

# Panel 25: Why Causal Learning Must Be Adopted within Acquisition Research

Chair: Robert Stoddard  
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# Panel Introductions



Anandi Hira  
USC; Paper #1



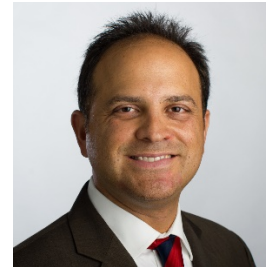
Robert Stoddard  
SEI; Chair



Dr. William Nichols  
SEI; Paper #2



Dr. Ray Madachy  
NPS; Discussant;  
Cost/Acquisition



Dr. Ricardo Valerdi  
U of Az: Discussant;  
Cost/Acquisition



Dr. David Danks  
CMU; Discussant;  
Causal Theory

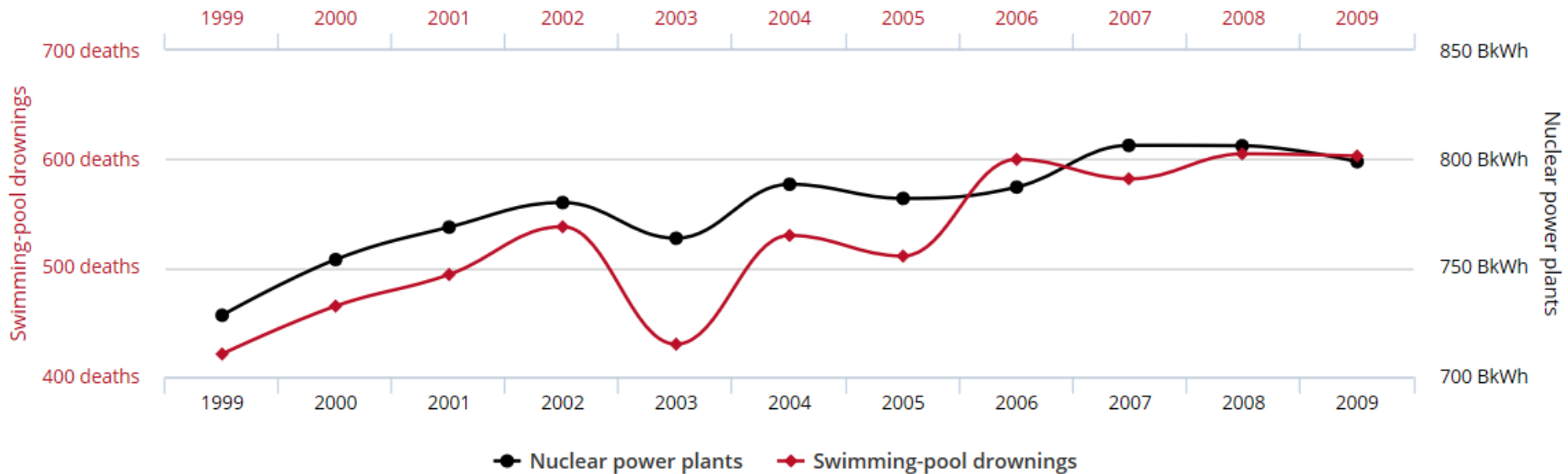


Dr. Mike Konrad  
SEI; Discussant;  
Causal Theory

# Why Do We Care about Causation?

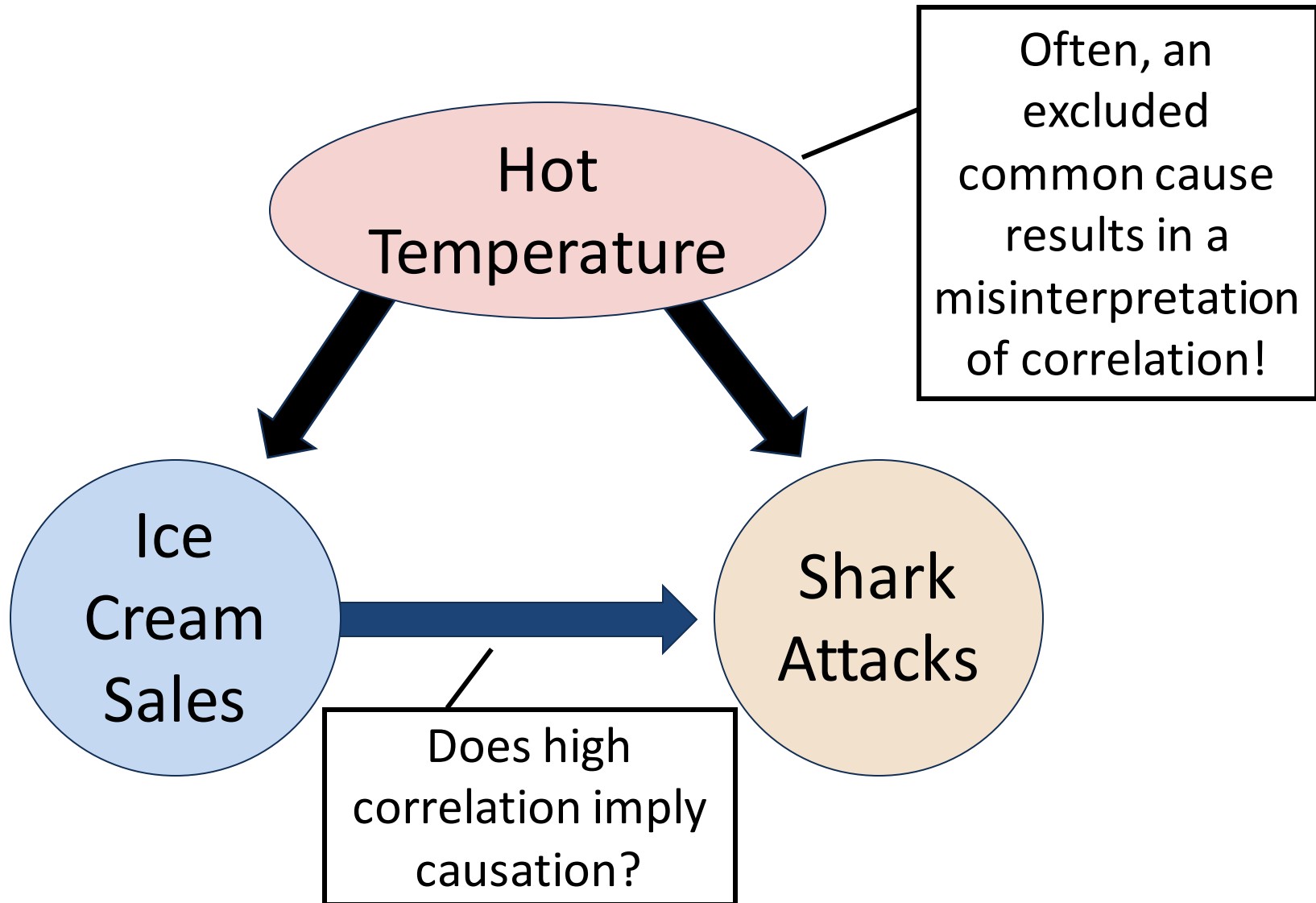
Number people who drowned while in a swimming-pool  
correlates with  
Power generated by US nuclear power plants

Correlation: 90.12% ( $r=0.901179$ )

