Week 11: Popular Articles

a) Meta-Analysis at 25; Gene V Glass, January 2000 (available online)

Gene Glass introduced the term "meta-analysis" (and the idea) in his AERA Presidential Speech in San Francisco in 1976; so this piece is 25 years after that introduction

[I attended the Glass speech; at the time I was a faculty member at Wisconsin (where Gene got his doctoral degree); Gene was a faculty member here at Illinois from 1965 to 67; he was promoted to Associate Professor with tenure at Colorado and left for Colorado in 1967]

This is a very "good read"; it talks about his interests in meta-analysis starting from his

neurosis; he had started psychotherapy when he was at Illinois

p. 280: he complains about statistical significance testing and its uselessness

p. 285: "my cynicism about research and much of psychology dates from approximately this period"

An enormous industry has developed since 1976: google "Cochrane Collaboration" (for medical meta-analyses and information) and "Campbell Collaboration" (for social and behavioral science meta-analyses and information)

Glass pushes whole data archives and not just summary statistics (which is one reason why meta-analysis was started in the first place)

Week 12: Popular Articles

a) The Treatment, Malcolm Gladwell (*New Yorker*), May 17, 2010

This article discusses drug development for cancer and generally why it is so difficult to develop drugs for the disease.

The Kaplan-Meir story that I have in the required reading is from this article.

From Wikipedia:

The Kaplan-Meier estimator is an estimator for estimating the survival function from lifetime data. In medical research, it is often used to measure the fraction of patients living for a certain amount of time after treatment. In economics, it can be used to measure the

length of time people remain unemployed after a job loss. In engineering, it can be used to measure the time until failure of machine parts. In ecology, it can be used to estimate how long fleshy fruits remain on plants before they are removed by frugivores. The estimator is named after Edward L. Kaplan and Paul Meier.

A plot of the Kaplan-Meier estimate of the survival function is a series of horizontal steps of declining magnitude which, when a large enough sample is taken, approaches the true survival function for that population. The value of the survival function between successive distinct sampled observations ("clicks") is assumed to be constant.

Rational drug design: start with the disease and work backwards to find a customized solution for the problem

Mass screening: start with a drug and hunt for the diseases it might attack

The combinatorial problem of drug development: which drugs in combination? what doses? what order? or all at once?

Generally, the increased use of multiple drugs in combination where the various drugs act on different things or aspects of the disease

Phases in clinical trials (see my book as well) quote on p. 301:

Experimental drugs must pass through three phases of testing before they can be considered for government approval. Phase 1 is a small trial to determine at what dose the drug can be taken safely. Phase 2 is a larger trial to figure out if it has therapeutic potential, and

Phase 3 is a definitive trial to see if it actually works, usually in comparison with standard treatments.

Phase 4 trials are after the drug is on the market and bad events associated with the drug are monitored by, for example, the FDA

b) The Ghost's Vocabulary: How the Computer Listens for Shakespeare's "Voiceprint", Edward Dolnick (*The Atlantic*), October, 1991

This article deals with authorship ideas: a quote on page 320 –

Rather than read, these literary sleuths prefer to count. Their strategy is straightforward. Most are in search of a statistical fingerprint, a reliable and objective mark of identity unique to a given author. Every writer will sooner or later reveal himself, they contend, by quirks

of style that may be too subtle for the eye to note but are well within the computer's power to identify.

The classic example is the statistical work on who wrote the various Federalist Papers (by Mosteller and Tukey):

The Federalist Papers are a series of 85 articles and essays written by Alexander Hamilton, James Madison, and John Jay promoting the ratification of the United States Constitution. Seventy-seven were published serially in The Independent Journal and The New York Packet between October of 1787 and August 1788. A compilation of these and eight others, called The Federalist; or, The New Constitution, was published in two volumes in 1788 by J. and A. McLean.

Ron Thisted and Brad Efron and the question of new words in Shakespeare; Shakespeare

played the ghost and recycled vocabulary in related plays (in time)

Basically, we have problems of inference, e.g., the story about Queen Elizabeth writing a Sonnet?

If a glass slipper doesn't fit, then the person is not Cinderella; if it fits, it does not prove you are

However, by abductive reasoning, if many pieces of Cinderella's clothing fit, this raises the probability of it being Cinderella

The story about Charles Babbage on page 319 is in the book (SGEP) as well:

In 1842 literature and science met with a thud. Alfred Tennyson had just published his poem

"Vision of Sin."   Among the appreciative letters he received was one from Charles Babbage, the mathematician and inventor who is known today as the father of the computer. Babbage wrote to suggest a correction to Tennyson's "otherwise beautiful" poem (in particular to the lines "Every moment dies a man, Every moment one is born.")   "It must be manifest," Babbage pointed out, "that, were this true, the population of the world would be at a standstill."   Since the population was in fact growing slightly, Babbage continued, "I would suggest that in the next edition of your poem you have it read: 'Every moment dies a man, Every moment 1-1/16 is born.' "   Even this was not strictly correct, Babbage conceded, "but I believe 1-1/16 will be sufficiently accurate for poetry."