## Threats to External Validity

### Population

1. **Generalization Across Subjects**
   - The extent to which we can generalize from the experimental sample to the accessible population.

2. **Interaction of Personological Variables and Treatment Effects**
   - The extent to which the intervention differentially affects the experimental participants based on their characteristics.

### Ecological

3. **Verification of the Independent Variable**
   - The extent to which one can reproduce the exact implementation of the independent variable.

4. **Multiple Treatment Interference**
   - The extent to which one can generalize the effects of a single independent variable when participants are exposed to several independent variables.

5. **Novelty and Disruption Effects**
   - The extent to which the novelty or disruptive aspects of an independent variable limit generalization to situations where these novelty or disruptive aspects are not present or fade away.

6. **Hawthorne Effect**
   - The extent to which the extra attention provided to the participants during the study limits generalization to situations where the extra attention is not present.

7. **Experimenter Effects**
   - The extent to which the study’s results are limited to the individual(s) implementing the independent variable.

8. **Pretest Sensitization**
   - The extent to which the study’s results are limited to situations where only a pretest is used.

9. **Posttest Sensitization**
   - The extent to which the study’s results are limited to situations where only a posttest is used.

10. **Interaction of Time of Measurement and Treatment Effects**
    - The extent to which the effects of the independent variable on the dependent variable will maintain through time.

11. **Measurement of the Dependent Variable**
    - The extent to which the generalizability of the study’s result are limited to the particular dependent measure used.

12. **Interaction of History and Treatment Effects**
    - The extent to which the study’s results can be generalized to a future time period.

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