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Game Theory and Customary International Law: A Response to Professors Goldsmith and Posner

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GAME THEORY AND CUSTOMARY INTERNATIONAL LAW: A RESPONSE TO PROFESSORS GOLDSMITH AND POSNER

*Mark A. Chinen**

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INTRODUCTION

Customary international law is being reevaluated by scholars who have questioned both its status with respect to federal law and its

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theoretical underpinnings. This in turn has led to a lively debate between these scholars and others who defend the more traditional view.¹ Such a debate is appropriate, given that relations among nation-states and other international actors have become more integrated and complex and as a result, issues of international governance have become increasingly important. One of the debate's core issues is the question of what exactly are the nature and role of international law and of customary international law in particular, within this environment?

In a pair of recent articles, Professors Jack Goldsmith and Eric Posner have used game theoretic principles to challenge the positivist account of customary international law.² Their writings join other early attempts to apply game theory to the international law sources.³ I have two purposes in this Article. The first is to evaluate game theory's potential for yielding greater insight into customary international law and international law more generally. The second is to respond to the conclusions about customary international law drawn by Professors Goldsmith and Posner.

In Part I, I discuss the approach proposed by these two scholars. Traditionally, customary international law is understood as a general and consistent practice of states followed out of a sense of legal obligation. In Professors Goldsmith and Posner's view, game theoretic principles suggest that customary norms are in fact the result of self-interested states acting in various strategic situations. They argue that three major conclusions can be drawn from this analysis. First, states do not comply with customary international law out of a sense of legal obligation—they act out of their rational self-interest in their interactions with other states. Second, customary norms do not reflect a single unitary logic. Third, they are skeptical that regularities in behavior among states that constitute a general and consistent practice exist. Such considerations lead

1. See, e.g., Curtis A. Bradley & Jack L. Goldsmith, *Customary International Law as Federal Common Law: A Critique of the Modern Position*, 110 HARV. L. REV. 815 (1993); Gerald L. Neuman, *Sense and Nonsense About Customary International Law: A Response to Professors Bradley and Goldsmith*, 66 FORDHAM L. REV. 371 (1997).

2. Jack L. Goldsmith & Eric A. Posner, *A Theory of Customary International Law*, 66 U. CHI. L. REV. 1113 (1999) [hereinafter *Theory*]; Jack L. Goldsmith & Eric A. Posner, *Understanding the Resemblance Between Modern and Traditional Customary International Law*, 40 VA. J. INT'L L. 639 (2000) [hereinafter *Modern and Traditional Customary International Law*].

3. See, e.g., Alan O. Sykes, "Mandatory" Retaliation for Breach of Trade Agreements: Some Thoughts on the Strategic Design of Section 301, 8 B.U. INT'L L.J. 301 (1990) (discussing trade agreements as noncooperative games); John Setear, *An Iterative Perspective on Treaties: A Synthesis of International Relations Theory and International Law*, 37 HARV. INT'L L.J. 139 (1996) (applying game theory to the international law of treaties); FERNANDO R. TESÓN, A PHILOSOPHY OF INTERNATIONAL LAW 73–103 (1998) (discussing the relationship between international law, game theory and ethics).

Professors Goldsmith and Posner to doubt the robustness of customary international law.

Professors Goldsmith and Posner's contribution is an important one. However, I draw different conclusions from the application of game theory to customary international law. In Part II, I put Professors Goldsmith and Posner's descriptive theory into some perspective by exploring whether the purported failure of customary international law to describe state behavior impacts the ability to use that law, first, as a tool for influencing state behavior, and second, as a source of rules of decision. First, with respect to influencing state behavior, I argue that the implications for a game theoretic critique extend to both custom and treaties—game theory appears to imply that in the final instance, neither source of law can be relied on to influence state behavior when interests change. However, even if this is true, international law can continue to be used instrumentally to enhance international cooperation when desired. Additionally, game theory explains why states cooperate or do not, but it does not explain anything new about the scope of the problem of international cooperation. Whether we feel confident in using custom or treaties to influence behavior depends on our assessment of the level of compliance with legal norms.

Second, with respect to the use of customary international law as a source of rules of decision, I argue that there is a sense in which a descriptive critique is inapposite because rules of law are used primarily to evaluate behavior, not describe it. However, if there is a broad mismatch between how states actually behave and how that behavior is evaluated, this raises questions about the legitimacy of that evaluation. In this regard, I argue that game theory has nothing to say about whether customary international law is a valid theory of law. At the same time, a broad mismatch would cause questions as to the value of such a theory.

In Part III, I argue that there is a sufficient amount of "true" cooperation among states to be construed as general and consistent state practices. First, game theoretic principles that model a preference for cooperation should apply to the formation of both customary norms and treaties. In contrast, Professors Goldsmith and Posner's applications of game theoretic models yield relatively low levels of cooperation among states. Unless those applications are modified, they do not account for the plethora of international treaties, which evidences relatively high levels of cooperation. Once such modifications are allowed, it is unclear why they should not apply to state interactions that do not result in treaties. Second, treating customary international law and treaties together is more consistent with the ways in which customary international law and treaties interact as sources of law. Since one source of law can

give rise to the other, both can be seen as manifestations of true cooperation among states. Third, there are game theoretic models that can account for such cooperation.

In Part IV, I examine the concept of *opinio juris*. I argue that recent game theoretic models of pro-social behaviors, in particular, strong reciprocity, are consistent with a strict concept of legal obligation that requires that at times persons who would prefer to defect will nevertheless cooperate. Because such models are just being developed, my arguments in this Part are tentative. Even so, such models indicate that it is too early to conclude from a game theoretic perspective that states never act out of a sense of legal obligation. Finally, in Part V, I discuss directions for further research.⁴

I. A NEW THEORY OF CUSTOMARY INTERNATIONAL LAW

A. *The Traditional Approach*

Professors Goldsmith and Posner suggest that game theoretic principles can be used to break through impasses that frustrate customary international law theory. Customary international law consists of general and consistent state practices followed out of a sense of legal obligation. The theoretical problems raised by customary international law are widely recognized. What level of general practice is required before a customary norm is established? How long must states follow a particular practice before it becomes a legally binding norm? How does a sense of legal obligation arise in the first place and what evidences it? If a customary norm by definition requires a sense of legal obligation, how do customary norms evolve, since to depart from a rule would violate it?⁵

Professors Goldsmith and Posner focus on two sets of issues crucial to the traditional understanding of customary international law. First, there is a set of “unarticulated assumptions” that underlie the traditional approach. According to Professors Goldsmith and Posner, supporters of the traditional approach understand customary international law as unitary, universal, and exogenous.⁶ Specifically, customary international law is unitary since all state actions included have the same “logical form.”

4. A thorough treatment of the issues discussed in this Article requires more rigorous mathematical modeling, which is not done here. Many of the sources I use here do provide mathematical support for their findings, which of course can be reviewed by the interested reader.

5. See ANTHONY A. D'AMATO, *THE CONCEPT OF CUSTOM IN INTERNATIONAL LAW* (1971); IAN BROWNLIE, *PRINCIPLES OF PUBLIC INTERNATIONAL LAW* (5th ed. 1998); MICHAEL BYERS, *CUSTOM, POWER AND THE POWER OF RULES* (1999).

6. *Theory*, *supra* note 2, at 1118–19.

In addition, customary international law is also universal since it binds all states except those who persistently object to it during its formation. Finally, customary international law is exogenous in the sense that it is an external force that influences state behavior.

Second, Professors Goldsmith and Posner argue that the traditional understanding of customary international law cannot explain international behavior. For them, “the traditional account cannot explain why [customary international law] changes in response to shifts in the relative power of nations, advances in technology, and other exogenous forces.”⁷ In fact, customary international law does not explain why nations frequently change their views about the content of customary international law, why national courts and politicians tend to articulate customary norms in self-serving ways, why states say one thing and do another, and, perhaps most importantly, why nations obey customary international law.⁸

B. *Game Theory and Customary International Law*

Professors Goldsmith and Posner suggest that new insight can be gained by identifying those situations in which behavioral regularities among states arise. In their view, instead of a set of rules established by a general and consistent practice followed out of a sense of legal obligation, customary international law actually refers to behavioral regularities that emerge out of self-interested state interactions in various strategic settings. There are four basic situations that give rise to such regularities: coincidence of interest, coercion, cooperation, and coordination.

Coincidence of interest occurs “where states engage in behavioral regularities simply because each obtains private advantages from a particular action (which happens to be the same action taken by the other state) irrespective of the action of the other.”⁹ Using an illustration drawn from the *Paquete Habana* decision,¹⁰ Professors Goldsmith and Posner posit a situation in which each of two belligerent states that patrol the same body of water can choose between attacking or ignoring commercial fishing vessels of the other state. Under certain conditions, it is simply more beneficial for each state, acting without regard to the other, to ignore the other state’s fishing boats than it is to attack them. The

7. *Id.* at 1119.

8. *Id.*

9. *Id.* at 1122.

10. 175 U.S. 677 (1900).

payoff for ignoring the other's boats is higher than it is for attacking,¹¹ and the fact that the two states refrain from attack is coincidental. "[T]he outcome is no more surprising than the fact that states do not sink their own ships."¹²

Coercion happens when "[o]ne state, or a coalition of states with convergent interests, forces other states to engage in actions that serve the interest of the first state or states."¹³ A powerful state could threaten to destroy a weaker state's navy if it attacks the stronger state's fishing boats. The stronger state could do this if the costs of carrying out the threat are relatively low. The weaker state, realizing that its payoff for attacking the stronger state's boats is very low, will not do so. If the stronger state has a better use for its navy, it too will refrain from attacking the weaker state's boats.¹⁴ Again, regularity in behavior is explained not by a general rule but by states responding rationally to a given strategic situation.

Cooperation arises when states find themselves in a bilateral repeated prisoner's dilemma.¹⁵ The logic of the prisoner's dilemma is such that it would be mutually beneficial if two states in such a dilemma cooperate, but if the game is played only once, the only "rational" thing to do is to defect. Over repeated interactions, though, states realize that it is more beneficial to cooperate so long as the other does not defect. However, several conditions must be met. First, both parties must care about the future—that is, they must both be willing to defer a present payoff for future gains.¹⁶ Second, the states must believe that they will continue to encounter each other for the foreseeable future. Finally, the payoffs for defection must not be too high relative to the payoffs for cooperation.¹⁷ Because of these conditions, Professors Goldsmith and Posner believe that behavioral regularity among states through cooperation is less likely to arise than through coincidence of interest or coercion. Nev-

11. *Theory*, *supra* note 2, at 1122–23.

12. *Id.* at 1123.

13. *Id.*

14. *Id.* at 1124.

15. *Id.* at 1125–26. *See also infra* text accompanying notes 83–85. The prisoner's dilemma is well known. Two prisoners are accused of committing the same crime. The prosecutor, examining each suspect separately, gives each two choices, to deny guilt or to confess. If both prisoners deny guilt, each goes free. If both confess, both will be imprisoned for three years. If one confesses and the other does not, the one who confesses will go free and receive a reward and the one who denies guilt will be imprisoned for six years.

It would be better for both prisoners if both denied guilt. However, each prisoner is afraid of being caught in a situation in which he denies guilt and the other confesses. So the only rational choice for each player is to confess.

16. This means that the future discount must be low.

17. *Theory*, *supra* note 2, at 1126.

coercion. Nevertheless, when such conditions exist, true cooperation among states does occur.¹⁸

Finally, coordination between states can arise when “each state’s best move depends on the move of the other state.”¹⁹ In this situation, state 1 prefers to take action X if state 2 takes action X, and state 1 prefers to take action Y if state 2 takes action Y. The problem, however, is that there must be some way of knowing or communicating in advance what each state will do to make coordination possible; otherwise, the states must choose based on the some guess as to what the other will do.

Since, in Professors Goldsmith and Posner’s view, most behavioral regularity among states can be explained as self-interested responses in one or more of these four types of games, it is no longer necessary to posit a universal customary norm that explains such behavior. Their theory “suggests that many apparently cooperative universal behavioral regularities are illusory.”²⁰ Indeed, even though cooperation can result from players that find themselves in a repeated prisoner’s dilemma or coordination game, Professors Goldsmith and Posner argue that on the international level, cooperation in these situations is probably rare. This is partly due to the fact that universality implies a large number of actors. In the case of the *n*-person repeated prisoner’s dilemma, however, the game eventually raises public goods or tragedy of the commons problems: despite cooperation among large numbers of players, one will always find it advantageous to defect or freeride. In the case of coordination, the sheer number of players makes such coordination very difficult. Given these problems, Professors Goldsmith and Posner argue that to the

18. *Id.* at 1127. For purposes of this Article, I will use “true” cooperation to refer to instances of behavioral regularities that are not merely the products of coincidence of interest or of coercion. More positively, it is a decision that it is preferable to cooperate with or coordinate one’s strategy with another’s.

