Lecture 17: Recall Experiment - Setup

**Factorial Crossing**

Example: An experiment conducted by a child psychologist where 4th grade students were given a task of memorizing a passage and then asked to recall the passage.

**Three Decisions**

Response: a recall score based on the amount of the passage recalled and the correctness of what was recalled. Higher scores indicate better recall.

Material: 4th graders.

**Three Decisions**

Conditions:

Factor A: Reinforcement.
- Two levels; None and verbal

Factor B: Isolation Time.
- Three levels; 20, 40 or 60 minutes.

**Treatments**

Treatments are made by crossing the levels of the two factors.

A treatment consists of a level of one factor together with a level of the second factor.

**Treatment Combinations**

<table>
<thead>
<tr>
<th>Reinforcement</th>
<th>Isolation Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>20 minutes</td>
</tr>
<tr>
<td>None</td>
<td>40 minutes</td>
</tr>
<tr>
<td>None</td>
<td>60 minutes</td>
</tr>
<tr>
<td>Verbal</td>
<td>20 minutes</td>
</tr>
<tr>
<td>Verbal</td>
<td>40 minutes</td>
</tr>
<tr>
<td>Verbal</td>
<td>60 minutes</td>
</tr>
</tbody>
</table>

**How Many 4th Graders?**

Resources are limited so each treatment will be assigned to only four 4th graders.
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Sample Size Tables
- Groups = 6
- 4 per group
- Alpha = 0.05
- Beta = 0.20
- Can detect a 3.0 standard deviation difference in treatment population means.

Reinforcement
- Groups = 2
- 12 per group
- Alpha = 0.05
- Beta = 0.10
- Can detect a 1.4 standard deviation difference in reinforcement population means.

Isolation Time
- Groups = 3
- 8 per group
- Alpha = 0.05
- Beta = 0.10
- Can detect a 2.0 standard deviation difference in isolation time population means.

Distinction
- There is a difference between treatment population means and factor level population means.
- Recognize this difference!

Relationships
- As we increase the number of individuals in the groups, we can decrease the chance of making errors with the same size difference in means.

Relationships
- As we increase the number of individuals in the groups, we are able to detect smaller differences in means with the same chances of error.