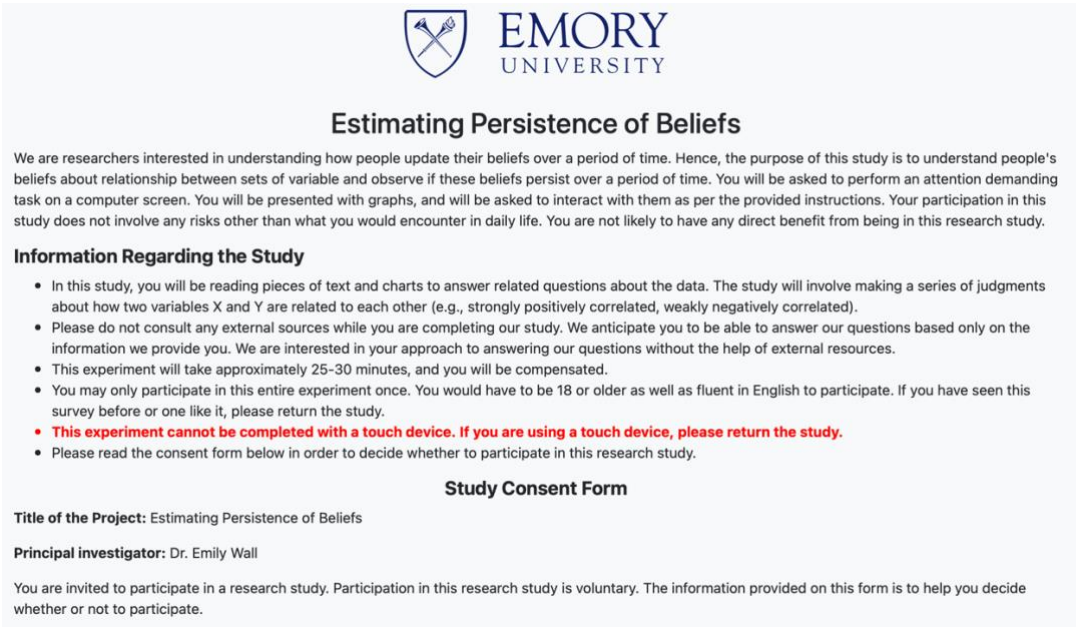
1. **Consent form for participant's consent.**



EMORY UNIVERSITY

Estimating Persistence of Beliefs

We are researchers interested in understanding how people update their beliefs over a period of time. Hence, the purpose of this study is to understand people's beliefs about relationship between sets of variable and observe if these beliefs persist over a period of time. You will be asked to perform an attention demanding task on a computer screen. You will be presented with graphs, and will be asked to interact with them as per the provided instructions. Your participation in this study does not involve any risks other than what you would encounter in daily life. You are not likely to have any direct benefit from being in this research study.

Information Regarding the Study

- In this study, you will be reading pieces of text and charts to answer related questions about the data. The study will involve making a series of judgments about how two variables X and Y are related to each other (e.g., strongly positively correlated, weakly negatively correlated).
- Please do not consult any external sources while you are completing our study. We anticipate you to be able to answer our questions based only on the information we provide you. We are interested in your approach to answering our questions without the help of external resources.
- This experiment will take approximately 25-30 minutes, and you will be compensated.
- You may only participate in this entire experiment once. You would have to be 18 or older as well as fluent in English to participate. If you have seen this survey before or one like it, please return the study.
- **This experiment cannot be completed with a touch device. If you are using a touch device, please return the study.**
- Please read the consent form below in order to decide whether to participate in this research study.