19. *Id.* Coordination games take several forms, but the most common example used in game theory is the so-called battle of the sexes. A couple is deciding what to do for the evening. One prefers going to the opera, the other watching football, but each would rather spend time with the other than go to the opera or watch football alone. Under these circumstances, it would be best for both parties if both chose opera or both chose football. However, arriving at this outcome depends on the ability of each individual to communicate his or her intention to cooperate with the other. Alternatively, if such communication is not possible, each party is better off choosing based on the probability that the other party will choose a particular activity. For an introduction to coordination games and a discussion of recent experiments with them, see RUSSELL W. COOPER, COORDINATION GAMES: COMPLEMENTARITIES AND MACROECONOMICS viii–xiii, 1–17 (1999).

Note that both the prisoner’s dilemma and the battle of the sexes require cooperation between the players to arrive at the best solution for both of them. However, in the prisoner’s dilemma, there is only one such solution (cooperate), but in the battle of the sexes, there is more than one optimal solution. In this Article, I will use cooperation to refer to cooperation in both prisoner’s dilemma and coordination games, but will use coordination only to refer to cooperation in coordination games.

20. *Theory*, *supra* note 2, at 1129.

extent that there is cooperation among states, it is more often accomplished through treaties. Most behavioral regularity among states that purports to serve as a basis for customary norms can be explained by coincidence of interest or coercion.²¹

Professors Goldsmith and Posner also argue that in none of these instances does a state act out of a sense of legal obligation. It acts to serve its own national interest. This self-interest results in shifts, sometimes rapid, in customary norms. Customary norms form and change when either the rules of the game or its payoffs change.²² In the case of coincidence of interest, such interests change when the environment changes. In the case of coercion, change occurs when a state is no longer more powerful than the other. In the case of regularities arising out of a repeated prisoner's dilemma, what begins as behavior stemming from pure coincidence of interest can develop into true cooperation even when payoffs change. In the case of coordination games, customary norms can arise and change through trial and error.²³

As support for their theory, Professors Goldsmith and Posner examine specific areas where customary international law is thought to be robust: neutrality, diplomatic immunity, maritime jurisdiction, and the protection of coastal fishing vessels.²⁴ In each case, they argue that the record of actual state behavior is better explained by self-interested responses to specific strategic situations than by exogenous customary international norms. For example, in the area of neutrality, Professors Goldsmith and Posner trace state compliance with the principle of free ships, free goods.²⁵ They note that although early in its history, the United States proclaimed its adherence to the principle, it quickly de-

21. They argue, "many of the behavioral regularities called [customary international law] do not reflect meaningful international cooperation, but rather reflect coincidence of interest or coercion, both of which lack normative support." *Modern and Traditional Customary International Law*, *supra* note 2, at 671–72.

22. To illustrate, Professors Goldsmith and Posner return to the fishing boats discussed earlier. *See supra* text accompanying notes 11–14. There, two states initially decide not to attack each other's boats through coincidence of interest. Even though payoffs change such that it is now beneficial for each state to attack, the states might still refrain because not attacking has become a focal point that is a possible desirable strategy for states. *See Theory*, *supra* note 2, at 1133–34. (For more discussion of focal points, *see infra* text accompanying notes 33–35.) Alternatively, in the case where states start with a policy of attacking boats, if circumstances change so that it is no longer worth attacking boats, one state can announce that it will no longer attack. If the other state knows the announcing state's payoffs for not attacking, it might decide to "trust" the statement and stop its attacks as well. *Id.* at 1134.

23. To return to the battle of the sexes, *supra* note 19, after a series of unenjoyable evenings alone, one will give up and go to the opera, or perhaps the couple will take turns.

24. *Theory*, *supra* 2, at 1139–67 (discussing neutrality, diplomatic immunity, and maritime jurisdiction); *Modern and Traditional Customary International Law*, *supra* note 2, (discussing coastal fishing vessels).

25. *Theory*, *supra* note 2, at 1139–51.

parted from it during the Civil War by broadly expanding the concepts of blockade and continuous voyage.²⁶ During the Spanish-American War, Spain upheld the principle, not so much because it was a legal norm, “but rather because it lacked the naval capacity” to violate the norm.²⁷ Britain during the Boer War, and Russia during the Russo-Japanese War, eventually complied with the principle, but only after receiving threats from other countries. States were never able to agree to the principle during treaty negotiations at the beginning of the 1900’s, and the principle eventually disappeared during the First World War. For Professors Goldsmith and Posner, examples like this show how changes in state behavior are better explained by shifting interests than by customary norms and exceptions to those norms.²⁸ In short, “nations mouth their agreement to popular ideals as long as there is no cost in doing so, but abandon their commitments as soon as there is a pressing military or economic or domestic reason to do so.”²⁹

II. GAME THEORY AND THE ROBUSTNESS OF CUSTOMARY INTERNATIONAL LAW

Professors Goldsmith and Posner’s theory is intended to provide an alternative account of customary international law. The explanatory power of that theory leads them to question the robustness of custom as it has traditionally been understood.³⁰ Theirs is primarily a descriptive project: if they are right, there are relatively few general and consistent behaviors among states, none of which is motivated by a sense of legal obligation. Therefore, they hold it is inaccurate as a descriptive matter to speak as if such behaviors exist. I evaluate these descriptive claims in Parts III and IV, but in this Part, I examine the significance of Professors Goldsmith and Posner’s critique for two other important uses of customary international law. If customary international law does in fact fail to describe state behavior, in what ways, if any, does that impact our ability to use customary international law, first, as a tool for influencing state behavior, and second, as a source of rules of decision? I also examine

26. *Id.* at 1140–43.

27. *Id.* at 1144.

28. Professors Goldsmith and Posner reach similar conclusions with respect to diplomatic immunity and maritime jurisdiction. In addition, Professors Goldsmith and Posner argue that diplomatic immunity is a good example of behavioral regularities that can arise from the repeated bilateral prisoner’s dilemma. *See id.* at 1153–55. *See also Modern and Traditional Customary International Law*, *supra* note 2, at 642–54 (discussing state practice with regard to enemy coastal fishing vessels).

29. *Modern and Traditional Customary International Law*, *supra* note 2, at 672.

30. *Theory*, *supra* note 2, at 1121.

the implications of the answers to these questions for custom as a theory of law.

With respect to influencing state behavior, the implications for a game theoretic critique extend to both custom and treaties—game theory appears to imply that in the final instance, neither source of law can be relied on to influence state behavior when interests change. International law can nevertheless continue to be used instrumentally to enhance international cooperation when desired. Additionally, game theory explains why states cooperate or not, but reveals nothing new about the scope of the problem of international cooperation. Thus, whether policymakers feel confident using custom or treaties to influence behavior depends more on their assessment of states' levels of compliance with legal norms.

With respect to the use of customary international law as a source of rules of decision, there is a sense in which a descriptive critique is inapposite, because rules of law are used primarily to evaluate behavior, not describe it. If there is a broad mismatch between how states actually behave and how that behavior is evaluated, however, questions arise about the legitimacy of the evaluation. Game theory has nothing to say about whether customary international law is a valid theory of law. Again, however, a broad mismatch would cause us to question the value of such a theory.³¹

A. Customary International Law as a Means of Influencing State Behavior

Professors Goldsmith and Posner argue that customary international law fails to influence state behavior.³² If this is true, one must question the implications for a policymaker contemplating using customary international law instrumentally to influence state behavior. And while Goldsmith and Posner concede the communication value of treaties, they nevertheless believe the problem of influence extends equally to treaty law.

Professors Goldsmith and Posner hypothesize that many treaties facilitate cooperation among states by allowing states to communicate. Communication in turn helps states create what is known in game theory

31. It should be noted that, in general, Professors Goldsmith and Posner have not taken a position about the wider implications of their theory, and therefore should not be criticized for arguments they have not made. This section is not so much a direct critique of their theory as it is an attempt to understand its significance with respect to other aspects of international law.

32. Professors Goldsmith and Posner argue that “[n]ations would act no differently if [customary international law] were not a formally recognized source of law.” *Modern and Traditional Customary International Law*, *supra* note 2, at 672.

as focal points.³³ “[I]n a game of multiple equilibria, anything that tends to focus the players’ attention on one particular equilibrium, in a way that is commonly recognized, tends to make this the equilibrium that the players will expect and thus actually implement.”³⁴ As Roger Myerson notes, the outcome of a prisoner’s dilemma is so dismal that players have a strong incentive to enter into commitments if they are allowed to communicate with one another before the beginning of the game.³⁵

Professors Goldsmith and Posner suggest that treaties can serve as records of actions that serve as such focal points. “A treaty can record the actions that will count as cooperative moves in an ongoing repeat prisoner’s dilemma or the actions that achieve the highest joint payoff in a coordination game.”³⁶ Treaties, like customary international law, “can emerge endogenously from the rational behavior of states.”³⁷ Under this view, customary international law is the label attached to particular kinds of behavioral regularities among states, while a treaty is a label used to refer to pronouncements about such regularities. At the same time, customary international law and treaties differ in that the former develops in the absence of authoritative communication among interested states, while the latter are the product of such communication. This further explains why treaties are more likely than custom to enable cooperation and coordination among states.³⁸

Despite these advantages, treaties are on the same shaky footing, in Professors Goldsmith and Posner’s view, as customary international law in their ability to influence state behavior. Treaties, like customary norms, do not have any binding force in themselves.³⁹ “States refrain from violating treaties (when they do) because they fear retaliation from the treaty partner(s), or because they fear a failure of coordination, not because they feel an obligation.”⁴⁰ If this is true, international law is generally ineffective as a means of influencing state behavior, given that treaties and customary international law are the primary sources of that

33. *Theory*, *supra* note 2, at 1170–71.

34. ROGER B. MYERSON, *GAME THEORY: ANALYSIS OF CONFLICT* 371 (1991). The concept originates in THOMAS C. SCHELLING, *THE STRATEGY OF CONFLICT* (1960). Professor Schelling gives a good example of the focal point phenomenon. He asked a number of respondents where in New York City they would meet someone if they were given no time and location for the meeting and could not communicate with the other. The common answer was noon at the Grand Central Station information booth. *See id.* at 55–56.

35. MYERSON, *supra* note 34, at 371–72. This description of pre-game focal negotiations is a vastly oversimplified account of bargaining under game theory. For an introduction to cooperative game theory, *see id.* at 370–416.

36. *Theory*, *supra* note 2, at 1171.

37. *Id.* at 1172.

38. *Id.*

39. *Id.* at 1171.

40. *Id.*

law. Thus, under this view, game theory informs the hypothetical policymaker that international law helps states to cooperate, but in the end does nothing to prevent them from defecting when their interests change.

However, at least two qualifications should be made. First, even if game theory predicts that departures from international law will occur with changing interests, there is still a place for an instrumental use of international law. One can continue to use international law to enhance state cooperation—not an unimportant task. Perhaps game theory's greatest potential for contributing to international law is to provide a rigorous means of describing and articulating important aspects of state interaction and cooperation.⁴¹ The hope is that fully developed game theoretic models will help states design law that creates or enhances the conditions for cooperation, if such cooperation is desirable. Such models would help the international community understand better why some problems are more intractable than others.⁴² States could then decide how institutional and diplomatic resources should be allocated to address such issues. Game theory also could assist in evaluating existing law and suggesting improvements to that law. Finally, game theory could help explain the conditions under which violations of a law are likely.⁴³

Second, although game theory may describe more fully the reasons why states depart from international norms, it is common knowledge that such departures occur. Compliance on the international level has always been an issue because of the lack of effective enforcement mechanisms. In that respect, game theory provides no new information about the effectiveness of international law in influencing behavior. Standard game theory purports to explain why states break the law, but it does not indicate the magnitude of the problem. That becomes an empirical question.

