GAME THEORY
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MICHAEL WAINWRIGHT

Game Theory and Postwar American Literature

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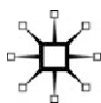
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Game Theory and Postwar American Literature

Michael Wainwright

In Memoriam
Roy Noel Wainwright
(1928–2013)
and leaves what something hidden from you chose

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Preface

Now, as there are many actions, arts, and sciences, their ends also are many; the end of the medical art is health, that of shipbuilding a vessel, that of strategy victory, that of economics wealth.

—Aristotle, *Nicomachean Ethics* (1094^{a}7–10)

This interdisciplinary volume applies the theory of games of strategy (or game theory), the mathematical simulation of rational decision-making first axiomatically established by John von Neumann (1903–57) in "Zur Theorie der Gesellschaftsspiele" (December 1928), to American literature of the immediate postwar era.[1] These cultural products are particularly receptive to this interpretive approach because they resound to the same political, social, and economic pressures that environed the Hungarian-born von Neumann after his permanent relocation to America shortly before World War II. Having practically abandoned the theory of games of strategy after the publication of "Zur Theorie der Gesellschaftsspiele," von Neumann purposefully reengaged with the subject following his emigration from Europe, and this renewed interest would last until his terminal illness took hold at the beginning of 1956.

Certainly, recondite analysis does not guarantee useful insight, but the underlying principles of von Neumann's theory are neither unimaginatively abstruse nor unsuited to the field of literary criticism.[2] "Claims about reasons and rationality," as Samuel Scheffler acknowledges in prefacing Derek Parfit's (1942–) *On What Matters* (2011), "are scarcely less controversial than claims about right and wrong" (xxiii), literary portrayals of cognition demand greater critical attention than scholars of literature have heretofore provided, and game theory answers this call with its ability to model *coordination problems*. In these strategic situations, people must make choices in the knowledge that the same options

face other people and that the outcome for each person will result from everybody's decisions. The four most frequently encountered coordination problems are the Stag Hunt, the Prisoner's Dilemma, Chicken, and Deadlock. The following study illustrates each of these *social dilemmas* with reference to at least one literary work. These illustrations neither intend nor offer a mathematical extension of game theory; instead, they provide the most concerted yet readable consideration to date of social dilemmas in postwar American literature.

The specific timeframe for the overarching sociohistorical analysis covers the period from the successful Manhattan Project trial on July 16, 1945, to President John F. Kennedy's (b. 1917) "Remarks at the Dinner of the Protestant Council of the City of New York" on November 8, 1963, a fortnight before his assassination. Postwar international relations, von Neumann's life, and the related development of the theory of games of strategy and its applications within this period provide the present volume with its overall thematic shape, but beyond this inflection, the separate introduction of each social dilemma provides an additional level of marshaling. While occasionally defying the temporal order set by the publication dates of primary texts, this supplementary modulation accommodates the interdisciplinary demands that make this study so insightful. In another conscious variation on standard literary criticism, a number of the textual examples under discussion come from beyond the academically validated canon, so that paradigmatic works by Truman Capote (1924–84), Ray Bradbury (1920–2012), and Lorraine Hansberry (1930–65) stand alongside a selection of seldom analyzed short stories by William Faulkner (1897–1962), on the one hand, and texts by rarely studied authors Virginia Kellogg (1907–81), Ivan Goff (1910–99), Ben Roberts (1916–84), Horace McCoy (1897–1955), and Harry Brown (1917–86), on the other hand. That all of these examples spoke of and to American anxieties in the immediate postwar period, however, explains their inclusion. Fittingly, the flexibility of game theory as an interpretive method not only accounts for this readjustment in critical attention, but also accommodates the resultant genres, which comprise the short story, screenplay, stage play, novel, and documentary fiction; in turn, this accommodation achieves another interpretive aim: a reduction in the figurative gap between fiction and nonfiction.

Traditional scholars of literature might balk at this hermeneutical shift, but they should consider its outcome, which prizes experiential quality before subjective experience. This analytical move does not discount the importance of individuals as individuals; rather, the primary

interpretations offered throughout the following volume, whether they involve fictional, nonfictional, or science-fictional subjects, impartially address experiential qualities. Moreover, the following interpretations of literature, while emphasizing logic, rationality, and consciousness, provide a rounded hermeneutic that discounts neither the unconscious contribution to behavior nor the behavioral influence of conscience. That Parfit turns to the theory of games of strategy in *Reasons and Persons* (1984), the greatest contribution to utilitarian philosophy since the first appearance of Henry Sidgwick's (1838–1900) *The Methods of Ethics* (1874), and that the present study occasionally defers to the Parfitian should come, therefore, as no surprise—that the chapter headings that follow echo at once the title from the English translation of von Neumann's seminal paper ("On the Theory of Games of Strategy") and the title of Parfit's latest publication (*On What Matters*), is an explicit means of expressing this debt.

