Thinking Straight Tuesday , May 16

Morning Session

- Review of Assignment and discussion on correlation and causation

- Video: "Prisoners of Silence"

- Discussion of Theories relevant to the video as well as issues concerning causation.

Afternoon Session beginning at 1 pm

Workshop on virtue ethics.
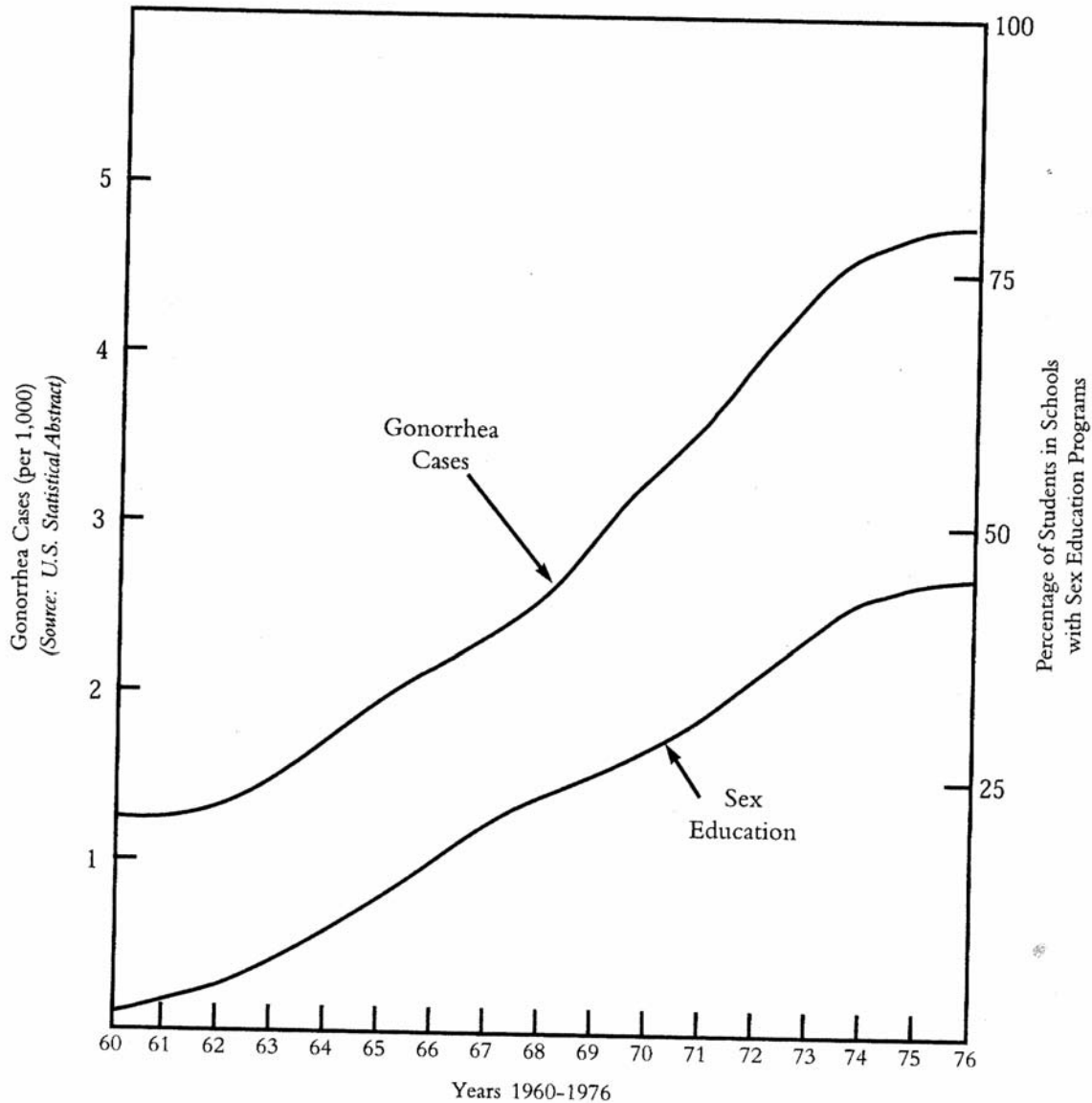
Causal Arguments and Statistics

