Complaints about Experimental Validation

- Basili [93]: describes 4 paradigms, proposes experience factory
- Fenton & al [94]: rigorous quantitative experimentation is missing -- results aren’t valid without it
- Tichy & al [95]: CS seriously lacks experimental validation
  > classified papers, assessed validation
  > prescriptive about kinds of validation expected
- Tichy [98]: debunks 8 excuses not to experiment
- Zelkowitz & al [98]: experiment requires data collection
  > 12 validation models
  > analyzed 1 papers, found 1/3 no experiment, 1/3 validation by assertion

All these are prescriptive — they start with research model!
Shaw: Types of Research Validation

• Persuasion  I thought hard about this, and I believe...
• Implementation  Here is a prototype of a system that ...
• Evaluation  Given these criteria, the object rates as ...
• Analysis  Given the facts, here are consequences ...
  Formal model  Rigorous derivation and proof
  Empirical model  Data on use in controlled situation
  Controlled experiment  Carefully designed statistical experiment
• Experience  Report on use in practice
  Qualitative model  Narrative
  Empirical model, tool  Data, usually statistical, on practice
  Notation, technique, actual use  Comparison of systems in actual use