Two introductory chapters, which outline the theory of games of strategy and expound on its relevance and usefulness to literary hermeneutics, explain the theoretical aspects of the textual interpretations found in the subsequent five sections. Chapter 1, "On Preliminary Matters," opens the theoretical prolegomenon by defining the relevant game-theoretic terminology, calling for a critical focus on literary portrayals of reasons for human behavior, and identifying the structural basis of coordinative situations. The debate then moves to cultural assumptions about self-interest, and the resulting theoretical deference to what Robert Hanna terms "protologic" (43), before answering the supplementary demands of intersubjectivity with reference to psychological theories of human motivation, psychoanalytical theories of intra- and interpsychic relays, and philosophical theories of ethics. Abraham H. Maslow (1908–70), Jacques Lacan (1901–81), and Henry Sidgwick supply these respective additions. The "Three Viewpoints Argument," as a development of Sidgwick's focus on rational decision-making and conscience in his "Two Viewpoints Argument" from *The Methods of Ethics*, results. This updated perspective readjusts the analytical prominence afforded to the constituents of the human psyche, paying special attention to the determining force of conscious rationality, recognizing the contribution of the unconscious, and acknowledging the influence of conscience. This widening of the game-theoretic perspective would have appealed to von Neumann, whose "later probing into the relationship between the computer and the brain," as Norman Macrae reports, "was sometimes criticized as too Freudian" (56), and whose conscience had prompted not only his resignation from the German Mathematical

Society in 1935, but also his decision to refuse election to the German Academy of Sciences in 1950.

The second chapter, "On Game Theory, the Art of Literature, and the Stag Hunt," offers a wide-ranging discussion that covers von Neumann's development as a mathematician between the two world wars, his aesthetic attitude toward mathematics, and his game-theoretic contribution to ending what Alfred North Whitehead (1861–1947) termed "the temporary submergence of the mathematical mentality" (44). By the age of 22, von Neumann had earned both a degree in chemical engineering and a PhD in mathematics, and these qualifications enabled him to engage in postdoctoral work at the University of Göttingen. During this assignment, which lasted from 1926 to 1927, von Neumann also toyed with the mathematics of games, making his first notable appearance at a colloquium in addressing a short paper on the subject to the Göttingen Mathematical Society on December 7, 1926. Chapter 2 discusses the detailed inferences from this address, which appeared in "Zur Theorie der Gesellschaftsspiele," before considering von Neumann's conception of scientific aesthetics in "The Mathematician" (1947). "Just as probability theory far transcends its role as the logical basis of rational gambling," concludes Anatol Rapoport (1911–2007) in *Two-Person Game Theory* (1966), "so does game theory transcend its original guise as the logical basis of parlor games" (13). This transcendence inspired the next generation of game theorists to identify and define the social dilemmas invoked but not substantiated by von Neumann. The Stag Hunt, as one such development, confirms Whitehead's opinion of von Neumann's contribution to the reemergence of the mathematical mentality, submerged since "the time of Rousseau onwards" (44), by succinctly recasting Rousseau's treatise on cooperative hunting among primitive men in game-theoretic terms. The relative scarcity of Stag Hunts in postwar literature therefore indicts the state of international politics during this period.

Although the twofold introduction on theory makes each of the five main sections that follow practically autonomous, these textually focused chapters introduce the other three social dilemmas in necessary succession; as a result, these sections best reward the reader as a series of linked and developing papers. Chapter 3, "On the Postwar Strategic Background, the Prisoner's Dilemma, and *In Cold Blood*," prefigures this premise in referencing the Stag Hunt. Aware of the dangers of internal disloyalty both at home and abroad, Joseph Stalin (1878–1953) played a strategic game of international diplomacy that would secure his Stag Hunt within the politburo by testing the Allies' dependence on the same

strategy. The result was a Prisoner's Dilemma across the Iron Curtain, with each side aware of the need for mutual restraint, but with the circular logic that drives strategic choice around this coordination problem guaranteeing neither participant the best of possible outcomes. The national consequences of this international strategic background lead chapter 3 into a detailed examination of Capote's *In Cold Blood: A True Account of a Multiple Murder and Its Consequences* (1966). According to Capote, his book exemplified a new literary class, the *nonfiction novel*. "What I wanted to do," he explained, "was bring to journalism the technique of fiction" (*Conversations* 120). The apparently motiveless murder of the Clutter family of Holcomb, Finney County, Kansas, on the night of November 14–15, 1959, provided Capote with an opportunity to put his theory into practice. Capote's subject matter was controversial; the book became a best-seller; its popularity rested on Capote's artistic manipulation of nonfictional material. As this chapter argues, however, what separates *In Cold Blood* from newspaper investigations of the case, what emerges from *In Cold Blood* in defiance of Capote's factual inadequacy, and what makes *In Cold Blood* so insightful both in sociohistorical and neutral (or transhistorical and asocial) terms, is Capote's implicit realization of the fundamental framework that places two social dilemmas—the Prisoner's Dilemma and Chicken—at the strategic, thematic, and aesthetic heart of his work.