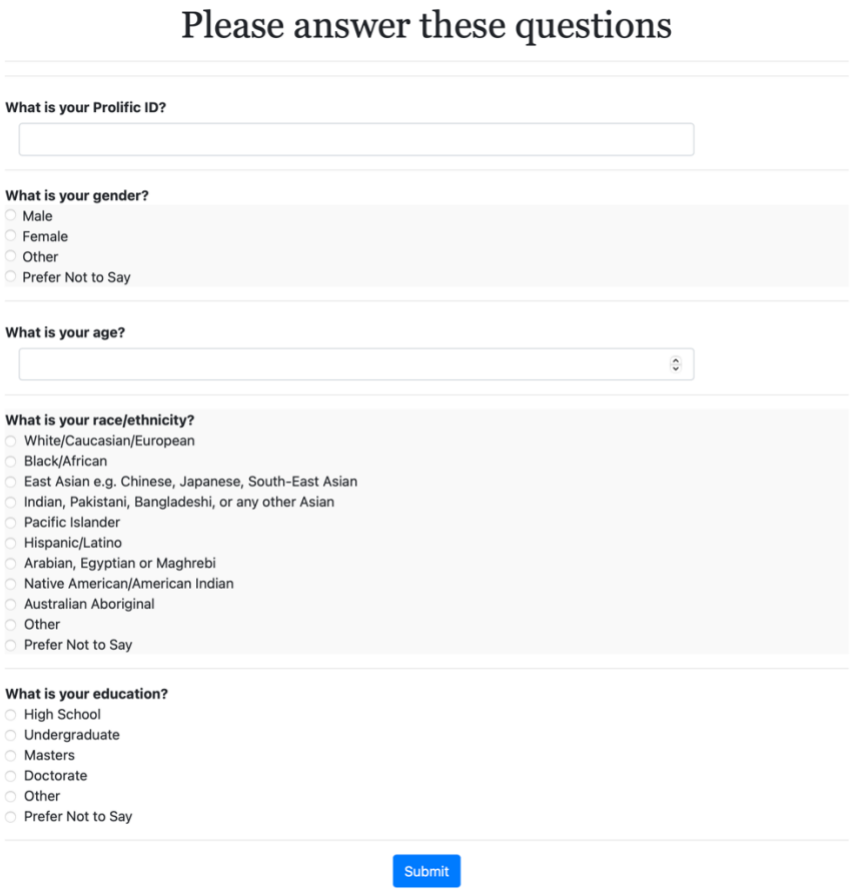
Study Consent Form

Title of the Project: Estimating Persistence of Beliefs

Principal investigator: Dr. Emily Wall

You are invited to participate in a research study. Participation in this research study is voluntary. The information provided on this form is to help you decide whether or not to participate.

2. **Participant information is entered.**



Please answer these questions

What is your Prolific ID?

What is your gender?
- Male
- Female
- Other
- Prefer Not to Say

What is your age?

What is your race/ethnicity?
- White/Caucasian/European
- Black/African
- East Asian e.g. Chinese, Japanese, South-East Asian
- Indian, Pakistani, Bangladeshi, or any other Asian
- Pacific Islander
- Hispanic/Latino
- Arabian, Egyptian or Maghrebi
- Native American/American Indian
- Australian Aboriginal
- Other
- Prefer Not to Say

What is your education?
- High School
- Undergraduate
- Masters
- Doctorate
- Other
- Prefer Not to Say

Submit

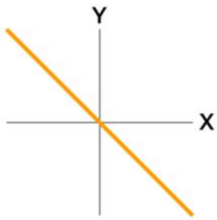
3. How to interpret correlation visualization is taught.

Instructions: Correlation

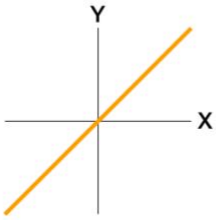
Welcome! In this study you will be asked to make a series of judgments based on your belief about the strength of the relationship between two variables. Please read all the instructions carefully as your performance is dependent on understanding the task.

The relationship between two variables will be represented by a line, as in the examples below. The angle of the line indicates the degree to which one variable increases or decreases as the other variable changes.

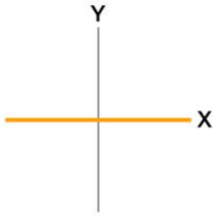
Negative Relationship: For two variables X and Y, an increase in X is associated with a decrease in Y. The line for a **negative relationship** would look like this:



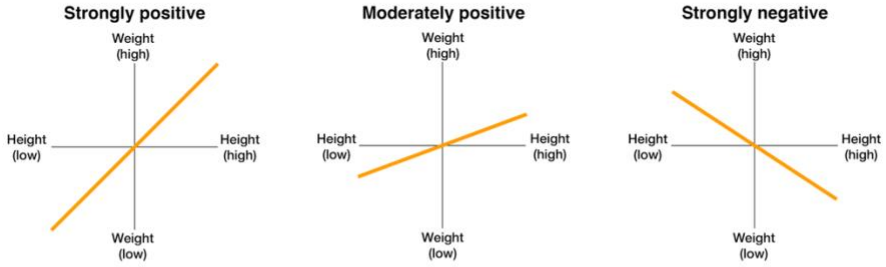
Positive Relationship: For two variables X and Y, an increase in X is associated with a increase in Y. The line for a **positive relationship** would look like this:



Unrelated Variables: For two variables X and Y, an increase in X is associated with no-change in Y. The line for **unrelated variables** would look like this:



Let's take an example set of variables where X = height and Y = weight. Of the three lines shown below, which one do you think best represents the true relationship between height and weight?



