Truth is One, Paths are Many

The **Karma** yoga

The **Jnana** yoga

The **Bhakti** yoga

The path of **Action**
The path of **Devotion**
The path of **Knowledge**

“Three Questions One Might Ask”

[Royall, 1997]

What should I **DO**?

What should I **BELIEVE**?

What's the **RELATIVE EVIDENCE**?

Path of Action:

Search for rules to govern our behavior such that, in the long run, we will not be wrong too often.

Path of Action:

$p < \alpha$: Reject H0

$p > \alpha$: Accept H0*

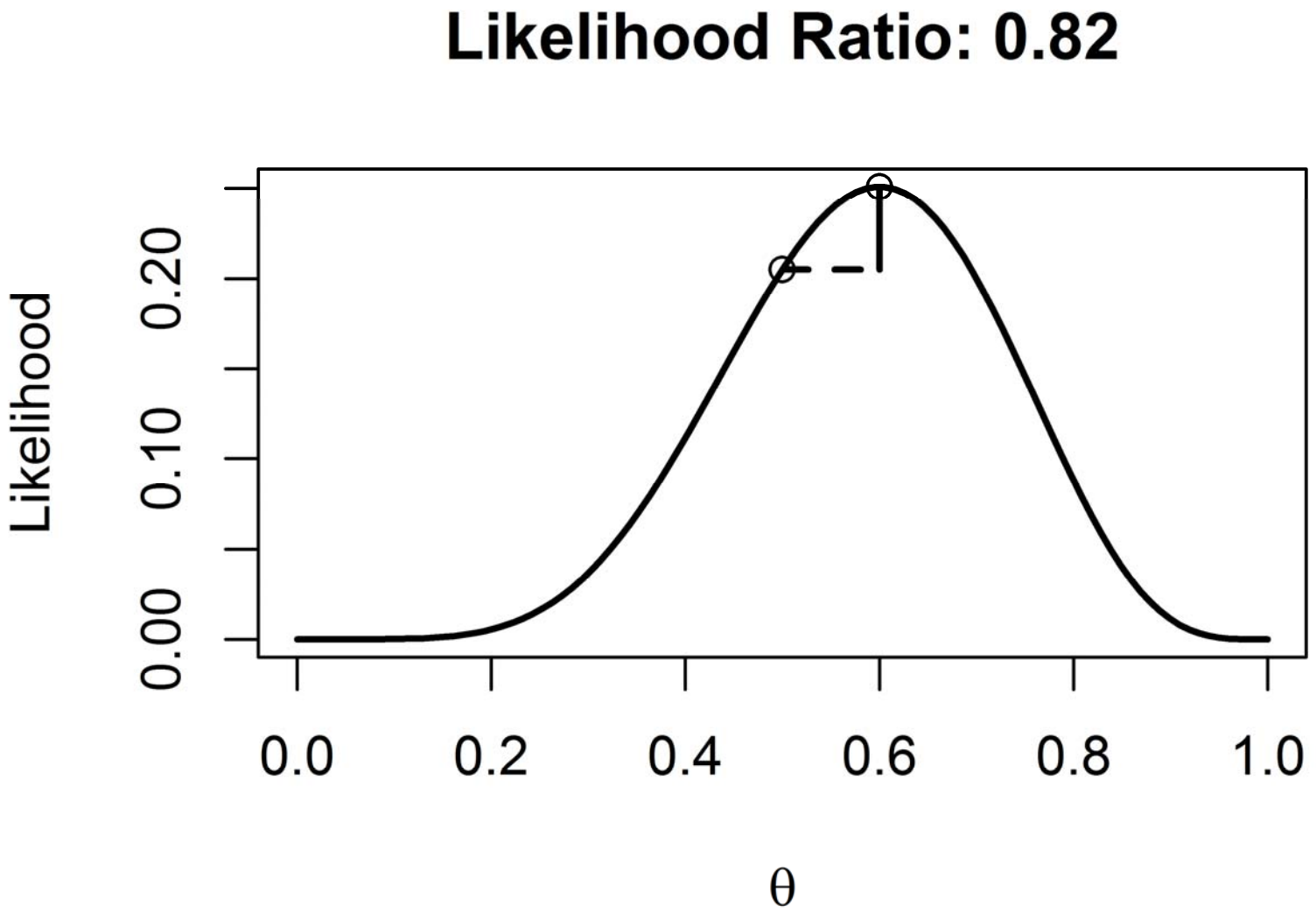
*or remain in doubt

A rule to govern our **behavior** in the **long run**. It tells us **nothing** about the **current test**.

Path of Knowledge:

Compare the likelihood of different hypotheses, given the data.

You flip a coin 10 times. Is it biased?


Likelihood Ratio: 0.82
Likelihood
0.00
0.10
0.20
0.0
0.2
0.4
0.6
0.8
1.0
θ

The Path of Belief:

Do you really believe this coin will come up heads 60% of the time? No. You have prior beliefs.

The Path of Belief:

Bayesian statistics allows you to express evidence in terms of ‘degrees of belief.’

