Problem Set #7: Paired Samples t-tests

1. Two students are conducting a class project to determine whether music is a better cue for autobiographical memories than pictures or words. They kind of get their wires crossed so they don’t run the experiment the exact same way. Carrie gives each of her subjects three cues – a song, a picture, and a word (counterbalancing the order). Julia gives one group of students a musical cue, and a separate group of subjects a pictorial cue and a third group a word cue. Which design operationalized cued type (music vs. picture vs. word) as a within subject variable? Explain.
2. Do people experience higher emotional well-being when exposed to sunshine? To test this, a researcher recruits a sample of 8 people. She asks them to complete a questionnaire measuring their emotional well-being when they are exposed to high levels of sunshine and then again when they’re exposed to low levels of sunshine. Conduct a t-test to determine if sunshine affects subjective feelings of well-being (Steps 1 through 8). Be sure to interpret the results and report the test statistic correctly. Set alpha at .05.

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Person 1 | Person 2 | Person 3 | Person 4 | Person 5 | Person 6 | Person 7 | Person 8 |
| Low | 14 | 13 | 17 | 15 | 18 | 17 | 14 | 16 |
| High | 18 | 12 | 20 | 19 | 22 | 19 | 19 | 16 |

Step 1: Decide whether you are conducting a one- or a two-tailed test.

Step 2: Specify the ***NULL*** hypothesis (HO)

Step 3: Specify the ***ALTERNATIVE*** hypothesis (HA)

Step 4: Designate the rejection region by selecting α.

Step 5: Determine the critical value of your test statistic

Step 6: Use sample statistics to calculate test statistic.

Step 7: Compare *observed* value with *critical* value

Step 8: Interpret your decision regarding the null including an appropriate measure of effect size.