Height and weight have a **moderately positive** relationship: For the most part, taller people tend to weigh more. However, this relationship is not perfect, since there are many tall, skinny people who don't weigh that much, as well as many short people who weigh a lot. So unlike the line shown to the left for a perfectly positive relationship, the line that best represents the true relationship between height and weight is closer to a horizontal line (the middle option in the row above).

Press Continue below to learn more about the next steps.

Continue

4. How to elicit beliefs is taught to the participants.

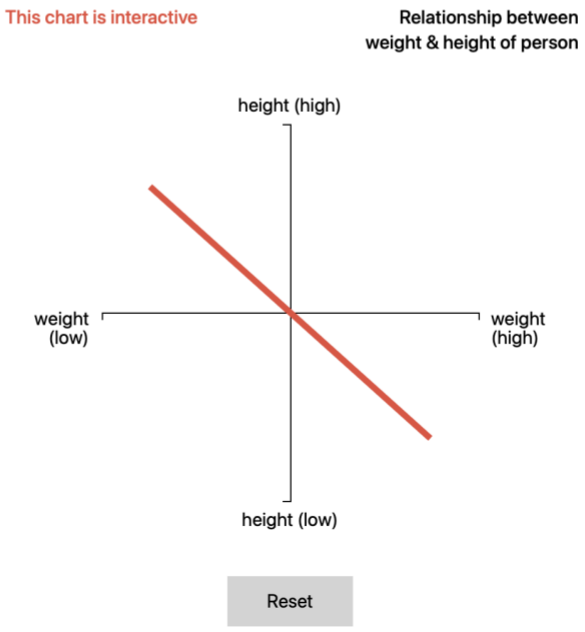
Instructions: Belief Elicitation

Throughout the task you will create a line chart which represents your belief about the true relationship between two variables. **In this page, we will practice with the line and cone interactive chart!**

The red line represents what you think is the **most likely** relationship between the two variables. First you will *move* the mouse to adjust the angle of the line according to what you think is the most likely relationship, then you will *click* the mouse button to record your response.

The gray lines represent **plausible alternatives** that you think have some chance of representing the true relationship, but are less likely than the red line. After you set the angle of the red line, you will adjust the set of plausible alternatives that you think could also represent the relationship between the variables. You can select the gray lines after selecting the red line.

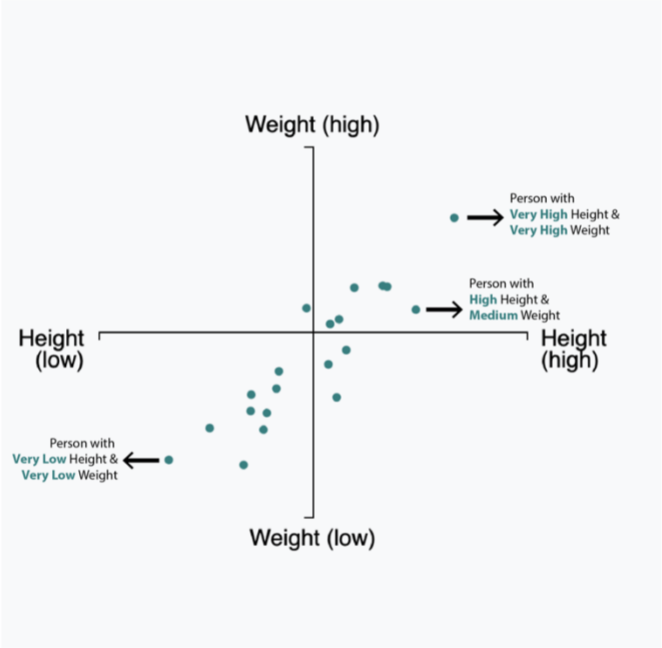
Let's practice recording your belief about the relationship between two variables, weight and height. Move the mouse over the chart until the angle of the red line represents what you think is the **most likely relationship** between the variables Weight and Height, then click to record your response. Next, move the mouse again in order to adjust the **set of plausible alternatives** (gray lines) to include relationships between the two variables that are plausible, but less likely, than the red line. When you are finished, click the mouse again to record your response.