The path of Action
The path of Devotion
The path of Knowledge

Neyman-Pearson

Bayesian Statistics

Likelihood

DL2

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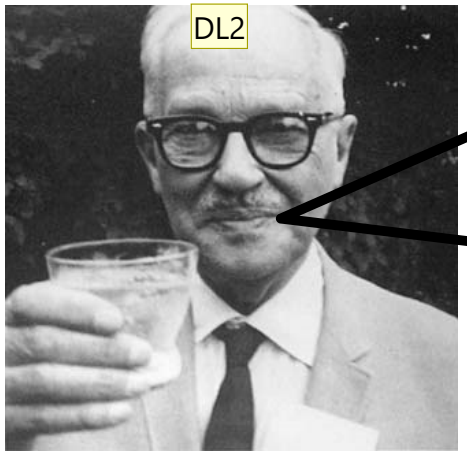
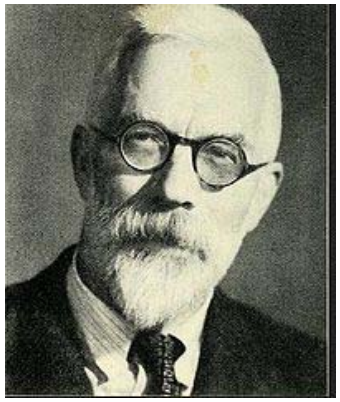
DL2 Daniel Lakens; 19-1-2016



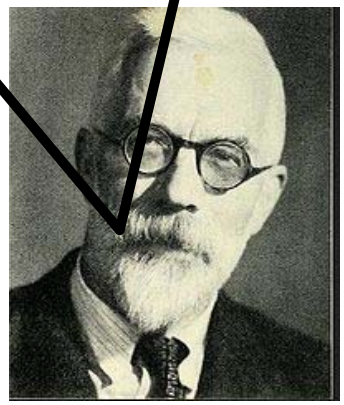
Haha, I've won, my approach to statistics is the underlying logic of almost all statistical tests you see in journals!



Slide 17

DL2 Daniel Lakens; 19-1-2016

Oh shut up! No one knows your name, and everyone uses *p*-values in the incorrect way I proposed!



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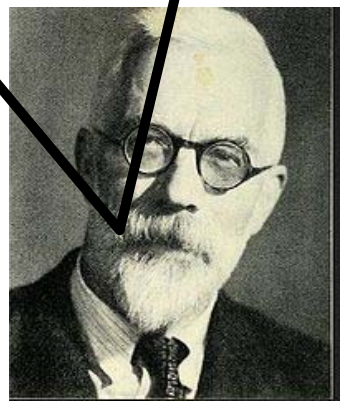
DL2 Daniel Lakens; 19-1-2016

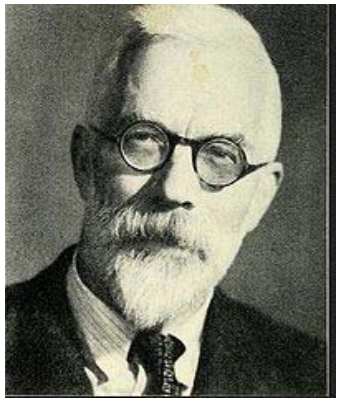
And, in case you didn't know, people love me so much, they named the *F*-distribution in my honor!



Slide 19

DL2 Daniel Lakens; 19-1-2016


DL2



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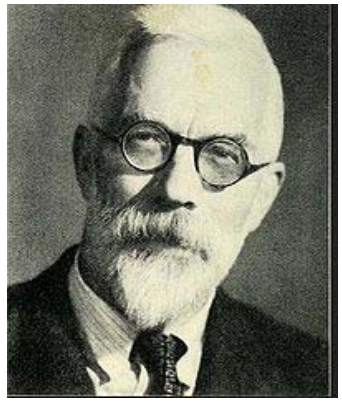
DL2 Daniel Lakens; 19-1-2016

Gentleman!
Calm down! In the future, everyone will use Bayesian statistics anyway!!



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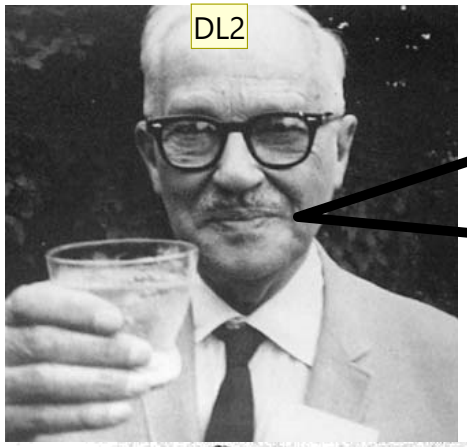
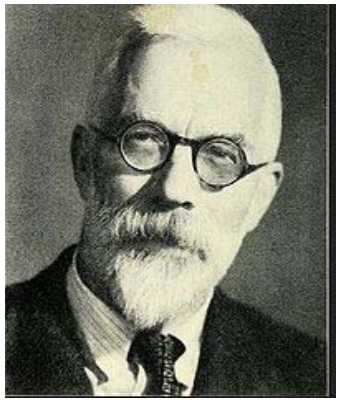
DL2 Daniel Lakens; 19-1-2016



Yeah, right. My prior on that happening isn't very high, Reverend Bayes.