41. See, e.g., JON HOVI, *GAMES, THREATS & TREATIES: UNDERSTANDING COMMITMENTS IN INTERNATIONAL RELATIONS* (1998) (using game theoretic principles to understand the making of international commitments). It is important to note, however, that game theory has its limits in the modeling of international behavior. For a discussion of those limitations, see Richard E. Quandt, *On the Use of Game Models in Theories of International Relations*, 14 *WORLD POL.* 69 (1961); Peter G. Bennett, *Modelling Decisions in International Relations: Game Theory and Beyond*, 39 *MERSHON INT'L STUD. REV.* 19 (1995). See also *GAME THEORY AND INTERNATIONAL RELATIONS: PREFERENCES, INFORMATION AND EMPIRICAL EVIDENCE* (Pierre Allan et al. eds., 1994) (discussing, *inter alia*, attempts to address some of the limitations involved with international relations and information).

42. See, e.g., Hugh Ward, *Game Theory and the Politics of Global Warming: The State of Play and Beyond*, 44 *POL. STUD.* 850, 853–62 (1996) (providing game theoretic models of changes in policies towards global warming).

43. See, e.g., Kenneth W. Abbott, "Trust But Verify": *The Production of Information in Arms Control Treaties and Other International Agreements*, 26 *CORNELL INT'L L.J.* 1 (1993) (discussing, *inter alia*, the use of game theory to discuss conditions for defections from arms control treaties).

Therefore, even though standard game theory suggests that the reasons for obeying law stem from self-interest, that might not matter from an instrumentalist perspective, if the frequency of departures from international norms is relatively low. In this respect, Louis Henkin's famous statement that "*almost all nations observe almost all principles of international law and almost all of their obligations all of the time*,"⁴⁴ may very well remain valid.

B. Customary International Law as a Source of Rules of Decision

Another way to assess the significance of Professors Goldsmith and Posner's theory is to examine it from the perspective of a judge or arbitrator asked to apply customary international law to resolve a dispute, or that of a legal advisor deciding whether to use custom in advising a government concerning a contemplated action. Would a decisionmaker or legal advisor be more or less inclined to use customary international law as a source of rules of decision if she believes there are few, if any, general or consistent practices, and none motivated by a sense of legal obligation?

In some respects, such a belief should not matter. The judge, arbitrator, or legal advisor is being asked to apply a rule to attach legal consequences to state behavior. In that context, the rule does not describe state behavior, it evaluates it. It does so by creating the preconditions that allow legal institutions to intervene in some way. Speaking of contract damages, Lon Fuller writes: "[T]he things which the law of damages purports to 'measure' and 'determine'-the 'injuries', 'items of damage', 'causal connections', etc.-are in considerable part its own creations, and . . . the process of 'measuring' and 'determining' them is really a part of the process of creating them."⁴⁵

Similarly, attempts to measure or determine "generality," "consistency," and a "sense of legal obligation" can be viewed in large measure as the genesis of those concepts, reflecting the evaluative function of international law.⁴⁶ Evaluations then serve as the predicate for individual or collective state action in response to a particular state's behavior. Sometimes international law performs this function in connection with retroactively attaching sanctioned consequences to state behavior. For example, a holding by a World Trade Organization Dispute Settlement

44. LOUIS HENKIN, *HOW NATIONS BEHAVE* 47 (2d ed. 1979) (emphasis in original).

45. L.L. Fuller & William R. Purdue, Jr., *The Reliance Interest in Contract Damages*, 46 *YALE L.J.* 52 (1936).

46. Fernando Tesón makes a similar distinction in describing *opinio juris*. He argues, "To say that X is a customary rule is to condemn, for moral reasons, self-interested deviation." TESÓN *supra* note 3, at 90.

Body that a member has violated a provision of the GATT is an evaluation of state behavior. That evaluation forms the predicate for eventual sanctions if the state refuses to respond appropriately to such a decision. At other times, evaluation takes place prospectively, as when a state contemplating a particular action tries to predict what the international response to such action might be. Such activities have very little to do with description. In this context, a criticism of customary international law for its lack of descriptive power is beside the point.

At the same time, an argument that there are very few, if any, consistent behaviors motivated by a sense of legal obligation might be relevant to the evaluative function of law, because it raises questions about the legitimacy of applying rules of decision.⁴⁷ One would expect some correspondence between description and evaluation, if for no other reason than that if legal evaluations could not possibly be mapped on to common perceptions of how the world is, their legitimacy would be in serious question. It would be difficult to justify a finding that there is an applicable general practice among states if there was, in fact, no such practice at all. That is why it is important to establish that there is more true cooperation among states than would be suggested by Professors Goldsmith and Posner's theory. There are, however, greater and lesser degrees of correspondence. In the struggle to determine that correspondence, one should not lose sight of the fact that an attack on customary international law for its descriptive power is limited because of the difference between description and evaluation.

C. Customary International Law as a Theory of Law

A possible mismatch between what is evaluated and what is described might have other, even more far-reaching, implications. It may be that customary international law is not robust as a theory of law—it is impermissible to attach legal significance to behavioral regularities or irregularities that are observed on the international level. Game theory cannot provide that kind of critique, but questions about the legitimacy or value of customary law as a theory of law arise where there is a broad mismatch between actual state behavior and customary international law's account of that behavior.

47. Of course, by raising the issue of legitimacy, I depart from Professor Goldsmith and Posner's main project, which is positive, not normative. However, if law is primarily used to evaluate behavior rather than describe it, the normative impact of their positive theory lies in the match between what is evaluated and what is described, which in turn raises the issue of legitimacy.

Professors Goldsmith and Posner do not extend their theory to such questions. They write, “The purpose of our argument is not to define law, but to explain international behavior and its relationship to what people call ‘customary international law.’”⁴⁸ Moreover, “the theory takes no position on the jurisprudential issue of whether international law is really ‘law.’”⁴⁹ Nevertheless, it is appropriate to consider whether game theory can serve as a critique of customary law as law—if for no other reason than to see how far the implications of game theory can be drawn. Indeed, some elements of Professors Goldsmith and Posner’s theory hint of such a critique. As soon as one speaks of customary law and treaty law as lacking normative force in and of themselves, one must wonder what this says about the status of international law as law. Moreover, Professors Goldsmith and Posner argue that one of the mistakes of traditional theorists is to construe state departures from previous commitments or behavioral regularities as excuses or exceptions to a customary legal norm.⁵⁰ From a game theoretic perspective, such departures are simply actions of self-interested states. Why, then, is it wrong to speak of such departures as exceptions to legal norms or as violations of them, unless it is inappropriate to speak of such norms as legal in some sense?⁵¹

Of course, game theory cannot sustain such an attack on law. All that standard game theory can do is describe and explain behavioral regularities among individuals or groups of players. Although game theory cannot say when it is appropriate to call such behavioral regularities legal in nature, it likewise cannot tell us when it is *inappropriate* to do so—unless one assumes that behavioral regularities that result from a

48. *Theory*, *supra* note 2, at 1121.

49. *Id.*

50. *Id.* at 1167.

51. The behavioral regularities and communication among states that Professors Goldsmith and Posner describe are quite similar to the social norms Professor Posner describes in other writings. *See, e.g.*, ERIC A. POSNER, *LAW AND SOCIAL NORMS* (2000). Professor Posner argues that social norms, such as gift giving, voting, going to church, etc., are behavioral regularities that people engage in to signal, “that they are desirable partners in cooperative endeavors.” *Id.* at 5. One of the themes of his argument is that “social norms are usefully understood as mere behavioral regularities with little independent explanatory power and exogenous power to influence behavior.” *Id.* at 7–8. Thus, “the claim that a social norm caused X or Y is an empty claim.” Rather, “[t]he appropriate claim is ‘individuals seeking a or b interacted in such a way as to produce behavioral regularities that we call ‘social norms.’” *Id.* at 8. Such a description of social norms aligns with Professors Goldsmith and Posner’s description of behavioral regularities that arise on the international level.

Professor Posner does not define law in his book, but law has an impact on such norms. Law can affect the signaling power of social norms by addressing dysfunctions of nonlegal enforcement mechanisms. *Id.* at 221. For example, Professor Posner argues that the role of contract law is to prevent defections caused by large changes in price. *Id.* at 157–60. What is important for this Article’s purposes is that social norms and law are not the same.

drive to maximize utility, however understood, cannot be given legal significance. Such an assumption requires some idea of what is meant by 'legal' and, by implication, 'law.' Game theory cannot yet call into question the robustness of customary international law in that way.

In this regard, Fernando Tesón also doubts game theory's ability to sustain a more general critique of international law as law.⁵² Like Professors Goldsmith and Posner, he uses game theory and its premise of self-interested behavior to criticize the positivist account of both customary and treaty law. He points to the central pillar of the positivist view: state consent to legal obligations. For Professor Tesón, game theory's assumption of self-interest obviates the need for such consent. Consent, which normally serves as the basis for the binding nature of an international norm, is relegated to a label for the recognition of a self-maximizing norm. "Under the assumptions of game theory, consent does not do *any normative work* in the explanation of international behavior."⁵³

Although Professor Tesón uses game theory to attack the positivist account of law, he ultimately rejects game theory as a basis for law. This is consistent with his more general claim that the normative force of law is ultimately grounded in ethics. Game theory does not explain "normativity" in this way. Game theory can explain why it might be in an agent's best interest to obey law, but in Professor Tesón's view, this is not the same as making an ethical decision. "What is distinctive about doing our duty is that we are obligated to do it especially when it is costly to us, when doing it frustrates some preference or interest that we have. That is why moral choice cannot be captured by strategic analysis."⁵⁴ Thus, because game theory cannot account for moral choice, it cannot distinguish between good and evil forms of cooperation between states.⁵⁵

Professor Tesón therefore offers a competing account of state behavior. He argues that states do make moral choices. Although states often do consider self-interest, "we may assume that often they cooperate because they believe that cooperation is the right thing to do, regardless of future payoffs."⁵⁶ This is best illustrated by the doctrine of *pacta sunt servanda*. To Professor Tesón, although *pacta sunt servanda* is normally viewed as a customary rule, it is actually a moral rule. An optimizing account of human behavior would not be able to derive such a rule.⁵⁷ It

52. See *infra* text accompanying notes 53–55.

53. TESÓN, *supra* note 3, at 85.

54. *Id.* at 79.

55. *Id.* at 92–94.

56. *Id.* at 80.

57. *Id.* at 89.

would be illogical for a system based on the maximization of utility to derive a rule requiring an individual state to act against its interest.⁵⁸

Although game theory cannot serve as a critique of law as such, it raises important negative implications for customary international law as law. Suppose there are few instances of behavioral regularities among states attributable to coordination or cooperation, and frequent deviations from what regularities do exist. One could argue it is not particularly helpful to have a law that applies in very few cases, that implies the international community is comprised of scofflaws, or both.

With respect to customary international law, however, the first implication may not be so problematic. It would not be surprising that, even under the traditional view of customary international law, relatively few state practices can be construed as customary legal norms. Professors Goldsmith and Posner have gone a step further, attempting to show that even those few areas where customary international law seems to apply are questionable. This, of course, raises concerns about the legitimacy of customary international law as an evaluative tool, if it becomes too far removed from what actually takes place among states.

The second possibility, that the world is comprised of scofflaws, is again an empirical question about the level of compliance with international norms. Just as no one would respect a law everyone breaks, so too should one question a theory of law that implies that everyone is a lawbreaker, no matter how well grounded that theory.

Thus, the real impact of a game theoretic claim that customary international law fails to describe state behavior lies in the match between law's evaluative function and the phenomena to which such law is applied. It is not necessary that there be an exact correspondence between the two, since by definition there cannot be an exact, or perhaps even close, correspondence. Nevertheless, the legitimacy of customary international law, both in terms of its acceptability to the world community when used to attach legal consequences to state behavior and as a theory of law, is roughly proportional to the degree to which its evaluations track what is described. Thus, customary international law would stand on firmer footing if there were evidence of greater cooperation among states, and if the application of game theoretic models to international behavior would allow for more true cooperation. For these reasons, it is appropriate to look more closely at cooperation on the international level.

58. Professor Tesón's strong concept of legal obligation is utilized later in this Article. See *infra* Part IV.B. Although law is ultimately grounded in the shared values of a community, one need not go as far as Professor Tesón does to understand that game theory (at least in its standard form) is limited in its ability to account for law.