5. How to interpret scatterplots is taught to the participants.

Instructions: Sample Data Visualizations

In this study you will encounter charts that represent real data about the relationship between two variables. Each scatter plot displays certain number of observations. Each circle in the scatter plot represents one observation i.e. the value for the two variables. For example, the top right circle in the following chart represents a person who has a very high height and weight. The circle at the bottom left represents a person who has a very low height and very low weight.



Whenever you see a scatter chart with a dataset such as the one above, you should compare the relationship in the observed data to your pre-existing belief about the relationship between the two variables.

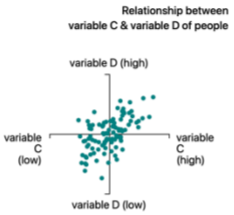
Press Continue below to learn more about the next steps.

Continue

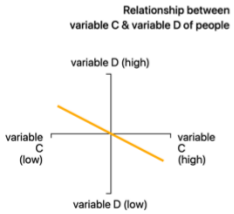
6. Practice questions with scatterplots is provided.

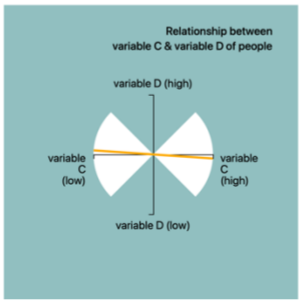
Practice With Scatter Plots (1 / 2)

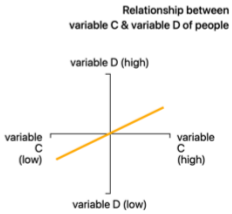
Now let's make sure you understand how to interpret the scatter plots. **Please look at the scatter plot below and choose the line which best represents the relationship between the variables based on the data in the scatter plot.**



Given the data in the scatter plot above, which of the lines below best represents the relationship between the variables?

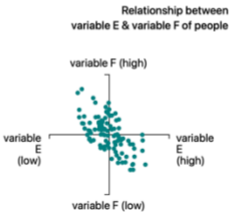




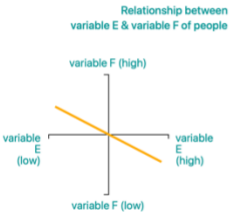


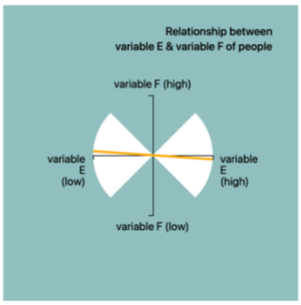
Practice With Scatter Plots (2 / 2)

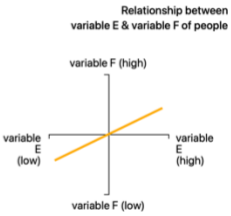
Now let's make sure you understand how to interpret the scatter plots. **Please look at the scatter plot below and choose the line which best represents the relationship between the variables based on the data in the scatter plot.**



Given the data in the scatter plot above, which of the lines below best represents the relationship between the variables?





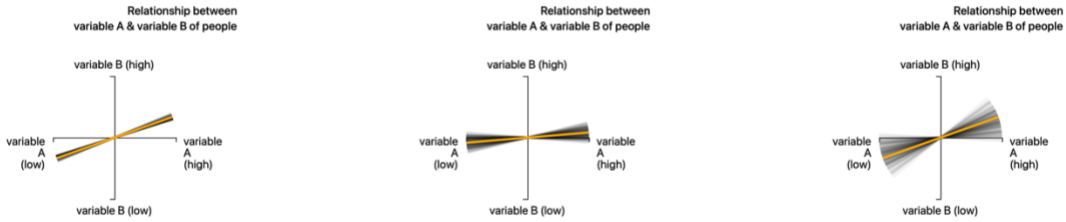


7. Practice questions with uncertainty visualization is provided.

Practice with drawing uncertainty (1 / 2)

Now let's make sure you understand how to interpret the set of plausible alternatives in terms of uncertainty about the relationship between the variables. **Please read the scenario below and choose the best answer.**

Scenario: Imagine a person believes the relationship between **variable A** and **variable B** is **moderately positive, but they are not very confident** . Of the options below, which chart best represents their beliefs about the relationship between the variables?

