

PKAL-QUIRK 2010 1

Statistical Literacy at Augsburg College

MILO SCHIELD,
Augsburg College

Webmaster [www. StatLit.org](http://www.StatLit.org)
VP National Numeracy Network
US Rep: International Statistical Literacy Project
October 9, 2010
Sponsored by PKAL and Quirk at Carleton College
www.StatLit.org/2010SchieldAugsburg6up.pdf

**STATISTICAL LITERACY : STATISTICS
As
ART APPRECIATION : ART**



www.StatLit.org

PKAL-QUIRK 2010 3

Wired Magazine: Oct 2010

COURSE LISTINGS

1.	STATISTICAL LITERACY	Making sense of today's data-driven world.
-----------	-----------------------------	--------------------------------------------

FALL SEMESTER 2011


WIRED

UNIVERSITY!

PKAL-QUIRK 2010 4

Essential Skills You Didn't Learn in College

By Jim Rogers
Jim Rogers is a blogger for The Journal Record. He is also an entrepreneurship professional.
Posted: 07:04 AM Tuesday, September 28, 2010



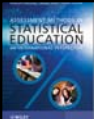

Statistical Literacy: You may be in the Disraeli camp regarding statistics, but you certainly should be able to recognize how a statistic is gathered and presented.

This skill carries so much importance these days whether it's with the use of polls and focus groups, increasing efficiency in operations or recognizing trends versus noise ...

Unfortunately, most math instructors avoid statistics and most statistics instructors make the material seem absolutely painful.

All the more reason to bone up and outperform the pack.

PKAL-QUIRK 2010

Statistical Literacy: Association-Causation

Statistical literacy is the ability to **read and interpret** summary statistics in the everyday media: in graphs, tables, statements and essays. Statistical literacy is needed by 'data consumers.'

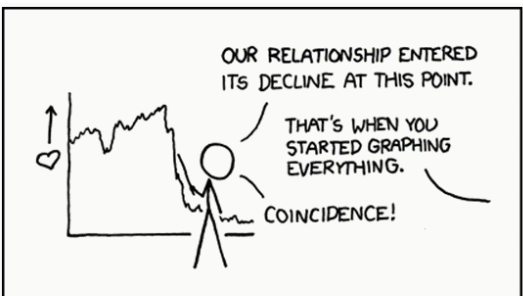
#1: Can distinguish association from causation

1. Association is not causation
2. Association is not necessarily causation.
3. Association is often a good sign of causation.

Schield (2010) in *Assessment Methods in Statistical Education*

PKAL-QUIRK 2010 6

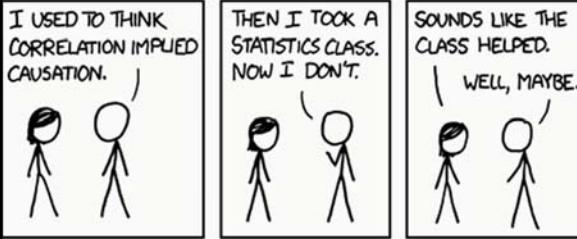
Correlation vs. Causation



PERMANENT LINK TO THIS COMIC: [HTTP://XKCD.COM/523/](http://xkcd.com/523/)
 AGE URL (FOR HOTLINKING/EMBEDDING): [HTTP://IMGS.XKCD.COM/COMICS/DECLINE.PNG](http://imgs.xkcd.com/comics/decline.png)


PKAL-QUIRK 2010 7

Correlation vs. Causation



PKAL-QUIRK 2010 8

Speculative Statistics: #1: attributable to



PKAL-QUIRK 2010 9

Association to Causation: #2: linked to ...



PKAL-QUIRK 2010 10

Association to Causation: #3: tied to ...



PKAL-QUIRK 2010 11

Association to Causation: #4: due to ...



PKAL-QUIRK 2010 12

Association to Causation: #5: because of ...



PKAL-QUIRK 2010 13

Association to Causation: #6: from ...

Investing & Analysis RSS • ARCHIVE

Print Page | Forward Page | E-mail Us

Study: 45,000 U.S. Deaths From Lack of Insurance

Friday, September 18, 2009 2:30 PM Article Font Size - +

WASHINGTON -- Nearly 45,000 people die in the United States each year -- one every 12 minutes -- in large part because they lack health insurance and can not get good care, Harvard Medical School researchers found in an analysis released on Thursday.

PKAL-QUIRK 2010 14

Association to Causation: #7: kills (action verb)

siLobreaker
NEWS SEARCH ANALYSIS INSIGHT

Home Global Issues Technology Science Business

Published 09/18/2009 by National Underwriter

Study: Uninsurance Kills

Lack of Health Insurance Kills 45,000 a Year Harvard Study Finds 40 Percent Greater Risk of Death for Uninsured

PKAL-QUIRK 2010 15

Association to Causation: #8: causes / blame for ...