Form of Argument   *Example*

A is correlated with B   **Smoking is correlated with Heart Disease**
———————————————   ————————————————————————
(likely) A causes B   **(likely) Smoking causes heart disease**

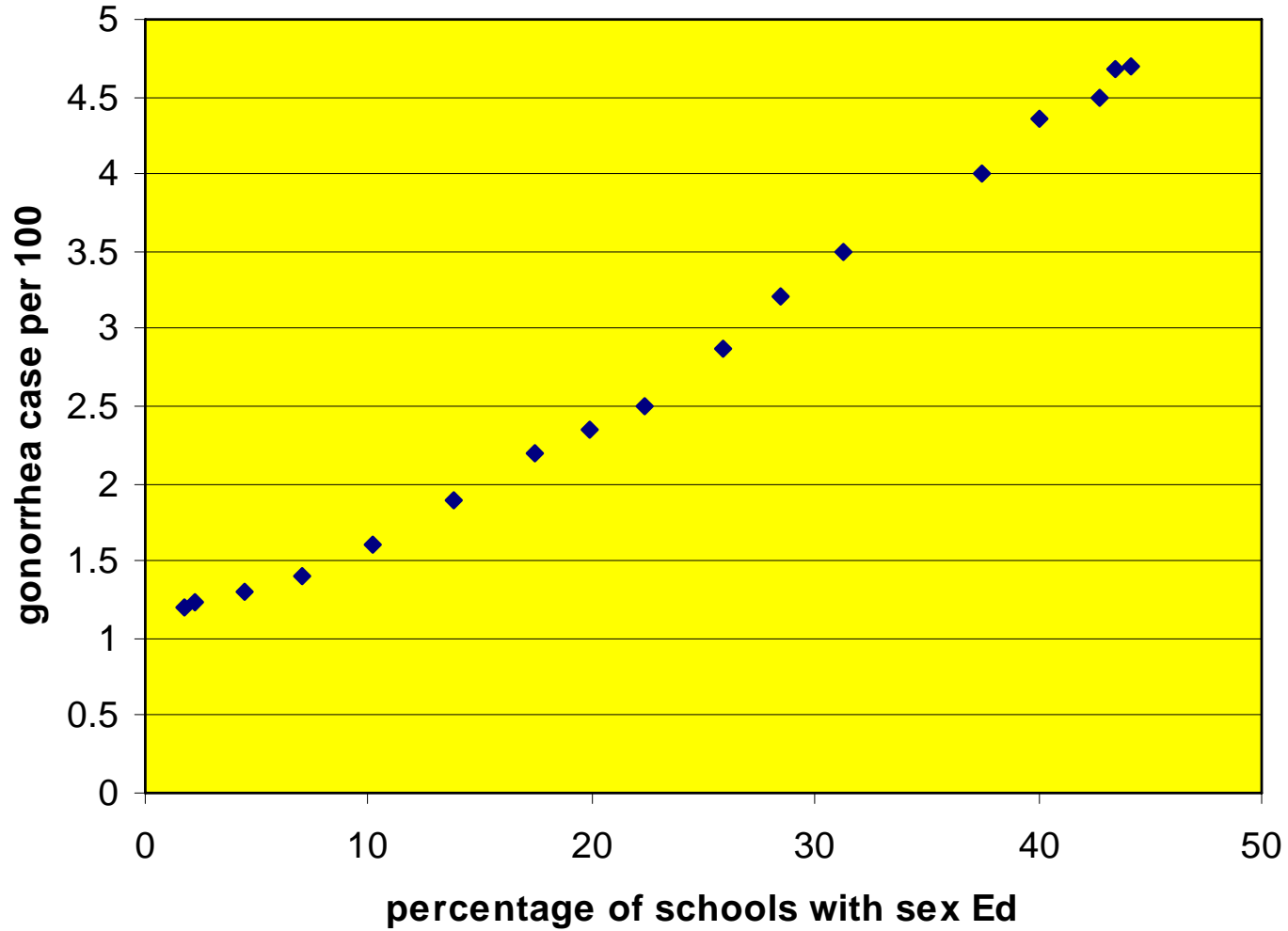What makes makes for a good causal argument –What makes for a bad one.

