

UNIVERSITY OF ALBERTA

PSYCH 282 Behaviour Modification Fall 2025

Assignment 2:
Modifying your Behaviour

Instructor: **Dr. Jeffrey M. Pisklak**

General Instructions

This second assignment will follow directly from Assignment 1 where you gathered baseline data on a target behaviour of your choosing. Your primary task will be to conduct a behavioural treatment designed to modify (i.e., increase or decrease) this same target behaviour in some way. Similar to the first assignment, you will be measuring your behaviour for a minimum of 21 days while this treatment is taking place. You will then need to create a scientific poster detailing, among other things, the methods and results of this treatment with relevant analyses and figures.

1 The Treatment Plan

The treatment you create does NOT need to consist of just one strategy but can consist of many different strategies. Moreover, **the strategies you select should be based on principles discussed within the course.** i.e., they should be *behavioural* in nature. For instance, you should be appealing to concepts like reinforcement, schedules of reinforcement, the Premack principle, stimulus control, differential reinforcement, extinction, motivating operations, shaping, chaining, prompting, etc.

As we move through the course we will cover many such strategies; however, for a more immediate list of suggestions, chapters 15, 16, 20, and 22 of your textbook are typically among the most useful for developing treatment ideas.

2 The Scientific Poster

A scientific poster (also known as an “academic poster”) is a visual representation of a research project that is typically presented at conferences, symposiums, or other academic events. Its purpose is to communicate scientific information in a concise and visually appealing format.

The design of a scientific poster is important to effectively convey information and attract viewers. It should have a clear and logical layout, with readable fonts, **concise text**, and visually appealing graphics. The title should be attention-grabbing and accurately reflect the study. Visual elements such as tables, graphs, and images should be used to enhance understanding and highlight key findings.

You are free to use any software you want to produce your poster, but the final product must be submitted as a PDF file. Numerous examples and templates of scientific posters can be found online through a basic internet search. At the end of this document you will find an example of one of your instructor's research posters. This is meant to show you the general style of academic posters and not intended to be something you need to replicate. You are encouraged to be creative in your design. Just remember, your creativity should enhance, not hinder, the clarity of your message.

2.1 Poster Specifications

2.1.1 Size

There is no single size and orientation all academic posters adhere to. The size and orientation are dictated by where the poster is being presented. For this assignment, you can choose to use either a landscape orientation that is 120cm × 90cm or a portrait orientation that is 90cm × 120cm. It is highly recommended that, *prior* to designing your poster, you ensure it is the correct dimensions.

2.1.2 Title, Name, Affiliation, and Affiliation Logo

The top of your poster should provide a clear and engaging title for your behaviour modification project, along with your full name and university affiliation (i.e., University of Alberta). The official UofA logo should also be clearly represented somewhere on the poster. High-quality versions of the official logo can be downloaded on the course website beneath these instructions.

2.1.3 Sections

Your poster should contain, at a minimum, all of the following sections:

- *Target Behaviour*: This section should provide the following:
 1. The operational definition of your target behaviour.
 2. A description of your treatment goal in **quantitative** terms. i.e., do you want the behaviour to increase or decrease and, given your baseline data, what is *your* criteria for a successful treatment? There is no right or wrong answer here. It is up to you to decide what an acceptable criteria should be, but whatever criteria you choose should be **unambiguous**.
- *Methods*: This section should at a minimum describe the following:
 1. The type of design employed (i.e., an A-B design).
 2. The behavioural strategies that were employed to modify your behaviour. i.e., What did you do and what was your rationale for doing it? What contingencies did you use/modify; where there antecedent manipulations, etc.
- *Results*: This section should include, at a minimum, all of the following:
 1. A single high-resolution (≥ 300 dpi) or vector graphic plot that displays both your baseline and treatment phases with a separate regression line (i.e., line of best fit) on each ([further details are discussed below](#)). This plot must be made using R via Google Colaboratory. Please note that you are not limited to only providing this plot. If there is other information you want to provide in graphical form, you are free to do so and are allowed to use other software to achieve this.
 2. A figure title and caption associated with each plot you show ([further details are discussed below](#)).
 3. The **mean** of the last four days of both phases.
 - Note: The reason for requiring the mean of *the last four days*, as opposed to the mean of an entire phase for instance, is because we want to get a sense of your behaviour at a point in time when it is least likely to be contaminated by the effects of reactivity and learning.
 - If your y-axis is plotted cumulatively be sure to calculate your means using the raw data (not the cumulative data) so that the mean is easy to interpret.
 - If you want to calculate other statistics in addition to these two means (e.g., slope, R^2 , etc.) you are more than welcome to as long as they have relevance/purpose.
 - * For example: rare extreme values heavily affect the mean and may make it unrepresentative of the data as a whole. Consequently, a more robust statistic like the **median** might be more appropriate.
 - Make sure the viewer clearly understands what the displayed statistics refer to, such as data from the last four days.
- *Conclusions*: This should include, at a minimum, a statement indicating whether the criteria for a successful treatment was met.
 - If yes, how would you promote maintenance over the long term?
 - If no, how would you change your treatment or procedures?
 - You are also encouraged to include information about limitations or problems that arose trying to implement the treatment.

