**Mixed Design**

Airplanes are modern miracles that let people travel great distances. Many people are not afraid to fly and some even find it a relaxing time when they are disconnected from the demands of modern digital life for a few hours. On the other hand, some people are terrified of flying. Some fear the process of flying, i.e., being hurdled at 500 mph in an aluminum tin-can with wings. Others might fear the small spaces, social situations, not being in control, or some combination such as feeling trapped for hours with strangers on a giant abomination of physics. People with severe anxiety, as measured by the Beck Anxiety Index, can have panic attacks before even boarding the plane or will panic when they board.

You test between two modern therapies for reducing their flying anxieties. You randomly select 20 people with severe anxiety associated with flying and assign them to one of two therapy types, desensitization therapy (DT) vs cognitive behavioral therapy (CBT). In DT people are exposed to what they fear in incremental steps, for example 1) imagine you are flying, 2) let’s go the airport together, 3) let’s sit on empty plane together. In CBT, people talk about their anxieties and are given cognitive tasks to do to try to break them from the negative-feedback-thought-loops that can raise anxiety levels during stressful situations. You have primary data from the first three sessions after collecting a baseline measure of anxiety. Note that Beck Anxiety Inventory (BAI) ranges from 0-63, with 36-63 categorized as severe, 22-35 as moderate, and 0-21 as low anxiety.

Since panic attacks are physical responses to anxiety, you hypothesize that since DT places people in situations that will elicit a physical response in safe/controlled environment, where CBT does not, DT will result in the largest reduction in anxiety scores over the course of the 3 sessions than a person undergoing CBT. Below are the results of BAI measured after each session.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Subject | Therapy | Baseline | Session 1 | Session 2 | Session 3 |
| 1 | DT | 59 | 54 | 48 | 46 |
| 2 | DT | 50 | 46 | 39 | 39 |
| 3 | DT | 57 | 44 | 40 | 37 |
| 4 | DT | 45 | 30 | 23 | 18 |
| 5 | DT | 53 | 39 | 38 | 34 |
| 6 | DT | 41 | 41 | 35 | 32 |
| 7 | DT | 40 | 31 | 26 | 25 |
| 8 | DT | 59 | 44 | 41 | 43 |
| 9 | DT | 59 | 59 | 52 | 49 |
| 10 | DT | 48 | 38 | 39 | 34 |
| 11 | CBT | 50 | 46 | 47 | 45 |
| 12 | CBT | 46 | 43 | 41 | 41 |
| 13 | CBT | 45 | 42 | 39 | 37 |
| 14 | CBT | 60 | 55 | 53 | 53 |
| 15 | CBT | 57 | 55 | 55 | 53 |
| 16 | CBT | 42 | 39 | 39 | 40 |
| 17 | CBT | 58 | 55 | 57 | 59 |
| 18 | CBT | 41 | 40 | 41 | 40 |
| 19 | CBT | 38 | 40 | 42 | 42 |
| 20 | CBT | 39 | 35 | 34 | 33 |

You check the assumption after the fact and find out:

Sphericity, *W* = .303, χ2(5) = 19.984, *p* = .0013.

Box’s M test, *M* = 21.66, χ2(10) = 19.984, *p* =.085.

1. Based on this information decide how you are going to approach the analysis. ***Use headers, bullet points, and makes lists in your answer.***
   1. Write up a short analysis plan.
      1. How are you going approach the ANOVA?
         1. Are you going to apply corrections? *Briefly justify why or why not*.

[**Note:** *Don’t skip the interaction, but you can note here if you are worried about examining it].*

* + 1. What follow-ups are you going to use.
       1. **You should do the follow-up tests in a way that fits with the hypotheses.** 
          1. Make sure to explain which errors terms you are going to use and *why*.
          2. Are you going to correct them in any way? *Briefly justify why or why not.*

1. Run the ANOVA and do the follow up your proposed.