
Negotiation Analysis: From Games to Inferences to Decisions to Deals

James K. Sebenius

Exemplified by the pioneering work of Howard Raiffa and often expressed in the pages of Negotiation Journal, the emergent prescriptive field of “negotiation analysis” progressively developed from Raiffa’s early contributions to game theory and to his later foundational work in statistical decision theory and decision analysis. Drawing from each of these fields but methodologically distinct from them, negotiation analysis has mainly adopted an “asymmetrically prescriptive/descriptive” orientation. It develops the best possible advice for what one or more parties should do conditional on empirically grounded assessment of what the other side(s) actually will do. An extensive negotiation analytic literature has developed, often making the traditional assumption of a well-specified and fixed situation for analysis. Relaxing this requirement, however, more recent work systematically puts the “setup” of a negotiation itself — its parties, their interests, their no-deal options, the sequence and process choices or design — into the realm of strategic and tactical choice.

Key words: negotiation analysis, decision analysis, game theory.

James K. Sebenius is the Gordon Donaldson Professor of Business Administration at the Harvard Business School in Boston, the director of the Harvard Negotiation Project, and a founder and principal of Lax Sebenius: the 3-D Negotiation Group, a negotiation advisory firm. His e-mail address is jsebenius@hbs.edu.

Introduction

Negotiation Journal has published work representative of many intellectual traditions over its first quarter century. At the Program on Negotiation (PON), the journal's sponsoring entity, an eclectic group of scholars has likewise developed multiple approaches to the challenges of negotiation, mediation, and conflict resolution. By far, PON is best known for its development of "interest-based" negotiation, a concept that underpins the best sellers *Getting to Yes* (Fisher and Ury 1981; Fisher, Ury, and Patton 1991), *Getting Past No* (Ury 1991), *Difficult Conversations* (Stone, Patton, and Heen 1999), *Beyond Reason* (Fisher and Shapiro 2006), and other influential prescriptive works that elaborate an interest-based approach. But along with a great many academic institutions, PON has nurtured less popularly known, more formal streams of work generally associated with traditional academic disciplines such as economics and cognitive psychology. For example, PON-linked faculty have undertaken important game-theoretic and experimental investigations of negotiation-related phenomena, especially from a behavioral viewpoint.

Among these more formal streams of work, "negotiation analysis" has become most distinctively associated with Harvard and especially with PON cofounder Howard Raiffa, his students, and his colleagues. While Raiffa should properly be called the "father of negotiation analysis," this approach slowly evolved from earlier intellectual traditions to which Raiffa and various collaborators made decisive contributions. It is no exaggeration to say that Howard Raiffa essentially defined three distinctive fields — statistical decision theory, decision analysis, and negotiation analysis — and greatly influenced several others including game theory.

There is no better way to understand the nature and origins of negotiation analysis than to track the highlights of Raiffa's intellectual trajectory. In tandem with a brief account of these highlights, in this article I explain the conceptual foundations of negotiation analysis, especially in comparison with game theory, decision analysis, and relevant behavioral traditions. I conclude with a look at ongoing developments in negotiation analysis and its close cousins by a number of people working in the area.

Howard Raiffa and the Intellectual Origins of Negotiation Analysis

Game Theory

As a graduate student in mathematics at the University of Michigan in the early 1950s, Raiffa was drawn to the excitement of game theory, which had been launched by John von Neumann and Oskar Morgenstern (1944) with their magisterial *Theory of Games and Economic Behavior*. Game theory held the high promise of characterizing a wide variety of human "strategic" interaction — the moves and countermoves in cooperative and competitive

situations — using a small number of scientific principles. In 1957 Raiffa coauthored with psychologist Duncan Luce his first major work, *Games and Decisions* (Luce and Raiffa 1957), which presented a powerful and lucid synthesis, major extension, and searching reconsideration of the limits of this game theory roughly a decade after its founding. To this day, *Games and Decisions* remains a standard, notable in particular for the tight relationship between its precise mathematics and underlying human phenomena. Much of game theory, both before and after, stood out for its mathematical elegance but often seemed to lose sight of its supposed links to actual conflict and cooperation. Moreover, as I elaborate below, game theory's emphasis on "equilibrium" solutions sharply limits its prescriptive value for many classes of negotiation problems.