3 The Results Section Plot

Inside the “Results” section of your poster, you will need to include a plot depicting the behavioural data you gathered. As per Assignment 1’s plotting instructions, excessive use of colours, fonts, symbols, and other unnecessary effects will be penalized. The goal is for you to produce a professional looking plot that effectively communicates your results. Furthermore, the plot you create must be a high resolution or vector-based image made using R, via Google Colaboratory. It must also display the results of *both* the baseline and treatment phases with regression lines (i.e., “lines of best fit”) included on each. We will be walking through how to do this in class. An example of the type of plot you are expected to produce can be seen below in [Figure 1](#).

3.1 Plotting Cumulatively

While it is not a requirement for this assignment, you are also allowed to plot your data cumulatively (see [Figure 2](#) below for an example). Doing this can aid the interpretation of statistics like the regression line’s slope (abbreviated β_1). For instance, the treatment phase’s slope in Figure 2 is calculated to be $\beta_1 = 2.13$. With cumulative data, we can straightforwardly interpret this value as the *rate of responding*: On average, there was 2.13 hours of studying per day observed during the treatment phase. By contrast, the baseline phase only showed a rate of responding of 0.71 hours per day. Assuming the regression line describes the data relatively well¹, we have an unambiguous measure of improvement: the rate of studying in the treatment phase was three times as high as it was in the baseline.

Please note: while plotting your data cumulatively aids the interpretation of some statistics, like the slope, it can make other statistics, such as the mean, less intuitive. So you may want to report certain statistics using the non-cumulative (absolute) data. We will be walking through, in class, how you can easily make your data cumulative and calculate various statistics like the mean (M), median (Mdn), slope (β_1), and R^2 , during the second scheduled R tutorial. Note also, in the non-cumulative graph, [Figure 1](#), the y-axis is displaying the duration in minutes, whereas the cumulative graph, [Figure 2](#), is displayed in hours. This was done to make the cumulative graph easier to interpret (40 hours = 2400 minutes). Considerations like this need to be made for the viewer when creating a plot.

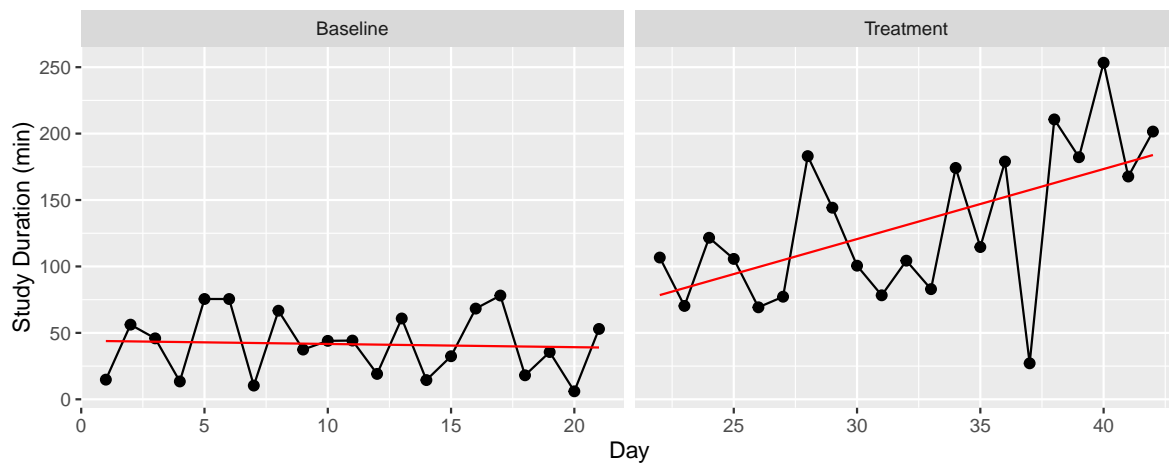
Since space is limited and the cumulative and non-cumulative figures display the same information, it is recommended to choose one type of plot (either cumulative or non-cumulative) for your poster. Including both is redundant and not typically useful for academic posters.