In chapter 4, "On Chicken in *Kiss Tomorrow Goodbye*," the critical focus moves from the nonfiction novel to the screenplay and the cinematic novel. A detailed treatment of McCoy's *Kiss Tomorrow Goodbye* (1948, 1950) follows a brief consideration of Kellogg's *White Heat* (1948, 1949). Each work was a rational vehicle for updating the screen persona of the aging but still potentially bankable James Cagney (1899–1986). To this end, scriptwriters Ivan Goff and Ben Roberts shaped Kellogg's *White Heat* to fit the strategic dilemmas of the atomic age. The final screenplay at once acknowledges the threat of mutually assured destruction (MAD) and anticipates the associated phenomenon of consciously assured but subconsciously unnerved MADness-induced madness. McCoy's *Kiss Tomorrow Goodbye*, which Harry Brown would turn into a screenplay that cannot help but exhibit aspects of Cagney's resurfacing auteurial presence, effectively takes the protagonistic premise of Kellogg's *White Heat* a stage further, providing a graphic conflation of game-theoretic and psychoanalytical concerns: the former play out in protagonist Ralph Cotter's games of Chicken; the latter play out in his deviant sexuality. Tracing both these themes throughout the novel, and comparing the resultant traces with Brown's suggestively different

screenplay, recommends McCoy's *Kiss Tomorrow Goodbye* as a work of contextual importance in a nuclear era dominated by international warnings and threats.

After reflecting on other prominent versions of Chicken in postwar cinema—including Michael Powell and Emeric Pressburger's *The Elusive Pimpernel* (1950) and Nicholas Ray's *Rebel Without a Cause* (1955)—chapter 5, "On Countercultural Chicken in *Fahrenheit 451* and *A Raisin in the Sun*," turns to alternative American cultures of the period. A game-theoretic reading of Bradbury's *Fahrenheit 451* (1953) comes first. In this science fiction novel, which maintains a nonfictional essence in projecting the contemporary American subject into the near future, Bradbury offers an antiauthoritarian worldview that stands out against the strategic backdrop of imminent nuclear destruction. A game-theoretic reading of Hansberry's *A Raisin in the Sun* (1959) comes next. This stage play, which carries all the nonfictional weight of a performance piece, illustrates the antiauthoritarian credentials of the complementary African-American worldview. Those underprivileged by racial categorization, as this investigation attests, also suffered under the social dilemma that fretted Bradbury's ruling-class rebels. Predicated on MADness, the Prisoner's Dilemma of international relations was a nightmare, with the conventional play of mutual nonaggression (sometimes tenuously) deferring an alternative act of practical and devastating hostility.

The penultimate chapter, "On Coldblooded Chicken," reads this alternative in the context of the Vienna summit of June 1961. Attention to this first face-to-face meeting between President John F. Kennedy and Premier Nikita Khrushchev (1894–1971) returns the literary focus to Capote's *In Cold Blood*. Although the idea of chickening out dates back centuries, and despite American literature and cinema testifying to the commonality of the related social dilemma throughout the 1950s, the official naming of this social dilemma did not occur until the British philosopher Bertrand Russell's (1872–1970) meditation on *Common Sense and Nuclear Warfare* (1959). In drawing an analogy between a juvenile game of automotive daring and international brinkmanship, Russell's naming of Chicken somewhat lagged behind the cultural game. Philosophy was playing catch up with a cultural *pre-diction* that appreciated the circular logic of a social dilemma that would come to define the immediate result of the Vienna summit: the Berlin Crisis. In a sense, then, Capote was ahead of the game. Accusations of cowardice between the Clutters' murderers (Perry Edward Smith [1928–65] and Richard Eugene Hickock [1931–65]), as a manifestation of each

man's fear of the other man's trustworthiness, are telling in this respect, with the author's factual adequacy as a documentary novelist indicting Chicken for the murderous impulse realized in Holcomb. If the common images, symbols, terms, and phrases of the Cold War seeded differences between the behavioral inclinations of individual Americans, then they did so as expressions of those social dilemmas, the Prisoner's Dilemma and Chicken, which tended to structure rational instincts at this time. The postwar strategies encompassed by *In Cold Blood* hereby emerge from the investigations undertaken in chapters 3 and 6 as Capote's major contribution to the documentary novel.

Pursuing the strategic politics of the Cuban Missile Crisis, "On Called Bluff in Capote, Deadlock in Twain, and Bully in Faulkner" closes the present volume with a broadening of textual focus that at once confirms the flexibility of game theory as a hermeneutic and illustrates the prescient literary expression of Called Bluff (a combination of Prisoner's Dilemma and Chicken), Deadlock, and Bully (a combination of Deadlock and Chicken) as three rarely discussed yet vitally important coordination problems. A brief examination of Called Bluff in *In Cold Blood* not only confirms Capote as an intuitive master of game theoretics, but also impels the focal widening that follows. "William Faulkner," states Myra Jehlen, "may be the darkest of the figures who define this nation's literary tradition, or one of the two darkest, along with Mark Twain." Whereas postbellum American literature usually sustains a transcending optimism, Twain (1835–1910) and Faulkner refute any "meaningful challenge to the prevailing order of things," with not even "tragic confirmation available" to their characters, "only failure" (154). For Jehlen, this failure concerns the "brutal and perverse" (155) American relationship with "Nature and Nature's God." An interdisciplinary hermeneutic based on the theory of games of strategy contests Jehlen's claims, reading Twain's *Adventures of Huckleberry Finn* (1884) and Faulkner's "A Justice" (1931, 1950) as ontological laments: humanity must contend with the inescapability of coordinative logic. Twain's illustration of Deadlock and Faulkner's delineation of Bully testify to their intuitive appreciation of both the single, unalterable, and a priori set of schematic logical structures behind social dilemmas and the persistence of that unchangeable presence despite the sociohistorical fluctuations that differentiate one culture from another. Twain's retrospective prescience concerns the demic isolation that helped to ensure the Confederacy's defeat in the American Civil War, on the one hand, and the murderous stalemates of World War I, on the other hand. Faulkner's retrospective prescience concerns the Armistice of World War I, on

the one hand, and the state of international relations following World War II, on the other hand. The passing years have mitigated neither the relevance nor the importance of either author's thoughts concerning the social and political ramifications of human coordination.