From Game Theory to Statistical Decision Theory

If *Games and Decisions* explored the interaction of self-interested, consciously "strategic" players, Raiffa's attention increasingly turned to a critical subset of this class of problems, namely that of individual decision making or "games against nature." More precisely, these are decisions under uncertainty whose outcomes depend on uncertain or "chance" events whose occurrence is best represented probabilistically. For example, success in drilling for oil depends on the chance event — from the driller's subjective perspective — of whether oil is present underground, not on "nature" taking countermoves to outwit the driller. Working closely with Robert Schlaifer and John Pratt in the early 1960s, Raiffa essentially defined the area of "statistical decision theory" in two books: *Introduction to Statistical Decision Theory* (Pratt, Raiffa, and Schlaifer 1995) and *Applied Statistical Decision Theory* (Raiffa and Schlaifer 2000).

Traditional or "classical" statistical methods — the stock in trade even of the great majority of social scientists to this day — generally rely on "objective" probabilities and do not typically take into account prior beliefs or evidence about the phenomenon under investigation. By contrast, the more sophisticated "statistical decision theory" developed by Raiffa and his colleagues used Bayesian methods to incorporate wide classes of "subjective probabilities" into formal analyses as well as to combine new data and evidence with prior views to produce updated inferences. (Familiar "objective probabilities" are most closely associated with repeatable events such as coin tosses or dice rolls that can be interpreted in terms of their relative frequencies. For example, there is a one-sixth chance of a two coming up on a single roll of a fair die. Among other characteristics, rigorously assessed "subjective probabilities" extend the logic of objective probabilities to uncertain events that do not permit meaningful interpretations in terms of repeatable, relative frequencies. For example, in an otherwise unique situation, Howard might "judgmentally assess" a one-third chance that David would walk away from a potential deal.)

From Statistical Decision Theory to Decision Analysis

If statistical decision theory offered an elegant means to incorporate subjective uncertainties into decision problems, the work was still very much in the spirit and form of mathematical statistics. By 1968, Raiffa had published a short, highly influential book, *Decision Analysis*, which essentially launched the field bearing this name. Almost engineering in spirit, decision analysis offered a robust, accessible means of making decisions under uncertainty. In essence, a decision analyst would approach a problem by disaggregating it into a sequence of choices and uncertain events together with a precise description of the possible consequences of each choice and each uncertain event in combination with the decision maker's attitudes toward time and risk. Careful assessments of the uncertainties and evaluations of the consequences transformed a qualitative problem into a quantitative one involving (often subjective) probabilities and values. The earlier work by Raiffa and his colleagues on statistical decision theory offered ready-made conceptual and computational tools to account for the elements of uncertainty while various analytic devices clarified the values at stake. Explicitly invoking a set of appealing axioms, these probabilistic and valuation factors could be precisely combined into a rigorously defined measure — “von Neumann Morgenstern subjectively expected utility” — that ranks different possible courses of action according to their desirability.

Decision analysis employed many influential concepts from game theory and economics, which purported to be *descriptively* accurate, that is, based on how people *actually* behave. But Raiffa's synthesis offered a resolutely *prescriptive* approach to individual decision making. In other words, he astutely realized that people do *not* actually make decisions in this logical, disciplined manner, as economic and game-theoretic models typically assume, but instead *should* wish to do so once they had thought hard about these problems. Indeed, the difficulties experienced even by bright students taking courses in decision analysis — understood as how one ideally *should* make decisions under uncertainty given precise, appealing assumptions — highlighted the distance between actual decision making and idealized, game-theoretic “rationality” assumptions. As such, decision analysis soon became the backbone of quantitative methods courses in schools of business and public policy worldwide, with a full complement of academics seeking to further the methodology and its application.

In subsequent years, Raiffa refined and advanced the decision-analytic approach with a series of coauthors, in particular extending it with Ralph Keeney to encompass common situations in which a single factor such as money is insufficient to capture the multiple attributes at stake in the outcome of a decision. Their work was reflected in *Decisions with Multiple*

Objectives (Keeney and Raiffa 1976), which offered heuristic and extensive mathematical techniques for making formal trade-offs among conflicting interests in individual decision making.

