

1. Research Designs in medical or other scientific literature

The 1979 NEJM article by Robert and Suzanne Fletcher described the frequency of various research designs in the general medical journals from 1946 to 1976. You are asked to update their series by examining these same journals (plus the British Medical Journal) in 2006. If you prefer, you can examine designs used in other research areas, such as Education, Forestry, Agriculture, Sports Medicine, Transportation, Injury Prevention, Veterinary Science, Ecology, Psychology, or any other area that interests you. The website <http://www.sciencegateway.org/rank/index.html> lists the high impact journals in some of these areas, while the website <http://www.sciencedaily.com> gives lay summaries of science news stories. Some research areas may be more amenable to the experimental approach than others. Try to select topics where there is a mix of experimental and non-experimental studies.

You should be able to characterize each article you select simply by reading the abstract or summary – you do not need to read (and indeed you may not have access to) the full text.

Some of the terminology used by the Fletchers is a bit outdated. In particular, avoid the term ‘trohoc’ – it never really caught on, and in any event we will try to see case-control and cohort studies as part of the same class, except that in case-control studies one has only ‘partial’ denominators. In marketing and economics, the sampling in such studies is called ‘choice-based’ (what is different between those who buy Toyotas versus Ford, or take public transportation versus private car?), or ‘outcome-based’.

What is most important is the classification into experimental versus non-experimental; among the latter, do try to determine if there is indeed a time element involved, or if the measurements or information collected do not allow you to say that the ‘effect’ followed the ‘cause.’ In some instances, where a characteristic does not change over time (e.g. genetic makeup, or other ‘traits’), it may not matter that the response and ‘stimulus’ were measured at the same time.

Not all studies will be of the comparative type – some may merely document the existence of a phenomenon.

The URLs, and the category of article, for the 4 most widely read general medical journals, are

<http://www.nejm.org/> – Original Articles

<http://jama.ama-assn.org/> – Original Contributions

<http://www.bmj.com/> – Research

<http://www.thelancet.com> – Articles

Suggested Data Items:

No. of Authors

No. of Subjects

Data existed/recorded before decision to perform the study?

Design: Experimental / not ? ;

– If yes, Random assignment ?

– If no, time-element ?

Primary Determinant i.e contrast Variable: Binary / Categorical / Ordinal / Interval ?

Outcome (Response) Variable: Binary / Categorical / Ordinal / Interval ?

Others .. to be decided in class

2. For lab. on Monday Oct 15th: Summaries of textbook chapters on research designs

Who does which.. to be decided in class

On Experimental Design¹

I constructed four miniature houses of worship

- a Mohammedan mosque,
- a Hindu temple,
- a Jewish synagogue,
- a Christian cathedral

and placed them in a row.

I then marked 15 ants (fourmis) with red paint and turned them loose. They made several trips to and fro, glancing in at the places of worship, but not entering. I then turned loose 15 more painted blue; they acted just as the red ones had done. I now gilded 15 and turned them loose. No change in the result; the 45 travelled back and forth in a hurry persistently and continuously visiting each fane, but never entering.

This satisfied me that these ants were without religious prejudices—just what I wished; for under no other conditions would my next and greater experiment be valuable.

I now placed a small square of white paper within the door of each fane;

- upon the mosque paper I put a pinch of putty,
- upon the temple paper a dab of tar,
- upon the synagogue paper a trifle of turpentine,
- upon the cathedral paper a small cube of sugar.

First I liberated the red ants. They examined and rejected the putty, the tar and the turpentine, and then took to the sugar with zeal and apparent sincere conviction.

I next liberated the blue ants, and they did exactly as the red ones had done.

The gilded ants followed. The preceding results were precisely repeated.

This seemed to prove that ants destitute of religious prejudice will always prefer Christianity to any other creed.

¹from Mark Twain, "On Experimental Design" in Scott W.K. and L.L. Cummings, Readings in Organizational Behavior and Human Performance, Irwin: Homewood, Ill., p.2, (1973).

However, to make sure, I removed the ants and put putty in the cathedral and sugar in the mosque. I now liberated the ants in a body, and they rushed tumultuously to the cathedral.

I was very much touched and gratified, and went back in the room to write down the event.

But when I came back the ants had all apostatized and had gone over to the Mohammedan communion.

I saw that I had been too hasty in my conclusions, and naturally felt rebuked and humbled. With diminished confidence I went on with the test to the finish. I placed the sugar first in one house of worship then in another, till I had tried them all.

With this result: whatever Church I put the sugar in, that was the one the ants straightway joined.

This was true beyond a shadow of doubt, that in religious matters the ant is the opposite of man, for man cares for but one thing; to find the only true Church; whereas the ants hunt for the one with the sugar in it.