In short, while human rationality has evolved as a mechanism for making practical and effective use of logic, evolution has simultaneously worked to hide that application for reasons of efficiency, and that evolutionary process has become cultural as well as biological. The resultant concealment baffles traditionalists in the arts. Literary scholars are among their number. Unlike the sciences, which appreciate and exploit this covert mechanism, the humanities need to unearth the basics of rationality. This task contributes to the search for "a complete and comprehensive form of interpretive criticism" (13), as championed by Joseph Carroll, Jonathan Gottschall, John A. Johnson, and Daniel J. Kruger, which advances "'a third culture' that integrates research in the life sciences, the social sciences, and the humanities" (1). The interdisciplinarity of the present volume, a study that favors the cognitive component of the Three Viewpoints Argument without losing sight of its remaining two elements, and aligns those interpretive trajectories within the historical, social, and political contexts that environed the primary texts under scrutiny, supports this commendable promotion.

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CHAPTER 1

On Preliminary Matters*

All the world's a stage,
And all the men and women merely players.
 —William Shakespeare, *As You Like It* (2.7.139–40)

"*G*ame Theory," as John Davis Williams (1909–64) elucidates in *The Compleat Strategyst* (1954), is shorthand for "the *Theory of Games of Strategy*" (3; emphasis original). The word strategy, "as used in its everyday sense, carries the connotation of a particularly skillful or adroit plan, whereas in Game Theory it designates any *complete* plan." In short, "*a strategy is a plan so complete that it cannot be upset by enemy action or Nature*; for everything that the enemy or Nature may choose to do, together with a set of possible actions for yourself, is just part of the description of the strategy" (16; emphasis original). Each strategic participant is a self-interested *player*. Individual players or teams of individuals are distinct (or atomistic) agents. "In some models," as Paisley Livingston notes, "a single 'player' is comprised of a number of 'agents' that are not even aware of each other's moves and strategic rationales" (69). Situations that involve two or more players who cannot or will not communicate definitively are acutely relevant to the human condition.[1] In these *coordination problems*, players must make choices in the knowledge that other parties face the same options, that a *coordination condition* equivalent to silence pertains between the players, and that the outcome for each party will result from the decisions of every player. "Coordination games," as Michael S. Alvard and David A. Nolin emphasize, "are characterized by common interest among players" (534); most game-theoretic modeling, as Williams observes, deals with two-player dilemmas, because "many situations which are not strictly

two-person games may be treated as if they were" (13); and "whether the outcome of a game is comic or tragic, fun or serious, fair or unfair," as Steven J. Brams (1940–) states in *Biblical Games* (1980), "it depends on individual *choices*" (6; emphasis original). Each logically minded player in a self-interested situation has to anticipate the other players' choices and pick a strategy according to the prospects of preference-satisfaction. Coordination problems often present each player with only two choices; these options concern *cooperation* or *defection* with regard to the other players; some games present a wider range of choices, but the theory of games of strategy can break these options down into a series of paired decisions. That two-choice two-player scenarios are common in game-theoretical modeling is, therefore, unsurprising. A *utility* (or *payoff*) describes the preference-satisfaction for each possible outcome, which may comprise a material gain (or *narrow utility*) or a combination of material and psychological gain; a *banker*—who is either extrinsic or intrinsic to the play, and who comprises an agency, authority, or a combination of the players themselves—sets this value.[2] The banker may rank the possible outcomes of a game according to a basic ordinal scale, a more detailed discrete scale, or a finely nuanced continuum.

"Nothing, in effect, can be grounded on chance—the calculation of chances, strategies—that does not involve at the outset a limited structuring of the situation," complains Jacques Lacan (1901–81) in *The Four Fundamental Concepts of Psycho-Analysis* (1977).[3] "When modern games [*sic*] theory elaborates the strategy of the two partners, each meets the other with the maximum chances of winning on condition that each reasons in the same way as the other. What is the value of an operation of this kind," remarks Lacan, "if not that one's bearings are already laid down, the signifying reference-points of the problem are already marked in it and the solution will never go beyond them?" (40). While game theorists do not necessarily assume "that one's bearings are already laid down" in a coordination problem, because underdevelopment of a person's rational faculty might offset that player's game-theoretic bearings, they do accept that "the signifying reference-points of the problem are already marked." This assumption, however, does not predetermine limited, obvious, and uninteresting outcomes to situations of strategic self-interest.