Further, Raiffa and others joined with prominent psychologists such as Amos Tversky to sharply distinguish among descriptive, prescriptive, and normative theories of decision making, approaches that are often confused; the product of a collaboration among David Bell, Raiffa, and Tversky (1988) became *Decision Making: Descriptive, Normative, and Prescriptive Interactions*. The marriage of decision analysis and systematic behavioral research gave rise to an important subfield, “behavioral decision theory,” which, along with many other developments in this thriving field, has been cogently characterized by Ward Edwards, Ralph F. Miles, Jr., and Detlof van Winterfeldt (2007) in their edited volume *Advances in Decision Analysis*.

From Decision Analysis Back to Interactive Decision Problems and Negotiation Analysis

In its most common form, decision analysis prescribes a systematic decomposition of the decision problem under uncertainty: structuring and sequencing the parties’ choices and chance events, then separating and subjectively assessing probabilities, values, risk, and time preferences. The von Neumann–Morgenstern expected utility criterion offers a simple method to aggregate these elements into a measure that explicitly ranks possible actions to determine the optimal choice. As noted above, this approach is especially well suited to decisions “against nature,” in which the uncertainties, such as the probability that a hurricane will strike Caracas in August, are not “interactive”; that is, they are not affected by the choices of other involved parties anticipating one’s actions.

But when decision making is *interactive* — as is true in negotiation, when each party’s anticipated choices affects the other’s and vice versa — assessment of what the other side will do qualitatively differs from assessment of “natural” uncertainties. Of course, the theory of games, Raiffa’s initial intellectual focus, was developed to provide a logically consistent framework for analyzing such interdependent decision making. In standard game-theoretic analyses, full descriptions of the courses of action open to each involved party are encapsulated into “strategies.” Rigorous analysis of the interaction of strategies leads to a search for “equilibria” or plans of action such that each party, given the choices of the other parties, has no incentive to change its plans. A great deal of analysis by game theorists seeks conditions for unique equilibria among such strategies.¹

Game theory has been especially useful for understanding repeated negotiations in well-structured situations. It has offered useful guidance for the design of auction and bidding mechanisms, has uncovered powerful competitive dynamics, has insightfully analyzed many “fairness” principles, and flourishes in many economic and other social science contexts. With

nonspecialist audiences in mind, a number of analysts have described some of the most useful contributions of game theory for understanding negotiating behavior.²

A fully rational “baseline” analysis helps one to understand the possible responses of a rational other side. Urging consistent, if not fully rational, behavior on the subject of one’s advice is often wise. After all, well-structured, repeated negotiations may penalize departures from rational behavior. Despite the evident value of game theoretic analysis, however, Raiffa and others realized that the dominant game-theoretic program to predict equilibrium outcomes resulting from the strategic interactions of fully rational players often lacks prescriptive power in negotiating situations. Many negotiating situations are neither well structured, repeated, nor embedded in a market context.

Furthermore, three more fundamental aspects of mainstream game theory often limit its prescriptive value. First, on standard assumptions, there are often numerous plausible equilibrium concepts, each with many associated equilibria — and no *a priori* compelling way to choose among them. Second, even where one party wishes to act rationally, the other side may not behave as a strategically sophisticated, expected utility maximizer — thus rendering conventional equilibrium analyses less applicable. A large and growing body of behavioral evidence suggests that people systematically and significantly violate the canons of rationality. (See Tsay and Bazerman 2009 in this issue.) Although negotiators normally exhibit purposive behavior, they many times depart significantly from the “imaginary, idealized, super-rational people without psyches” (Bell, Raiffa, and Tversky 1988: 9) needed to make many game-theoretic analyses work. Third, the elements, structures, and “rules” of many negotiating situations are not completely known to all the players, and even the character of what is known by one player may not be known by another. The frequent lack of such “common knowledge” fatally limits — from a prescriptive standpoint — much equilibrium-oriented game analysis. Even where it is possible to shoehorn such a situation into the form of a well-posed game and gain insights from it, the result may lose much prescriptive relevance. (See Sebenius 1992, 2002, 2007 for a more fully developed discussion of these points and their implications.)

