- Principles of Performance Monitoring
  - Measure Results, not Effort
  - Consult Reputable, Available Data Sources
  - Develop Sound Methodology
  - Periodically Reevaluate and Modify

Measuring Results vs. Effort

- –Difficulties:
  - •Requires reliable survey or study design

Example: Public Involvement

- –**Measures of Effort:**
  - •**Number of Meetings**
  - •**Newsletter Circulation**
- –Measures of Response:
  - •Meeting Attendance
  - •Participation Rate at Meetings
- –Measures of Results:
  - •Public Awareness
  - •Incorporation of Feedback

Probability Sampling Requires 2 Conditions

- Random mechanism
- Minimization of sampling error through sample size

-Examples of Common Random Sample Data:

- ADTs; Transit Passenger Miles; Opinion Surveys

–Limitations:

- Convenience Sampling Easier
  - –Mall Surveys; “Dot Polling” Exercises
- Decline in Effective Techniques
  - –Telephone Sampling in era of Cell Phones
- Self-Selected Sampling Error/Response Biases
  - –Mail-in surveys

Common Data Errors

- –Choose representative Base Year
- –Avoid biases in selecting underperforming/ overperforming peers
- –Choose data with consistent definitions, reporting methods and data integrity
  - •Safety
    - –All Crashes
    - –Long Forms Only
    - –Injuries/Property Damage Only
    - –Georeferencing (Mileposts? Street Addresses? Nearest Intersections?)

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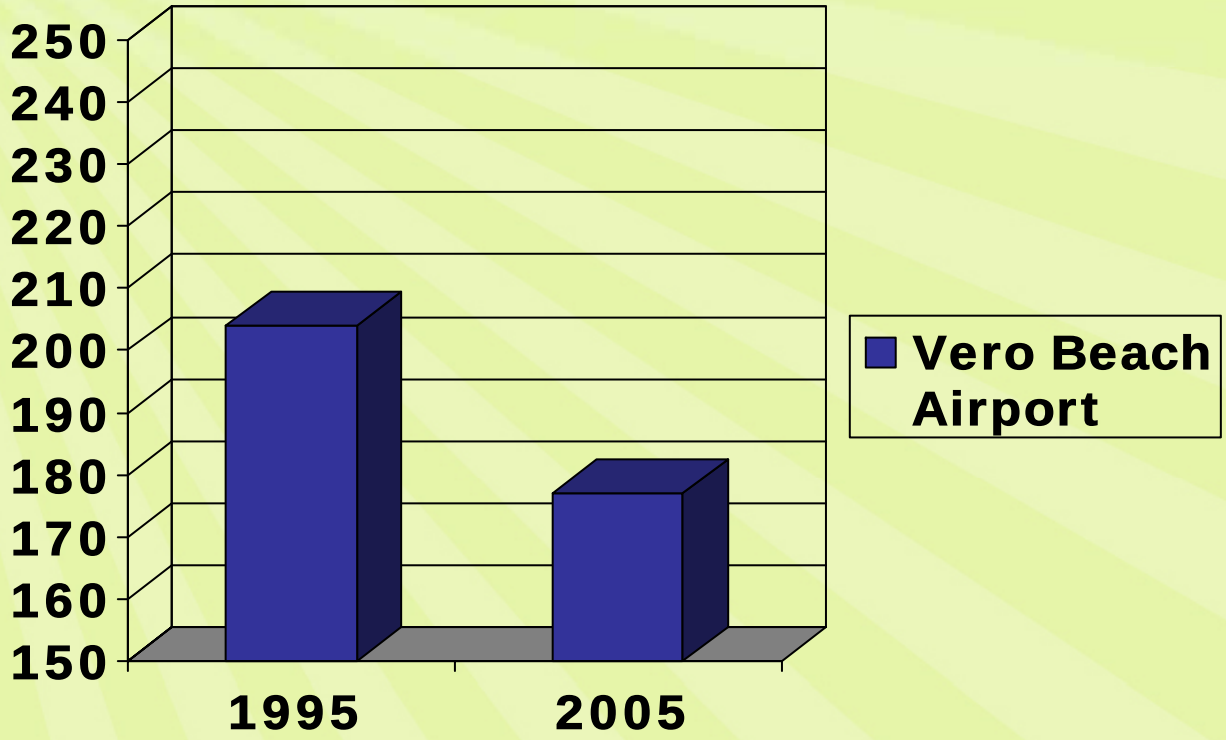
Evaluating Data – Science vs. Superstition