A logical approach to certain coordination problems, as Oskar Morgenstern (1902–77) explains, will provoke "an endless chain of reciprocally conjectural reactions and counter-reactions" (174), which demands what often amounts to an unsatisfactory conclusion: an arbitrary choice from the solutions on offer. What is more, as Derek Parfit

(1942–) avows in *On What Matters* (2011), "we can respond to reasons [. . .] without knowing that this is what we are doing" (2:461), and the work of Sigmund Freud (1856–1939), so often resorted to by behavioral analysts, offers limited enlightenment in such cases. "The main reason we know little about the cognitive impulses, their dynamics, or their pathology, is that they are not important in the clinic," admits Abraham H. Maslow (1908–70) in *Motivation and Personality* (1954), "and certainly not in the clinic dominated by the medical-therapeutic tradition, i.e., getting rid of disease." Whereas the split subject's societal interrelations are the object of psychoanalysis, the unified subject is the object of psychological monitoring and administration—but neither approach provides the insight proffered by game theory. Freudian psychoanalysts tend to overlook the importance of cognition, ignore the rational thought processes of the human subject, and search exclusively for signs of severe repression. "As a consequence," declares Maslow, "we find nothing on the subject [of conscious impulses] in the writings of the great inventors of psychotherapy and psychodynamics, Freud, Adler, Jung, etc." (48)—a point that Lacan concedes in *The Four Fundamental Concepts of Psycho-Analysis*: "Freud has told us often enough that he would have to go back to the function of consciousness, but he never did" (57); even Freud's *Group Psychology and the Analysis of the Ego* (1921), which presents a theory of identity, one on which the majority of early ego psychologists relied, does not provide a theory of consciousness. Filling this conceptual gap adds additional contours to the psychical map. These additions help to identify behavioral triggers that psychoanalytical practices often overlook. Lack of a rational solution to an intersubjective dilemma, where such an answer is a contextual expectation, can incite compulsive actions, obsessive behavior, hysteria, or paranoia. "There is," as Ian Parker's Lacanian reading of this coordinative predicament explains, "a tension [. . .] between the 'subject' and 'structure'" (338). This tension, or absence of expected closure, helps to explain why, as David Metzger reports, there is a "curiously logical range of behaviors identified in the psychoanalytic clinic" (81).

Although the unconscious was a topic that absorbed Freud's terrific energies, "to make the id the sum total of the subject's innate dispositions," as Lacan and Michel Cénac admit, "is a purely abstract definition devoid of use value" (121); as a result, Freudian subject matter need not obsess present-day epistemological, hermeneutical, or psychological studies. "If physicists can change their minds about the correctness and accuracy of their theories," submits Henry C. Plotkin in *The Imagined World Made Real* (2002), "who would bet against our theories about the

mind/brain altering, and altering in a big way, as novel empirical methods are developed and fresh theoretical insights arise. For example," propounds Plotkin, "it is extraordinary that psychology came to realize the huge importance of the human ability to understand that others have intentional mental states, so called Theory of Mind [. . .], only about 20 years ago" (166–67). This lack of insight seems particularly remarkable when psychologists readily admit that "there is no evidence that any non-human animal, chimp or otherwise, understands that others of its kind know things or want things in the same way that it itself knows or wants things" (198).

The history of debates concerning self-interest further magnifies the noteworthiness of this nescience. "The resolute application of the assumption of self-interest to social actions and institutions," as Russell Hardin summarizes, "began with Hobbes and Machiavelli, who are sometimes therefore seen as the figures who divide modern from early political philosophy. Machiavelli commended the assumption of self interest to the prince; Hobbes applied it to everyone" (64). In *The Prince* (1531–32), Niccolò Machiavelli (1469–1527) does not renounce the influence of God on human affairs, but unlike most Renaissance scholars, he charges individuals with significant responsibility for their personal circumstances. "I believe that it is probably true that fortune is the arbiter of half the things we do," states Machiavelli, "leaving the other half or so to be controlled by ourselves" (105). One matter of pure self-interest, according to Machiavelli's judgment, is an individual's loyalty to an alliance. The utility "for being a true friend" is "prestige," and employing this strategy in collaborative games "is always more advantageous than neutrality" (96).

Self-interest also lies at the root of human actions for Thomas Hobbes (1588–1679). Rationality, as Hobbes expounds in *Leviathan* (1651), displaces morality, loyalty, and contractual fidelity:

> First, that when a man doth a thing, which notwithstanding any thing can be foreseen, and reckoned on, tendeth to his own destruction, howsoever some accident which he could not expect, arriving may turne it to his benefit; yet such events do not make it reasonably or wisely done. Secondly, that in a condition of Warre, wherein every man to every man, for want of a common Power to keep them all in awe, is an Enemy, there is no man can hope by his own strength, or wit, to defend himself from destruction, without the help of Confederates; where every one expects the same defence by the Confederation, that any one else does: and therefore he which declares he thinks it reason to deceive those that

help him, can in reason expect no other means of safety, than what can be had from his own single Power. (73)

"We should keep our contractual promises," as Jean Hampton explains of Hobbes's reasoning, not for the sake of trustworthiness, but "because of the *reputation* of trustworthiness we shall acquire" (55; emphasis added).