Ironically, after his first intellectual milestone, the brilliant game-theoretic assessment of interactive decision making (*Games and Decisions*), Raiffa had largely refocused — via statistical decision theory and decision analysis — on noninteractive, individual decision problems “against nature.” But two decades later, he consistently found himself drawn back to interactive problems such as negotiation, in which the *joint* decisions of the involved parties mutually influence one another in determining outcomes. Considerable experience, however, had made Raiffa acutely conscious of the limits, briefly described above, of an

orthodox game-theoretic approach for developing good prescriptive theories.

Hence, he developed a hybrid approach that has become known as “negotiation analysis.” Not only did this approach seek to overcome key limits of game theory, it became a vital intellectual bridge. For years, a great scholarly divide had existed between work that was predominantly descriptive and that which was predominantly prescriptive. Analysts such as game and mathematical economists generally explained what “rational” people *should* do, while organizational and social psychologists, for example, often focused on describing and explaining what real people *actually* do. While there were exceptions, the intellectual divide was generally real and ran deep.

Raiffa’s integrative perspective on negotiation, however, was explicitly “asymmetrically prescriptive/descriptive,” that is, advising one side what it should do — conditional on what the other side is most likely in fact to do. Of course, decision and negotiation theorists had elegant prescriptive frameworks but were relatively thin on rigorous or empirically grounded description. Analogously, much behavioral work carefully accounted for how people do behave but was quite *ad hoc* or simply silent on the prescriptive side. (Amos Tversky’s work brilliantly illustrates this latter category.) In his 1982 book *The Art and Science of Negotiation*, Raiffa’s asymmetrically prescriptive/descriptive theoretical orientation explicitly yoked *a priori* prescriptive theory to the theoretical and empirical work of behavioral scientists who rigorously described and accounted for actual behavior. This has greatly enriched both the rigor and relevance of negotiation analysis. (An additional perspective is what Raiffa calls “externally prescriptive/descriptive,” a stance appropriate to advising third parties such as mediators and arbitrators about how best to act, given assessments of the protagonists.)

And as a direct result of Raiffa’s conceptual integration, much behavioral work, such as that of Max Bazerman and his colleagues, now directly feeds prescriptive frameworks and, in turn, is informed by them. (This work both preceded and paralleled the rise of the experimental economists, such as Al Roth, who have been reconstructing economic theories in the light of careful behavioral lab studies rather than stylized, *a priori* assumptions about human behavior.)

Much excellent work has been done by many people squarely on one side or the other of the prescriptive/descriptive divide. From my point of view, however, the real bridge builders have been Howard Raiffa from the analytical, prescriptive side and Max Bazerman from the behavioral, descriptive one. In particular, each has influenced many other scholars to adopt and develop this asymmetrically prescriptive/descriptive approach, which is now thriving both explicitly and implicitly. Raiffa’s work has set the stage for powerful prescriptive theories, conditioned on rigorously grounded description.

Since retiring a number of years ago, Raiffa has sought to advance a more unified approach to decision making, drawing on the various emphases of his earlier work. Indeed, he has been quite productive, coauthoring a popular and synthetic book on decision making, *Smart Choices*, with John Hammond (Hammond, Keeney, and Raiffa 1998) as well as an update of the mathematical *Introduction to Statistical Decision Theory* with Pratt and Schlaifer (Pratt, Raiffa, and Schlaifer 2008). With David Metcalfe and John Richardson, Raiffa (Raiffa, Richardson, and Metcalfe 2002) synthesized much of his life's work on individual and joint decision making in the accessible *Negotiation Analysis: The Science and Art of Collaborative Decision-Making*.³

Negotiation Analysis: A Rough Methodological Characterization

Although somewhat eclectic, major works in the field of negotiation analysis since *The Art and Science of Negotiation* in 1982 have sought to develop prescriptive theory and useful advice for negotiators and third parties. Like decision analysis, negotiation analysis typically decomposes the problem into characteristic elements. It generally emphasizes assessing the full set of involved parties and their potential coalitional alignments, their underlying interests, and their alternatives to negotiated agreement. It stresses a range of approaches to productively manage the inherent tension between competitive actions to “claim” value individually and cooperative ones to “create” value jointly, as well as efforts to change perceptions of the setup of the negotiation itself. Each of these several negotiation elements is common in more popular negotiation handbooks, but negotiation analysts have carefully worked out the precise analytic relationships among these factors and have developed a range of technical tools for evaluating and forging them into useful prescriptions.