09/18/2009 07:18 PM ID: 80765 [Permalink](#)

Lack of Health Insurance Causes More U.S. Deaths Than Drunk Driving, Homicide

Nearly 45,000 Americans die per year in large part because they lack health insurance and can't get quality care, according to a Harvard Medical School study. That translates to one death every 12 minutes.

14 WFIE.COM THE TRI-STATE'S NEWS AND WEATHER LEADER

Lack of insurance to blame for almost 45,000 deaths: Study

By Karen Pallarito, HealthDay Reporter

PKAL-QUIRK 2010

Statistical Literacy: Critical Thinking

Take "CARE"

Know that all statistics are influenced by:

- Context: ratios, study design and confounding
- Assembly: how groups/measures are formed
- Randomness: in small samples, in big groups
- Error/bias: subject, measurement or survey bias

From Ch 11 in *Assessment Methods in Statistical Education*

PKAL-QUIRK 2010 17

USA TODAY Home News Travel Money Sports Life Tech

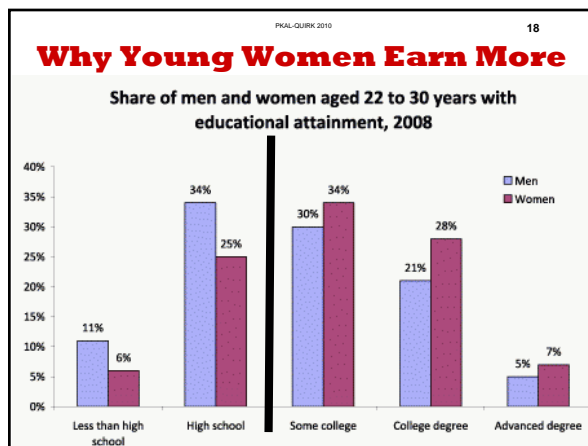
Young, single, childless women out-earn male counterparts

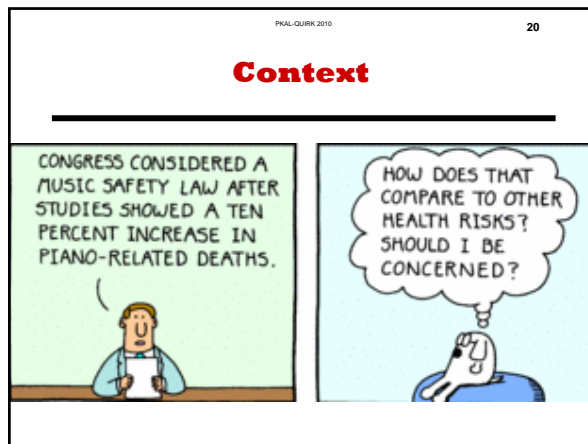
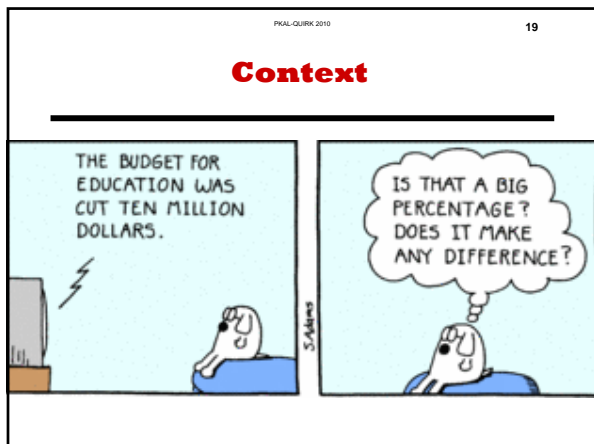
Updated 9/22/2010 9:34 AM | Comments 434 | Recommend 15 | E-mail | Save | Print | Reprints & Permissions | RSS

By Paul Wiseman, USA TODAY [Share](#)

But, young women earn **LESS** at the same job than men.
Same data. How is this possible?

CONFOUNDING: Young women have more education than men and are going into higher paying jobs than men. They outnumber young men in those jobs but they earn less than the young men in those jobs.





PKAL-QUIRK 2010

SUMMARY
Peter Holmes (2003)

W. M. Keck Statistical Literacy course

- “is *different*”: “different emphasis”, “different background”, “a different package”
- “goes beyond Numeracy”
- is more in line with the statistical literacy “needed by most people in everyday life to read the news, by those in business commerce or management, and by policy makers.”

PKAL-QUIRK 2010 23

News-Based Statistical Literacy Online Training

March 2011: Check on online statistical-literacy training course: a must for anyone planning to teach a news-based quantitative or statistical literacy course. This training course is scheduled for May-June 2011. It will use a newly revised Statistical Literacy textbook, updated Moodle right-wrong math exercises and an anonymous online forum to promote student critical thinking about numbers in the news.

** Check at www.StatLit.org/Schild.htm

PKAL-QUIRK 2010 24

Difficult Challenge; Worthy Goal

Teaching students to think critically about the use of numbers as evidence in arguments

- A difficult challenge; a worthy goal
- The future of higher education
- The future of liberal education
- The future of civil discourse

PROJECT DISCOURSE CIVIL