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Photo (Optional): Recommended dimensions 250x250. . Allowed file types: jpg jpeg png.

Workshop Title: ***Statistical Literacy: Teaching Confounding and the Cornfield Conditions***

Workshop Abstract (128/150):

Confounder-based statistical literacy is different. Less than a 30% overlap with traditional statistics. More focus on observational studies than on random sampling or assignment. More focus on confounding than on statistical significance. More focus on multivariate 'controlling for' than on two-sample hypothesis testing. Teaching this course without computers requires different skills. Participants learn how to use simple middle-school mathematics to 'take into account' (to 'control for') the influence of a confounder on comparisons. Comparisons may involve gender or race. Learning how to handle these 'hot' topics in an important part the course. After seeing how confounding can influence an association, some students become statistical cynics. Participants will learn about the Cornfield conditions and the importance of effect size to help students become good critical thinkers about everyday statistics. GAISE 2016 compliant.

Intended Duration: What length of workshop are you proposing?

Half-day

One-day

1.5 days

2 days

Connection to Theme:

Communicating about big data (entire populations) can be difficult for statistical educators who typically deal with statistical tests and p-values in small data sets. In the 21st century with big data everywhere, most associations are statistically significant. The issue remaining is confounding. The phrases "taking into account" or "controlling for" are not normally a part of any introductory statistics course. Yet confounding is arguably the biggest problem in dealing with observational data and with most everyday statistics. This session focuses on ways of describing and controlling confounding that don't require a computer.

Engagement: Describe how your session will be structured to build in interaction and engagement.

Participants will use simple weighted averages to take into account (control for) the influence of binary confounders on a two-group comparison. Participants will apply this technique to untangling social statistics such as the male-female wage gap and the black-white income gap. Participants will apply this technique to see how cases attributable and statistical significance can be influenced. Participants will use ordinary English to express conditional probabilities: to describe and compare counts and percentages as presented in statements, tables and graphs. Finally, participants will use the Cornfield conditions to determine whether a given confounder can nullify or reverse an observed association.

Goals: Describe what you hope participants will take away from your session.

Participants will have a better appreciation for the prevalence, value and importance of observational data, the influence of confounding, some simple techniques for controlling the influence of confounders, and the importance of the Cornfield conditions in warding off confounders and student cynicism. Participants may be motivated to offer a confounder-based statistical literacy course for students in non-quantitative majors.

Technology (Optional): *Presenter: Access to PowerPoint, Excel and the web. Ability to share screen and record session locally or to the cloud using Zoom or equivalent.*

Prior Knowledge (Optional): *None required.*

Funding Available? (Optional): *None for participants.*

Submission: <https://www.causeweb.org/cause/uscots/uscots23/proposals>