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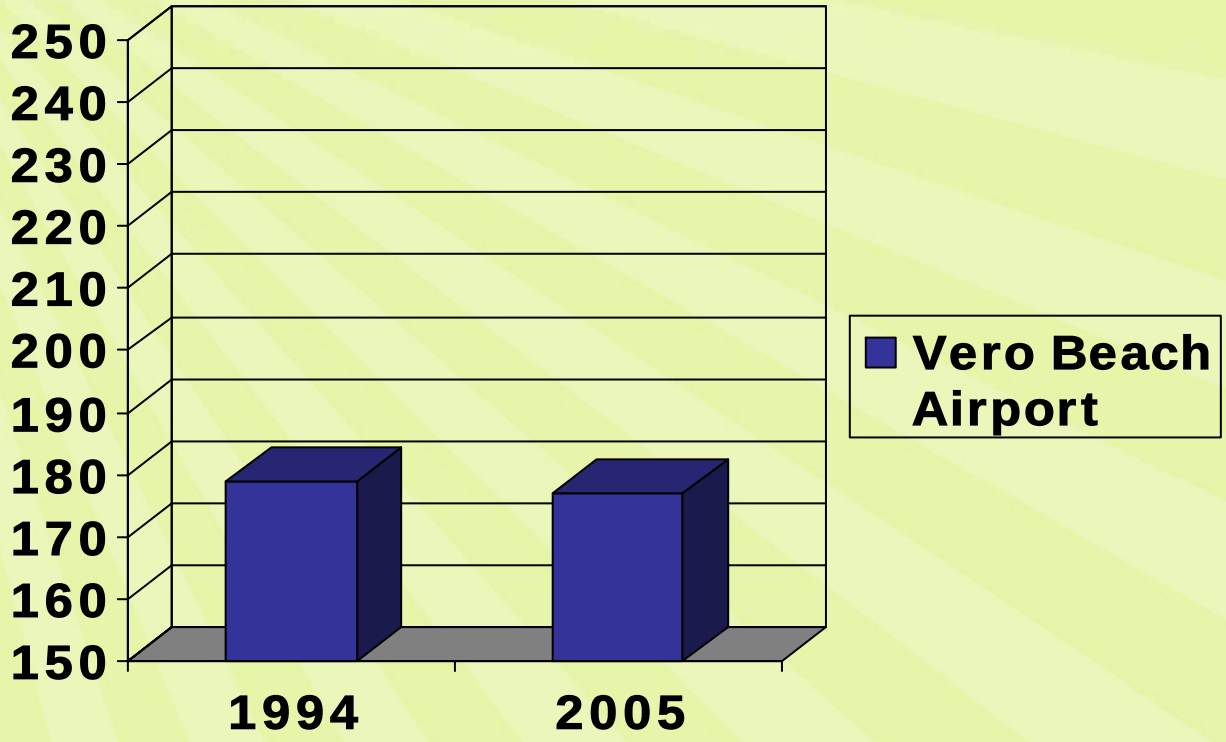