The claims of Machiavelli and Hobbes are notable expressions of what Parfit, in *Reasons and Persons* (1984), deems a fundamental truth: that the motivational primacy of self-interest "has been believed by most people for more than two millennia" (194). Although theories of rationality vary according to their substantive aims, they all have the formal purpose of logical behavior, with the Self-interest Theory being the supremely rational version of these numerous hypotheses.[4] Self-interest Theory provides an individual with the ultimate aim of following choices that make that person's life proceed as well as possible. Such game-theoretic players, in trying to maximize life's payoffs, as Brams notes, "think carefully about their choices and the possible choices of other players" (*Biblical* 6).

That Gottfried Wilhelm von Leibniz (1646–1716), as an intellectual descendent of Hobbes, "was the first to express the idea which motivates game theory" (391), as Brian Skyrms and Peter Vanderschraaf state, therefore, comes as little surprise. "In general," laments Leibniz in his posthumously published *New Essays on Human Understanding* (1765), "I wish that some able mathematician were interested in producing a detailed study of all kinds of games, carefully reasoned and with full particulars. This would be of great value in improving the art of invention," believes Leibniz, "since the human mind appears to better advantage in games than in the most serious pursuits" (395). Because "people appear to devote special energy to their deliberations when they must choose strategies in the games they play," comment Skyrms and Vanderschraaf, "Leibniz suggested that philosophers should attempt to better understand the reasoning of the players engaged in games" (391).

A contradictory statement, however, precedes Leibniz's philosophical appeal. "We need a new kind of logic, concerned with degrees of probability," he insists, "since Aristotle in his *Topics* could not have been further from it." Aristotle's *Topics* "set[s] out certain familiar rules, arranged according to the commonplaces—rules which may be useful in some contexts where a discourse has to be developed and given some

likelihood—without taking the trouble to provide us with balances which are needed to weigh likelihoods and to arrive at sound judgments regarding them" (395). On the one hand, Leibniz rightly adjudges the need for estimating risk, but on the other hand, he overly criticizes the common rules of reasoning. That Jean-Jacques Rousseau (1712–78) provides an informal yet important game-theoretic description of a specific coordination problem confirms Leibniz's misplaced zealousness in underplaying the fundamental rules of reasoning. Leibniz effectively agreed with Machiavelli and Hobbes on the cause of human motivation, and their common view, as Hardin maintains, "went on to remake economics through the work of [Bernard] Mandeville and Adam Smith" (64), but Leibniz's influence helped to maintain the epistemological split between logic and mathematics. For, as Louis Althusser observes, "logic in its modern form" did not become "part of the continent of Mathematics" (39) until the late nineteenth century; as a consequence of this delay, the ludic domain would not receive fitting mathematical treatment until John von Neumann's (1903–57) "Zur Theorie der Gesellschaftsspiele" (December 1928).

Von Neumann's breakthrough postdated Freud's examination of Sophocles's *Oedipus Rex* (c. 430 BC) and Shakespeare's *Hamlet* (c. 1601) in *The Interpretation of Dreams* (1900) by almost 30 years. In the interim, literary scholars embraced Freud's work, with the continued employment of psychoanalysis as a literary hermeneutic taking rational decision-making for granted. Nonetheless, that critics can apply game-theoretic principles to texts written without a thorough knowledge of von Neumann's discipline was first mooted by Morgenstern in *Wirtschaftsprognose* (1928), with his reading of Arthur Conan Doyle's "The Final Problem" (1893). Not only does Doyle's tale of Sherlock Holmes and Professor Moriarty predate "Zur Theorie der Gesellschaftsspiele," but Morgenstern's interpretation also received von Neumann's seal of approval in their collaborative *Theory of Games and Economic Behavior* (1944), which reprises the intuitive approach to "The Final Problem" offered by *Wirtschaftsprognose*, but in rigorous mathematical terms.

Notwithstanding this endorsement, the game-theoretic analysis of Doyle's story sank into obscurity. "One of the most influential and least-read books of the twentieth century" (41), as William Poundstone remarks in *Prisoner's Dilemma* (1992), von Neumann and Morgenstern's *Theory of Games and Economic Behavior* enjoyed an appreciative but limited reception on publication. "The impact of the *Theory of Games*," as Robert W. Dimand and Mary Ann Dimand chronicle, "was mediated

through the efforts of a small group of eminent and soon-to-be-eminent scholars who read and digested the work and wrote major review articles" (15). Journal editors devoted an "extraordinary" (15) amount of space to these reviews. Von Neumann and Morgenstern's opening chapter was a particular revelation. "In it," as Andrew Schotter observes, "the entire Walrasian tradition is challenged, the modern axiomatic treatment of numerical utility is developed, and the notion of a 'solution' to a n-person game is introduced" (viii).[5] Arthur H. Copeland's overall assessment of *Theory of Games and Economic Behavior* was, therefore, typical of its specialized reception on publication: "posterity may regard this book as one of the major scientific achievements of the first half of the twentieth century" (498).