3.2 Figure Titles and Captions

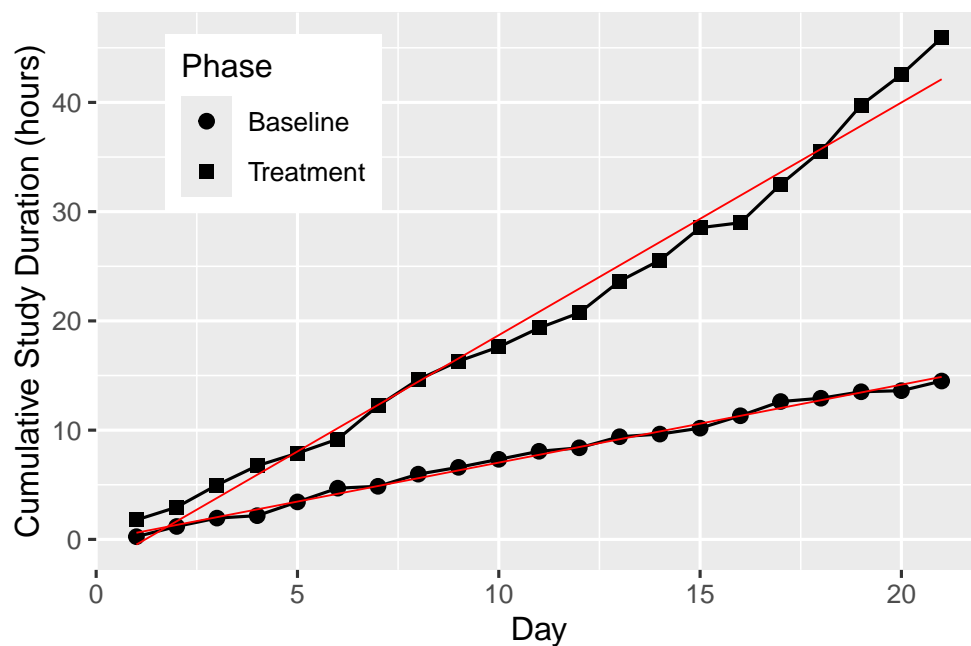
Each plot you provide will also need to include (as per APA guidelines) a figure [title and caption](#).² A figure caption is a brief one or two sentence description of what is being presented in the plot. An example is provided for Figure 1 and 2 below.

¹In this case the regression line describes the data very well and we could even use an R^2 statistic to quantify how well it does.

²You may be wondering why my poster (at the end of this document) does not follow the APA-style figure guidelines. The answer is simple: my colleagues and I are far too badass to follow the rules. We were also not being graded on this aspect.

Figure 1*Study Duration Across the Baseline and Treatment Phases*

Note. Daily duration of studying, in minutes, across 42 days of the baseline and treatment phase is shown in black. An ordinary least-squares regression line, applied to each phase separately, is shown in red. The vertical dashed line indicates a phase change.

Figure 2*Cumulative Study Duration Across the Baseline and Treatment Phases*

Note. Cumulative duration of studying, in hours, across 21 days of the baseline and treatment phase respectively is shown in black. The baseline phase is represented by circular points and the treatment by square points. An ordinary least-squares regression line, applied to each phase separately, is shown in red.

4 Submission Information

This assignment is worth 10% of your total grade and due by **23:59 Friday November 28th**. You will submit your assignment via Canvas using the Assignment submission link found on the course website.

In the file submission box, the following three files need to be uploaded:

1. Your poster as a .PDF file.
2. A single .CSV file containing your collected baseline and treatment data.
3. A copy of the R code (the .IPYNB file) used to generate your results section plot.

Other Notes

- Late submissions will **NOT** be accepted and will receive a score of 0. Note that “by 23:59 p.m.” means anything submitted **at** or **after** 23:59 p.m. is considered late.
- If Canvas isn’t working properly near the deadline, late submissions will still not be accepted. Submitting at the very last minute is done entirely at your own risk. To avoid problems, please plan to upload your work well before the deadline.
- If you accidentally submit the wrong files by mistake, you can resubmit the assignment on Canvas (provided the due date has not passed). Only your most recent submission will be graded, so double-check your work before submitting again. Files submitted after the due date will not be accepted.
- **If you are unable to complete your project, or have ethical concerns, contact the instructor immediately.**
- Please ensure that you are familiar with our class policy regarding “*exemption requests related to technical and non-technical issues*” (see the syllabus).
- Remember that **procrastination and last-minute completion carry inherent risks, for which responsibility rests with the student.**