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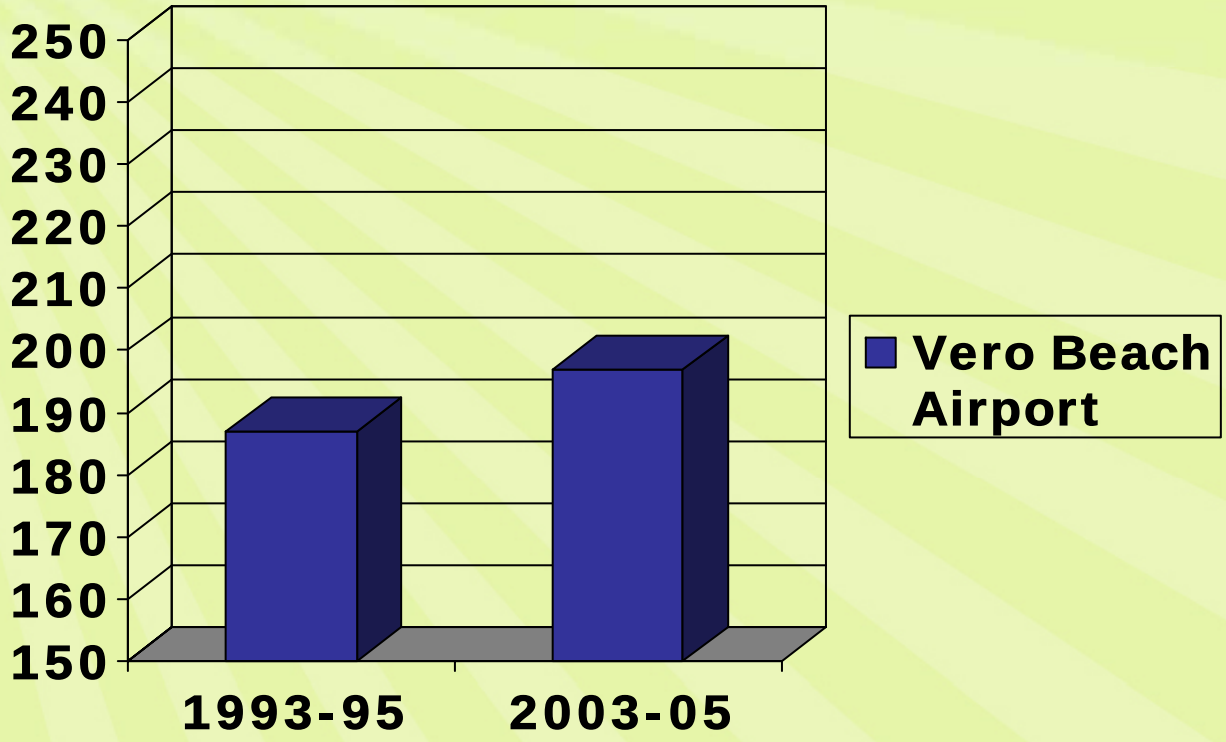

More Science vs. Superstition

"Post Hoc" Fallacy

– Confusing Correlation with Causation

