

The Social Sciences and Innovation in Gaming

By MARGARET M. MCCOWN

This is a fascinating time to be a gamer, particularly one developing policy games. The types of problems to be gamed, the technical support available to do so, and the importance of exercises' findings all seem imbued with unusual potential and urgency. The security challenges that we capture and present in strategic games are increasingly characterized by transnational, networked, and multilevel domestic, national, and international factors, all of which require new or, at least, *sharpened* tools to represent and assess. At the same time, a range of new tools, from distributed computer gaming systems to virtual reality, has become available. This article argues, however, that for practitioners writing virtually any game, the social sciences—economics, political science, and sociology—constitute the single most important source of both substantive theory and methodological insight.

The simple explanation behind this assertion is that almost all strategic level policy problems are also social science problems; they concern how actors, whether individuals, groups, bureaucracies, social movements, or nations, make calculated decisions with respect to their interests and environment, construct social institutions and rules to further those goals, and compete for goods allocated in ways influenced by all of the above. This article briefly highlights some ways in which social scientists have theorized and tested hypotheses about how and why actors make and break rules, and the relevance of these efforts to gaming.

Game Theory Is Not a Theory of Gaming

Game theory is, of course, the social science tool mostly widely associated with gaming. Game theory is not a theory of wargaming, policy gaming, or strategic gaming, but rather a tool of applied mathematics used widely across the social sciences.

If one is writing and executing tabletop exercises, one is, in fact, doing almost the opposite of game theory—but it is useful to review the discipline nonetheless, for its approach yields concepts useful to gamers in both their parsimony and generalizability.

Game theorists create mathematical models of interdependent decisionmaking. These models represent how rational players make calculated decisions, anticipating other players' reactions on the basis of their preferences that yield certain outcomes. In other words, a game is some set of rules, giving a group of players choices that result in different payoffs. The “game” is for players to determine the choice that gets them the biggest payoff, taking into account the ways that they anticipate other players responding to them.¹ Taken together, these concepts—rational actors, rules presenting players with some set of choices, and outcomes with some payoffs—define the game.

In tabletop exercises, designers do not express these factors in diagrams or equations but rather in detailed scenarios rich in contextual detail. Even though the “rules” may be no more elaborate than a description of the state of the world within the game and the instruction that players should describe their best response to it, these key elements are embedded within every good scenario: some set of rules that shape the players' options—options that will have different potential payoffs and can be assumed to elicit some reaction from other players. Games may hold some factors constant (such as a game with only a blue team, in which the reactions of “opponents” are not explicitly projected) or just describe them cursorily (a scene-setting scenario that tells participants which sandbox they are playing in and the context that shapes their decisions but that may not restrict their decision options beyond that). But it is useful for gamers to keep in mind that an effective exercise will have all of these components explicitly or implicitly and, just as important,

the postexercise analysis should address them and explain why they were instantiated as they were.

Game theory, then, gives analysts a means of thinking systematically about complex, multistage, interdependent decisionmaking and the factors that go into it. The different constituent parts of games—rationality and individual decisionmaking, the rules of the game, and the incentives they create—have stimulated further empirical social science research of relevance to exercise designers.

Homo Economicus

Game theory assumes players are rational, which is to say they will be able to identify and select the outcome most beneficial to them from the options and tradeoffs available to them. Since we know that most individuals do not pause with every choice they make in a day to contemplate all possible decisions, calculate the relative benefit they might get from

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each, and then order these choices in terms of benefits, this assumption has prompted a great deal of research on how individuals and groups do actually make decisions if they do not act like game theorists' *homo economicus*. In fact, the assumption works pretty well at predicting behavior, on aggregate.

But experimental research shows there are some interesting ways in which people

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consistently deviate from the assumption in what is often called “boundedly rational behavior.” Several well-known examples have to do with how people make calculations with respect to risk. For instance, people tend to make risk-averse choices if the expected outcome of their decision is positive, but make risk-seeking choices to avoid negative outcomes. And their decisions can be changed simply by reframing the descriptions of the outcomes without changing the actual benefit they get from them. This is called the “pseudo-certainty effect.” People also frequently fall prey to the “sunk costs fallacy”—continuing an endeavor once an irretrievable investment has been made, despite knowing that it does not change the probability of an ideal outcome. The literature examining the ways in which people do and do not deviate from perfect rationality is interesting and relevant for a whole range of policy games, such as those that investigate the dynamics of bargaining processes or the impact of perceived risk on decisionmaking in crisis simulations.