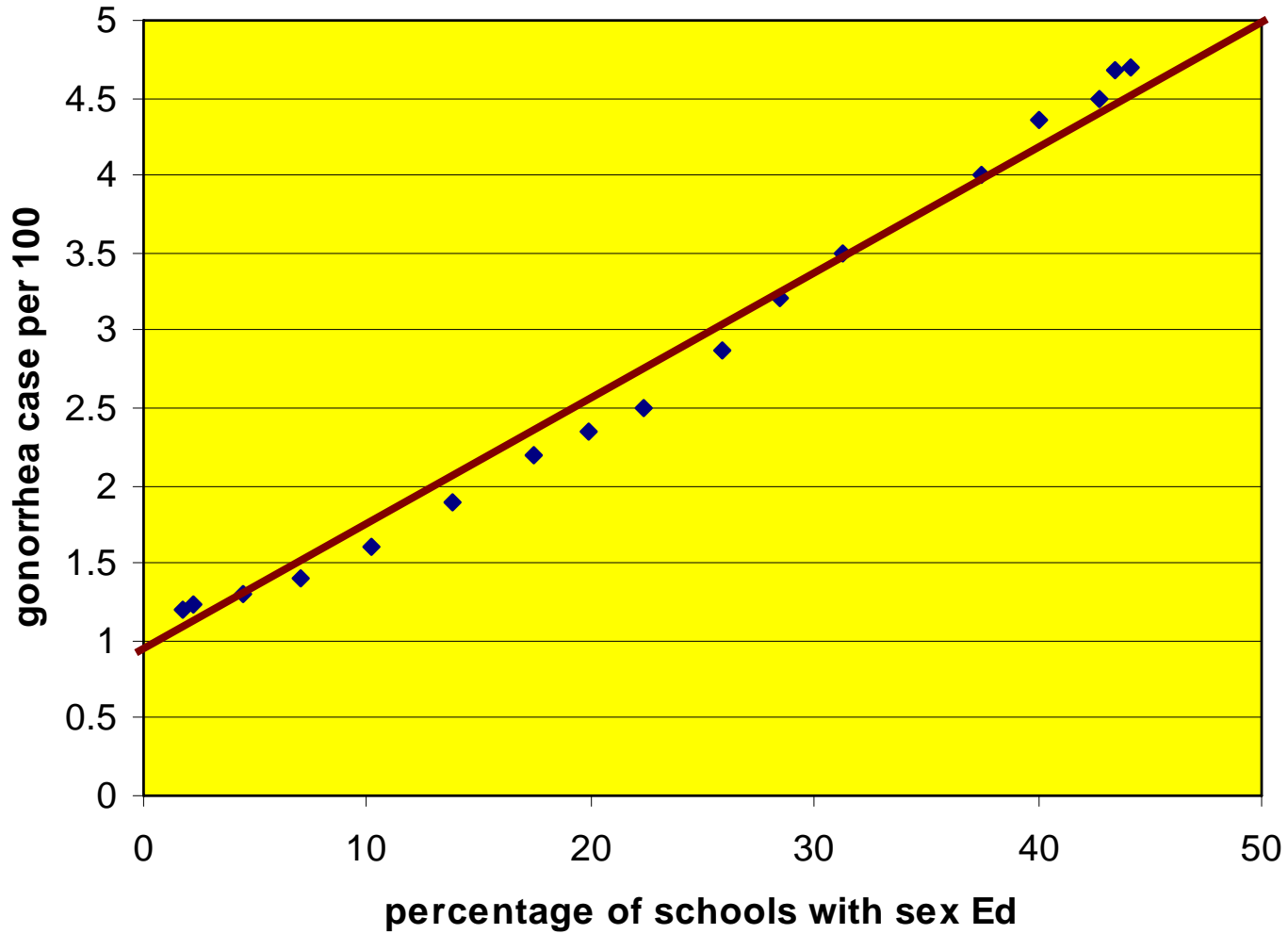**Time Series suggests possible relatedness**