Was one event's timing actually another event's cause?

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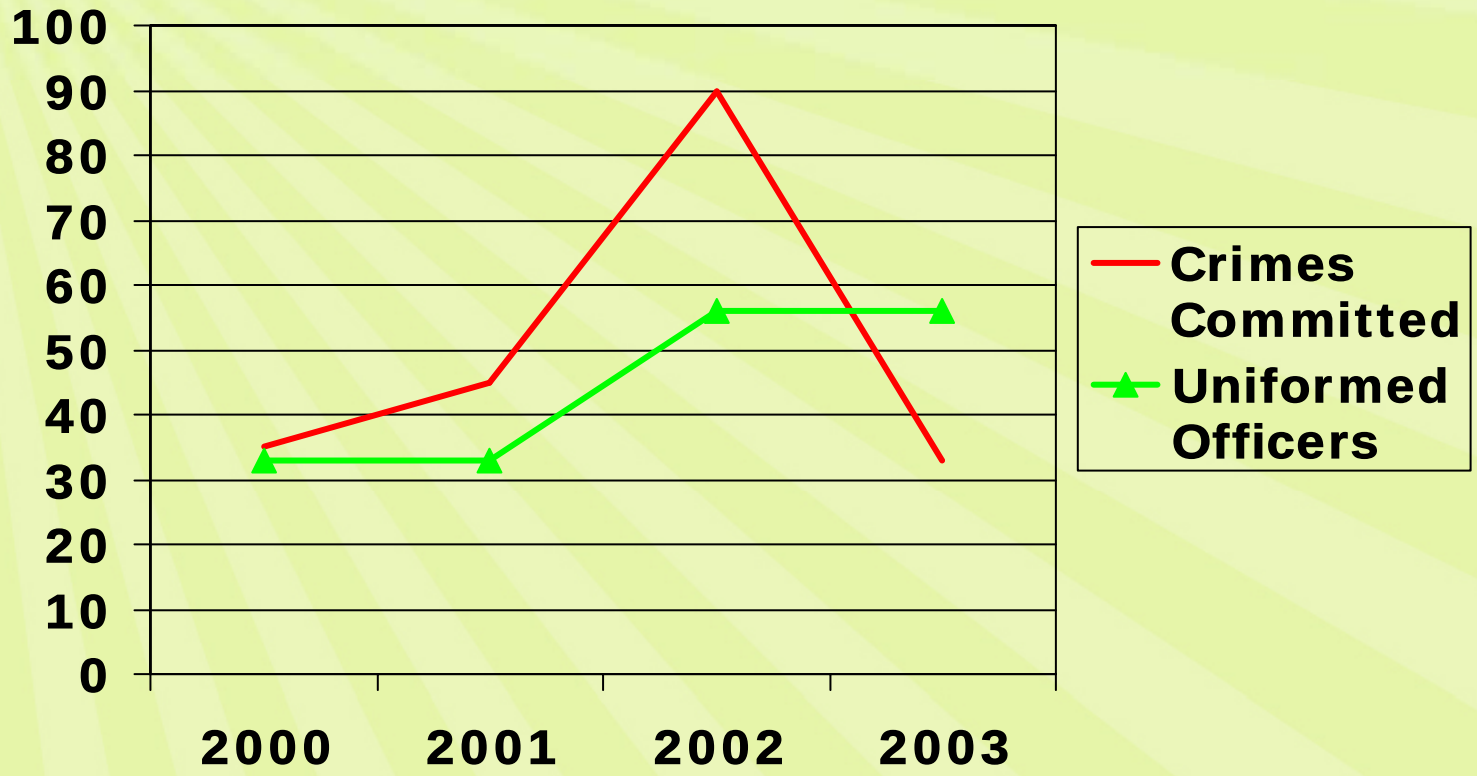