III. COOPERATION AMONG STATES

Customary international law claims states are engaging in a common and consistent practice, which presumes that they are cooperating with one another. This Part argues that there is enough cooperation among states to justify such a claim. This argument is based on three supporting assertions. First, the four strategic situations—coincidence of interest, coercion, cooperation, and coordination—should account for the behavioral regularities reflected in both customary international law and treaties. These situations cannot, however, account for the plethora of treaties without modifications to the models that could apply equally well to customary law. This increases the probability that one is observing true cooperation with respect to customary law. Second, the complex way in which treaties and customary international law interact support the claim that they are more properly viewed together as methods for enabling cooperation among states. Third, game theoretic models would account for such levels of cooperation.

A. Treaties as Evidence of Cooperation Among States

The last century witnessed a mushrooming of treaty law, particularly after the Second World War. The United Nations is now the repository of over 40,000 certified true texts of treaties.⁵⁹ How might game theory account for this evidence of large-scale cooperation among states? Why would a state be willing to bind itself to a treaty? It is unlikely to do so simply because its interests just happen to coincide with another's. A state would be aware that the conditions that give rise to coincidence are ethereal—its interests could quickly change. A state would not lock itself into a treaty under those circumstances. If it finds that it is preferable to commit itself to a treaty, then the state is probably in some other game, one that gives rise to true cooperation. In addition, states could cooperate through treaty making because they find themselves in a repeated prisoner's dilemma or in a coordination game. Professors Goldsmith and Posner, however, believe that the conditions that would allow for cooperation in those scenarios are relatively rare. If so, there should be no basis for cooperation or coordination irrespective of what form such cooperation or coordination takes. In a repeated prisoner's dilemma that eventually results in a treaty, states must have the same low future discount necessary for true cooperation that results in a customary norm. Similarly, whether one uses a multilateral treaty or a customary legal

59. Palitha T.B. Kohona, *The United Nations Treaty Collection on the Internet*, 92 AM. J. INT'L L. 140, 141 (1998).

norm to coordinate railroad gauges (an example Professors Goldsmith and Posner use), there must still be agreement on a standard gauge.⁶⁰

If cooperation does not explain these treaties, there are three other possibilities. The first is that most treaties are coerced. That does not seem plausible, although, of course, examples do exist. The second is that the conditions that make cooperation possible under repeated prisoner's dilemma or coordination games are present. Third, either communication or another set of factors is present that makes possible cooperation and coordination when states interact, but is not captured in the standard repeated prisoner's dilemma or coordination game.

Note what happens, though, if either of the two latter possibilities is allowed. If the conditions for cooperation are more prevalent than thought, this also means that cooperation among states that does not result in treaties might be more prevalent as well. Such cooperation might well serve as the basis for customary international law. If, for example, communication is considered, what precludes states from communicating about issues that do not eventually result in treaties? Since communication facilitates greater cooperation, it would seem natural for states to communicate about issues of importance to them, decide whether or not to cooperate and then determine whether to embody such cooperation in either a treaty or a customary legal norm. This would mean that far more stable behavioral regularities result from versions of the repeated prisoner's dilemma or coordination game that could serve as the basis for international law, and in particular, a general and consistent practice of states.

B. *The Interaction of Custom and Treaties*

States have recognized a close relationship between treaties and custom. Article 38 of the Statute of the International Court of Justice establishes, *inter alia*, sources of international law as both treaties and customary international law.⁶¹ Both have been recognized by states through this treaty as legitimate sources of international law to be used by the International Court of Justice to resolve disputes among states. In an odd way, the treaty itself points to an almost recursive relationship between the two sources of law because by treaty, states have acknowledged that customary law exists and is authoritative. Indeed, any time states submit a dispute to an international tribunal that uses customary

60. Although ultimately critical of game theory as a sufficient basis for international law, Professor Tesón is also of the view that a game theoretic account of treaties would explain treaties as solutions to coordination problems and the repeated prisoner's dilemma. TESÓN, *supra* note 3, at 82–83. He also believes that treaties would be unnecessary in the case of coincidence of interests. *Id.* at 81–82.

61. See STATUTE OF THE INTERNATIONAL COURT OF JUSTICE, Art. 38.

international law they acknowledge the validity of such law as a source of rules of decision.

The relationship between the two sources of law is complex and dynamic. Customary international law often gives rise to treaties, as when a treaty codifies existing customary law. The Vienna Convention on the Law of Treaties is a good example.⁶² As is well known, that treaty is generally acknowledged to codify previously existing customary international law on the formation, interpretation, and termination of treaties.⁶³ Such codifications are rarely, if ever, a simple restatement of the law; customary international law often is unable to systematically treat all of the issues that may arise within a given subject matter. The process of codification, therefore, often serves as a further development and elaboration of the norms that are being expressed in treaty form. Further, codification may actually be the last step in 'crystallizing' norms that have not yet attained the status of law.⁶⁴ At the same time, the fact that customary international law and treaty law touching the same area may overlap does not necessarily affect the legal force of either source of law.⁶⁵

Treaties, on the other hand, may serve to create customary international law.⁶⁶ Article 38 of Vienna Convention on the Law of Treaties contemplates that it is possible for a treaty rule to become binding on a state as a customary rule recognized as such.⁶⁷ A good example of this is found in a report cited by the International Court of Justice to support a general finding that humanitarian law is binding not only as treaty law but also as customary international law.⁶⁸ In that report, the United Nations Secretary General lists a number of treaties that together constitute a part of international humanitarian law that apply during armed con-

62. Vienna Convention on the Law of Treaties, May 23, 1969, art. 38, 1155 U.N.T.S. 336 [hereinafter Vienna Convention].

63. RESTATEMENT (THIRD) OF THE FOREIGN RELATIONS LAW OF THE UNITED STATES Part III introductory note (1987) (accepting the Vienna Convention "as, in general constituting a codification of the customary international law governing international agreements").

64. For a discussion of the process of "crystallization" and the issues that arise from it, see H.W.A. THIRLWAY, INTERNATIONAL CUSTOMARY LAW AND CODIFICATION 16-30, 80-94 (1992); MARK E. VILLAGER, CUSTOMARY INTERNATIONAL LAW AND TREATIES (2d ed. 1997).

65. For example, the International Court of Justice found, in the *Nicaragua* case, that although Article 51 of the UN Charter governs the right of individual and collective self-defense, the United States was still bound by customary international law on the same subject. The court wrote, "Article 51 of the Charter is only meaningful on the basis that there is a 'natural' or 'inherent' right of self-defense, and it is hard to see how this can be other than of a customary nature, even if its present content has been confirmed and influenced by the Charter." *Military and Paramilitary Activities (Nicar. v. U.S.)*, 1986 I.C.J. 14, 94 (June 27).

66. VILLAGER, *supra* note 64, at 167-92.

67. Vienna Convention, *supra* note 62, art. 38.

68. *Legality of the Threat or Use of Nuclear Weapons*, 1996 I.C.J. 226, 258 (July 8).

flict.⁶⁹ The Secretary General reports that that part of humanitarian law “has beyond doubt become part of international customary law.”⁷⁰

To complete the circle, subsequent developments in customary international law can affect previously existing treaties. As Nancy Kontou observes, when a treaty is established, the subject matter of that treaty continues to evolve.⁷¹ “State practice may continue evolving outside the convention in response to changing conditions or perceptions of interests, and new conflicting custom may emerge as a result.”⁷² In such circumstances, “[o]ne party has the right to call for the termination or revision of a treaty on account of the development of new custom.”⁷³

The close relationship between customary international law and treaties has a number of implications for a game theoretic treatment of those sources. First, the way in which treaties and customary law can give rise to the other indicates that both sources should be understood as manifesting cooperation among states or assisting in such cooperation. The Vienna Convention on the Law of Treaties is understood to have codified existing customary law on that subject. John Setear makes a persuasive argument that this law is itself designed to enhance cooperation by providing occasions for frequent iterations of strategic encounters among states at each stage of treaty formation.⁷⁴ If this is true, then the law of treaties performed that function before it was codified in the Convention and thus serves as an example of customary international law being used to facilitate state cooperation. Indeed, the creation of the Convention is itself an example of such cooperation. In this respect, any treaty that codifies previously existing customary norms reflects cooperative behavior that has already emerged in the formation of the underlying customary norm.

Second, the relationship between the two sources of law strengthens an argument that communication can result in both forms. Assume that

69. *Id.* Those treaties are: the Geneva Conventions of 12 August 1949 for the Protection of War Victims; the Hague Convention (IV) Respecting the laws and Customs of War on Land and the Regulations annexed thereto of 18 October 1907; the Convention on the Prevention and Punishment of the Crime of Genocide of 9 December 1948; and the Charter of the International Military Tribunal of 8 August 1945. *Id.*

70. *Id.* There is something of a chicken and egg question here. The Court continued by stating that the treaties on humanitarian law reflected pre-existing customary international law on the same subject. *Id.*

71. NANCY KONTOU, THE TERMINATION AND REVISION OF TREATIES IN LIGHT OF NEW CUSTOMARY INTERNATIONAL LAW 10 (1994); *cf.* THIRLWAY, *supra* note 64, at 95 (arguing that if an area of international law has been codified in treaty, customary international law is ancillary).

72. KONTOU, *supra* note 71, at 10, 69.

73. *Id.* at 145. For a discussion of the conditions when such a rule applies, *see id.* at 146–47. *See also* VILLAGER, *supra* note 64, at 193–226.

74. Setear, *supra* note 3.

communication among states tends towards the treaty form. To the extent that a customary norm is generated from an existing treaty rule, it is plausible to construe that norm as the product of the communication that took place during the formation of the underlying treaty rule. This in turn means that the customary norm might reflect true cooperation made possible by such communication.

Third, (although well beyond the scope of this Article) the relationship between sources points game theory in the direction of more dynamic modeling of the forms of law. That is, one sees legal regimes evolving not only in terms of substance but also in form, from custom, to treaty, and back again. This is not to say that form and substance are not interrelated: it is not necessarily the case, or even likely, that a regime governed by treaty would be completely replaced by one governed by customary law.⁷⁵ Nevertheless, a reasonable approach would be to first examine the emergence of a norm and then examine the form in which it takes.

Differences in the way in which treaty norms and customary norms are created, implemented, and amended present various advantages and disadvantages such that states find it useful to employ both forms of law depending on particular circumstances. For example, treaty negotiation often involves high transaction costs. If the benefits of having an international norm embodied in treaty form outweigh those transaction costs, a state will incur them; otherwise, a state may choose to allow the norm to remain in its customary form. Similarly, with respect to amending international norms, the "choice" between treaty and customary forms might depend in part on a calculation of the costs and benefits of "lock-in," that is, the permanence of the legal norm. If states want to ensure permanence, they will choose the treaty form, but at the risk of being held to a norm even though the conditions that gave rise to that norm might change. In contrast (putting aside for now the logical problems raised by *opinio juris*), a customary international norm is arguably more malleable.

On the other hand, the fact that there are so many treaties might indicate that the treaty form tends to be preferred. Treaty law tends to be clearer, more precise, and more accessible than customary law. When clarity, precision, and accessibility are desirable, then the treaty form may prevail. Customary law takes time to develop and thus is unsuitable when rapidly changing events require a faster response by the world

75. VILLAGER, *supra* note 64, at 192. Some argue that treaties do not have the advantage in this regard. See O. A. ELIAS & C.L. LIM, THE PARADOX OF CONSENSUALISM IN INTERNATIONAL LAW 173–87 (1998) (criticizing the supposed advantages of treaties as a source of international law).

community.⁷⁶ Further, the increase in the number of states and international organizations might make treaties the preferred form.⁷⁷ For one thing, the large number of states itself makes it difficult to determine customary rules. However, given the complex interaction of custom and treaties, states may have less control over the shape international norms will take than one might expect.

C. Cooperation, Communication, and New Games

There are two possible explanations for the relatively high degree of cooperation and coordination among states, as evidenced by the large number of treaties. First, some prisoner's dilemma or coordination games are being played under conditions (for example, caring about the future) that create incentives for cooperation. Second, either communication or some other factor not captured in the standard repeated prisoner's dilemma or coordinating game makes cooperation and coordination among states possible.

It should be noted that it is not necessary that states *should* cooperate with one another. Game theory indicates that in certain games, optimal results can be achieved only through cooperation. If game theoretic principles can elucidate when state cooperation is likely, and if the presence of such conditions seems plausible on the international scene, then one might expect stable coordinated behaviors that are candidates for a general and consistent state practice.⁷⁸ Nor will states *always* cooperate or be *likely* to.⁷⁹

In addition, although I will discuss game theoretic models that purport to account for state behavior, I will also refer to game theoretic models that account for the behavior of individuals or groups of individuals. Professors Goldsmith and Posner argue that it is "hazardous" to equate state behavior with individual behavior. For one thing, they argue, individuals are subject to a number of cultural, historical, and biological

76. THIRLWAY, *supra* note 64, at 1–2.

77. There may also be historical reasons for preferring the treaty form. Writing in the 1970s, H.W.A. Thirlway also argues that a number of the newer states that emerged out of the colonial era rejected customary rules that purportedly supported colonial structures. *Id.* at 4.