The Signal for Good News (SiGN) Model of Suboptimal Choice

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Suboptimal Choice Phenomenon

A hungry pigeon is given a choice to peck one of two keys:

Key A:

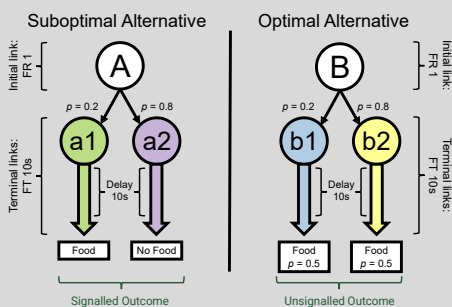
- Provides food 20% of the time.
- Delay stimuli signal food delivery.

Key B:

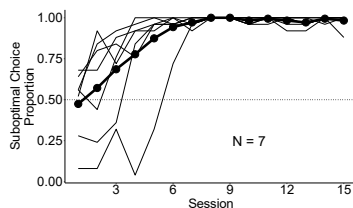
- Provides food 50% of the time.
- Delay stimuli do not signal food delivery.



(Adapted from Fantino & Skinner, Schedules of Reinforcement, 1997)



Hungry pigeons develop strong preference for the suboptimal alternative, despite receiving LESS FOOD!
E.g., Pisklak et al., 2019



Supplementary Material & References

SiGN Model Paper
(Dunn et al. 2023)



Data and R Code



Study	DOI
Dunn et al. (2023)	https://doi.org/10.1037/rev0000416
Fantino (1969)	https://doi.org/10.1901/jeab.1969.12-723
Kendall (1985)	https://doi.org/10.1016/0376-6357(85)90040-3
Pisklak et al. (2019)	https://doi.org/10.1002/jeab.553
Stagner & Zentall (2010)	https://doi.org/10.3758/PBR.17.3.412

Signals For Good News Model

- Choice is determined by primary (a.k.a. *unconditional*) and *conditional* reinforcement.
- Conditional reinforcement is defined in terms of *Delay Reduction Theory* (Fantino, 1969):
 - Stimuli signalling a reduction in waiting time to food are reinforcing.
 - Two sources in the suboptimal procedure:
 - Delay-reduction produced by entry into the terminal link.
 - Delay-reduction produced by the signalling stimulus (i.e., Good News)

$$\text{SIGN Equation: } \frac{R_a}{R_a + R_b} = \frac{r_a \delta_a}{r_a \delta_a + r_b \delta_b} \text{ when } \delta_a > 0, \delta_b > 0$$

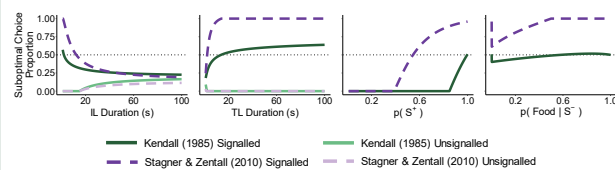
$$= 1 \text{ when } \delta_a > 0, \delta_b < 0$$

$$= 0 \text{ when } \delta_a < 0, \delta_b > 0$$

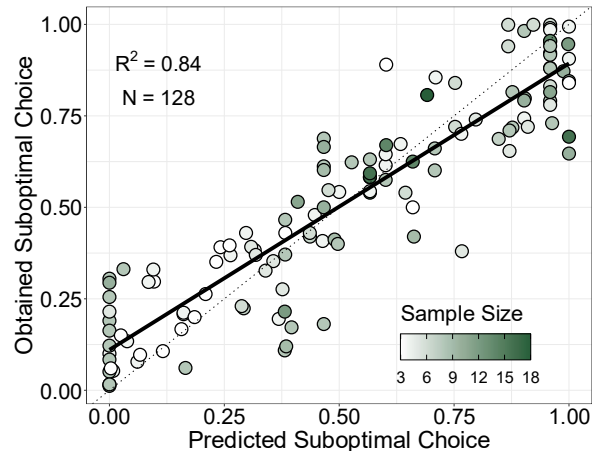
R_x = choice responses on a given alternative x
 r_x = rates of primary reinforcement
 δ_x = delay reduction (i.e., conditional reinforcement)

Model Evaluation

Predicted Functions



SiGN Predictions vs. Obtained Choice



- Data sourced from 128 conditions across 33 publications.
- No free parameters were used (i.e., all predictions are *a priori*).



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