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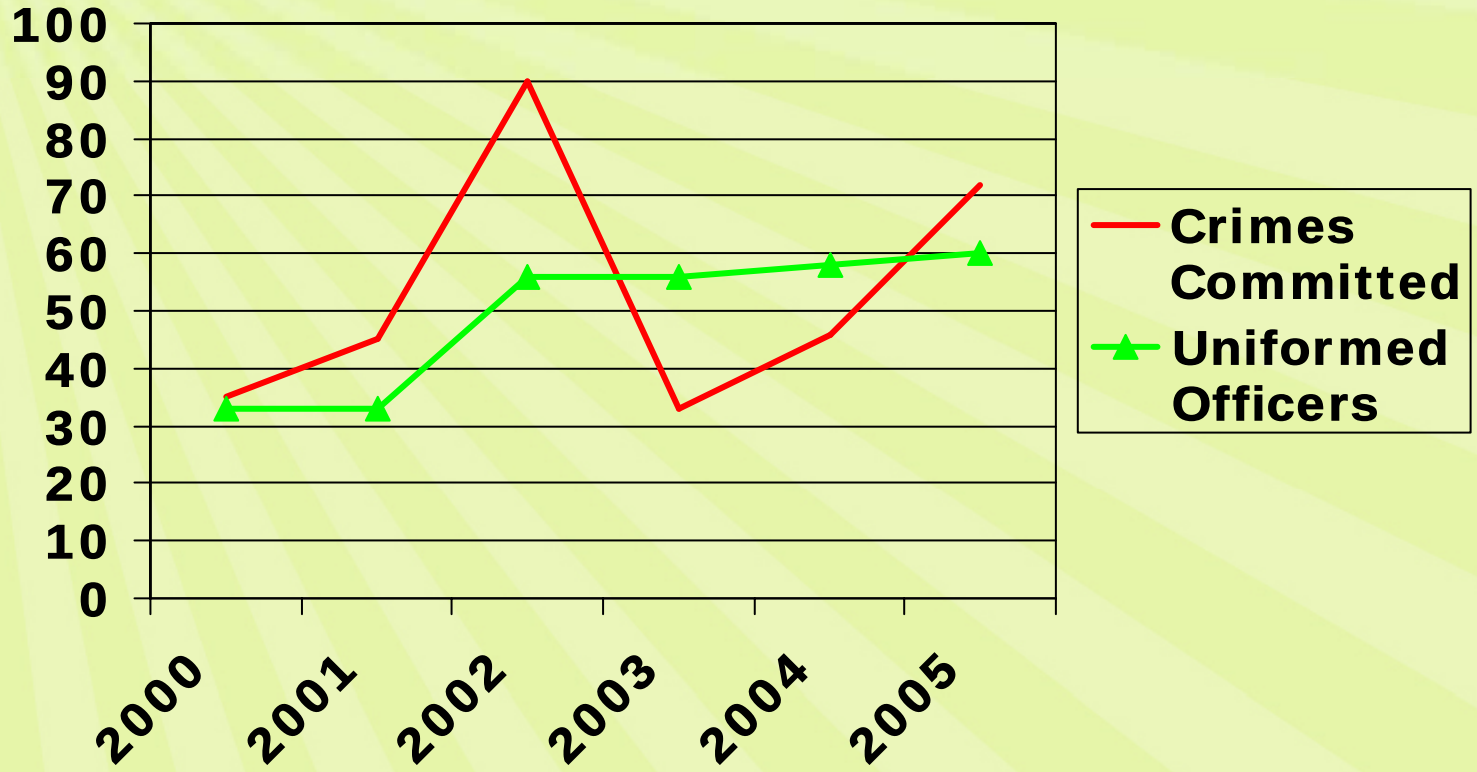
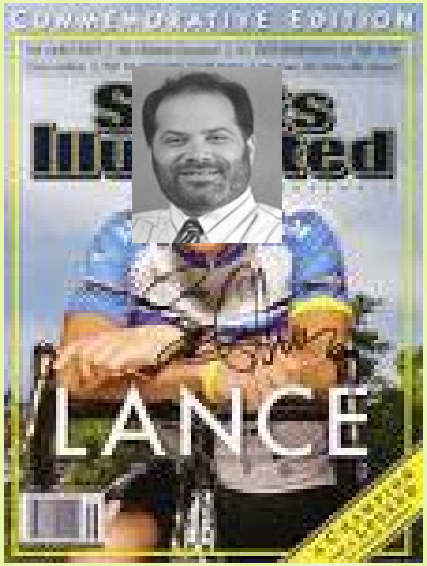
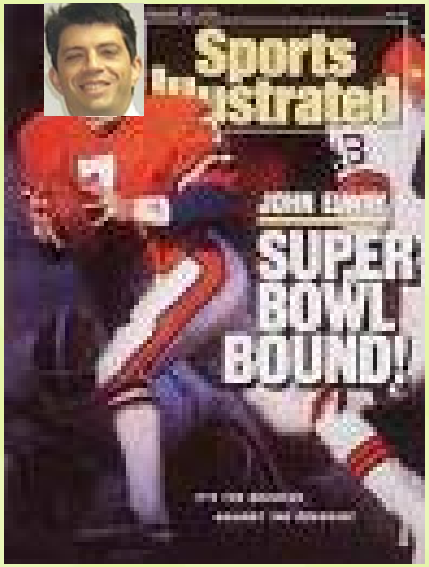