78. I will treat the issue of general and consistent practice later in this Part. *See infra* text accompanying notes 135–36.

79. However, if cooperation at the state level does not occur, one would expect that rational international actors would attempt to find ways outside of the state machinery to cooperate or coordinate, to the extent such cooperation or coordination is necessary to achieve marginally better outcomes. This appears to be borne out in reality. The integrative forces of globalization could be understood as the result of many international players, including non-governmental organizations, transnational corporations, and individuals and government agencies, who are interacting strategically. If states are unable to arrive at fitter strategies that allow for greater payoffs on the international level, over time they will grow obsolete.

forces that influence behavior but do not apply to states.⁸⁰ Further, the process of state decisionmaking with respect to foreign policy decisions is much more complex than individual decisionmaking.⁸¹

I agree that there are differences between the behavior of individuals and what motivates them and the behavior and motivations of states. For example, the sheer number of individuals interacting with each other makes possible the emergence of cooperative patterns that might not be possible with a collection of some 190 states (although later I qualify this). I am prepared, though, to give greater credence to the evidence with respect to individuals for three reasons. First, as I discuss in detail below, states themselves are subject to both legal and extralegal forces that constrain behavior and are roughly analogous to cultural forces that constrain individuals. For example, although an individual "rogue" state may not care about such a label, most states try to avoid behaviors that would result in being labeled as such by the rest of the world's nations. Economic globalization is creating powerful incentives for concerted action among states. To be sure, these are economic as opposed to cultural forces, but the fact that states are motivated to engage in concerted behavior for economic reasons does not detract from the fact that such forces also limit state behavior.

Equally important, (although initial work is being done in this area) it is not yet possible to make fine distinctions between types of players.⁸²

80. They write:

[I]ndividual action takes place in an environment of dense and overlapping institutions, including families, governments, churches, and workplaces, all of which sanction those who deviate from norms, habituate people to behavior consistent with norms, and have roots that plunge deep into history and (in the case of the family) biology. Although international institutions exist, they are not as numerous, dense, and effective as domestic institutions.

Theory, *supra* note 2, at 1138–39 n.54.

81. "[B]ecause the individual decisionmaking process differs from the national decisionmaking process (which involves bargaining and compromise among many constituencies within a political framework), arguing about one on the basis of an analysis of the other is hazardous." *Id.*

82. As James Morrow puts it: "[Game theory] is a theory of interdependent decisions—when the decisions of two or more individuals jointly determine the outcome of a situation. The 'individuals' can be persons or collective entities that make consistent choices." JAMES D. MORROW, *GAME THEORY FOR POLITICAL SCIENTISTS* 1 (1994).

Game theoreticians are now beginning to use models that do not view states as unitary actors. See, e.g., Keisuke Iida, *When and How Do Domestic Constraints Matter: Two-Level Games with Uncertainty*, 37 J. CONFLICT RES. 403 (1993) (using game theoretic principles to model the relationship between international negotiations and domestic decisionmaking processes). A series of articles on this topic was published in the *Journal of Conflict Resolution* in 1997. See, e.g., Robert Pahre & Paul A. Papyoanou, *Using Game Theory to Link Domestic and International Politics*, 41 J. CONFLICT RES. 4 (1997); James D. Morrow, *When Do "Relative Gains" Impede Trade?*, 41 J. CONFLICT RES. 12 (1997); Suzanne Lohmann, *Linkage Politics*, 41 J. CONFLICT RES. 38 (1997).

The very examples that Professors Goldsmith and Posner use to show conditions under which behavioral regularity could emerge among states—coincidence, coercion, cooperation, and coordination—all have their origins in game theory as games played by individuals. On the level of those basic games, there is no meaningful distinction between individuals and states: the prisoner's dilemma is a dilemma whether the prisoner is a person or a country. Finally, quite often state action reflects the decisions of a relatively small number of individuals in power. To be sure, such individuals are highly influenced by other factors, but it seems unlikely that individual choice can be completely factored out in an account of international decisionmaking.

D. The Conditions for Cooperation in the Repeated Prisoner's Dilemma and Coordination Games

As Professors Goldsmith and Posner note, under certain conditions, cooperation among players is possible even in a prisoner's dilemma.⁸³ Robert Axelrod hosted two tournaments in which he invited contestants to submit strategies for the prisoner's dilemma and played them off one another. Before the second tournament, Professor Axelrod disclosed the results of the first and allowed the contestants to modify their strategies based on those results. The strategy that resulted in the highest overall score for both tournaments was Tit for Tat, a strategy that cooperated on the first move and then followed whatever the other player did.⁸⁴ It was a successful strategy because it did not compare its scores to those of other players, never started out by defecting, it retaliated immediately after the other defected, it forgave an opponent that resumed cooperating, and it was easily understood by other players.⁸⁵

Professor Axelrod's work received much attention because it appeared to demonstrate that cooperation was possible, and indeed desirable, even in a game such as the prisoner's dilemma. However, Professor Axelrod and other game theoreticians are aware that cooperation is not inevitable under all conditions. Each player must have a relatively low future discount. Each player must expect to encounter the other in the future. Finally, the payoffs for cooperation must outweigh the payoffs for defection.⁸⁶

As Eric Rasmusen notes, there are at least three reasons why one should not expect cooperation to arise out of every repeated prisoner's

83. See *supra* text accompanying notes 15–18. See also ROBERT AXELROD, *THE EVOLUTION OF COOPERATION* (1984).

84. AXELROD, *supra* note 83, at 31–32.

85. *Id.* at 109–23.

86. See *supra* text accompanying notes 16–17.

dilemma. Tit for Tat never beats any strategy on a one-on-one basis.⁸⁷ Tit for Tat won the two tournaments because it earned a relatively large number of points per round, but it never had the highest score in any one game. Thus, in an elimination tournament, Tit for Tat would be eliminated relatively early.⁸⁸ In addition, Professor Rasmusen argues, a player would normally want to revise its strategy based on those of the others. Although some of the strategies designed for the second tournament would have won the first, they did poorly because the environment of the second tournament had changed. Other programs that did allow for changing strategies did not do well in the game, but would have done better had there been more iterations of the game.⁸⁹ Finally, if there are occasional defections through what is known as trembles, two Tit for Tatters facing each other would do poorly because a defection would be followed by defection and so on.⁹⁰ “Tit-for-tat is suboptimal for any given environment, but is robust across environments, and that is its advantage.”⁹¹

Cooperation is thus possible but not inevitable. The issue then is whether the conditions for cooperation are present among states. Samuel Bowles and Herbert Gintis show that conditions that exist in communities make possible the emergence of pro-social behaviors. They suggest that one reason that communities, such as residential neighborhoods, old boy networks, ethnic associations, etc., might persist in modern life is because they foster cooperative behavior among individuals who face cooperation problems raised by strategic situations like the prisoner’s dilemma.⁹² A community is “a structure of social interaction characterized by high entry and exit costs and non-anonymous relationships among members.”⁹³ Interactions among members are frequent. In addition, “communities lack a centralized structure capable of making

87. ERIC RASMUSEN, GAMES AND INFORMATION 152 (3rd ed. 2001).

88. *Id.*

89. *Id.*

90. This refers to a small chance that a player will pick an out-of-equilibrium strategy. *Id.* at 139.

91. *Id.* In international relations, another critique of the Tit for Tat approach is that cooperation among states is unlikely because states are concerned with relative gains; that is, they evaluate their own gains in light of the gains of other states. Marc Busch and Eric Reinhardt find, however, that cooperation can emerge even when relative gains are a concern, as long as the choice of strategies allows for retaliation when there are defections. Marc L. Busch & Eric R. Reinhardt, *Nice Strategies in a World of Relative Gains: The Problem of Cooperation Under Anarchy*, 37 J. CONFLICT RES. 427 (1993).

92. Samuel Bowles & Herbert Gintis, *The Moral Economy of Communities: Structured Populations and the Evolution of Pro-social Norms*, 19 EVOLUTION & HUMAN BEHAVIOR 3 (1997).

93. *Id.*

decisions binding on its members.”⁹⁴ Members of a community, therefore, cannot enforce bargains.

This description of communities is relevant here. From the perspective of individuals, the state is the result of the complex interaction of many individuals and coalitions of individuals. From the perspective of states interacting with other states on the international level, however, states appear to share the characteristics of a community of individuals. Like communities of individuals, states as a group have very high entry and exit costs. They are not anonymous with respect to each other, and they interact frequently. There is no central authority capable of making decisions binding on states.

Professors Bowles and Gintis show that even though community members cannot enforce agreements, communities nevertheless encourage cooperation in three ways: through reputation effects, retaliation effects, and segmentation effects. By reputation effects, Professors Bowles and Gintis mean that where, as in a community, there is a high frequency of interaction among members, the cost of gathering information about members lowers and the benefits from gaining such information rises.⁹⁵ The wide availability of information creates an incentive among agents to act in ways beneficial to others in the community. “Thus when agents engage in repeated interaction, they have an incentive to act in ways that build their ‘reputation’ for cooperative behavior.”⁹⁶

According to the model, then, relatively low information costs about players will create incentives to gain a reputation for being cooperative. Does this obtain for states? On the one hand, information about a state’s likely intentions and motives is quite costly. Many countries, such as the United States, spend significant resources to obtain information about, and predict, the likely behavior of other states. On the other hand, states, like people, have reputations for being cooperative or not, based on history. Such information is relatively inexpensive.⁹⁷ In this sense, it would

94. *Id.* at 4.

95. *Id.* at 7, 11–14.

96. *Id.* at 7.

97. It would be interesting in this regard to examine from a game theoretic perspective the role the United Nations plays in the interactions of states. Even if we put aside the legal significance of state activity at the United Nations level, such as official statements and UN resolutions, such a role has the potential of being quite important. The UN’s existence has at least two effects: it makes possible an almost daily set of interactions between states and lowers the cost of obtaining information about a given state. For an example of game theoretic principles as applied to international regimes more generally, see James D. Morrow, *Modeling the Forms of International Cooperation: Distribution Versus Information*, 49 INT’L ORG. 387 (1994).

behoove a state to engage in cooperative behavior, if only to enhance its reputation as a cooperative state.⁹⁸

The retaliation effect occurs when persons who know that they will have long-term interactions with others act favorably to avoid future repercussions.⁹⁹ This is an elaboration of Professor Axelrod's findings. Professors Bowles and Gintis show that high entry and exit costs with an associated expectation of frequent interaction increases the likelihood of cooperative outcomes. Repeated encounters change interactions among community members in two ways. First, they allow members to adopt more complicated strategies that take into account the prior actions of other members and second, they require that a player take into account the aggregate payoffs over the entire game¹⁰⁰ (thereby addressing two of the reasons Professor Rasmusen identifies why the repeated prisoner's dilemma does not always result in cooperation¹⁰¹). They then show that if the probability of terminating the game is sufficiently low, Tit for Tat becomes an evolutionarily stable strategy;¹⁰² that is, unilateral defections

98. Professors Goldsmith and Posner are skeptical that a concern for reputation will influence state behavior, in part because states will preserve their reputations only when it is in their interest to do so. *Theory*, *supra* note 2, at 1135–37. But the point of Professors Bowles and Gintis' work is that existing conditions in community-like settings make it unlikely that a rational actor would cease to care about its reputation.

As rational actors, foreign-policymakers would consider reputation. A good example comes from transcripts of recordings made during the Cuban Missile Crisis. One of the early options for responding to the presence of offensive nuclear weapons in Cuba was surprise air strikes to destroy the missiles before they became operational. One of several reasons a surprise attack was ruled out was the adverse impact that it would have on the United States' reputation. Under-Secretary of State George Ball, argued that Premier Khrushchev needed to be warned before any military action:

Even though it may be illusory, I think we still have to [warn him], because I think that the impact on the opinion and the reaction [of the allied countries] would be very much different than a course of action where we strike without warning, that's like Pearl Harbor. It's the kind of conduct that one expects of the Soviet Union. It is not the conduct that one expects of the United States.

