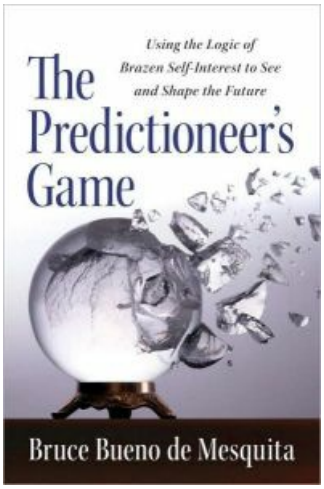

Book The Predictioneer's Game

Using the Logic of Brazen Self-Interest to See and Shape the Future

Bruce Bueno De Mesquita
Random House, 2009
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Recommendation

Game theorist Bruce Bueno de Mesquita has a successful record of applying game theory to predicting the outcome of critical foreign policy issues. Among his other accomplishments, the author achieved a 90% accuracy rate in forecasts for the U.S. government, often about the future direction of other countries. In this book, he applies game-theory analyses to complex questions about such public policy issues as the development of nuclear weapons in North Korea, the potential for Iraq to ally with Iran, and the risk of a major war between Israelis and Palestinians. To illustrate the numerical framework of games, Bueno de Mesquita also features examples that model mundane behavior, such as shopping for cars or choosing which movie to watch. Though the book is thick with passages that focus on foreign policy, *BooksInShort* nonetheless recommends it to executives who want to learn how experts use game theory to predict and engineer the future.

Take-Aways

- Games, which are simulations of actual situations, can help predict the future.
- A "predictioneer" uses game theory to predict and engineer the course of future events.
- Game theory presumes that self-interest guides everyone's rational behavior.
- Games are either cooperative or competitive: Charades is a team-oriented game, while poker relies on deceiving other players.
- Reducing verbal or written information to numbers – which is critical to modeling outcomes – is relatively easy.
- Game design begins with a four-step process: First, identify all the players, not just the decision makers.
- Game design begins with a four-step process: First, identify all the players, not just the decision makers.
- Third, assign numerical values to reflect the significance of the issue to each player, and fourth, rank each player's power to sway the others.
- The hardest part of game design is identifying and addressing the most decisive element in an uncertain situation.
- Badly designed incentives can trump game theory's warnings and insights.

Summary

Selfishness and Foresight in Game Theory

Selfishness is the key presumption in game theory, and for good reason. People reliably defend their self-interest; true altruism is an anomaly. This presumption of self-centeredness guides the design of mathematical games that reveal probable outcomes from a wide range of circumstances. To predict the outcome of an issue, begin by assessing the motives of the "stakeholders," the individuals who have an interest in the result, and consider how important the issue is to each person. Knowing how stakeholders will respond to certain facts and beliefs is the first step in accurately predicting their future behavior.

"It is possible for us to anticipate actions, to predict the future, and, by looking for ways to change incentives, to engineer the future."

Shaping the future, of course, is more valuable than just predicting it. One effective way to engineer results is to present information that alters other people's beliefs. A "predictioneer" uses such tools from the field of game theory to predict and engineer the future. "Predictioneering" is useful in all sorts of tasks, from purchasing a car to acquiring a company, addressing environmental problems or studying terrorist threats. The same steps apply, regardless of the situation: After determining the needs of all important stakeholders, work on shaping their beliefs and directing the sequence of events to influence the outcome.

"By estimating carefully people's wants and beliefs, anyone can make a reliable forecast of what each and every one of them will do."

Consider, for example, the task of buying a car. Your very presence at an auto dealership puts you at a disadvantage in terms of striking a good bargain. In game theory terminology, simply showing up at a dealership is a "costly signal" that you're a captive consumer who probably will make a purchase. Once you're there, you're also subject to sales games designed to get you to pay the highest possible purchase price. But car shoppers can get much lower prices if they know exactly what model they want, even the color, and use the telephone to get it. Call several dealerships and announce plans to buy a car by the end of the day. Ask each salesperson his or her lowest price. Refuse to negotiate over extra items. Ignore assertions that a particular type of car is in short supply. This phone-based approach eliminates the body language messages that many shoppers convey unconsciously and that salespeople use to their advantage. Using the phone instead of visiting dealerships transforms a sales game into a shopper-controlled auction.