More Science vs. Superstition

The “Sports Illustrated Jinx”

Premise: Appearance on the Cover of SI leads to career demise





- **Softball Trophy**

-**Golf Tournament (Best ball)**

-Trivia Night at Ale House

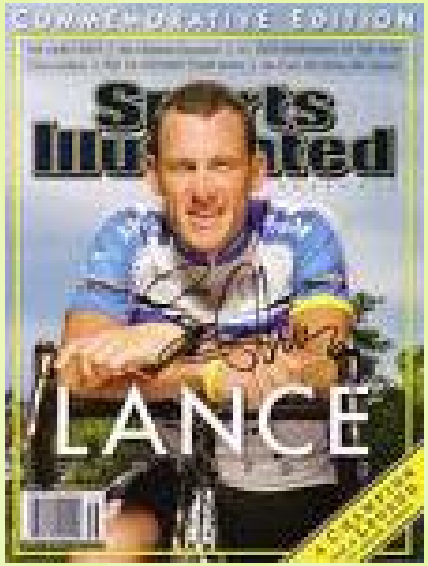
Could Happen Again

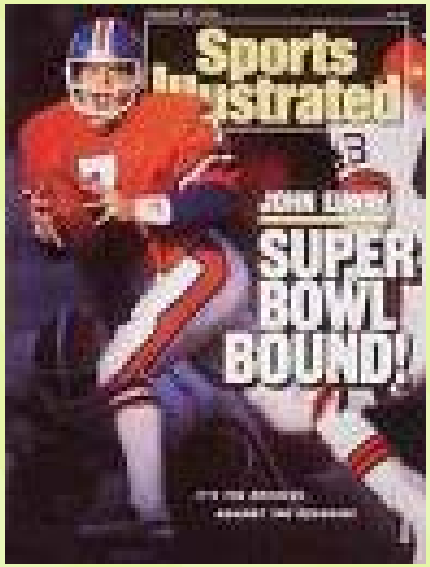
More Science vs. Superstition

The “Sports Illustrated Jinx”

Premise: Appearance on the Cover of SI leads to career demise

Actuality: Appearance often follows career highs…which are inevitably followed by natural dropoffs





Super Bowl ?

Gold Medal ?

Kentucky Derby ?

Reoccurance Less Likely

Sources for Performance Indicators

- –Peer Statistics
- –National Standards and Benchmarks
  - •Research Organizations: TRB, TTI, CUTR, T2 Centers
  - •State and Federal Databases: Census, NTD, NHTSA, Florida Traffic Crash Facts, etc.
- –Consultant Data
- –Self-generated
  - •Initial baseline revised over time

Some Effective Performance Monitoring Examples

Small Transit-Intensive Cities

Indicators:
Passenger Miles/Vehicle Miles
Passenger Miles Per Capita

Standards:
Average for UZAs with populations from 200k – 1 million

Incentive:
Funding implications – accurate data collection

TQOS Performance Monitoring

Effective Measures

- Service Coverage to TOI areas

Questionable Measures

- Hours of Operation

Ineffective Measures

- Passenger Loading

Emerging Trends:

Monitoring Transportation and Land Use Performance

Macro Variables:

“By 2020, Increase Population within 1.5 miles of regional employment centers by 20%”

-Treasure Coast Transportation Plan

Micro Variables:

Street Network Performance

-US EPA, ICF Kaiser Engineering

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Table 2. Roadway and Block Measures for the 13 Study Regions.

	Centerline miles per sq. mile	Intersections per sq. mile	Percent 4-way intersections	Percent major-minor intersections	Median block size (acres)	Percent of blocks under 4 acres
Philadelphia	10.6	57.1	27.9%	22.6%	3.9	51.4%
Atlanta	7.8	31.3	14.6	24.8	8.9	23.3
Houston	10.5	50.9	32.8	19.0	5.8	34.4
Pittsburgh	10.6	59.0	27.9	24.7	2.7	65.3
Tampa/ St. Petersburg	11.9	68.5	26.8	20.4	4.0	50.0
St. Louis	11.4	58.7	24.7	24.8	5.2	35.5
New Orleans	17.0	106.8	52.2	32.1	3.1	63.8
Charlotte	7.9	34.7	17.4	25.9	7.8	23.5
Nashville	8.3	33.3	21.3	26.8	7.9	24.3
Omaha	12.7	70.7	33.2	23.6	4.8	37.5
Little Rock	10.4	54.7	30.1	32.2	3.7	52.5
Erie	11.1	54.9	38.3	27.1	5.4	29.0
Binghamton	9.6	46.0	21.4	28.2	5.1	35.5

Performance Monitoring

- Is there anything that dosen't look right?
- Is there evidence of causation?
- Has there been opportunisitic selection?
- Is anything being witheld or overlooked?

Source: Stephen Campbell, PhD "Flaws and Fallacies in Statistical Thinking"

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- Fully Integrate Performance Monitoring into the Planning Process
- Tie to Objective Development
- 9J5 Definition: “Objective” means a specific, measurable, intermediate end that is achievable and marks progress toward a goal

- Sound Performance Monitoring:
  - Measure Results, not Effort
  - Consult Reputable, Available Sources
  - Develop Sound Methodology
  - Periodically reevaluate and modify