



How Will Predictive Modeling Change the P&C Industry in the Next 5-10 Years?

CAS Predictive Modeling Seminar
San Diego
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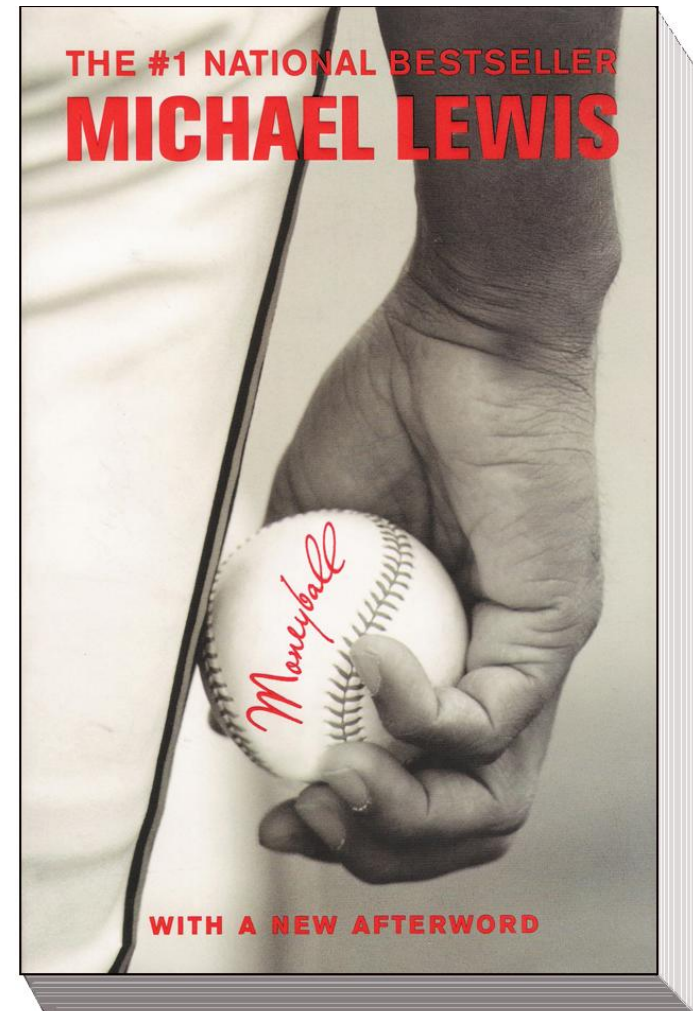
Prefatory Remarks
Jim Guszczka, Deloitte Consulting

The Problem with Prediction

- A grand unifying theory of baseball, movies, and physics:
- “It’s tough to make predictions, especially about the future.”
 - Yogi Berra
- “Never make forecasts, especially about the future.”
 - Samuel Goldwyn
- “It is exceedingly difficult to make predictions, especially about the future.”
 - Neils Bohr

And Yet...

- Billy Beane and Paul DePodesta transformed the business of professional baseball by using predictive analytics to select players for the Oakland As.
- **Key insight:** the market for baseball players had been *inefficient* because the art of selecting players had been rooted in tribal wisdom and “professional judgment”.
 - Analytic decision-making outperformed seasoned baseball scouts.
 - Despite low payroll, Beane was able to “run circles around taller piles of cash”.
 - Michael Lewis, *Moneyball*