Sales confirmed the wider indifference implicitly recognized by Copeland. "In five years," as Poundstone records, "the book had still not quite sold 4000 copies" (*Dilemma* 41). Yet, even if their volume had been more widely read, any reaction from scholars of literature would have been predictably unenthusiastic. "An arcane theory lifted from one domain and applied to another," as Brams acknowledges, "may simply be inappropriate" (*Biblical* 6)—and an assumption of unsuitability tends to foreshadow mathematical investigations of literature. While "the specificity of narrative models lies in depicting experiential content, if only by virtue of depicting agents in pursuit of humanly recognizable goals" (49), writes Peter Swirski (1966–) in *Of Literature and Knowledge* (2007), the elements of logic in mathematical models "are valued precisely to the extent they can be voided of subjectivity." Literary critics have offered "scarcely any commentary to date about the analogies between mathematics and narrative fiction" because they are "intimidated by such manifest differences" (50). Certainly, recondite analytical practice does not guarantee useful insight, but the basic principles of game theory are neither unsuited to literary criticism nor abstruse. More importantly, as Samuel Scheffler acknowledges in prefacing Parfit's *On What Matters*, "claims about reasons and rationality are scarcely less controversial than claims about right and wrong" (xxiii), and literary portrayals of reasons, rationalities, values, and moralities call for greater critical attention than scholars of literature have heretofore provided.

Game theory offers a means of addressing this demand with its fundamental acceptance of what Robert Hanna terms "protologic" (43). Protologic "is not a logical *system* as such," explains Hanna, "but rather a single set of *schematic logical structures*, in the form of a coherent repertoire of metalogical principles and logical concepts" (43; emphasis

original). This singular group "is unrevisable and *a priori* precisely because its total set of schematic logical structures determines what will *count* as a possible logical system, and because some knowledge of this set of structures must also be consciously *available* to thinkers if they are to be able to justify assertions or claims made about any classical or nonclassical logic." In short, "protologic is both constructively and epistemically presupposed by every logical system" (44; emphasis original).

To appropriate Thomas Nagel on objectivity in *The View from Nowhere* (1986), protologic is an irreducible normative fact without which "we couldn't do physics or anything else" (7–8). This presubjective verity, which advantageously antedates the social constructions of race, class, gender, and sexuality, helps to mold subjective beliefs and actions. As an irreducible normative fact, protologic is indefinable in the "sense that," as Parfit explains in *On What Matters*, "it cannot be helpfully explained merely by using words," and this limitation can be problematic. Hence, "we must explain such concepts," as Parfit advises, "by getting people to think thoughts that use these concepts" (1:31). Furthermore, while human rationality has evolved as a mechanism for making practical and effective use of protologic, evolution has simultaneously worked to hide that application for reasons of efficiency. Unlike the sciences, which appreciate this covert mechanism, the humanities need to rediscover the basics of rationality.

Classical philosophy helps to reconnect the basic concepts of rationality to literary studies. Aristotle, as a student of Plato, recognized the preeminence afforded to humans by their souls' rational element; living matter, as Platonic idealism extols, survives metabolic changes but not alterations in form (*eidos*); Aristotelian ethics, therefore, concerns souls rather than forms. For Aristotle, as C. D. C. Reeve summarizes, "souls consist of distinct, hierarchically organized constituents." Aristotle's *Nicomachean Ethics* (350 BC) enumerates three organizational levels. The most basic constituent "is the vegetative soul, which is responsible for nutrition and growth, and which is also found in plants and other animals." The intermediate constituent is the "appetitive soul, which is responsible for perception, imagination, and movement, and so is present in other animals too, but not in plants." Souls of this type lack rationality, "but, unlike the vegetative, can be influenced by it." The most advanced constituent, which comprises two divisions, is rationality. While the scientific element of rationality "enables us to contemplate or engage in theoretical activity," the calculative element of rationality "enables us to engage in practical and political activity" (xvi).

Hanna's approach to cognition provides a twenty-first-century elaboration of Aristotle's inchoate but influential understanding of rationality. The human mind is endowed "with an innate constructive modular capacity for cognizing logic," argues Hanna, which makes its possessor "a competent cognizer of natural language, a real-world logical reasoner, a competent follower of logical rules, a knower of necessary logical truths by means of logical intuition, and a logical moralist" (xviii). Hanna's competent cognizer is both *procedurally* and *substantively* rational according to Parfit's definition of these terms in *On What Matters*. Individuals who imagine the overall effects of their possible actions, avoid wishful thinking, assess the probabilities of alternative outcomes, and follow other concomitant rules are "*procedurally* rational" (1:62; emphasis original), whereas *what* they choose rather than *how* they choose concerns their substantive rationality. While *value-based* theories of behavioral reasons are both procedurally and substantively rational, *desire-based* theories of behavioral reasons are only procedurally rational. Michael Smith's commentary on Parfit's argument helps to elucidate this difference. "Value-based theories hold that an agent's reasons for action are a function of the values that can be realized by his actions. Desire-based theories, by contrast, hold that they are a function of the desires, perhaps idealized, that his actions will satisfy" (116). For Parfit, a value-based theory of behavioral reasons must replace concepts of behavioral reasons based on conscious desires. Nevertheless, "such desire-based views," as Scheffler acknowledges, "have been profoundly influential, both within and outside of philosophy" (xxiii).