Because advice to one side does not necessarily presume the full (game-theoretic) rationality of the other side(s), negotiation analysts increasingly draw on the findings of behavioral scientists and experimental economists. Negotiation analytic prescriptions typically expect intelligent, goal-seeking action by the other parties, but not necessarily full game-theoretic (interactive or “strategic”) rationality. As such, they tend to deemphasize the application of game-theoretic solution concepts or efforts to find unique equilibrium outcomes (except in situations in which the conditions for equilibria warrant such solutions). Such descriptive assessments of the others need not assume tactical naiveté; as contextually appropriate, the assessments can incorporate none, a few, or many rounds of “interactive reasoning.” Further, this approach does not generally assume that all the elements of the negotiation or “game” are common knowledge. Instead, to evaluate possible strategies and tactics, negotiation analysts generally focus on changes in perceptions of the “zone of possible agreement” and the

(subjective) distribution of possible negotiated outcomes conditional on various actions.

In the skeptical view of John Harsanyi (1982), the negotiation analytic approach might boil down to “the uninformative statement that every player should maximize expected utility in terms of his subjective probabilities without giving him the slightest hint of how to choose these subjective probabilities in a rational manner.” Distinct classes of factors, however, have been isolated that can improve subjective distributions of negotiated outcomes. Understanding the dynamics of creating and claiming value can improve prescriptive confidence. Psychological considerations can help, as can cultural observations and knowledge of organizational constraints and patterns, historical similarity, systematic decision-making biases, and contextual features. Less than full-blown game-theoretic reasoning can offer insight into strategic dynamics as can blends of psychological and game-theoretic analysis. When one relaxes the assumptions of strict, mutually expected, strategic sophistication in a fixed game, Raiffa’s (1982: 359) conclusion is appealing: that some “analysis — mostly simple analysis — can help.” (For summaries and evaluations of negotiation analytic frameworks and technical tools, as well as extended evaluations of the methodological differences from game theory, see, e.g., Sebenius 1992, 2001, 2002, 2007.)

Negotiation Analysis: Representative Works

If descriptive psychological approaches to negotiation lack a prescriptive framework, if decision analysis is not directly suited to interactive problems, and if traditional game theory presupposes too much rationality on all sides, then negotiation analysis represents a response that links prescriptive and descriptive research traditions. This approach has been used to develop analysis and prescriptions for the simplest bilateral negotiations between monolithic parties, for negotiations through agents or with linked “internal” and “external” aspects, for negotiations in hierarchies and networks, for more complex coalitional interactions, as well as moves “away from the table” to change the setup of the perceived negotiation itself, including the challenge of “negotiation design” to enhance the likelihood of desirable outcomes.

While a full literature review is well beyond the scope of this article, a number of representative works illustrate some key directions of the field. And a natural caution is in order: because “negotiation analysis” is not a sharply defined field but rather an emergent prescriptive approach as broadly characterized above, any literature assessment will necessarily include works that belong to other traditions as well.

Prior to the *Art and Science of Negotiation*, one of the first works that could be said to be in the (later) spirit of negotiation analysis was Thomas Schelling’s *The Strategy of Conflict* (1960) followed by his *Arms and*

Influence (1966). The point of departure of these works was game-theoretic, but they proceeded with less formal argument and their analysis had a far broader direct scope. Although nominally in the behavioral realm, Richard Walton and Robert McKersie's (1965) *Behavioral Theory of Labor Negotiation* drew on Schelling's work as well as rudimentary decision and game theories. It highlighted distinctions between so-called "integrative" (loosely, positive sum, or win-win) and "distributive" (loosely, zero sum, or win-lose) bargaining as well as the "intraorganizational" negotiations that take place in tandem with the bargaining between labor and management.

After *The Art and Science*, I published an extended application of some of these ideas in the context of the mammoth Law of the Sea (LOS) negotiations, *Negotiating the Law of the Sea: Lessons in the Art and Science of Reaching Agreement* (Sebenius 1984). The second part of this book developed several negotiation analytic topics independent of the LOS context (the nature of joint gains, the underlying bases of value-creating deal designs, as well as "negotiation arithmetic" or the analysis of "adding and subtracting issues and parties").