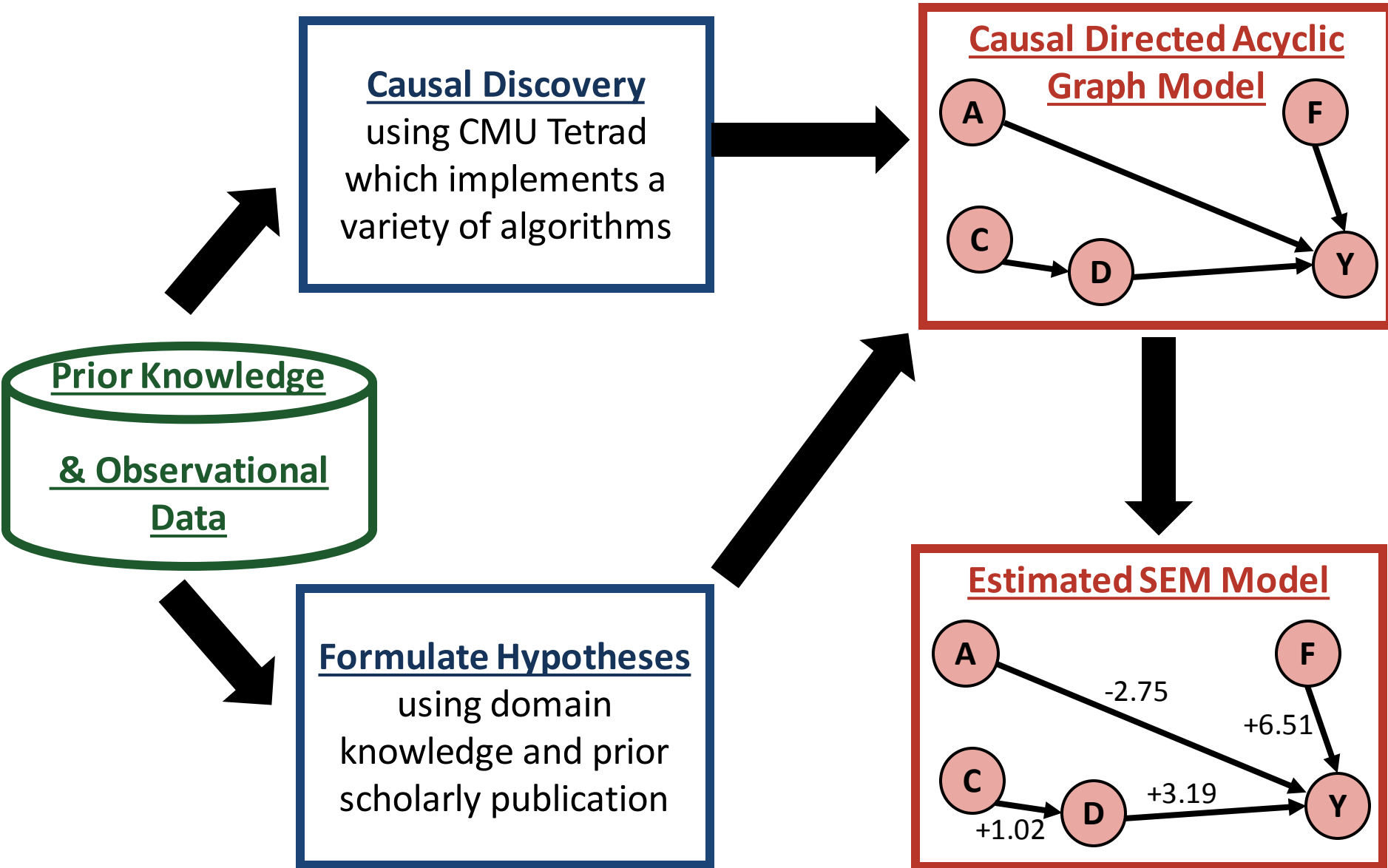


<http://www.tylervigen.com/spurious-correlations>

# More about Misinterpreting Correlation!



# The Causal Learning Landscape



# Tetrad (Open Source) for Causal Discovery

May be found at:

<http://www.phil.cmu.edu/tetrad/>

Code located at github:

<https://github.com/cmu-phil/tetrad>

Video Tutorials from 2016 Summer Short Course

<http://www.ccd.pitt.edu/training/presentation-videos/>

User Manual



Adobe Acrobat  
Document

# Benefits to Acquisition Research

- Benefits to experimentation and further research
  - Offer alternative to expensive, prohibitive experiments of acquisition factors
  - Eliminate many non-causal factors from unnecessary further research
  - Improve the repeatability and reproducibility of research
  - Reduce time and cost of acquisition program interventions
  - Integrate separate causal conclusions towards a holistic acquisition causal model
- Policy and practice informed by evidence and information about causality

# Context of Two Papers

**Paper 1:** “*Comparing Causal Search Analyses with Traditional Statistical Methods*”

presented by Anandi Hira

**Paper 2:** “*Inferring Causality with Data from Personal Software Process*”

presented by Dr. William Nichols



# Panel Contact Information

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