

Lecture 7: Systematic Pluralism

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Contextualism

- ➔ **SC Pepper, *World Hypotheses: A Study of Evidence*, Berkeley: UC Press, 1942**
 - ↪ Named Contextualism
 - ↪ Human events are active, dynamic, developmental moments of a continuously changing reality
 - ↪ Knowledge is embedded in an evolving context of time, space, culture and the local tacit rules of conduct
 - ↪ The context of explanation is an integral part of both what is explained and how it is explained
 - ↪ The scientific enterprise is a part of an evolving socio-historic context
 - ↪ Analogy: a boat being reconstructed at sea, one board at a time
- ➔ **Contextualism: Attractive to behavioral scientists**
 - ↪ Interpreted as advocating methodological and theoretical pluralism
 - ↪ Every method or theory is limited - fallible - in some way
 - ↪ No single proper or complete or unlimited perspective on reality
 - ↪ Obligated to search for multiple routes, each at a different level of analysis

Historical View

➔ 19th Century view of man as machine

- ↪ Study how it works, not why
- ↪ Detached curiosity akin to physics
- ↪ Value judgments, good/bad, personal feelings have no place
- ↪ Humans subject to mechanical laws

➔ Period of uncertainty

- ↪ Loss of great hope: certainty

➔ Change in outlook

- ↪ Experimental work of *artifact* researchers helped to change the face of much of behavioral science
- ↪ View of laws of human behavior as socio-culturally and temporally pluralistic
- ↪ Change is a given, a reflection of the inherent complexity and open-ended nature of ongoing active events and their contexts

Historical View

➔ Current new position and ideas

- ↪ Active, intentional nature of much of human behavior
- ↪ People are continuously engaged in the reconstruction of knowledge
- ↪ Researchers are active participants, not detached
- ↪ Multiple methods to uncover process-like, intentional nature of cognition and behavior
- ↪ Human phenomena acquire meaning as part of a wider socio-historical context

Statistical Analysis

➔ Rationale

- ↳ Essential aspect of the rhetoric of justification in behavioral sciences evaluation, defense and confirmation of claims of truth
- ↳ Traditional ways to shore up facts and inductive inferences
- ↳ Imposes a sense of order and lawfulness

➔ 4 problems in the methodological spirit of statistical data analysis

- ↳ Dichotomous decisions on significance
- ↳ Low power
- ↳ Significance as defining results
- ↳ Over emphasis on single studies

Statistical Analysis

- ➔ **Over reliance on dichotomous on significance testing decisions**
 - ↪ Anti-null if p is not greater than .05
 - ↪ Pro-null if p is greater than .05
 - ↪ .05 α considered to be axiomatic: on the one side joy; on the other side ruin
 - ↪ Comes from the fact we ought to avoid *Type I* errors
 - ↪ A convenient and stringent enough fail safe standard
 - ↪ *Not axiomatic*: strength of evidence is continuous on the magnitude of p
- ➔ **Tendency to do many research studies in situations of low power**
 - ↪ Often ignore the extent to which the sample size is stacking the deck against themselves
 - ↪ May be considered to be too complicated
 - ↪ Seminal work of Cohen on Power in the 60s - has resurfaced as an important issue

Statistical Analysis

- ➔ **Defining results in terms of significance alone**
 - ↪ Need to consider effect size estimation procedures
 - ↪ Both when p is significant as well as when not significant
 - ↪ Guides our judgment about sample size
 - ↪ Significant p values should not be interpreted as reflecting large effects
- ➔ **Over emphasis on single studies at the expense of accumulating results**
 - ↪ Accumulating results critical for increasing weight of evidence
 - ↪ Evaluate impact on things other than p value - use multiple criteria
 - ↪ Make more use of meta-analysis
 - ↪ Accumulate data via meta-analysis, not just results
 - ↪ Often need to compute effect size and significance where it does not exist

Methodological Problems

➔ 4 problems on methodological substance

- ↪ Omnibus tests
- ↪ Need for contrasts
- ↪ Misinterpretation of interaction effects
- ↪ Hidden nesting

➔ Omnibus tests

- ↪ In SWE, too much reliance on shotgun metrics
- ↪ Need to ask focused questions
- ↪ Focused test more relevant
- ↪ Omnibus tests
 - Of dubious practical or theoretical significance
 - Effect size estimates are of doubtful utility

➔ Need for contrasts

- ↪ Specific predictions are analyzed by comparing them to the data
- ↪ Temporal progression levels are emphasized in contrast approach
- ↪ Increased statistical power results from contrasts
 - Avoid Type II error

Methodological Problems

➔ Misinterpretation of interaction effects

- ↪ Mathematical meaning of interaction effects is unambiguous
- ↪ But only a tiny fraction of results interpreted correctly
- ↪ May be due to lack of correspondence between the meaning of “interaction” in the analysis of variance model and its meaning in other discourse

➔ Hidden nesting

- ↪ Concealed non-independence of observations
 - results from sampling without regard to sources of similarity in the persons sampled
- ↪ Significance and effect size estimation become problematic
- ↪ Samples too similar
 - Usual assumptions underlying analysis do not hold
- ↪ Degrees of freedom fall somewhere between the number of people and the number of groups of people in the study

Re-Emphasis

- ➔ There will almost always be two kinds of information we want to have for each of our research questions:
 - ↳ *The size of the effect and*
 - ↳ *Its statistical significance*
- ➔ Magnitude of significance test = size of effect x size of study
 - ↳ *Significance will increase for any given size of study*
 - ↳ *For any given size of effect and for any given size of study, there will be a corresponding test of significance*
- ➔ Much of the analysis we will look at is about how to determine these three elements in a study