Using the wide range of insights in *The Art and Science of Negotiation* as a point of departure, David Lax and I developed an overall negotiation analytic method in the first part of *The Manager as Negotiator* (Lax and Sebenius 1986) that highlighted a small set of consistently critical elements; the second part of our book focused the method on managerial negotiations within and among organizations. While earlier works had mainly treated the "integrative" and "distributive" aspects of negotiation as distinct and separable, Lax and I reconceptualized these fundamental processes as "creating value" and "claiming value" and showed how they were analytically and practically inseparable. Our concept of the "negotiators' dilemma" explained how competitive moves to claim value individually could drive out the cooperative moves necessary to create value jointly — as well as a number of means for productively managing this inherent creating-claiming tension.

Negotiation Analysis, edited by H. Peyton Young (1991), furthered this evolving tradition in a somewhat more formal vein. I (Sebenius 1992) outlined a methodological synthesis of this emerging field in a *Management Science* article, "Negotiation Analysis: Characterization and Review." Further contributions in the same vein include *Wise Decisions*, edited by Richard Zeckhauser, Ralph Keeney, and myself (Zeckhauser, Keeney, and Sebenius 1996), Raiffa's (1997) *Lectures on Negotiation Analysis*, and, adding insights from organizational and information economics, *Beyond Winning* by Robert Mnookin, Scott Peppet, and Andrew Tulumello (2000). In this latter work, Mnookin and his colleagues highlighted and developed three critical tensions in negotiation: between creating and claiming value, between assertiveness and empathy, and between principal and agent. Kenneth Arrow and his colleagues (1995) drew on several methodological traditions to highlight the analytic role of "barriers" to agreement. In a trade

context, John Odell's (2000) *Negotiating the World Economy* offered an extended demonstration of the power of these concepts in international relations theory building. While negotiation analytic in spirit, the common points of departure of the works described above were formally analytic: game theory, economics, and decision analysis.

Often in parallel with the analysts discussed above, another group of researchers was coming increasingly close to a negotiation analytic view, but from an explicitly behavioral starting point. With roots in the cognitive tradition pioneered by Daniel Kahneman and Amos Tversky (1974) and elaborated by behavioral decision theorists,⁴ behavioral scholars began in the late 1980s and early 1990s to explicitly link their work to that of Raiffa and his colleagues. In particular, Margaret Neale and Max Bazerman's (1991) *Cognition and Rationality in Negotiation*, the more popularly oriented *Negotiating Rationally* by Bazerman and Neale (1991), and Leigh Thompson's (2001) *The Mind and Heart of the Negotiator* pulled together and developed a great deal of psychological work on negotiation — both cognitive and social — in an asymmetrically prescriptive/descriptive framework. *Negotiation Genius*, a recent practitioner-oriented work by Deepak Malhotra and Max Bazerman (2007), has a strongly behavioral flavor.

An excellent review of the psychological side of negotiation can be found in an article by Bazerman, Jared Curhan, and Don Moore (2000). Reviews focusing on developments on the social psychological side can be found in an article by Bazerman, Curhan, Moore, and Kathleen Valley (2000). Complementing this work is burgeoning research in experimental economics (Kagel and Roth 1995) and what Colin Camerer (1997) described as a "behavioral game theory." This work blends game-theoretic and psychological considerations in rigorous experimental settings. These efforts began to systematically build up more structure on what had been, in the works of Raiffa and his colleagues, a descriptive side of the ledger that was largely *ad hoc* and casually empirical.

Negotiation Analysis beyond the Table: The Role of Setup

While most negotiation analysis focuses on the interactive process "at the table" with the elements of the situation assumed to be well specified and fixed, a continuing strand of inquiry has involved moves to change the perceived negotiation itself or to set up a different one in the first place. For example, in the *Art and Science of Negotiation* as well as in *Negotiation Analysis*, Raiffa analyzed several mechanisms for collective decisions including a range of auctions and bidding schemes, processes for "fair division," and voting procedures. Implicitly, depending on the characteristics of such mechanisms and of the situation at hand, negotiators or third parties might seek to convert a standard face-to-face process into a different and more appealing setup.