Maslow's "A Theory of Human Motivation" (1943) remains one of these leading influences. That months rather than years separated the publication of Maslow's paper from the appearance of von Neumann and Morgenstern's *Theory of Games and Economic Behavior* suggests how academically significant the subject of human behavior had become by the middle of the twentieth century. Maslow postulates that the needs of humans "arrange themselves in hierarchies of pre-potency" (370). These structures include both material and immaterial factors, with the former of a more rudimentary character than the latter. *Physiological needs*, which include breathing, hydration, nutrition, excretion, homoeostasis, and sex, "are the most pre-potent of all needs" (373). Only one of these motivational factors, sexual stimulation beyond autoeroticism, requires a degree of human interaction. With the adequate satisfaction of physiological needs, which hereafter "exist only in a potential fashion in the sense that they may emerge again to dominate the organism" (375), another set of needs arises. These *safety needs* include bodily security

and health, protective accommodation, and reliable employment. *Love needs*, which focus on friendship, affection, and belonging, emerge with the sufficient discharge of safety needs. *Esteem needs*, which concern confidence, achievement, and respect from others, follow from the satisfactory fulfillment of love needs. Finally, with the ample gratification of esteem needs, arises the *need for self-actualization*. Maslow repeatedly emphasizes that passing a threshold of satisfaction rather than attaining satiation is enough for the next set of needs to emerge. His "average citizen" (388)—undoubtedly a member of the ruling class—"is satisfied perhaps 85 per cent in his physiological needs, 70 per cent in his safety needs, 50 per cent in his love needs, 40 per cent in his self-esteem needs, and 10 per cent in his self-actualization needs" (389).

Although Maslow does not explicitly invoke issues of coordination, that each transitional step from the first to the fourth tier in his hierarchy involves an increasing degree of human interaction, while the fifth level dispenses with the need for such interrelations, posits a theoretical hybridity, with relativism dominating subjectivism. That each new tier (until the last) demands an increasing amount of intersubjectivity may also account for the stepwise decrease in satisfaction percentages that Maslow proffers. These increasing degrees of difficulty withhold self-actualization from most people. While normality is a vexed issue, Maslow's contentions in *Motivation and Personality* about the generality of human needs, on the one hand, and their cultural specificity, on the other hand, display a finer social conscience. "Our classification of basic needs is in part an attempt to account for this unity behind the apparent diversity from culture to culture," he states. "No claim is made yet that it is ultimate or universal for all cultures. The claim is made only that it is relatively *more* ultimate, *more* universal, *more* basic, than the superficial conscious desires from culture to culture, and makes a somewhat closer approach to common-human characteristics. Basic needs," concludes Maslow, "are *more* common-human than superficial desires or behaviors" (54–55; emphasis original).

In the wake of Maslow's conceptual model, American academics adapted and developed notions of human motivation, with environmental mastery, vocational and recreational competence, and information processing identified as behavioral stimuli that supplement the urges of need-reduction. Concerning environmental mastery, as Anne Anastasi chronicles, "investigators have described the relevant behavior as stimulus seeking, sensation seeking, exploration, environmental manipulation, and spontaneous play" (17). One of the foremost champions of the environmental approach to human motivation was Robert Sessions

Woodworth (1869–1962). In terms of competence motivation, as promoted by Robert W. White (1904–2001), researchers examine the individual's desire to master a task. Their findings reveal that success often prompts an individual to practice another skill, and this iterative motivation can make mastery an autotelic issue. On information-processing motivation, which relates to the acceptance of useful data, the disregard for extraneous material, and the recollection of details appropriate to the present situation, the work of Joseph McVicker Hunt (1906–91) has proved especially notable.[6]

These developments in motivational theory, as well as his personal need for self-actualization, would prompt Maslow to emend his original model. The second edition of *Motivation and Personality* (1970) offers a seven-tiered pyramid.[7] Two new levels separate esteem needs from the desire for self-actualization. The first of these additions recognizes aspects of environmental mastery and comprises the *cognitive needs* of knowing, understanding, and exploring. Although "negative determinants for acquiring knowledge (anxiety, fear)" were part of his initial hierarchy, Maslow believes that "there are some reasonable grounds for postulating positive *per se* impulses to satisfy curiosity" (48). An attraction toward the mysterious, the unknown, and the curious is a sign of psychological health. "The contrasting reaction to the well known," remarks Maslow, "is one of boredom" (49). The second of Maslow's additions comprises the *aesthetic needs* of competency, spontaneity, and originality in creativity. "The testimony of history, of the humanities, and of aestheticians," adduces Maslow, "forbids us to bypass this uncomfortable (to the scientist) area." He posits aesthetic needs as a meeting ground for dynamic and Gestalt psychologists. Aside from this personal opinion, as Maslow himself admits, "the needs for order, for symmetry, for closure, for completion of the act, for system, and for structure may be indiscriminately assigned to *either* cognitive, conative, or aesthetic, or even to neurotic needs" (51; emphasis original). Significantly, then, whatever the categorical allocation of aesthetic needs, Maslow's ordinary citizen harks back to the *integritas* and *consonantia* of Thomist aesthetics, rather than aside or forward to the arts of disparity, asymmetry, and angularity.

In the posthumously published *The Farther Reaches of Human Nature* (1971), Maslow alters his hierarchy of prepotent desires for the last time, relegating self-actualization by placing the *need for self-transcendence* at the hierarchical summit. *Transcenders*, according to Maslow, "may be said to be much more often aware of the realm of Being," and tend to be "metamotivated." A transcender not only has "unitive consciousness,"