

PSYC 7014, Week 10 stats lab: ANOVA contrasts

Part A, Experimental Question: Does praise influence performance?

Note: this uses the same data from last week, so you can simply build from that analysis.

There is some limited empirical evidence suggesting that a person's performance in a given task is influenced by the type of feedback that they receive. For example, a person that consistently receives positive feedback may in turn perform better than one that consistently receives critical feedback. To test this empirically, a group of participants completed a simple throwing task (attempted to throw get a ball into a small hole) under three between subjects conditions of feedback (judgment):

- (1) Praised as being above average when got the ball close or in the hole;
- (2) Criticized as being below average when missed or got it close to the hole;
- (3) no feedback/judgment was provided.

Experimenters tallied the **number of misses out of 12 total throws** for each participant, i.e. ***higher values indicate poorer performance***.

Imagine that you **do not** have any empirical support or theory to reasonably make an a priori prediction about the relationship between these three groups. What kind of test should you run?

Be sure to report your results in an APA-style narrative, including any necessary Figures (or tables).

Part B, Experimental Question: Does praise influence performance?

Using the data from Part A re-run the analysis imagining this scenario:

There is some limited empirical evidence suggesting that a person's performance in a given task is influenced by the type of feedback that they receive. For example, a person that consistently receives positive feedback may in turn perform better than one that consistently receives critical feedback. To test this empirically, a group of participants completed a simple throwing task (attempted to throw get a ball into a small hole) under three between subjects conditions of feedback (judgment):

- (1) Praised as being above average when got the ball close or in the hole;
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Using a similar performance task, Davis et al. (2014)* found that participants that were positively reinforced (positive feedback) showed improved performance above baseline (neutral feedback). In contrast negative feedback appeared to show no diminished effect. Based upon their results you have reason to make two *a priori* predictions about the outcome of your data:

1. That the Praised group should perform better than both the No Feedback and Criticized groups, and...
2. The No Feedback and Criticized groups should perform roughly equivalent with one another (i.e., no significant differences).

Set up a series of **Orthogonal Contrasts** that allow you to test both of these hypotheses. In doing so use the correction method of your choice that you feel best allows for you to test your contrasts. **Be sure to report your results in an APA-style narrative, including any necessary Figures (or tables).**

Part C, Experimental Question: Age related effects on heart rate variability?

The diagnosis of autonomic neuropathy frequently depends on results of tests which elicit reflex changes in heart rate. At present, the diagnostic criteria (expected heart rate variability in each test) is not age specific. With this in mind, a group investigators hypothesize that an age-specific diagnostic criteria would improve the validity of the tests. A first, and important step in this process involves actually confirming whether or not heart rate variability changes as a function of age. With this in mind we have conducted a study assessing the effect of age upon heart rate variability using one of the tests used for diagnosis. In particular, we measured the heart rate variability in response to a single deep breath in individuals of 5 age groups.

Given the lack of any empirical work connecting age and heart rate variability, we have no a priori predictions with respect to individual age groups, nor any prediction with respect to trends in the data.

Run the necessary ANOVA and post-hoc tests to that allow you to test for differences in means between age groups. In doing so use the correction method of your choice that you feel best allows for you to test your multiple comparisons. **Be sure to report your results in an APA-style narrative, including any necessary Figures (or tables).**

* it may be useful to think of ways to efficiently convey all of your pairwise comparisons.