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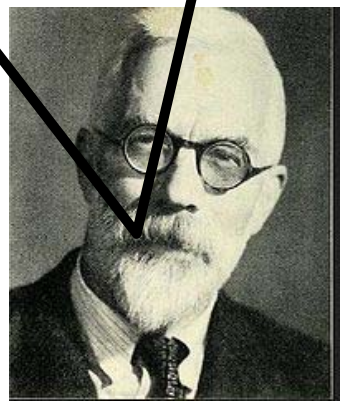
DL2 Daniel Lakens; 19-1-2016

Haha, good one Jerzy,
my Frequentist friend.
Come, let's go for a
long run.



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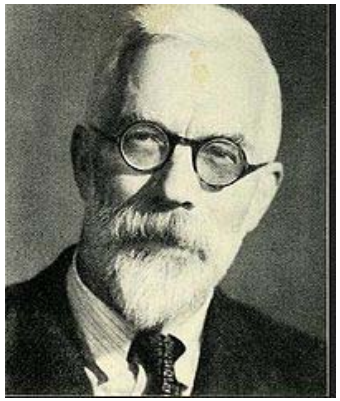
DL2 Daniel Lakens; 19-1-2016


DL2



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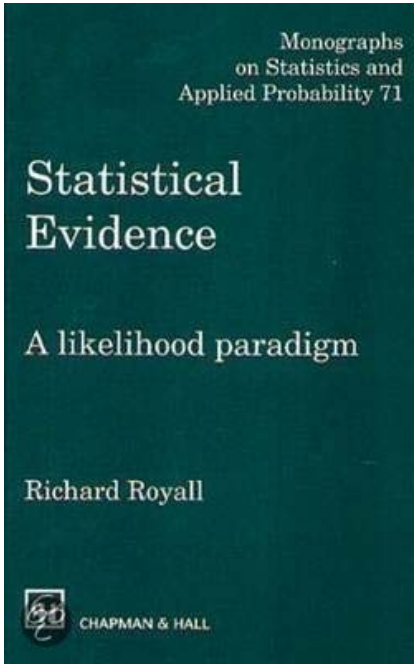
DL2 Daniel Lakens; 19-1-2016

DL2


Monographs
on Statistics and
Applied Probability 71
Statistical
Evidence
A likelihood paradigm
Richard Royall
CHAPMAN & HALL

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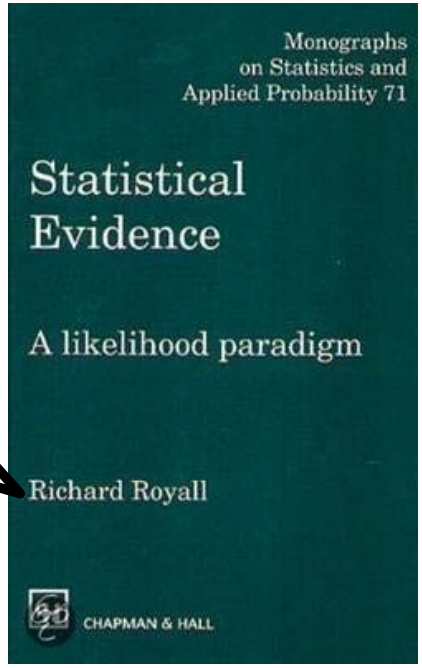
DL2 Daniel Lakens; 19-1-2016

No one cares about your subjective opinion, Reverend Bayes. Let's use likelihoods without priors!



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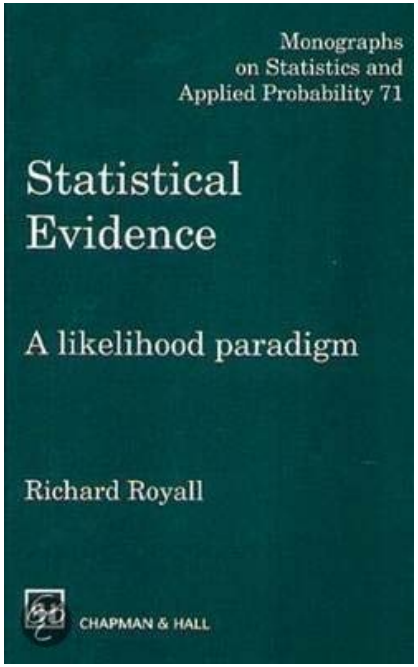
DL2 Daniel Lakens; 19-1-2016

Oh, come on! Don't be such a nuisance! No one even knows what a likelihood paradigm is!

DL2



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DL2 Daniel Lakens; 19-1-2016

It’s not either-or

Different questions give different answers.

Ask the question you want the answer to.