Figure 9.1 Rate of gonorrhea cases per 1,000 population (actual estimates) and percentage of students (largely fictional estimates) in high schools with sex education programs

Scatter diagram/ scatter plot

Gonorrhea Rate and Sex Education Classes

Gonorrhea Rate and Sex Education Classes

Gonorrhea Rate= .83 + .085 Percent,   r = .995, r² =.990

Approximate Guide to Verbal Interpretation of Strength for Association Measures Ranging from 0 to ± 1

Value of Measure		Verbal Interpretation
	0	No Association
±	.01-.25	Weak Association
±	.26-.55	Moderate Association
±	.56-.75	Strong Association
±	.76-.99	Very Strong Association
±	1	Perfect Association

- Husband's versus Wife's heights r = .36 r^2 = **.130**

- Husband's versus Wife's ages r = .94 r^2 = **.884**

- Professional Golfer's Putting Success: Distance of putt in feet versus percent success   r = -.94 r^2 = **.884**

r is correlation coefficient, r^2 is coefficient of determination

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Correlation Does *Not* Imply Causation

Even very strong correlations may not correspond to a real causal relationship.

What makes for a bad one?

Five common criticism of Causal

Increase in Sex Ed classes is (positively) correlated (associated) with increased in gonorrhe

(likely) Increase in Sex Ed classes caused increase in gonorrhea

- **Coincidental**
  (A new strain of gonorrhea happened to emerge)

- **Both effects of the same underlying cause**

  (Increased sexual activity caused both)

- **Causal effect is genuine but insignificant**
  (Sex Ed classes encouraged risky sex for only a few)

- **Causal relation in the wrong direction**

  (Increase in gonorrhea caused introduction of more Sex Ed)

- **Causal relation may be complex**
  (Sex Ed caused changes in attitude that lead to increased sexual activity that lead to increased gonorrhea, but increased STDs might have simultaneously caused more sex Ed courses to be introduced)

Prisoners of Silence Video

A TV documentary about issues surrounding facilitated communication as a technique used to help autistic and other developmentally disabled people.

Pay special attention to

(1) Any empirical theories that might be involved in the controversy about facilitated communication

(2) Any issues of causation and experimentation that are relevant to the controversy

Evidence of Causation

- A properly conducted experiment establishes the connection
- Other considerations:
  - A reasonable explanation for a cause and effect exists
  - The connection happens in repeated trials
  - The connection happens under varying conditions
  - Potential confounding factors are ruled out
  - Alleged cause precedes the effect in time

Table II. Correct Subject Responses for Three Levels of Support and Two Facilitator Knowledge Conditions

Subject	No help		Medium support		Full support	
	Aware	Unaware	Aware	Unaware	Aware	Unaware
1	0	0	0	0	2	0
2	0	0	0	0	6	0
3	0	0	3	0	8	0
4	0	0	0	0	6	0
5	0	0	0	0	1	0
6	0	0	0	0	7	0
7	0	0	0	0	0	0
8	0	0	0	0	7	0
9	0	0	0	0	12	0
10	0	0	0	0	10	0
Totals	0	0	3	0	59	0

Example Experimental Results

Model of a "good experiment"

