

this observational
time: studies;

next
time. probability

read: (D) (B) | AM57
180 + 18
ch. 7-8; LN pp. 95-118

today: LN pp. (F3) →

homework 2...
R. (32), (34)

R-(36) flow chart

human pets are often impossible
on ethical grounds

R-(35) case study

Djerasi

(I) outcome: (systolic) (sdp)
blood pressure (mmHg)

(I) treatment (supposedly
causal
factor)

: pill use
(T)
vs.
non use (C)

(115) / 75
systolic / diastolic

basic design: obs. study

(enemy) (Z1) potential confounding
factor (PCA) : (9se)

is age
a PCF
here?

① Z_1, Y associated? ✓ (2)

age ↑ sbp ↑ on average

yes

② Z_1, Z associated? ✓

age ↑ pill use ↓ on ave

if we don't attempt to defeat
this PCF, the results will
be biased in favor of the pill

how defeat
a PCF?

- ① at design time (cont)
- ② at analysis time ✓

key idea: to defeat a PCF,

hold it constant: $\Phi - 36$
bottom

after controlling (adjusting) for

eye, we conclude that pill use ⁽³⁾
increased 5% by about 5 units.

Q: Is this difference practically significant?

A: Yes, it's small but important.
Cumulatively over time, this
would lead to worse health.

Ch. 3 Probability L - 95 12.37

mmHg:

JLM

Poissonville

(1797-
1869)

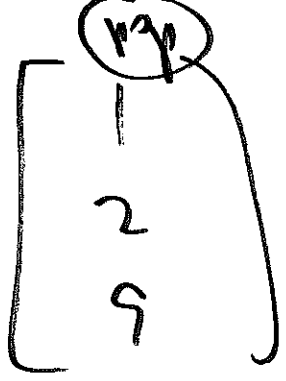
(1655) Fermat & Pascal
(ELM)

Rev. T Bayes (1760)
(Bayesian)

Cournot (1825), Venn (1850)

fulg

sample



at random

$$[Y_1] \quad n=1$$

$$P(Y_1 \text{ is odd}) = \frac{2}{3} = 67\%$$

ELM? yes

$$P(\text{any one of their children is normal}) = \frac{1}{4} = 25\%$$

ELM? yes to 4 outbreaks in Punnett square

$$P(\text{carrier}) = \frac{2}{4} = 50\%$$

$$P(\text{T-5 baby}) = \frac{1}{4} = 25\%$$

| # of children | P(at least 1 T-5) |
|---------------|-------------------|
| 1 | 25% |
| 2 | > 25% |
| : | : |
| 5 | |

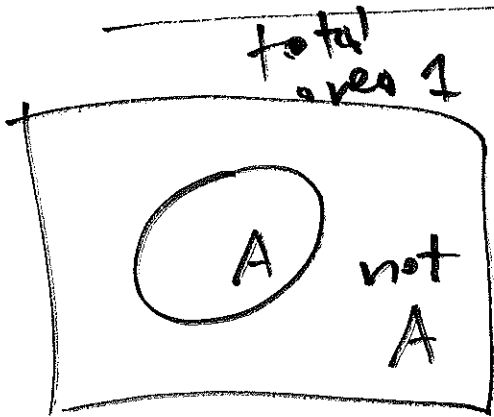
as # children 4, P(1 or more T-5) ↑

$$P(A \text{ or } B) = P(A) + P(B)$$

$P(A) ? P(\text{not } A) ?$

⑤

$P(A \text{ and } B) \stackrel{?}{=} P(A) ? P(B)$



$$P(\text{rectangle}) = 100\% = 1$$

$$1 = P(A) + P(\text{not } A)$$

$$\rightarrow P(A) = 1 - P(\text{not } A)$$

$$0\% \leq P(A) \leq 100\%$$

0 1

7-(37)

Every rule