Indeed, for some time, both analysts and practitioners have realized that certain actions by negotiators can best be understood in terms of a tacit or explicit negotiation over what the game itself will be.⁵ To proceed further down this line of analysis, we need to ask precisely what determines a negotiation's perceived setup. One answer seems simple and compelling but has deep implications: *a negotiation's setup is simply that which the parties act as if it is* (Lax and Sebenius 1986). Ariel Rubinstein (1991: 919) took a similar view in attempting to increase the real-world relevance of game theory when he argued that a game theoretic-model "should include only those factors which are perceived *by the players* to be *relevant*" (emphasis in the original). Adam Brandenburger and Barry Nalebuff (1996: 234–235) compatibly observed that "people draw boundaries and divide the world up into many separate games. It's easy to fall into the trap of analyzing these separate games in isolation. . . . The problem is that mental boundaries aren't real boundaries . . . you can create new links between games or sever existing ones. And by doing so you can change the scope of the game."

As such, there is no *a priori* reason why this or that issue or party should be included, why this or that interest should be excluded, or why this or that basic process choice should be made or mutually accepted. If the parties come to deal with a particular set of issues, alternatives to agreement, or basic process choices, then those elements in fact make up part of that negotiation's setup. In an early example, Walton and McKersie (1965) focused on how negotiators seek to change perceptions of the game by what they called "attitudinal restructuring." In the context of competitive business strategy, Brandenburger and Nalebuff (1996) developed a powerful, analogous logic for "changing the game," describing both an overall approach and including many ingenious examples of this phenomenon. This means that a perfectly legitimate, highly relevant, and potentially valuable form of analysis may involve a search for ways to change the perceived setup — even though the menu of possibilities may not be common knowledge.

In *3-D Negotiation*, Lax and Sebenius (2006) identified, highlighted, characterized, and systematically analyzed major classes of moves intended to change a negotiation's setup, focusing on elements such as parties, interests, no-deal options, as well as the sequence and basic process choices. Illustrated by numerous detailed examples from practice, we made such "setup moves," which often take place away from the table, into a core dimension or centerpiece of our negotiation analytic approach (along with more traditional tactics and deal design choices). Indeed, *3-D Negotiation* made explicit and systematic how purposive action on behalf of the parties can *change* the very structure of the situation and, therefore, the outcomes. Michael Watkins's (2006) *Shaping the Game* developed a related logic for game-changing moves as did his

earlier *Breakthrough International Negotiation* (Watkins and Rosegrant 2001).

Issues can be linked or separated from the negotiation to create joint gains or to enhance leverage. Parties may be “added” to a negotiation to improve one side’s no-agreement alternatives as well as to generate joint gains or to extract value from others. The process of choosing, then approaching and persuading others to agree may best be studied without the common assumption that the game is fully specified at the outset of analysis. (For examples of process sequencing to build or break coalitions, see Sebenius 1996.) Although perhaps less commonly, parties can also be “subtracted” — meaning separated, ejected, or excluded — from larger potential coalitions. For example, the Soviets were excluded from an active Middle East negotiating role in the process leading up to the Camp David accords that involved only Israel, Egypt, and the United States.

One of the most familiar classes of setup moves has to do with what Guhan Subramanian (2010) refers to and analyzes as “deal process” choices. For example, one well-known result in auction theory (Bulow and Klemperer 1996) confirms that transforming a two-party negotiation into an active auction with additional bidders vying for a deal can be a potent value-claiming strategy. Under fairly stringent conditions, this analysis suggests that adding another bidder improves the seller’s expected outcome relative to more skillful bargaining by the seller without that extra bidder.⁶ Subramanian and Zeckhauser (2005) elaborate the point that treating auctions and negotiations as separate processes in practice and theory is problematic. Using the term “negotiauction,” they offer advice to buyers and sellers on the most promising setup choices depending on the types of parties and assets under consideration.

