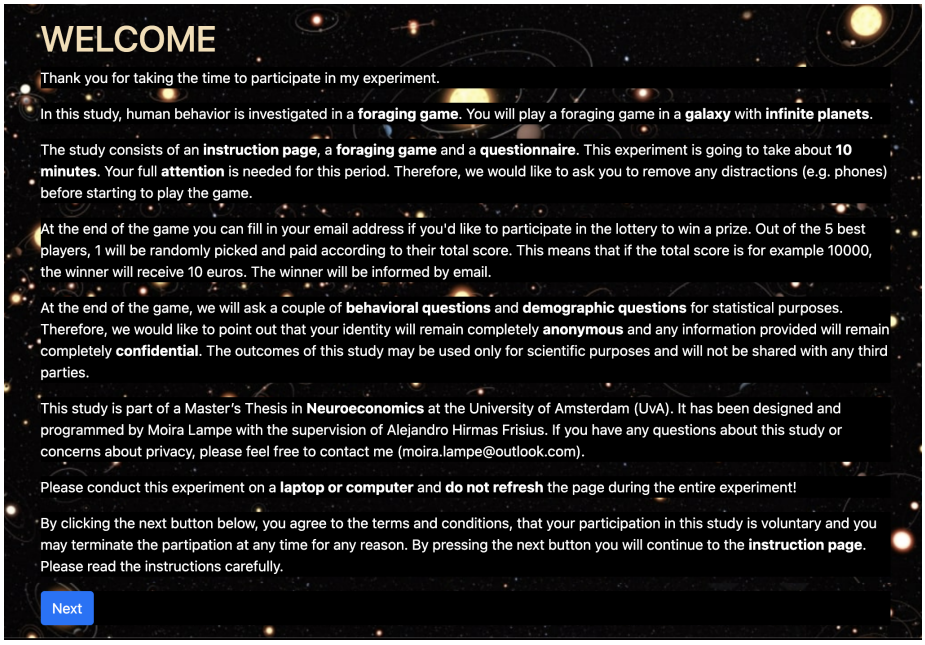
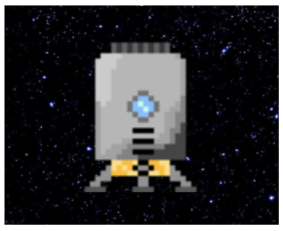
6 Appendix

6.1 Instructions



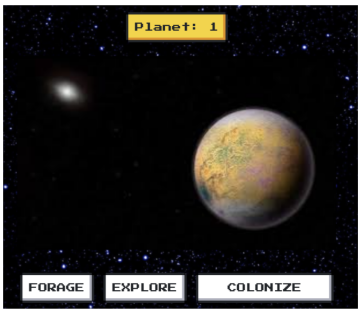


Decisions

In the beginning of the game, you do not know anything about the galaxy. You also have little information about the planets. The only thing you know is that planets' resources will be shown in terms of a payoff that can vary between [0, 100].

You have **5 levels** to complete. In each level you will play multiple rounds, where you can make **3 decisions**:

1. **Forage**
2. **Explore**
3. **Colonize**



Forage

If you decide to **forage** on a given **planet**, you will get to know how rich this planet is in terms of **resources**. With **every time** you decide to **forage** on this **planet**, you are **already collecting resources** that will be added to your **total score** of this level. Remember, the resources will be shown in terms of a **payoff** that can go from **0 to 100**.

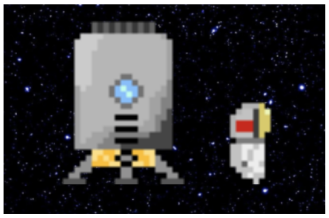
Every day the harvest can change a little bit. Every round, the value you receive can vary up to 10 points from the planet value (from -10 to 10).

Example: Let's say that planet 1 has a randomly specified value of 50. Every round that you decide to forage on this planet's resources, you will be given a random value that ranges between 40 and 60 [40, 60].

By **foraging** on a **planet**, you **learn** more and more about its **value**, which will give you a **better idea** about whether this **planet** will be **feasible** for you and your people (in the long run). If you **decide** to **exploit resources** on a **planet**, you gather **resources** in the form of a payoff.

Explore

If you do not wish to **stay** on the **current planet**, because you do **not like the payoff** of the **planet** or because you believe that there might be a better planet in the orbit, you can decide to keep **exploring** and thereby going to the next **planet**. **Travelling** from one planet to the next one also comes with a **cost** as you will have to use some of your **resources** to travel there. This is the **exploration cost**, that you will **learn** about **before** every level starts. If you decide to keep exploring, you **cannot** go back to the previous planet.



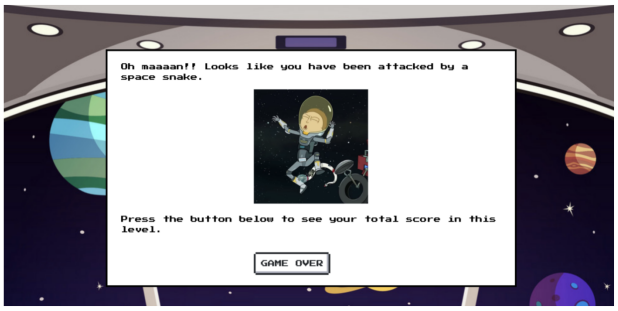
Colonize

If you think that you have found a **planet** that gives you **enough resources**, you can decide to **stay** on this planet **forever**. In order to do this, you can just click the button **Colonize**. Your **payoffs** will then **automatically** be iterated through the rounds until the **game ends**. This means that for this level your **decision-making** is over.