Games, Knowledge and Belief

Two types of game theory predominate. John von Neumann and Oskar Morgenstern wrote a book about "cooperative" game theory in 1947. In a cooperative game, honesty prevails. The players' statements match their actions. For example, charades is a cooperative game that requires players to perform together as a team in pursuit of a common goal.

"Decision making is the last frontier in which science has been locked out of government and business."

John Nash, the Nobel Prize-winning mathematician, is known for his theory on the prevalence of "noncooperative," or competitive, games that reward deception. Players in noncooperative games misrepresent their intentions to gain advantage, or "leverage," over their opponents. In short, "lies are a part of strategizing." In poker, for example, players can win by communicating false signals of confidence that belie their awful cards.

"The view of people as cold, ruthless and self-interested is at the heart of game-theory thinking."

Individuals and institutions tend to avoid or to break commitments that violate their self-interest. This tendency is ubiquitous in the business world. Many firms breach contracts that become unexpectedly unprofitable, even if the breach exposes them to legal liability. Similarly, politicians sometimes fail to keep costly campaign promises after they win elections.

"Game theorists use mathematics to work out what people are likely to do."

Pay careful attention to your stakeholders' statements and actions to determine the types of games they are playing. Learn to understand your opponents' true motives by identifying discrepancies between what they say and what they do. In the terminology of game theory, players learn more about each other – or become "updated" – during each round of moves and countermoves in a game.

"Even in relatively simple games involving relatively few players there can be multiple outcomes."

Distinguishing knowledge from belief is important. In many games, the winning player estimates what other stakeholders believe and know about a situation, and then influences the other participants' beliefs to engineer an outcome. In some games, engineering a preferred outcome involves developing a consensus of belief among a coalition of stakeholders.

Reducing Words to Numbers

To use game theory to assess the probability of an outcome, convert the data on hand into mathematical form. Turning verbal or written information into numbers is easier than you think. Imagine several friends who want to watch a movie and who are considering two choices, "The Sound of Music" and "A Clockwork Orange." Give anyone who strongly prefers "The Sound of Music" a score of 100, anyone who strongly prefers "A Clockwork Orange" a score of 0 and anyone who is purely indifferent a score of 50.

"Everyone shares these two goals: Get their preferred outcome, and get credit for any outcome."

Give a score of 40 or 45 to someone who slightly prefers "A Clockwork Orange," or a score of 55 to 60 to someone who leans a bit toward "The Sound of Music." Then adjust these scores based on the importance, or "salience," that each person attaches to attending the movie he or she prefers. Adjust these scores again based on the ability of each friend to influence the others. If most of the final scores exceed 50, "The Sound of Music" is the optimal choice. If most of the scores are below 50, "A Clockwork Orange" is the best option.

"It's essential to turn information into numerical values, and in fact it's not especially hard to do."

People generally make such calculations in their heads without formally expressing them in mathematical terms. However, one primary purpose of reducing information to numbers is to compare numerical forecasts against instinctive views of the future and determine if they converge or diverge.

Predicting the Future in Four Steps

Many news reports have depicted North Korean dictator Kim Jong Il as a quirky leader – possibly with a loose grasp on sanity – who easily could start a war. But his posturing as an unpredictable force is purposeful and rational. Kim has resisted efforts by the US government to discourage development of nuclear weapons in North Korea, and his resistance has been a signal to the US and the rest of the world that the cost of agitating him could be war.

> "Getting the data is not that hard. The more difficult question is how to frame the issue so that we answer the right question."

How can the world reduce the threat of a nuclear war involving North Korea? A 2004 study based on game theory identified more than 50 players with influence over North Korea's nuclear ambitions; the most important were Kim Jong Il and former US President George W. Bush. Researchers obtained all the information for the study from newspapers, magazines and other publicly available sources. The study predicted that North Korea would eliminate its nuclear technology program in return for concessions from the US. The predicted pact was remarkably similar to an actual agreement between the two nations in 2007.

> "The greatest value of a model is when it provides an insight that is contrary to the decision makers' expectation."