In line with this focus on changing the negotiating setup, negotiation scholars have also pointed out that there is often considerable scope for creative “negotiation design” to enhance the chances and value of agreement. Case examples of this phenomenon dissected in negotiation-analytic terms include the work that Singaporean legal scholar and ambassador Tommy Koh did as president of the Third United Nations Conference on the Law of the Sea (Antrim and Sebenius 1991), former U.S. Senator George Mitchell’s efforts to broker a peace accord in Northern Ireland (Curran and Sebenius 2003), and, in contrast, former U.S. United Nations Ambassador Richard Holbrooke’s work leading to the Dayton Accords that ended the war in Bosnia (Curran and Sebenius 2003), as well as U.S. trade representative Charlene Barshefsky’s choices with respect to negotiating a United States–Chinese Intellectual Property Regime (Hulse and Sebenius 2003). I have also analyzed a range of detailed negotiation design issues for large-scale negotiation conference diplomacy — specifically for climate change talks, chlorofluorocarbon control, and the Law of the Sea (Sebenius 1991, 1995a, 1995b).

In other settings, negotiation design choices may involve the choice of discrete processes such as optimally matching various alternative dispute resolution mechanisms to different classes of disputes: “matching the forum to the fuss” (Sander and Goldberg 1994). Lawrence Susskind, Sarah McKernan, and Jennifer Thomas-Larmer (1999) have carefully analyzed numerous design choices for public disputes. Closely related is the question of influencing a *stream* of negotiated outcomes to improve the odds of mutually beneficial agreements; examples include the design of organizational dispute resolution systems (Ury, Brett, and Goldberg 1988; Costantino and Merchant 1996). Finally, the institutional and regulatory context may be consciously shaped to influence the frequency and quality of negotiations carried out within that setting. For example, Michael Wheeler and his colleagues (Wheeler 1994; Wheeler, Gilbert, and Field 1997) evaluated the design characteristics chosen to stimulate productive negotiations in Massachusetts over hazardous waste treatment facilities as well as a New Jersey system designed to foster socially desirable intermunicipal trading of affordable housing obligations.

In short, once the analytic focus moves beyond the direct interaction of the parties to the setup of the negotiation itself — treating the parties, interests, no-deal options, sequence, and basic processes as choice variables rather than as fixed and given — the realm of negotiation analysis opens up to such questions as linkage and separation, coalition building and breaking, as well as negotiation design. With the setup itself potentially “in play,” the architecture of negotiating encounters, with important outcome implications, becomes a key prescriptive lever.

Exemplified by the pioneering work of Howard Raiffa and often expressed in the pages of the *Negotiation Journal*, the emergent prescriptive field of “negotiation analysis” evolved from roots in game theory, statistical decision theory, and decision analysis. Drawing from each of these fields but methodologically distinct from them, negotiation analysis has mainly adopted an “asymmetrically prescriptive/descriptive” orientation. It develops the best possible advice for what one or more parties *should do* conditional on empirically grounded assessment of what the other side(s) actually *will do*. An extensive literature has developed, often making the traditional assumption of a well-specified and fixed situation for analysis. Relaxing this requirement, however, puts the setup of a negotiation itself into the realm of choice among the parties.

NOTES

I would like to thank David Lax, my long-time coauthor and collaborator, with whom many of these ideas have been jointly developed both conceptually and practically. My greatest intellectual debt, however, is to Howard Raiffa, to whom this article is dedicated. This article represents an evolution of my earlier syntheses and assessments of the emerging field of negotiation analysis, including Sebenius (1991, 2001, 2002, 2007), and draws closely and extensively on those works.

1. See the classic discussions of von Neumann and Morgenstern (1944) and Luce and Raiffa (1957); for more recent insightful assessments, with special regard to bargaining, see Roth (1985), Aumann (1989), Harsanyi (1989), and Rasmusen (1989).
2. See, for example, Weber (1985), Myerson (1991), and Young (1991).
3. Ironically, as a student and junior colleague of Raiffa's in the early 1980s, profoundly influenced by graduate work in decision analysis, I unsuccessfully urged that *The Art and Science of Negotiation* should instead be called *Negotiation Analysis*, the title he chose some twenty years later. This was unusual. Normally, when I came up with something supposedly "new" in my dealings with Howard, I would find versions of the same idea elegantly expressed somewhere in his prior work.
4. See, for example, Einhorn and Hogarth (1988) along with the other excellent collections of papers in Kahneman, Slovic, and Tversky (1982) and Bell, Raiffa, and Tversky (1988).
5. I investigated this phenomenon, dubbing it "negotiation arithmetic" or "adding" and "subtracting" issues and parties (Sebenius 1983, 1984).
6. For extensions and qualifications, however, see Bajari, McMillan, and Tadelis (2002).

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