

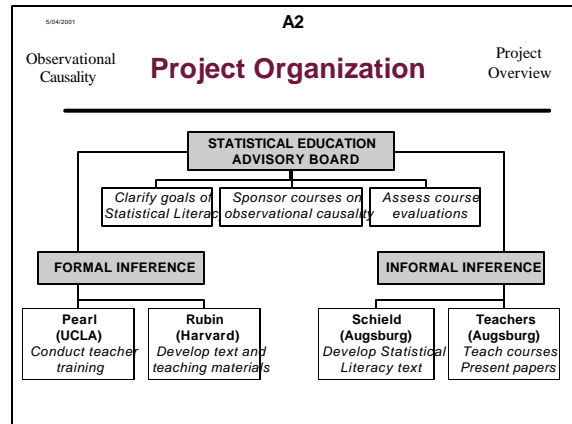
5/4/2001 A1 Project Overview

Observational Causality Project Overview

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**To Expand  
Statistical Education  
to include  
*Observational Causation***

Augsburg College Proposal




5/4/2001 A3 Project Overview

Observational Causality Project Overview

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**Statistical Education  
Program Evaluation**

Dr. Joan Garfield,  
Educational Psychology  
University of Minnesota



Co-editor (1997):  
“The assessment challenge  
in statistics education”

5/4/2001 A4 Project Overview

Observational Causality Project Overview

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**Causality:  
A Brief History**

Bertrand Russell: “Causes... there are no such things. ...a relic of a bygone age...”

1911: Karl Pearson (father of modern statistics) *removes causality*: “another fetish”.

1936: Sir Ronald Fisher *expands statistics to include causation based on experiments* involving randomized assignment.

5/4/2001 A5 Project Overview

Observational Causality Project Overview

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**Traditional Statistics**

	Experiment	Observational
Inference	Yes	[Yes]
Causation	Yes	No!
Modeling		
Selection	Yes	Yes
Intervention	Yes	No!

Inference: confidence intervals, hypothesis tests.  
Modeling: ordinary regression, logistic regression ,etc.

5/4/2001 A6 Project Overview

Observational Causality Project Overview

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**Observational Causation  
Current Status**

1959: Cornfield et al, *expand statistics to include “observational” causation*.

1974-1984: Donald Rubin (Harvard) introduces the Rubin Causal Method (RCM).





2000: Judea Pearl (UCLA) authors “Causality”: identifying observational causality graphically.

5/4/2001 **A7** Project Overview

Observational Causality **Formal Approach Rubin and Pearl**

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Donald Rubin Judea Pearl


5/4/2001 **A8** Project Overview

Observational Causality **Informal Approach Statistical Literacy**

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**Milo Schield**  
Augsburg College

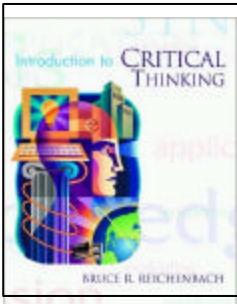

*“Statistical Literacy is the study of statistics used as evidence in arguments about causality”*



5/4/2001 **A9** Project Overview

Observational Causality **Statistical Literacy Bruce Reichenbach**

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5/4/2001 **A10** Project Overview

Observational Causality **Statistical Literacy Lynn Steen, Mathematician**

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“.. for the majority [of students] who will use their statistical knowledge primarily as citizens, homemakers, and parents, the values of statistical literacy as expressed in your proposal are of unquestionable importance.”

Lynn Steen, Past President of the American Mathematical Association




5/4/2001 **A11** Project Overview

Observational Causality **Statistical Literacy Mark Engebretson**

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Augsburg Physics Dept.  
Primary researcher  
NASA/NSF grants

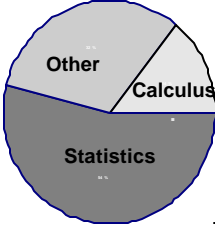
Co-author of  
Augsburg’s Vision  
2004 Statement of  
Mission



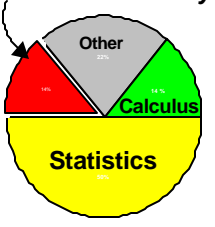
5/4/2001 **A12** Project Overview

Observational Causality **Statistical Literacy Goal (% of College Graduates)**

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Today: 2001



**Goal: 14% by 2014**