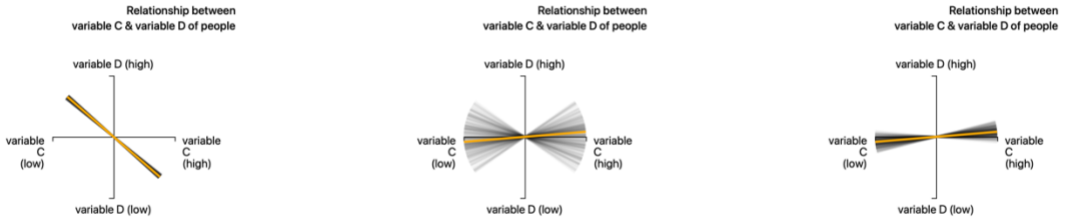


Continue

Practice with drawing uncertainty (2 / 2)

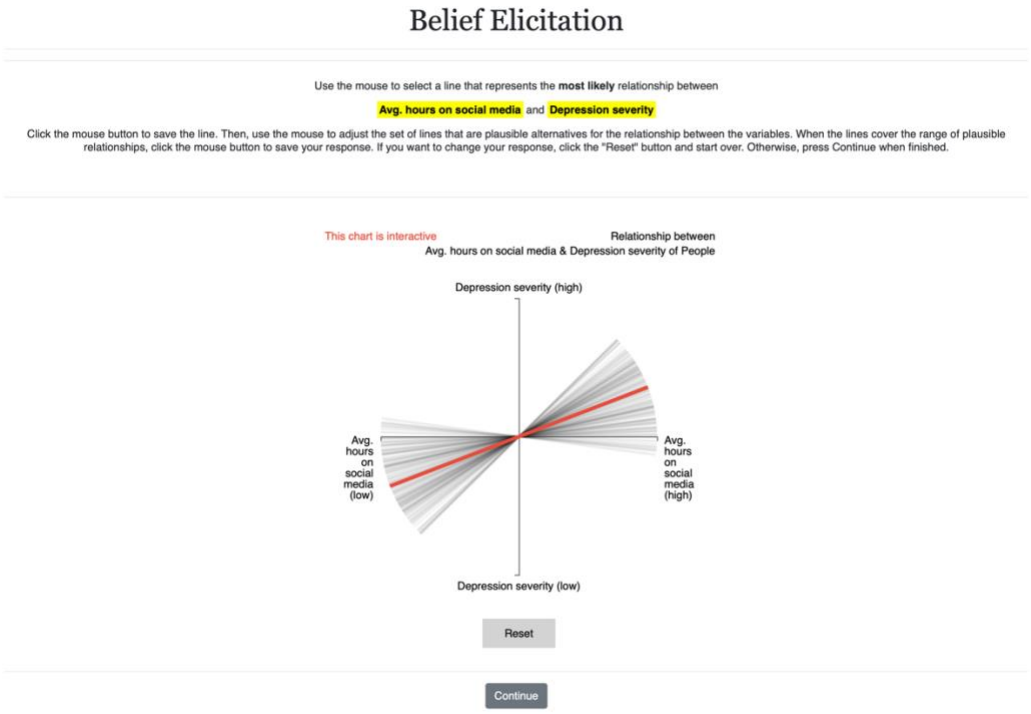
Now let's make sure you understand how to interpret the set of plausible alternatives in terms of uncertainty about the relationship between the variables. **Please read the scenario below and choose the best answer.**

Scenario: Imagine a person believes the relationship between **variable C** and **variable D** is **no relationship, but they are not confident at all** . Of the options below, which chart best represents their beliefs about the relationship between the variables?