THE KENNEDY TAPES: INSIDE THE WHITE HOUSE DURING THE CUBAN MISSILE CRISIS 143 (Ernest R. May et. al eds., 1997). Attorney General Robert Kennedy returned to this theme. "I think George Ball has a hell of a good point. . . . I think it's the whole question of, you know, assuming that you do survive all this, the fact that we're not . . . the kind of country we are." *Id.* at 149. Secretary of State Dean Rusk interjected, "This business of carrying the mark of Cain on your brow for the rest of your life is something . . ." *Id.* Robert Kennedy completed his thought. "We did this against Cuba. We've fought for 15 years with Russia to prevent a first strike against us [unclear]. Now, in the interest of time, we do that to a small country. I think it's a hell of a burden to carry." *Id.*

99. Bowles & Gintis, *supra* note 92, at 7, 14–17.

100. *Id.* at 14–15.

101. See *supra* text accompanying notes 87–91.

102. The term derives from the application of game theory to biology. "An [evolutionarily stable strategy] is a strategy, such that if all the members of a population adopt it, then no mutant strategy could invade the population under the influence of natural selection." JOHN MAYNARD SMITH, *EVOLUTION AND THE THEORY OF GAMES*, 10 (1982).

will not cause cooperation to deteriorate.¹⁰³

States can be characterized as having high entry and exit costs. Although new states do emerge, it is difficult to achieve international recognition as a state. Further, although one does not usually speak of states exiting, there are relatively few instances when states completely disappear from the scene. If they do disappear, it is usually as the result of great upheaval. The net effect is that states understand that they will interact frequently and that the possibility of terminating relations is relatively low.

The third effect, the segmentation effect, occurs in a population of many communities. In such a situation, it is more likely for a member of a community to interact with another member than with someone else randomly selected from the rest of the population. This enhances the frequency of likes interacting. "A result is that pro-social behaviors are more likely to be rewarded, those with pro-social norms begin more likely to interact with other pro-social agents, and conversely for anti-social behaviors."¹⁰⁴ Under these circumstances, cooperation among states is possible.

Other factors may also make agreement possible in coordination games. Professors Goldsmith and Posner are skeptical of the possibility of coordination on a multilateral level because of the difficulties and expense of coordination among a relatively large number of states.¹⁰⁵ R. Harrison Wagner observes that high coordination costs tend to reduce the present value of any future agreement to a level less than non-agreement.¹⁰⁶ Even so, Professor Wagner argues that the problem of costs is ameliorated by two factors. First, the emergence of large-scale organizations is probably related to the ability of small groups to dominate large groups.¹⁰⁷ Second, to the extent that major states or coalitions of states behave as unitary actors, cooperation is possible among them because the conditions for cooperation exist among such states.¹⁰⁸

103. Bowles & Gintis, *supra* note 92, at 15–17.

104. *Id.* at 7, 17–19. Except with respect to alliances of states, this effect does not appear to be as relevant to state cooperation.

105. *See supra* text accompanying notes 20–21.

106. R. Harrison Wagner, *The Theory of Games and the Problem of International Cooperation*, 77 AM. POL. SCI. REV. 344 (1983).

107. *Id.*

108. *Id.* For example, the then-newly independent states in Africa and Asia played an important role in the creation of the Vienna Convention on Succession of States in Respect of Treaties. *See* Emmanuel G. Bello, *Reflections on Succession of States in the Light of the Vienna Convention on Succession of States in Respect of Treaties 1978*, 23 GERMAN Y.B. OF INT'L L. 296 (1980).

E. Communication

Despite the absence of enforceable agreements, communication can still facilitate cooperation by providing focal points for certain optimal strategies. Assume that communication is a crucial factor in making possible cooperation at the international level. As noted, treaties sometimes result from customary international law and customary international law sometimes emerges from treaties; thus, it is hard to pinpoint when communication first takes place. What counts as communication in a treaty may count as communication in the formation of a subsequent customary norm, or, in the case of a codifying treaty, may well be the product of communication that formed the basis for the pre-existing customary norm.

Communication plays an important role in the formation of contemporary customary international law in another respect. As Jonathan Charney notes, contemporary customary international law often traces its roots to international fora such as the United Nations General Assembly, the Security Council, and other standing or ad hoc international groups.¹⁰⁹ At such fora, states address issues of common concern. Professor Charney writes:

Sometimes these efforts result in a consensus on solving the problem and express it in normative terms of general application. At other times, the potential new law is developed through the medium of international relations or the practices of specialized international institutions and at later stages is addressed in international forums. That process draws attention to the rule and helps to shape and crystallize it.¹¹⁰

In game theoretic terms, these types of fora provide states with the opportunity to communicate, thereby creating focal points that enable cooperation that would not otherwise be possible in certain games.¹¹¹

109. Jonathan I. Charney, *Universal International Law*, 87 AM. J. INT'L L. 529, 543-44 (1993). Other examples include the U.N. Commission on the Status of Women, an intergovernmental organization that prepares recommendations and reports on promoting women's rights. *Commission on the Status of Women*, <http://www.un.org/womenwatch/daw/csw/index.html#functions> (last visited Nov. 9, 2001). In addition, the United Nations Forum on Forests is an intergovernmental organization established to develop international norms with respect to forest management and conservation. *Report of the United Nations Forum on Forests on its First Session*, U.N. ESCOR, 2001 Sess., U.N. Doc. E/2001/42/Rev.1 (2001).

110. Charney, *supra* note 109, at 544.

111. "A functioning [international] regime elicits messages that allow the players to form expectations about one another's upcoming move." Morrow, *supra* note 97, at 404. Professor Morrow cites the International Telegraph Union, an international organization used to develop common standards for international messages, as an example of an international regime that allowed for the international solution of coordination games. *Id.* at 390-92.

F. Variations of Older Games and Evolutionary Games

Another way to account for relatively high levels of cooperation among states is to vary rules of the games already considered, or to introduce new games. For example, in *The Theory of Games and the Problem of International Cooperation*,¹¹² Professor Wagner experiments with three changes to the prisoner's dilemma. Along with increasing the number of players in the game, a second change is to allow players to make repeated choices in a single game. In this situation, cooperation will be the optimal strategy in any situation where the players have full knowledge of the other's choices, as long as no one believes that he or she is making the last or next to last choice.¹¹³ Thus, the players are given the chance to modify their strategies based on information about the other players' strategies. The modified game is similar to the repeated prisoner's dilemma, but differs because the repeated moves take place within a single game. Thus, cooperation is readily identifiable as an optimal strategy, whereas cooperation as the optimal strategy is not as apparent in the repeated game. It takes many iterations of the repeated prisoner's dilemma before the advantages of cooperation begin to show themselves.¹¹⁴ Thus, in the area of arms control, Professor Wagner argues that if a state is confident that it can detect an opponent's cheating, and re-arm before the opponent can take advantage of such cheating, then the arm's control agreement can be stable.¹¹⁵

The third change Professor Wagner makes is to give the players in a prisoner's dilemma more than two moves. Recall that in the standard

Professors Goldsmith and Posner also argue that communication about customary international law itself can lead to cooperation, which explains why states that are not influenced by customary norms nevertheless claim they are. "[A] nation's self-serving statement of its views about the content of [customary international law] can provide meaningful information that can, in the right circumstances, allow nations to cooperate." *Modern and Traditional Customary International Law*, *supra* note 2, at 665.

It should be noted, however, that communication alone does not ensure cooperation or coordination. James Morrow shows that international attempts at cooperation involve competing incentives created by distribution and information problems that arise in international coordination games. Morrow, *supra* note 97, at 403–07.

112. Wagner, *supra* note 106, at 330.

113. *Id.* at 333. In theory, if players knew exactly how many rounds they will play, they would defect from the beginning. If they knew that they were playing the last round, they would be tempted to defect since defection would result in greater gain to an individual, and there would be no need to worry about retaliation in subsequent moves. But if this were so, players in the second-to-the last round would also defect, since they know that defection will happen in the last round. This logic applies through continuously earlier rounds until it applies at the first round of the game.

114. *Id.*

115. *Id.* at 334. Professor Wagner speculates that one of the reasons state cooperation is relatively easy to achieve in some areas and more difficult in others is the ability to detect and respond to violations of any agreements. *Id.*

game, a player has a choice of either defecting or cooperating. If players are allowed to make other moves, than it is possible for the players together to devise strategies that will enhance the possibility for cooperation, such as retaliatory moves that each player has confidence in.¹¹⁶ Further, each individual player can devise retaliatory measures that increase its confidence in the other's cooperation.¹¹⁷ Additionally, allowing for more moves allows parties to bargain.¹¹⁸ This is not to say that bargaining alone ensures cooperation. As discussed above, bargaining, especially among large groups of states, can be costly and in other circumstances creates opportunities for coercion. Bargaining, however, does allow one to break the impasse posed by the prisoner's dilemma.

Other more sophisticated models of social norm formation also exist. In *Individual Strategy and Social Structure*,¹¹⁹ H. Peyton Young proposes a model for the emergence of social institutions based on fictitious play.¹²⁰ An institution for him is "an established law, custom, usage, practice, organization."¹²¹ His model attempts to show how individuals interacting with limited knowledge and sometimes erratically, will nevertheless over time arrive at social equilibria, such as "language, codes of dress, forms of money and credit, patterns of courtship and marriage,

116. *Id.* at 336.

117. *Id.* Professor Wagner is aware that such measures may create a security dilemma: increasing one party's security has the potential for decreasing the security of the other, thereby increasing the possibility of defection. But, Professor Wagner argues that although the security dilemma is a real problem, the existence of such a dilemma itself is not a sufficient condition for a defensive first-strike or an arms race. *Id.* at 337-42.

118. *Id.* at 342-44.

119. H. PEYTON YOUNG, *INDIVIDUAL STRATEGY AND SOCIAL STRUCTURE* (1998). For an overview of Professor Young's approach, see HERBERT GINTIS, *GAME THEORY EVOLVING: A PROBLEM-CENTERED INTRODUCTION TO MODELING STRATEGIC BEHAVIOR* 229-36 (2000) [hereinafter *GAME THEORY EVOLVING*].

Professors Goldsmith and Posner feel that Professor Young's work is unlikely to be relevant to customary international law. *Theory, supra* note 2, at 1131 n.42. For them, Professor Young's model "shows that as long as parties either experiment or occasionally make errors, and as long as they interact frequently, parties will eventually coordinate on Pareto-optimal actions." *Id.* However, they argue "'[e]ventually' . . . may be a very long time, and the games the model uses rely on institutional structure that is lacking with respect to [customary international law]." *Id.*

Despite this critique, Professor Young's model might, indeed, hold more promise for understanding customary international law than Professors Goldsmith and Posner believe. First, with respect to institutions, the games that Professor Young's model uses do not require institutions; they are used to explain the emergence of institutions. In other words, customary international law might be one of the institutions that allows for international cooperation. *See infra* text accompanying notes 127-32. The issue of time, however, is open, but Professor Young does account for the need for time to arrive at equilibrium. *See infra* text accompanying notes 135-37.

120. In fictitious play, a player bases her strategy on the past history of her opponent's moves.

121. YOUNG, *supra* note 119, at xi.

accounting standards, rules of the road.”¹²² Individuals “adjust their behavior based on what they think other agents are going to do, and these expectations are generated endogenously by information about what other agents have done in the past.”¹²³ This adjustment creates a feedback mechanism in which the individual’s responsive action creates a precedent, which creates expectations about that person’s likely future behavior, which in turn leads another individual to act, which creates yet another own precedent, and so on.¹²⁴ Over time, out of this feedback mechanism emerge patterns of behavior that constitute institutions. Institutions such as customs, practices, etc., are “predictable patterns of equilibrium and disequilibrium behavior” that emerge from such interactions.¹²⁵

One of the examples Professor Young gives for the evolution of institutions is the adoption of the right-hand driving convention in Europe, a process that spanned some two hundred years.¹²⁶ Deciding on which side of the road to drive can be understood as a coordination game between two persons approaching from opposite directions. It does not matter which side they use, so long as each chooses the same side. In the early stages, when traffic was relatively low, conventions emerged locally. As the amount of traffic increased, local conventions congealed into regional and then national conventions, finally being codified into national laws in the nineteenth century.¹²⁷ At the international level, the emergence of the right-hand rule received a push from the Napoleonic wars.¹²⁸ France switched from a primarily left-hand rule to a right-hand rule after the French revolution, a custom that Napoleon adopted for his armies and in turn spread throughout Europe during his campaigns.¹²⁹ Professor Young notes that thereafter, a gradual shift emerged, roughly from west to east, to the right-hand rule.¹³⁰

122. *Id.* at 4.

