Datascience of Physiological Time Series: Homework-1

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Question 1: Before you take the IAT, write out a short description of the generic IAT experiment design.

1. Describe a single trial. What is the measurement taken on each trial?

2. How are the trials structured? Describe the overall organization of the experiment.

Answer:

1. Any given trial in the IAT will have two categories, one on the left and one of the right. The subject is presented with either word or picture and is asked to press either 'e' or 'i' to select which category the presented word or picture belongs to. The measurement taken is the time taken for the subject to select e or i, after presenting the data on the screen.

2. The first part is sorting relating to concepts, where the subject is asked to categorize the data presented (either visual or textual) to them. The second part consists of categorizing based on evaluation, where the subject is asked to evaluate the given textual data and place them in the given categories.

The third part is where it gets interesting, this part combines both concepts and evaluation and the subject is asked to categorize the given words. In my opinion this is where the subject's implicit attitude/assesment towards the concept is measured, and the IAT test results depend on the time it is taken to complete the assesment as well. This response time is an indicator of implicit association as sorting is easier if the subjects have an association for the concepts and evaluation presented in the test for the two catergories.

The next part swtiches the poistion of the categories from left to right, this helps in minimizing in subjects learning the keystroke patterns. The fifth part of the experiment has the categories and the evaluations switched, this will be exactly opposite to part 3.

Question 2:

1. **Were you surprised by your results? You do not <u>have</u> to share your results, but please reflect on the experience of being a subject in this experiment. Did you understand what you were supposed to do? How did it make you feel to complete the task and see your results?**
2. **Describe your environment where you performed the task.**

What was optimized about the environment?

What was non-optimal?

Do you think the environment impacted your results?

3. What was the independent variable in this task?

4. What was the dependent variable?

Answer:

1. My results weren't surprising as they were the same as what I expected. Based on the description of the test, I understood that the test was based on the response speed for the parts where concepts and evaluations are combined and based on the response speed the test will let us know if we have an implicit bias towards certain category. It did make a little nervous while taking the test, but the results were re-assuring.

2. I took the test when I was at home with my noise-cancelling headphones. This helped me focus all of my attention on the test. But my cat did interrupt me once during the test. The non-optimal thing would be to take the test in a home environment in the first place. Escpecially that the test is based on reaction speed any interruptions have some chance of effecting the test results.

In my case, I think environment did not impact much, as my cat interrupted me during the initial parts of the test where it's only categorization. But I do think environment will have an effect on the test results.

P.s: I wanted to mention that locking the door at home is not an option for me to keep my cat away. She cries and constantly scratches the door if we close any. So the only option is to hope she doesn't disturb.

3. Within the context of each test, I think the Independent variable is the data presented; the words/evaluations/ attributes and the images.

4. The dependent variable in this test is the response speed of the user, based on that the strength of implicit biases of the subject are calculated.

Question 3: Take at least one more IAT.

1. **Identify at least two pieces of equipment involved in your experience of the IAT that could be different for another subject. (I'm being literal here. What objects or devices were part of YOUR experiment that would not be a part of MINE.)**
2. **How might the experimental design mitigate (or exacerbate) the confounding effects of these differences in equipment?**

Answer:

1. The two pieces of equipment I can think of are the keyboard and the monitor, both necessary to complete the test and as this test is done at different locations these are subject to change from subject to subject. I don't think we can consider laptops/computers as a device that varies across subjects becuase the test is in chrome browser and it runs exactly the same in all laptops. The things that significantly differ are keyboards and monitor/screen settings across subjects.

2. One of the strategies, I believe, they adopted to counter the different monitors is to use greyscale images. Different users might have different color settings on their monitors that might cause unwanted problems/ variations of the images(which are the stimuli in these tests) and by using the greyscale images they have mitigated this problem. Although they mitigated this problem, this design can have undesired effects if the subjects screen's contrast setting is too low, this will make it harder to identify what is in the image. The other experimental setting used is reversing the categories(just switchin positions, not changing evaluations of the categories) so that the subjects do not get used to the pattern and this influences the results. This category

reversal part in the test makes sure that the subject "unlearns" the pattern of keystrokes they executed before, so it doesn't effect the experiment.