1. Have a control (comparison) group

2. Random Assignment to one or the other

Two conditions

 Facilitator knows
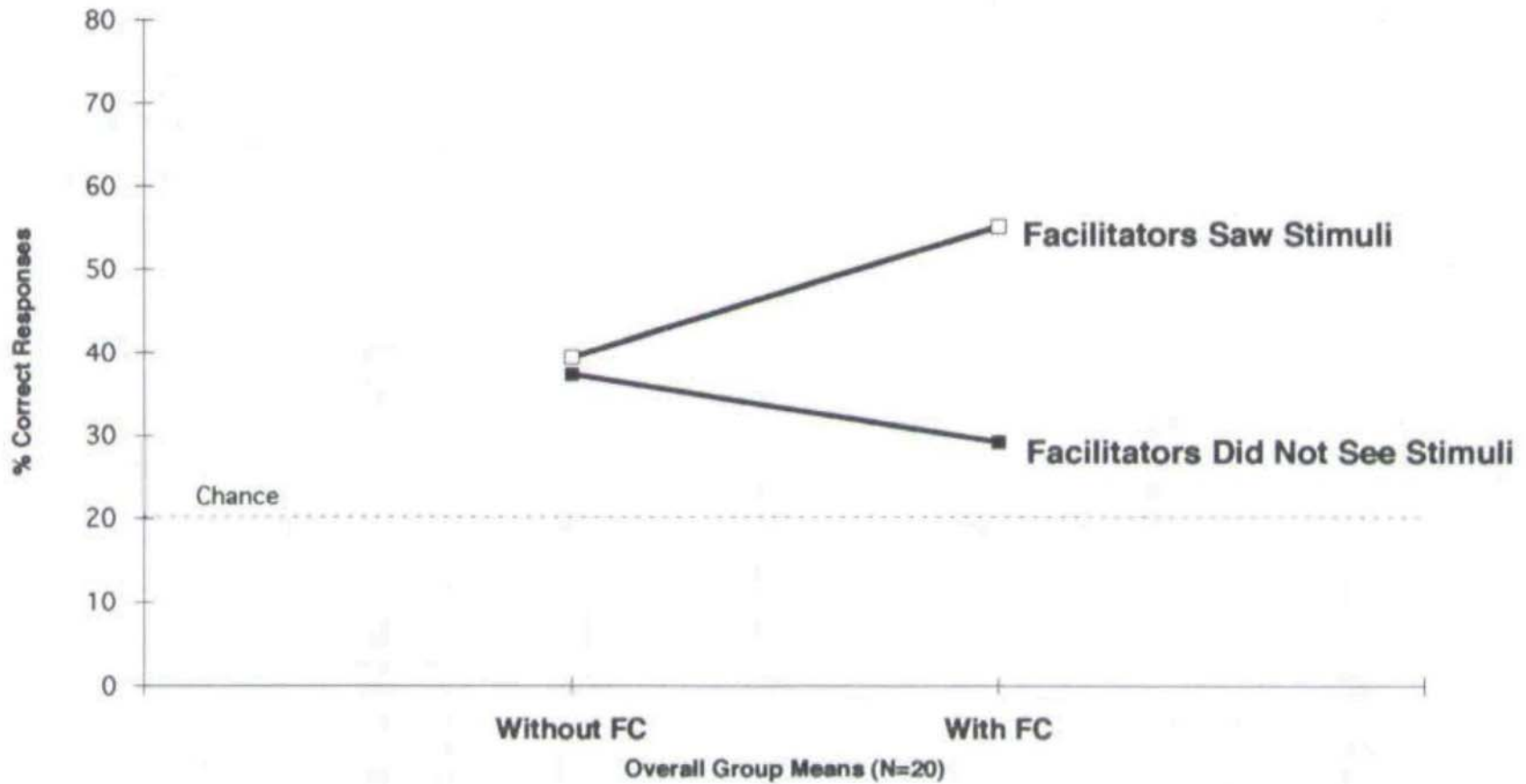
 Facilitator doesn't know

Fig. 1. Setwork design. Group data illustrating the interaction effect of the use of facilitated communication and facilitator knowledge on performance.

Scores in this method were the percentage of trials on which students pointed to the one of five pictures (or words) which corresponded to the picture (or word) which had been shown previously. Scores were computed separately for each of the four conditions (FC/informed, FC/not informed, no FC/informed, no FC/not informed) and are shown in Figure 1, across participants. A 2×2 ANOVA indicated that the interaction was significant, $F(1, 76) = 6.36, p = .0138$, with performance in the FC/informed condition significantly greater than in the other three conditions, which did not differ.

That's All Folks