Continue

8. The trials begin and participants elicit their prior beliefs



9. The supporting data is shown as scatterplots

Supporting Data

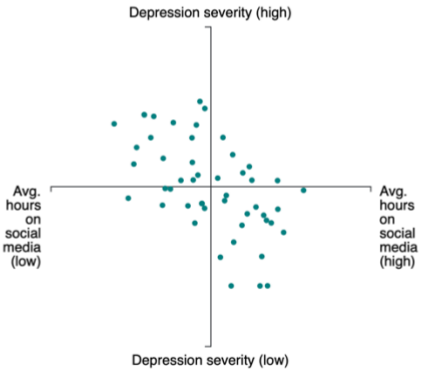
This scatter chart represents 50 data points randomly sampled from a much larger population representing the relationship between

Avg. hours on social media and **Depression severity**

Please take time to review this chart, in light of your previous decision. And then move forward to the next section.

This chart is not interactive

Relationship between
Avg. hours on social media & Depression severity of People



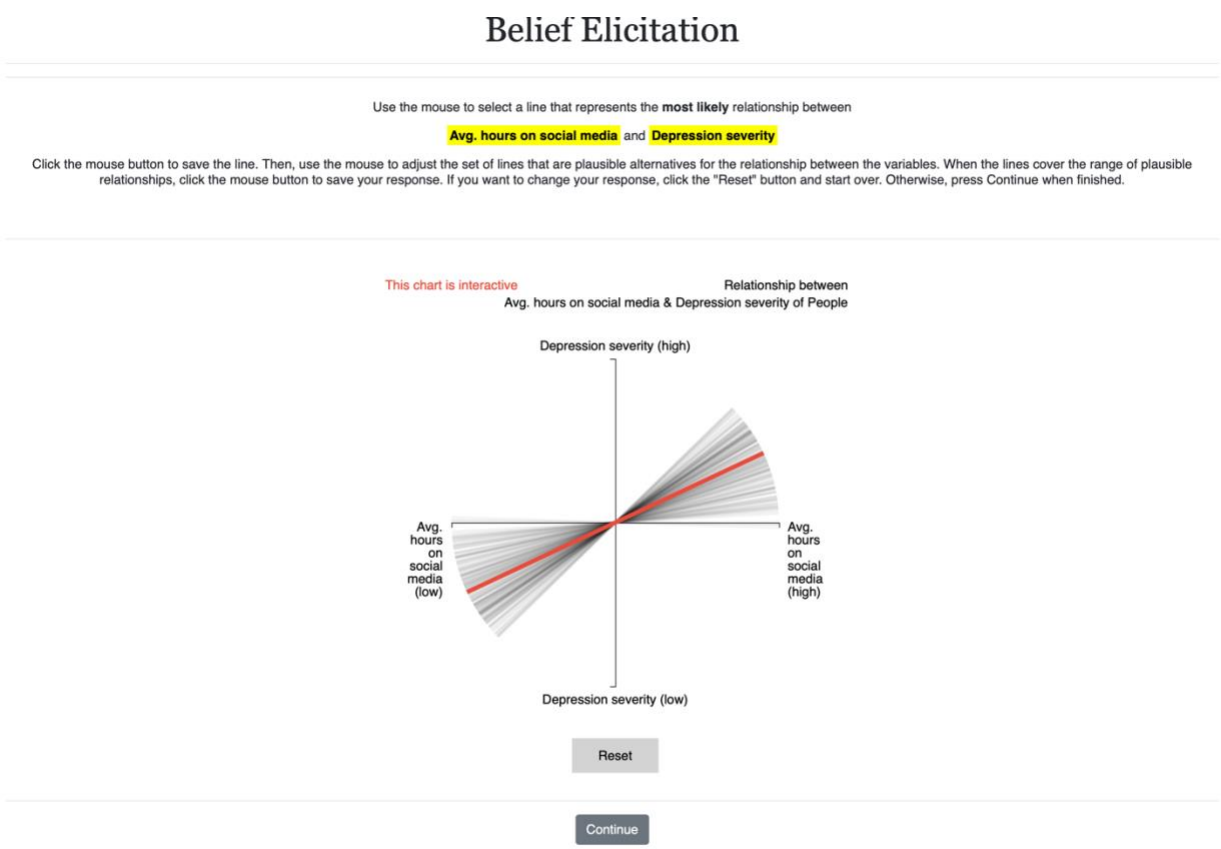
Continue

Now think about what you saw before and describe again the relationship between these variables:

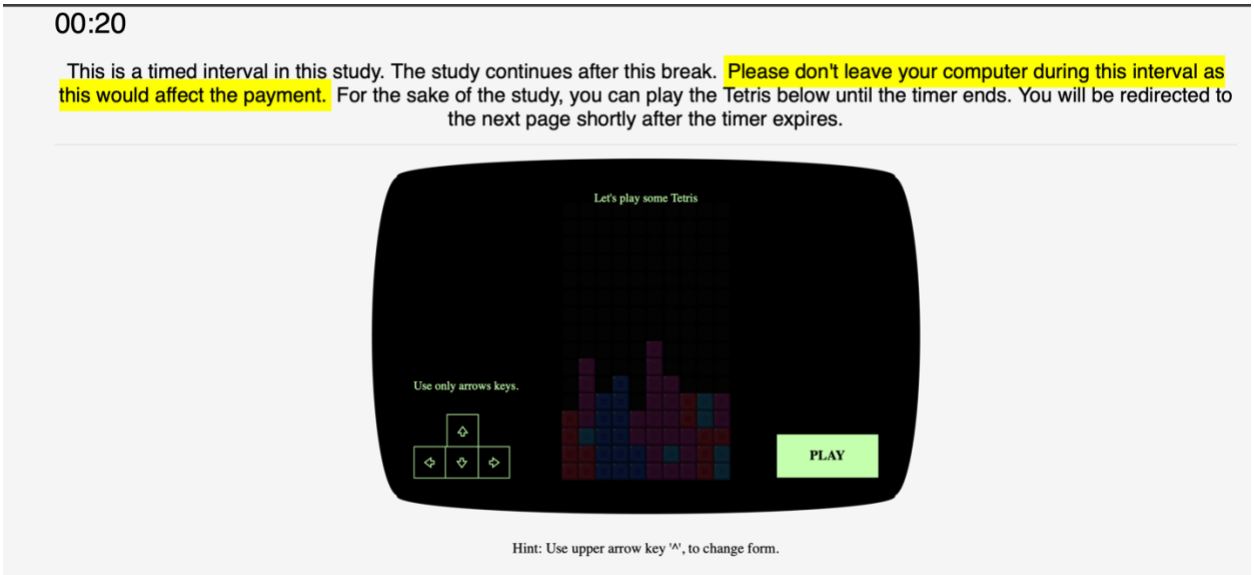
Avg. hours on social media & Depression severity of People

Continue

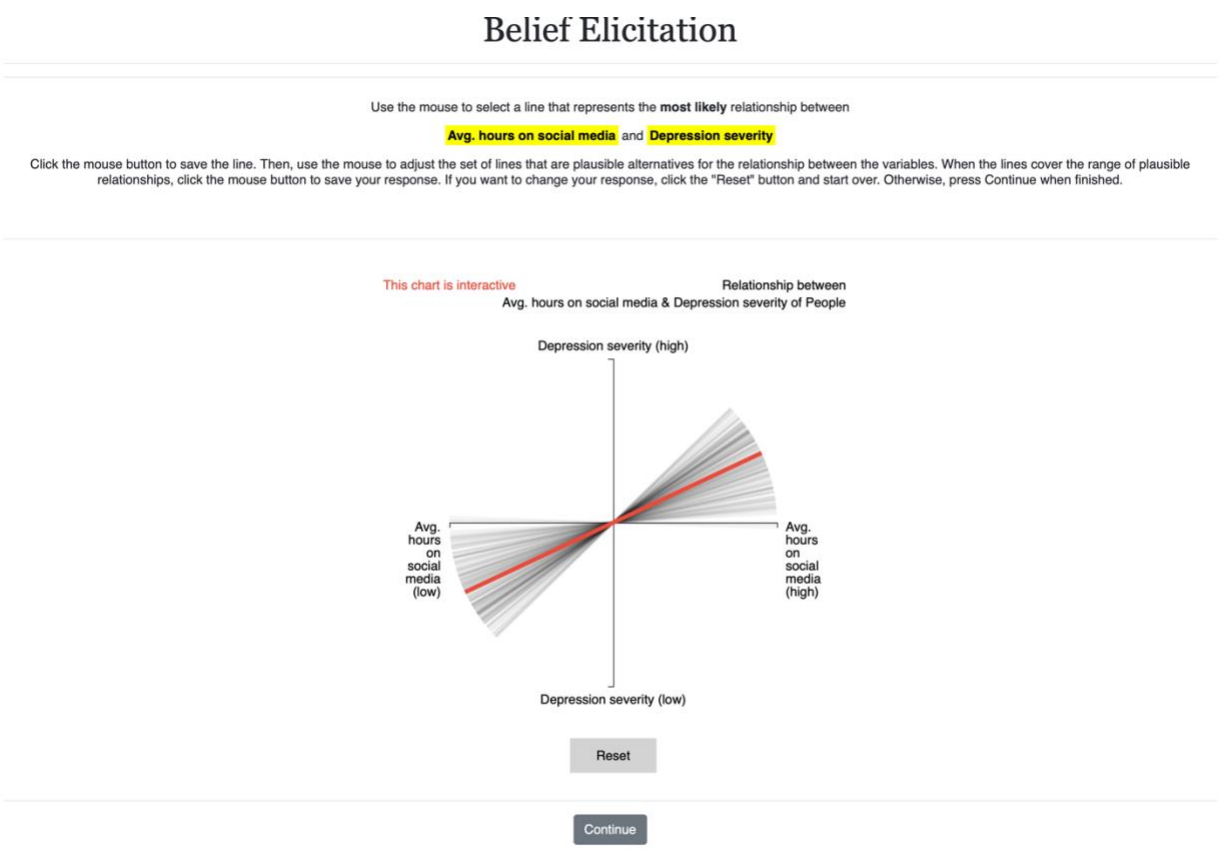
10. Posterior beliefs at T= 0 elicited.



