Motivation

- Statistics has great potential to impact the performance of a wide range of businesses
- And yet, many business statisticians feel they have
  - marginal influence on key business decisions, or
  - less intellectual stimulation than anticipated, or
  - both,
  - unless they are part of research teams (and these opportunities are becoming rarer)
- What can we do to attain job satisfaction?
Synopsis

- Some typical business statistics problems
- Thinking like a business person
  - Presenting analysis
  - Presenting data
- Knowing the business
  - Knowing the business, really
  - Recognising human psychology
- Seeking intellectual stimulation

Business statistics problems

- Credit scoring models
- Risk management models
- Customer profiling and segmentation
- Predictive response models
- Marketing / industrial experiments
- Quality control, Six Sigma
- Survey research analysis
- Conjoint models
- Choice models
Thinking like a business person

- Presenting analysis
  - Focus on key takeaways, not process
  - Reverse scientific deduction
  - Eradicate jargon
  - Be parsimonious

- Presenting data
  - Use graphics
  - Use annotations

Presenting analysis like a scientist

- Business problem: Why do some customers leave the franchise?
- Analysis: Elimination of hypotheses

Hypothesis A: Lost to competitor → Rejected
Hypothesis B: Lost to ipods → Rejected
Hypothesis C: Lost to internet → Rejected
Hypothesis D: Faulty radios → Rejected
Hypothesis E: Service incident → Plausible: further analysis to confirm

Scientific argument
Presenting analysis for a business audience

Hypothesis A: Lost to competitor
Rejected

Hypothesis B: Lost to ipods
Rejected

Hypothesis C: Lost to internet
Rejected

Hypothesis D: Faulty radios
Rejected

Hypothesis E: Service incident
Plausible: further analysis to confirm

Business case

Presenting data in science

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Scientific journal

- Primary concerns
  - Comprehensive
  - Precise
  - Technical
Presenting data in business

Country is most predictive of aggression

Country effects are relatively strong

All other effects are relatively weak

Correlated with higher aggression

Knowing the business

- Crucial to understand the business context
  - Finance: How does a company make money?
  - Psychology: How are decisions made? What incentives motivate the work force?
  - Marketing: What is the customer life cycle? What affects customer behavior?

- How to pick up the knowledge?
  - Nothing beats on-the-ground experience
  - Business news and magazines (Wall Street Journal, Financial Times, Economist, Business Week, Fortune, Forbes, CNBC, etc.)
  - MBA courses
  - Business books
  - Unconventional: Dilbert, The Office, etc.

Adapted from Kastellec & Leoni (2007)
Recognising human psychology

- Trust intuition (experience) should data or logic fails to “make sense”
- Inconclusive or negative results are a waste of time
- When in doubt, search harder

Intellectual stimulation

- If managed well, employees will have opportunity to pursue intellectually challenging projects
- Plenty of unsolved business problems
  - Reject inference
  - Missing data problems
  - Rare event prediction
  - Observational data
  - etc.
- Business impact is a bonus, not a given
Reading

- Tufte, Wainer, Gelman, Junk Charts
- Kahneman, Tversky and associates
- Davenport & Harris: Competing on Analytics
- Ayres, Supercrunchers
- Lewis, Moneyball
- Heath & Heath: Made to Stick
- Fisher and Ury: Getting to Yes
- Higgins: Analysis for Financial Management
- Taleb, Fooled by Randomness or The Black Swan