Rounds and Levels

The game consists of **5 levels**. In each level, you will be navigating through a galaxy with an **infinite amount of planets**.
With every time you **forage**, you go up one round, which is equivalent to **1 day**. With every time you **explore**, you lose **resources** (**exploration cost**).

BE AWARE: the galaxy does **not** come **without danger**. It is long known that there are **space snakes** around, and there is a **5% chance** that they **attack** you and your people. The level will go on until you are attacked by **space snakes**. This can either happen while you are still **foraging** or during the days on the planet which you decided to **colonize**. If you get **attacked by space snakes** while you are still actively **foraging**, you will see a **GAME OVER** page.



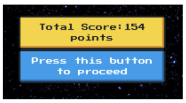
If you get **attacked** while you are already settled down on a **planet**(colonized), you will be informed on the **final results page** of this level.

When the **game ends** in this **level**, you will be sent to the **next level**. This will be a **different galaxy**, with **different planets**. It is important to note that each level is **independent** of each other.

After you have **finished the game**, you will be sent to the follow-up **behavioral** and **demographic questions**.

Payoff and Main Goal

Your **payoff** depends on the score you receive with each day you are **foraging** on a **planet**, the **payoff** you receive on the **planet** you decided to **settle** down on and the **exploration cost**.



EXAMPLE: suppose on **"Planet 1"** on the first day you receive a **payoff** of **60** after you decided to **forage**. The second day **51**, after you decided to **forage** again on the same **planet**. Then you decide to keep **exploring** to find a **better planet**, and **forage** on **"Planet 2"** on day 3 and receive a **payoff** of 80. Now suppose you want to **stay** on this **planet** and press **colonize**.

Then your **TOTAL SCORE** in that **level** will be:
60 + 51 - (exploration cost) + 80 + 'sum of all the upcoming values on that planet until the game ends'

If you want to know your total score and want to know how well you did compared to other players, please provide your email address in the demographic questionnaire. You will receive an email within the next 2 weeks. The same email will also announce the winner. Below you can also select a nickname you would like to use throughout the game. This nickname will then also be shown on the score page that will be sent to you by email.

TO SUM UP: Your **goal** is to try to have the **highest score** possible in each level while facing the constraint of having **exploration cost**, **no** way of **recalling** the **previous planet** and the possibility of the **game ending at random**. **GOOD LUCK!!!**

ATTENTION

Please do not refresh the **page** at any time **during the experiment**. If you wish to **re-start the experiment**, please **contact me** and I'll send you a **new link**. **Thank you!**

By **clicking** the **next button** below, you agree that you **carefully** read the **instructions**, and are now ready to **start the game**.

Next

6.2 Big Five Personality Test

Please indicate how much the following statement applies to you. With 1 being least applicable and 4 being most applicable.

"I am a fearful person."

6.3 Holt-Laury List

The Holt-Laury Task measures risk aversion. In this task, participants are given a set of paired lottery choices. These pairs are structured so that the lesser payoff in choice "A" is always worth more than the lesser payoff in choice "B" (e.g., the high payoff in "A" is $2.00 and the low payoff is $1.60, whereas the high payoff in "B" is $3.85 and the low payoff is $.10). Initially, the chance of the high payoff is 1/10 and the low payoff 9/10. With each step, the probability of the high payoff steadily increases by 1/10 (e.g., the second pair has a 2/10 probability for the high payoff and 8/10 for the low payoff). When the probability of the high payoff is low, choosing the "B" lottery is seen as the risky decision. As the probabilities change, the expected value of "B" over "A" increases. When this occurs, continuing to choose the "A" lottery indicates risk aversion.

Option A: 10% chance of 100 euros 90% chance of 80 euros.

Option B: 10% chance of 190 euros 90% chance of 5 euros.

6.4 Bellman Equation

$$V(stay, V) = V + \beta * V(stay, V) \tag{1}$$

$$\leftrightarrow V(stay, V) = \frac{V}{1-\beta}$$

$$\text{V(moving, V)} = \text{-c} + \beta \int_V^0 * v(move) \frac{du}{100} + \beta * \int_V^0 * v(stay, v) \frac{du}{100} (2)$$

$$\leftrightarrow V(moving, V) = \frac{1}{1-\beta * \frac{v}{100}} * (-c + \beta * \frac{100^2 - v^2}{2 * 100 * (1-\beta)})$$

$$\frac{v}{1-\beta} = \frac{1}{1-\beta * \frac{v}{100}} * (-c + \beta * \frac{100^2 - v^2}{2 * 100 * (1-\beta)}) \tag{3}$$

$$\frac{v}{1-0.95} = \frac{1}{1-0.95 * \frac{v}{100}} * (-5 + 0.95 * \frac{100^2 - v^2}{2 * 100 * (1-0.95)}) \tag{4}$$

$$\text{v} = 72 \text{ if c} = 5$$
$$\text{v} = 66 \text{ if c} = 50$$