123. *Id.* at 6. As Professor Gintis notes, game theory posits at least four ways in which an agent can “choose” a strategy. The first is to predict the expected behavior of other players and choose a best response. The second is to inherit a strategy from one’s parents and play it regardless of what other players do. The third is to mimic another’s strategy, perhaps if it appears to be more successful. The fourth is to recall the other player’s past strategies and develop a best response to it. *GAME THEORY EVOLVING*, *supra* note 119, at 229–30.

For an argument that states do take into account the past history of other state’s moves, see Catherine C. Langlois & Jean-Pierre Langlois, *Behavioral Issues of Rationality in International Interaction*, 43 *J. CONFLICT RES.* 818 (1999).

124. *YOUNG*, *supra* note 119, at 6.

125. *Id.* at 144.

126. *Id.* at 16–17.

127. *Id.* at 16.

128. *Id.* at 17.

129. *Id.*

130. *Id.* Portugal switched after World War I. Austria switched from province to province, completing the process with the Anschluss with Germany in 1938. Hungary and

This example, and Professor Young's model more generally, provide fresh insights into the emergence of international cooperation. The emergence of the right-hand rule is an example in which norms arise from the bottom up, from random encounters on domestic roads to the adoption of a common standard by several countries. If this cooperation explains some international norms, then to understand international cooperation more fully, one needs to look at the cooperation that emerges from individual interactions and which spreads from thence to the regional, national, and international levels.

Two more points should be made about Professor Young's work. First, the process he describes is buffeted periodically by random external shocks (such as the French Revolution), or unpredictable human behavior; hence, the system is never completely stable and always in flux. These shocks account for institutional change. However, as Professor Young demonstrates, some equilibria are more stochastically stable than others and thus are less likely to change over time.¹³¹ Such differences in stability would explain the persistence of some institutions and the transience of others.

Second, by "time," Professor Young refers to "event" time, meaning the number of interactive events that give rise to regular patterns of behavior. It is possible, therefore, in some situations to have a large number of interactive events occurring within a relatively short period of real time.¹³² This raises the question whether there is enough event time for norms to emerge on the international level. Interactions between states alone may be enough for norms to emerge. In any event, the problem is ameliorated by the fact that either local or transnational interactions among sub-state actors may give rise to equilibria that states then use as the basis for adopting international norms. For example, the practices that emerge from countless domestic business transactions are used with some variations in international transactions, in turn giving rise to a set of practices that might eventually find their way into international treaties.¹³³

Czechoslovakia also were forced to convert during this time. The last continental European country to switch was Sweden, which did so in 1967.

131. *See id.* at 46–65.

132. *Id.* at 15–16, 144.

133. The issue of time, however, is a real one, particularly if game theory attempts to capture more lifelike situations in which there are many players or several options. Suppose, as John Holland suggests, there is a game with 10 options and 20 moves; the game would have 10^{20} pure strategies. If a computer were capable of testing each strategy every 10^{-9} seconds, it would take about 30 centuries to test all possible strategies. JOHN H. HOLLAND, ADAPTATION IN NATURAL AND ARTIFICIAL SYSTEMS 41–42 (1975). Such considerations lead Professor Holland to focus on relatively good strategies and means of discovering better ones rather than a focus on finding the best strategy. *See id.*

G. Cooperation Among States as General and Consistent Practices

The realities of international cooperation as reflected in treaties and the interrelation between customary international law and treaties are such that there is more “true” cooperation among states that takes customary form than first meets the eye. Moreover, there are game theoretic models that begin to account for such cooperation. This recognition is important for customary international law because the legitimacy of customary law as both an evaluative tool and as a theory of law depends in part on a rough match between such evaluations and actual state behavior. In my view, such a match exists.

The reason I stress that the match need not be, indeed, cannot be, any more than a rough one is because of the difference between evaluation and description, between a legal theory and a model of behavior. The actual practice of states and the game theoretic models I have discussed suggest that the conditions for cooperation among states are present. However, is there enough cooperation: do the behavioral regularities that have been described by the models justify a finding of generality and consistency required of a customary norm? There are at least two facets to this problem. The first is with respect to frequency—how often must states observe a practice before it is general and consistent? Again, it is important to note that game theory itself cannot answer this question. Game theory can model conditions when cooperation among states may or may not be likely. A legal theory is needed to tell us how much generality and how much consistency is required before we can attach legal significance to the patterns of behavior that are observed among states.

Note what happens, though, if what is described roughly matches its evaluation. If a behavioral regularity among states is indeed relatively stable, then it begins to make more sense to speak of departures from that regularity as violations, provided, of course, that we have a theory of law which enables us to raise such a regularity to the status of law. Eventually, there may be enough endogenous shocks to that behavioral regularity such that there will be a change in the norm; but until that time, it becomes appropriate to think about competing behaviors as aberrant rather than adaptive.

The second facet concerns the motivations for behavioral regularities. Putting aside for now the important question of *opinio juris*, I wish to examine whether customary international law presupposes a unitary logic—that behavioral regularities must arise either out of the same contexts or out of the interaction of a large number of states. Suppose a state practice of refraining from attacking coastal fishing vessels emerged, and observers were able to determine that there were a number of

explanations for the purported consistency. Some states refrained from doing so out of coincidence, others were coerced into refraining from attacking out of fear of retaliation, some found themselves in a repeated prisoner's dilemma and realized that cooperation was in their respective best interests, and others were able to coordinate their activities. Suppose further that all truly cooperative behaviors could be explained through interactions of pairs of states, not a relatively large number of states. As long as most states refrained from attack, it is plausible to find as a legal matter that the behavioral regularity is general and consistent. As long as there is a practice, it should not matter why it is followed (again leaving aside the important question of *opinio juris*, to which I turn next), and nothing in the standard account of customary international law requires otherwise.¹³⁴

IV. GAME THEORETIC APPROACHES TO THE LAW AND THE PROBLEM OF *OPINIO JURIS*

In Part II, I argued that game theory cannot give a credible account of the law, and for that reason, there is an important sense in which game theoretic principles cannot call into question the robustness of a concept like *opinio juris*. At the same time, most commentators acknowledge that *opinio juris* is a concept for which it is difficult to account with any consistency, even though most also acknowledge the need for some concept that will distinguish behaviors that have legal consequences from those that do not.¹³⁵ If game theory can shed some light on these issues, it would be for the better. The answer given by Professors Posner and Goldsmith is that states do not act out of a sense of legal obligation. Standard game theory does not need a concept of law to explain strategic behavior among actors: maximization suffices.

Nevertheless, as long as legal consequences attach to behaviors, it is necessary to distinguish law from mere custom, which *opinio juris* is

134. Professor Villager also believes that a common practice can emerge for many reasons: "[S]ome States engage in a given practice, or make claims, for a wide variety of reasons (but not erroneously), i.e. alternatively or cumulatively because the conduct or claim is persuasive, out of self-interest, for reasons of political pressure, gain, comity, courtesy, etc." VILLAGER *supra* note 64, at 53. For him, the important motivation is *opinio juris*. *See id.*

I agree with Professors Goldsmith and Posner, however, that there is a problem of legitimacy. Why should one support behaviors that are the result of coercion or coincidence of interest? For example, most people would doubt the legitimacy of a treaty that was entered into under threat of war. Yet, as a rule, other forms of behavior, such as economic sanctions and other diplomatic measures are not prohibited under international law.

135. The jurisprudential basis for legal obligation in international law generally is the subject of debate. *See* Charney, *supra* note 109, at 531–32 (discussing theories of obligation under international law).

meant to do.¹³⁶ This Part explores other ways in which game theory might account for the problems raised by *opinio juris*. I intend to frame the issues that one must address in responding to the objections raised by Professors Goldsmith and Posner. I examine the possibility for a game theoretic account of law and suggest how some of these considerations could be relevant to accounting for *opinio juris*. Although *opinio juris* continues to be a vexing theoretical problem, recent game theoretic models of pro-social behaviors consistent with a strong sense of legal obligation make it too early to conclude that game theory's only account of *opinio juris* is that it does not exist.

A. Self-Interest and the Strong Reciprocator

Under standard game theoretical principles, any behavioral regularity in the cases of coincidence of interests, coercion, and even the cooperation resulting from repeated games, or coordination, can be understood as self-interested. As Roger Myerson puts it: “[A]ll we really have to work with in game theory is our assumption that each player is an intelligent and rational decision-maker, whose behavior is ultimately derived from the goal of maximizing his own expected utility payoff.”¹³⁷ Thus, “we need some model of cooperative behavior that does not abandon the individual decision-theoretic foundations of game theory.”¹³⁸ So, it is not surprising that in the situations described by Professors Goldsmith and Posner, a state's decision to cooperate is either ethereal (in the case of coincidence or coercion) or a rational decision that, given the circumstances, it is better off cooperating with others than not. By definition, in standard game theory, all behaviors are so motivated.

Self-interest therefore stands over and against *opinio juris* as the competing explanation for state behavior. “In place of *opinio juris*-the question-begging and confused talisman that accounts for why nations ‘adhere’ to [customary international law]-the [rational choice approach, which builds on game theory,] substitutes the much more familiar and

136. The need to distinguish between behaviors that have legal significance and those that do not seems to be the only reason for an *opinio juris* concept. I have never been fully satisfied with arguments that the reason for following a legal norm is important. As long as I stop at a red light, it should not matter whether I do so because I think it is good for society, because I am afraid of getting a ticket or getting into an accident, or because I realize that the law requires me to do so.

137. MYERSON, *supra* note 34, at 370. *But see* SMITH, *supra* note 102, at vii (arguing that game theory is better suited to biology in part because “there are good theoretical reasons to expect [animal] populations to evolve to stable states, whereas there are grounds for doubting whether human beings always behave rationally.”).

138. MYERSON, *supra* note 34, at 370.

plausible notion that a nation acts in accordance with its interests and resources.”¹³⁹ Which is the better way to explain state behavior?

There are several ways to approach this question. In addition to the distinction between explanation and evaluation discussed in Part II, another approach is to provide counterfactuals: cases in which it is plausible to conclude that a state has acted against its interest. For example, the case can be made that the United States’ decision to abide by the WTO Appellate Body Report in the Shrimp case was an act of regard for other states and against self-interest.¹⁴⁰ The problem with that approach, however, is that in most cases it is possible to recast the other-regarding behavior as self-regarding.

If every action can be cast in self-regarding terms, then the central proposition of standard game theory threatens to become trivial, and game theory is in danger of losing even its descriptive value. To put it another way, suppose that decisions can only be understood in terms of the payoffs to a player and that purportedly other-regarding behavior is in reality a manifestation of self-regard. Even so, experientially, the distinction begins to blur.

Law has always taken into account self-interest. Legal rules and self-interest often overlap. As Mark Villager argues, this represents a strength of customary international law rather than a weakness. “[A] rule which *a priori* meets individual [state] interests constitutes the very best means of ensuring the rule’s application by the [s]tates.”¹⁴¹ It also strengthens a law’s legitimacy. To use an obvious example, one of the justifications for federalism is that local government is better able respond to the needs of the people.¹⁴² It would be odd to have a law that did not provide some kind of benefit to those who establish it. One would not expect such a law to last very long: it either would fall into disuse or be replaced by another law. Self-interest and legal obligation therefore do not necessarily always conflict.

One must be careful then not to make too much of game theory’s premise of self-interest. This becomes clearer when one moves from standard game theoretic models to more recent, evolutionary models.¹⁴³ There is some evidence that individuals are not as self-regarding as standard game theory presupposes. As I discussed earlier, Professors

139. *Modern and Traditional Customary International Law*, *supra* note 2, at 661.

140. Report of the Appellate Body on United States—Import Prohibition of Certain Shrimp and Shrimp Products, <http://www.wto.org>, 1998 WL 720123 (W.T.O. Oct. 12, 1998).

141. VILLAGER, *supra* note 64, at 285.

142. *See, e.g.*, THE FEDERALIST NO. 46, at 296 (James Madison) (Isaac Kramnick ed., 1987) (arguing the same).

143. For a discussion of the literature, *see* GAME THEORY EVOLVING, *supra* note 119, at 254–58 and Herbert Gintis, *Strong Reciprocity and Human Sociality*, 206 J. THEORETIC BIOLOGY 169, 171–72 (2000) [hereinafter *Strong Reciprocity*].