That foresight stemmed from the four-step process researchers used to produce the study. This flexible process, based on game theory, is applicable not only to North Korean disarmament but also to many other types of tasks, large and small. The purpose of this four-step process is to create a mathematical model, or rules-based game, to predict future events. The steps are:

1. **Identify every important player** – Avoid focusing only on those who make the final decisions. In modeling a path toward agreement between North Korea and the US, for example, game theory required careful research and analysis of dozens of players, not just Kim Jong Il and George W. Bush.
2. **Determine what each stakeholder truly wants and what each may settle for** – Stakeholders whose preferred outcomes fail to materialize tend to support those alternative outcomes that are closest to their own. In the 2004 computer model of negotiations between North Korea and the US, Kim Jong Il agrees to eliminate nuclear weapon development in exchange for US concessions. Such concessions essentially mean foreign aid, which is a source of wealth that helps Kim control and boost his internal supporters who are best positioned to repel challenges to his rule.
3. **Assess the importance of the issue to each stakeholder** – The issue may have more salience for some people than for others; estimating salience allows a game theorist to compare the powers and priorities of all players.
4. **Rate the influence of each stakeholder** – Determine which people are most likely to influence the behavior of others. Such information helps a game theorist predict a probable sequence of events that could unfold as players make moves and countermoves. In complex game modeling, theorists use computers to account for such player variables as influence and salience.

Getting the Framework Right

The most difficult task in practicing game theory is correctly outlining the contours of a problem. In a proposed business acquisition, for example, settling on a fair price is an important consideration, but it may not be the decisive factor. Consider a doomed proposal to merge two companies in the pharmaceutical industry: The terms were mutually agreeable but the corporate marriage never happened, mainly because the chief executive officers of the two companies detested one another. In contrast, a French bank and a German bank merged because terms of the deal allowed the German senior management to remain in Heidelberg instead of relocating to Paris, as originally planned. Without the Heidelberg concession, the process would have failed to produce a merger.

> "Prediction can look backward almost as fruitfully as it can look forward, providing remarkable insight not only into what happened but also into what might have been."

Proficient creators of games use them to test hypothetical answers to specific questions, not vague inquiries. Consider two questions addressing the conflict between Israelis and Palestinians. This one is too vague: How can both sides reduce the risk of violence against each other? By contrast, a more specific question is more useful in game modeling: What must both Israel and Palestine do to maximize their tax revenue from tourism? For example, hypothetically, if each nation got a share of the other country's tourism-related tax revenue, Israel and Palestine would have a self-reinforcing reason to avert military confrontations that scare away tourists.

When Incentives Trump Insights

Badly designed incentives are among the biggest impediments to success in diplomacy, business and other fields. This was a central problem at Arthur Andersen, the defunct accounting firm. The once prestigious US firm failed because it discounted the potential legal liability of auditing risky companies. One such company, Enron, collapsed after issuing financial statements with fraudulent flaws that Arthur Andersen auditors did not detect. But the accounting firm's main problem was internal: Many senior partners recklessly took on risky corporate clients just before retiring. This boosted their individual income from the firm's retirement plan, but this was a bad incentive that predictably led to bad results.

> "Any predictioneer worth his or her salt must be willing to risk the embarrassment that comes from being wrong."

In 2000, Andersen commissioned a mathematical analysis that scored organizations based on their propensity to commit fraud. Using publicly available information and methods derived from game theory, analysts found that companies with the highest scores were most likely to defraud investors, and few had higher scores than Enron. But Andersen declined to apply the analysis to Enron and its other corporate clients, presumably because the accounting firm wanted to avoid a steep decline in its revenue. In 2002, however, Andersen surrendered its US licenses to operate after a federal court found it guilty of criminal charges arising from its audits of Enron.

With a less toxic set of incentives for senior partners, the management of Arthur Andersen might have seen the game-theory analysis in a more positive light. The outcome of a computer-modeled game is not a perfect substitute for the informed judgment of skilled and experienced managers. However, a well-modeled game can reveal a bias in managers' judgments by forecasting outcomes that diverge from commonly accepted scenarios. Numerical games are just games, of course. But numbers, at least, don't lie.

About the Author

Bruce Bueno de Mesquita is the Julius Silver Professor of Politics at New York University and a senior fellow at the Hoover Institution at Stanford University.