11. Distractor activity: Tetris

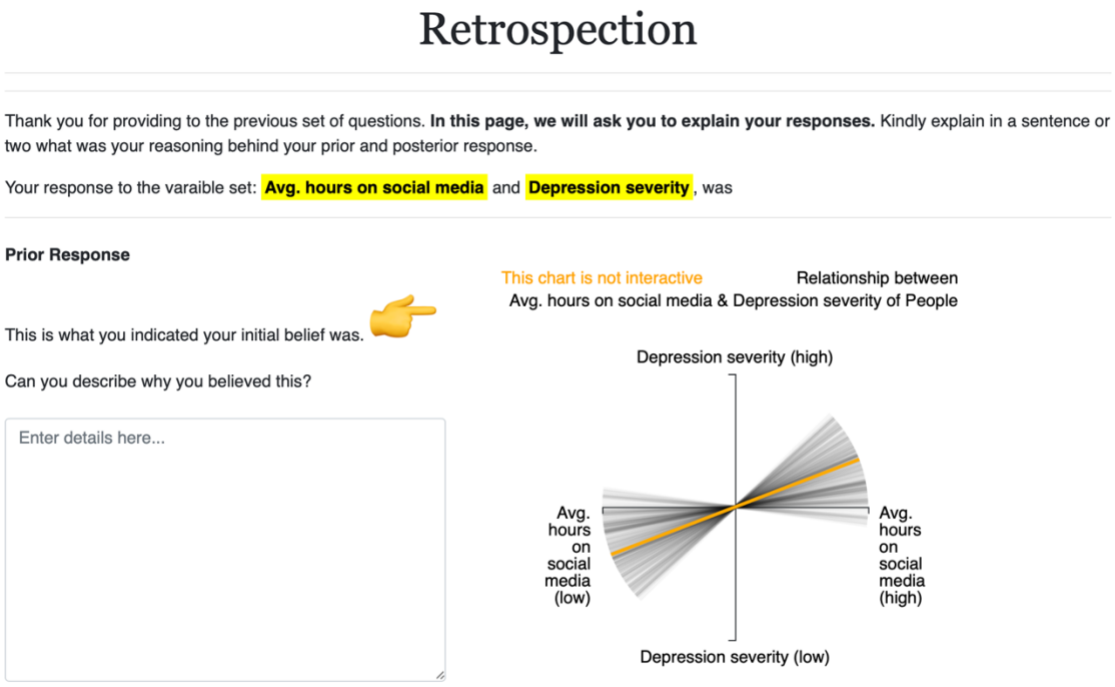


12. Posterior beliefs at T = 5 mins elicited.



Note: The above steps from 8 to 12 takes place for 3 datasets and then we do participant's retrospection.

13. Retrospective data collected by showing participants what they elicited for each step.



Note: The above is shown for prior, post t=0 and post t =5 for 3 datasets

14. For each dataset a likert scale is shown.