

ERMA 7200 Internal Validity Worksheet

Practice Exercise for Internal Validity

MATURATION: physiological processes occurring within the participants that could account for any changes in their behavior

- Subjects may change between test sessions of the experiment such that any changes in scores between testing sessions may simply be due to the passage of time rather than any treatment effects.
- Examples
 - Aging Processes: simply growing older; changes in motor coordination; cognitive development (cf. Piaget)
 - Physiological States: hunger, fatigue; attention span; motivation

SELECTION OF SUBJECTS: Any bias in selecting and assigning participants to groups that results in systematic differences between the participants in each group.

- The differences exist before one group is exposed to the experimental treatment.
- This threat to validity is great in quasi-experiments where the random assignment to treatment conditions is not possible.

MORTALITY/ATTRITION: Differential dropping out of some subjects from the comparison groups before the experiment is finished, resulting in differences between the groups that may be unrelated to the treatment effects.

- The problem is that the subjects who drop out of the study for whatever reasons may be different than those who complete it. This may inflate, obscure, or confuse the treatment effects of interest.
- The researcher excluding the data of particular subjects based on some criterion can also cause this bias.

TESTING: When participants are repeatedly tested, changes in test scores may be more due to practice or knowledge about the test procedure gained from earlier experiences rather than any treatment effects

- Similar to maturation except that the change is caused by the testing procedure itself.

HISTORY: Extraneous events occurring during the course of the experiment that may affect the participants' responses on the dependent measure.

- Could be major events occurring in society (e.g., social upheaval) or minor events occurring within the experimental situation (e.g., equipment malfunction)
- These events may account for the participants' responses in the experiment more so than the treatment of interest.

Determine which of the five threats to internal validity may apply to each example below (history, maturation, selection, testing, mortality).

1. A researcher decides to try a new mathematics curriculum in a nearby elementary school and to compare student achievement in math with that of students in another elementary school using the regular curriculum. The researcher is not aware, however, that the students in the "new curriculum" school have computers to use in their classrooms.
2. A researcher wishes to compare two different kinds of textbooks in two high school chemistry classes over a semester. She finds that 20% of one group and 10% of the other group are absent during the administration of unit tests.
3. Eight-grade students who volunteer to tutor third-graders in reading show greater improvement in their own reading scores than a comparison group that does not participate in tutoring.
4. A researcher designs a study to investigate the effects of simulation games on ethnocentrism. She plans to select two high schools to participate in an experiment. Students in both schools will be given a pretest designed to measure their attitudes toward minority groups. School A will then be given the simulation games during their social studies classes over a three day period while school B sees travel films. Both schools will then be given the same test to see if their attitude toward minority groups has changed. the researcher conducts the study as planned, but a special, unplanned documentary on racial prejudice is shown in school A between pretest and posttest.
5. In an experiment of survey methods, several people failed to return the control group survey.
6. A researcher uses the same set of problems to measure change over time in student ability to solve mathematics word problems. The first administration is given at the beginning of a unit of instruction; the second administration is given at the end of the unit of instruction, three weeks later. Improvement scores result.
7. The achievement scores of five elementary schools whose teachers use a cooperative learning approach are compared with those of five schools whose teachers do not use this approach. During the course of the study, the faculty of one of the schools where cooperative learning is not used is engaged in a disruptive conflict with the school principal.
8. A researcher tests a group of students enrolled in a special class for "students with artistic potential" every year for six years, beginning when they are aged five. She finds that their drawing ability improves markedly over the years.
9. The researcher uses a self-made test to compare the experimental and control group.
10. In an experimental test of alternative forms of the SAT, a group took the traditional SAT test form which lasted approximately four hours, and then took the shortened version which lasted about one hour immediately afterwards.