Institutions

A second social science literature of great relevance to gamers is that on institutionalism. Institutions are understood by social scientists as formal and informal norms, from social conventions to contracts to laws and constitutions that shape (and are created by) human interaction. In the game of politics, for instance, the constitution sets the rules of the game, defining who can play, when, and how. The structure of rules guides outcomes in pervasive ways. For example, an electoral system relying on proportionate representation, assigning seats in a legislature proportionate to the number of votes won nationwide, will tend to create the more direct link between voters and parties—as well as a large number of parties and greater likelihood of coalition governments.

Institutions create incentives for behavior, and depending on how complex they are, anticipating the way outcomes are shaped by these incentives may be difficult. The Israeli electoral changes of 2002 are a now famous example of the potential for unintended consequences to institutional change. There was gathering concern in Israel throughout the 1980s and 1990s about coalition politics and a perception that small parties, and particularly religious parties, had gained disproportionate influence, weakening the discretion of the prime minister in forming

coalition governments. The constitution was changed, requiring, among other things, that the prime minister be directly elected rather than the leader of the largest party to successfully form a coalition. Although the goal of these reforms was to strengthen the power of the prime minister in forming a coalition, in the first election after the law was changed, the power of the two largest parties was weakened. Direct election of the prime minister had the effect of electing heads of government who were separate from the largest parties in

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parliament, severing the link between party size and executive influence. It gave small parties more leverage to bargain with large parties and extract concessions in exchange for support, and it created a disincentive for constituents to vote strategically, casting a vote for a larger party they might prefer less but that they anticipate having greater power.

Institutions shape the incentives, payoffs, and winning strategies of all players in all games. The social sciences have extensively explored the consequences of different institutional arrangements, their impact on power distributions, the processes that undergird changes in them, and their micro-foundational roots in human decisionmaking. This work presents a rich set of hypotheses and empirical findings that could easily be explored in games examining issues as varied as the effect of different Iraqi constitutional arrangements to the efficacy of different stability and reconstruction measures in far less developed countries. The impacts of changes in the norms, formal and informal, that govern international relations or the structure of international organizations are also issues that seminar games are ideal for investigating.

Incentives Matter

One of the basic and most fundamental takeaways of the social science literature is that incentives matter and that they are shaped by the institutional rules of the game. These rules matter so much that they can

easily induce players, anticipating retaliation from others, to make rational choices that are suboptimal relative to those that could be achieved through cooperation. An entire thread of game theory is devoted to using models to suggest these counterintuitive findings. Tabletop exercises are not as parsimonious as mathematical models and not as specific about the rules and payoffs that shape outcomes, but this can be an advantage. A seminar game could constitute an excellent opportunity to weigh the incentive problems inhibiting, for example, cooperation in matters such as governance of the global commons. If one of the things that qualitatively specified games do well is collate expert knowledge, then they could be particularly effective at eliciting discussion about the ways in which certain institutions described in the scenario may create perverse incentives, giving policymakers a head start on identifying unintended consequences of decisions.

The social sciences and associated analytical tools, even game theory, do not provide theories of gaming per se. However, because much discourse and research revolves around questions and structures that have direct parallels and applicability to gaming, their insights have great relevance to exercise designers. Many social scientists have long been accustomed to thinking more rigorously about how the factors that are also the constituent parts of games work as well as the implications of different specifications of them. Moreover, problems attacked by both social scientists and gamers are essentially the same. For all of these reasons, extant work in economics, political science, and sociology should be the first point of departure for gaming practitioners looking for theory, methods, and ideas. **JFQ**

NOTE

¹ Although securities studies professionals often think of “strategic” as referring to the level of analysis above the tactical and operational level, in the context of a game theoretic model (and of the social sciences generally), it simply means the decision a player makes, taking into account what he anticipates opposing players doing in response to his choices.