



USA

Statistical Literacy News from the US

Milo Schield*

Statistical Literacy conference: Statistical Literacy will be a focus of the 2022 annual conference of the National Numeracy Network (NNN): Oct 21-23. The NNN mission is “to support numeracy: reasoning from data in everyday life.” This conference will feature Math 1300 (Statistical Literacy) offered by the University of New Mexico (UNM). This new course is designed for consumers of statistics: students in non-quantitative majors. This statistical literacy course is different: less than a 30% overlap with traditional statistics courses. More focus on observational studies than experiments, more focus on confounding than on randomness, more focus on ordinary English than Algebra, more focus on how statistical significance can be influenced by what is taken into account than on hypothesis tests or p-values. This conference, held in Albuquerque at UNM, will be hybrid: face-to-face and online. The call for papers has been issued. [2] International submissions and international participation are welcome.

Three new statistical literacy publications by US ISLP Representative: Milo Schield:

“Statistical Literacy: Seven Simple Questions for Policy-makers” was published by the Statistical Journal of the International Association for Official Statistics (SJIAOS). [3] The seven questions are (1) How big, (2) Compared to what? (3) Why not a rate? (4) Per what? The diabolical denominator (5) How were things defined, counted or measured? (6) What was taken into account (controlled for)? (7) What could and should have been taken into account? Examines an association based on data from the UK National Health Service showing that “Vaccinated cases were MORE likely to die of Covid than were unvaccinated cases.” But after taking into account age (use a simple graphical weighted average), this crude association is reversed: “Vaccinated cases were LESS likely to die of Covid than were unvaccinated cases.”

“Introducing Statistical Literacy: A Lesson Plan” was presented as an activity at the US Electronic Conference on Teaching Statistics. [4] The goals of this activity: Students will be able to: (1). distinguish statistics from numbers by giving examples. (2) state why statistics are different from numbers. (3) describe (by giving examples) how statistics can be influenced by (3a) Confounding (how a related factor can influence a connection or comparison), (3b) Assembly or assumptions (how things are defined, count-

ed, measured, summarized, presented). (3c) Randomness (the Sports Illustrated Jinx), (3d) Error/bias (examples of subject/response bias, measurement/researcher bias and sampling bias). (4). explain why “Take care” is good advice in dealing with statistics. (5) Connect the four letters in CARE with the four kinds of influence on a statistic.

“Statistical Literacy: Critical Thinking about Confounding” was presented at the 42nd Conference on Critical Thinking. [5] Confounding is not listed in the index of most introductory statistics textbooks. Few — if any — textbooks show students how to work problems that take into account (control for) the influence of a confounder. This paper illustrates how to take into account (control for) the influence of a confounder without using computer software. The influence of a measured binary confounder is taken into account using a simple weighted-average graph. Applies this technique to summary data from the UK National Health Service showing that “Vaccinated cases were MORE likely to die of Covid than were unvaccinated cases.” But after taking into account age, this crude association is reversed: “Vaccinated cases were LESS likely to die of Covid than were unvaccinated cases.” Students have never seen anything like this in their 12 years of mathematics or in their AP statistics class. Students recognize how many comparisons or averages, rates and percentages are really crude comparisons: comparisons that do not take anything relevant into account. They recognize the need for hypothetical thinking: thinking about what could and should have been taken into account. An auxiliary paper, “Statistical Literacy: Critical Thinking about Statistics,” was also presented at this conference. [6] Videos are available for both presentations.

Papers:

- [1] www.NNN-US.org
- [2] <http://www.nnn-us.org/resources/Documents/Meetings/2022/Call%20for%20Presentation%20Proposals.pdf>
- [3] www.StatLit.org/pdf/2022-Schield-SJIAOS.pdf
- [4] www.statlit.org/pdf/2022-Schield-ECOTS-Lesson-Plan.pdf
- [5] www.statlit.org/pdf/2022-Schield-CCT.pdf Paper, slides and video
- [6] www.statlit.org/pdf/2022-Schield-CCT2.pdf Paper, slides and video

* Statistical Literacy Coordinator and Adjunct, The University of New Mexico
schieldmilo@unm.edu