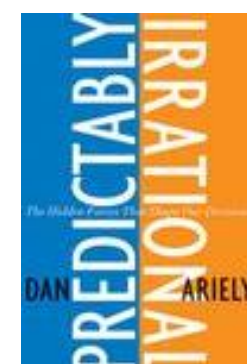
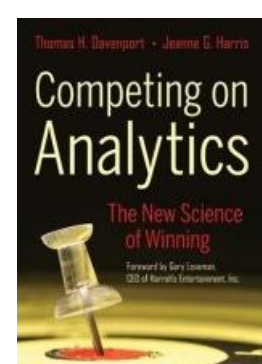
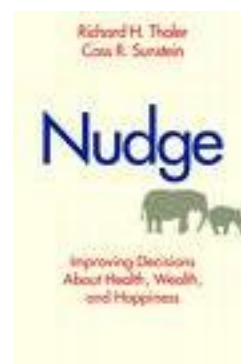
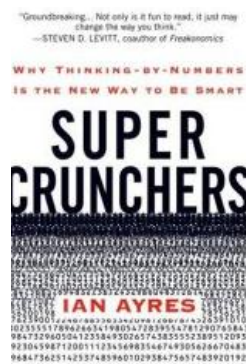
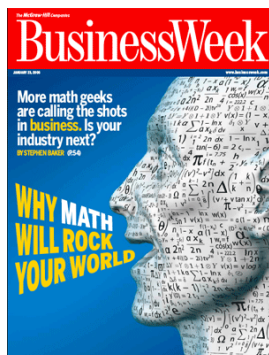
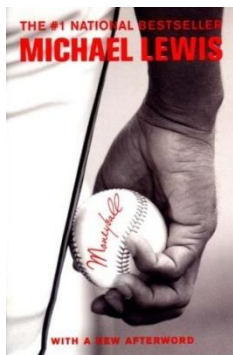
And Yet...

- “In Hollywood, nobody knows anything.”
 - Samuel Goldwyn, *Adventures in the Screen Trade*
- But maybe the predictive modelers do.
 - Neural Net models have been built to predict box office receipts based on predictive variables derived from the scripts.
 - Are today’s movie moguls like yesterday’s baseball scouts?



Analyzing Analytics

- Growing recognition in cognitive psychology & behavioral economics:
Predictive models help human experts make decisions more accurately, objectively, and economically.
 - Academic / psychological research dates back to the 1950's.
 - Now a growing consensus in the worlds of business, education, law, government, medicine, entertainment, ... and professional sports.
- Predictive modelling is the ultimate "transferable skill" – it applies in domains where experts must make decisions by judgmentally synthesizing information.
 - **"Human judges are not merely worse than optimal regression equations; they are worse than almost any regression equation."**



(Ir)rational Expectations

- Behavioral economists' assessment of *Moneyball*:

“The problem is not that baseball professionals are stupid; it is that they are human. Like most people, including experts, they tend to rely on simple rules of thumb, on traditions, on habits, on what other experts seem to believe. **Even when the stakes are high, rational behavior does not always emerge.** It takes time and effort to switch from simple intuitions to careful assessments of evidence.”

– Cass Sunstein & Richard Thaler review of *Moneyball*

- Traditional insurance underwriting: analogous to baseball scouting.
- We have consistently been able to build underwriting models with significant segmentation power.
- Implication: **“rational behavior had not emerged”** prior to the success of underwriting models.
 - More grist for the behavioral economists' mill
 - ... and motivation for future actuarial work.

Predicting Predictive Modeling

- In summary: Human decision makers are indispensable... but they do better jobs with predictive models in hand.
 - Baseball scouts ~ traditional underwriters
 - Paul DePodesta ~ “Super Crunching” actuaries
 - Note bene: the best underwriting models result when underwriters *collaborate with* actuarial modelers.

- In the next 5-10 years...
- Other areas in P&C where “equations can aid the experts”:
 - Workers Comp premium audit
 - Claim triage
 - Fraud detection
 - Market-based pricing, consumer choice models, elasticity modeling, ...
 - Cross-sell, target marketing
 - Individualized customer support
 - Hiring new agents (even more direct analogy with *Moneyball*)
 - Helping design ad campaigns (analogy with movie predictive model)

What's It All About?

- Much attention has been paid to the ways in which predictive modeling is able to refine traditional actuarial methodologies.
 - Cost-based pricing using GLM
 - Stochastic loss reserving
- But predictive modeling will mean more to the P&C industry than this.
- Predictive modeling will increasingly be regarded as a **core competency** around which forward-thinking P&C companies will fashion their competitive strategies.

Reference

“Analyzing Analytics – the Debate Between Intuition and Statistical Thinking”, James Guszczka, *Contingencies*, July-August 2008