Goldsmith and Posner are skeptical that states engaged in an n -person repeated prisoner's dilemma are likely to cooperate, predominately because under game theoretic principles, a player is under a strong temptation to defect irrespective of the cooperative behavior of the other players. Experiments with two variations of the n -person, repeated prisoner's dilemma—the public goods game and the common pool resource game—indicate that players do not perform as predicted by game theoretic models.

In the public goods game, participants are asked to contribute to a common account in exchange for individual benefits.¹⁴⁴ One would expect that a significant number of players would not contribute to the store of public goods. However, in reality, in one-stage public goods games, persons tend to contribute significant amounts to the pool. In repeated games, contributions do tend to wane in the middle stages and dwindle to zero as the game nears its end.¹⁴⁵ This, however, does not necessarily mean that the players get it wrong at the beginning and learn how to play the game over time.¹⁴⁶ Instead, the decrease in cooperation might reflect the only way under the rules of the game that cooperating players can retaliate against defectors.¹⁴⁷ Retaliation occurs even though it is against self-interest.

144. Professor Gintis describes a common version of the public goods game: an experimenter tells 10 subjects that \$1 dollar will be deposited into each of their private accounts for participating in the game. For every dollar that a participant moves from his private account to a public account, the experimenter will deposit fifty cents into each participant's public account after each round. The game is played for 10 rounds, and each participant is allowed to take home whatever remains in his account. If each person cooperates, during each round, each of the 10 subjects puts a dollar into the public account, resulting in \$10 in the public account, and the experimenter deposits a total of \$5 in each private account. After 10 rounds, the public account totals \$100, and each player takes home \$50.

However, a player can come out ahead if he chooses not to cooperate. If one player withholds his \$1 while all the others contribute, the free rider will end up with \$55 and all others will end up with \$45 each. If everyone chooses not to contribute, there is no money in the public pool, and everyone finishes with \$10. If only one person contributes, he will receive \$5 while all others will receive \$15. The moral of the story from a game theoretic perspective is that an individual stands to gain the most from not contributing, even if everyone else contributes. *GAME THEORY EVOLVING*, *supra* note 119, at 254–55.

145. *Id.* at 255.

146. Professor Gintis notes that in some experiments, increasing the number of rounds of play delays the decay in cooperation. *Id.*

147. Indeed, in other experiments, when subjects are given other means of retaliating, they use it in a way that preserves cooperation. *Id.* at 255–56.

Similar cooperation has been observed in experiments with the common pool resource game. The most famous example is the tragedy of the commons. Under this variation of the n -person repeated prisoner's dilemma, the players share a common resource such as a pasture. Each player then hopes that the other players will refrain from overgrazing (cooperating), while it is in his best interest to overgraze (not cooperate) no matter what the other players do. The result is overuse of the resource. Experiments with common pool resource games, however, have resulted in greater cooperation than predicted under the model, particularly when

One can draw one of two conclusions from the experimental data. The first is that the players are making mistakes when they play the game—they are cooperating when they should be defecting; “learning” is not taking place. The other possibility is that there is something wrong with the models themselves. Something else is going on that cannot be captured by a model that presupposes self-interest.¹⁴⁸

Most game theoretic models of cooperation require a strong possibility of future interactions among players. As Herbert Gintis points out, however, a critical weakness of the type of cooperation that arises from the repeated prisoner’s dilemma is that in times of crisis, when cooperation is most needed, the probability that a group will dissolve increases, thereby reducing the chance of future interaction. “[P]recisely when a group is most in need of prosocial behavior, cooperation based on reciprocal altruism will collapse, since the discount factor then falls to a level rendering defection an optimal behavior for self-interested agents.”¹⁴⁹

Professor Gintis notes, however, that the experimental data just discussed suggest the presence in human societies of individuals who exhibit strong pro-social behaviors that do not arise out of repeated games.¹⁵⁰ For purposes of this discussion, I focus on what Professor Gintis calls strong reciprocators. Strong reciprocators are individuals who cooperate with others and punish non-cooperators even when the

when communication and sanctioning are permitted. *Id.* at 257. For a more general discussion of the tragedy of the commons from a game theoretic perspective, see PRAJIT K. DUTTA, STRATEGIES AND GAMES: THEORY AND PRACTICE 91–102 (2000).

148. The experimental data with respect to individuals should be viewed somewhat skeptically. Studies of games involving teams, as opposed to games with individual players, have shown teams to be less cooperative. See, e.g., Gary Bornstein, David Budescu & Shmuel Zamir, *Cooperation in Intergroup, N-Person, and Two-Person Games of Chicken*, 41 J. CONFLICT RES. 384 (1997). But even this clannish behavior may have pro-social features. See *infra* note 149.

149. *Strong Reciprocity*, *supra* note 143, at 172. This kind of reasoning can be found in international law. One of the reasons that the International Court of Justice could not in the end rule on the legality or illegality of the threat or use of nuclear weapons in a circumstance in which a state’s very survival was at stake was a state’s fundamental right of survival, and hence, its right of self-defense. *Legality of the Threat or Use of Nuclear Weapons*, 1996 I.C.J. 226, 263 (Advisory Opinion of July 8).

150. See, GAME THEORY EVOLVING, *supra* note 119, at 258–61 (modeling a weak tendency of individuals to reduce inequality when on top and a strong urge to reduce it when on the bottom); *id.* at 278–83 (modeling a tendency to “favor members of one’s group over members of other groups at a net material cost to oneself”). Professor Gintis notes that these pro-social behaviors also are morally ambiguous. “*Homo equalis* seeks equality, but even at the expense of pulling down everyone if that hurts the well-off more than himself.” *Id.* at 278. *Homo parochius* divides the world into insiders and outsiders and differentiates on the basis of race, ethnicity, gender, etc. *Id.*

These kinds of tendencies speak to a kind of relativity in behaviors and exemplify complex human interactions. What is pro-social in one context, such as an individual’s regard for a group, may be anti-social in others, such as when groups interact. Then it becomes a question of what traits will dominate in any given situation.

probability of future interactions is low.¹⁵¹ Such persons have “a propensity to cooperate and share with others similarly disposed, even at personal cost, and a willingness to punish those who violate cooperative and other social norms, even when punishing is personally costly, and even when there are no plausible future rewards or benefits from so behaving.”¹⁵² They are the persons who, in retaliation, will refuse to contribute to the public goods game when others do not refuse, even though they are harming themselves.

Such individuals contribute to group fitness vis-à-vis other groups because their presence helps group members to cooperate even in times of crisis. They do so by either cooperating even when they lower their own fitness vis-à-vis others, or by punishing others who defect, even when such punishment exacts a personal cost. In that sense, the behavior of a strong reciprocator is optimizing at the group level. In another sense, however, it is altruistic, because strong reciprocators “increase the fitness of unrelated individuals at a cost to themselves.”¹⁵³ Professor Gintis shows that the same game theoretic mechanisms that can account for altruistic behavior among kin can exist among unrelated individuals, if there is a social process that allows strong reciprocators to interact with enough frequency.¹⁵⁴ He then goes on to model how a group with a sufficient number of strong reciprocators would have a fitness advantage over other groups.¹⁵⁵ In essence, a group that would benefit from continued cooperation when its existence is at stake would be fitter than a group that could not maintain its cohesion under similar circumstances.¹⁵⁶

If Professor Gintis’ model is plausible, then it and others like it demonstrate that game theory is no longer bound to the presumption that all behaviors are self-regarding. To be sure, other-regarding strategies are still measured against a fitness standard, so that a game theoretic account of behavior is never completely free from some form of optimization. It is now possible, however, to articulate a strategy that is not motivated exclusively by self-interest. Once that door has opened, it becomes

151. *Strong Reciprocity*, *supra* note 143, at 172–73. Professor Gintis draws from the work of Armin Falk and Urs Fischbacher. Armin Falk & Urs Fischbacher, *A Theory of Reciprocity* (Institute for Empirical Research in Economics Working Paper No. 6, 2000).

152. GAME THEORY EVOLVING, *supra* note 119, at 262. For a model of strong reciprocity in ultimatum games and the prisoner’s dilemma, see *id.* at 261–66.

153. *Strong Reciprocity*, *supra* note 143, at 173.

154. GAME THEORY EVOLVING, *supra* note 119, at 266–71.

155. *Id.* at 272–78. See also *Strong Reciprocity*, *supra* note 143, at 173–77.

156. See *Strong Reciprocity*, *supra* note 143. Professor Gintis notes, “*Homo reciprocans* is a spontaneous and often unconditional cooperator (ethically positive), but is morally judgmental and vindictive (ethically negative, at least according to liberal ethics).” GAME THEORY EVOLVING, *supra* note 119, at 278.

possible to explore whether there are other types of other-regarding strategies, including ones at higher levels of sophistication that would begin to share features normally associated with law and a sense of legal obligation.

B. *On the Possibility of a Game Theoretic Account of Law*

There are, of course, many steps in the evolution from strong reciprocity to lawmaking in societies, and from there to lawmaking on the international level.¹⁵⁷ There are at least two general ways in which game theory might attempt to account for law. One way is to view the law as an external constraint on the particular game that is being played. For example, the law might be seen as affecting the payoffs of a particular game. The task then is to see how rational players would respond to the particular legal constraint. Note, however, that in such an approach, game theory does not really explain law as such. Law is already assumed by the game; the game itself and the strategies that might be pursued in that game say nothing about the validity or normative force of the law itself, only how the law affects play.

The second way for game theory to account for law is to view law and/or lawmaking as part of the possible set of strategies that players can adopt, that is, as internal to the game. Because law and lawmaking are such complex phenomena, it may be that game theory may never be able to give this kind of explanation. Thus, it is helpful to narrow the issues by identifying at least some of the features commonly associated with

157. Before proceeding further, it is appropriate to discuss Fernando Tesón's attempt to cast *opinio juris* in game theoretic terms. He is ultimately critical of game theory's ability to account for international law. Professor Tesón suggests that *opinio juris* is used as a persuasive device by states who are trying to convince newly emerging states or states that have undergone changes in leadership to follow established norms. He argues, as I have, that state practice can be understood as a set of behaviors that arise out of repeated prisoner's dilemma and coordination problems. TESÓN, *supra* note 3, at 86. *Opinio juris* arises when new states emerge. He argues that "a repeated pattern of behavior becomes a norm when the participants in the practice wish to channel the behavior of newcomers." *Id.* (footnote omitted). When such newcomers emerge, it is unclear whether they will conform to that practice. Thus, "[b]y describing the regularity now to newcomers as a *binding customary norm*, the incumbents attempt to secure the cooperation of new states." *Id.* (emphasis in original). In Professor Tesón's view, this also happens with changes in governments of already existing states, which need to be persuaded to continue existing cooperation. *Id.*

I do not doubt that existing states encourage emerging states and new governments to adhere to norms by arguing that they are legally binding. However, *opinio juris* in concept tries to be more than a persuasive and legitimizing device—it is also a means of distinguishing legally binding norms from non-legally binding norms. Presumably, older states would prefer emerging states to adhere to at least some of the non-legally binding customs that are a part of international diplomacy. They must therefore have some way of distinguishing between the two—if only to decide when it is appropriate to use *opinio juris* as a persuasive tool. We must look elsewhere for a satisfactory account of a sense of legal obligation.

legal obligation and a sense of obligation. Of course, legal obligation is only one of the many concepts associated with law, and legal obligation is itself complex. Even so focused, it may still be beyond the reach of game theory to model those minimum requirements. At best models may address only one or at most two or three of the important features of obligation. What might some of those features be?

Three themes can be used to further this discussion: 1) the emergence of stable behavioral regularities, either through the standard accounts of the repeated prisoner's dilemma or through more sophisticated models, either evolutionary or dynamic or both; 2) game theory can explain why it is beneficial for a person to conform to a norm, but it cannot explain a strong sense of legal obligation;¹⁵⁸ 3) the strong reciprocator—someone who will cooperate or punish behavior without regard to self-interest—is necessary to ensure cooperation in extreme situations when most people would prefer to defect.

In times of crisis, a strong reciprocator will use force against a person whom he believed was in danger of defecting. The actions of the strong reciprocator could be so harsh that they become counterproductive: once a crisis has passed, people remember the threats and actions of the strong reciprocator and wreak their own revenge, which in turn threatens internal cohesion. Consider the following hypothesis: among its many functions, law replaces and is in some ways, an improvement, over the strong reciprocator. Societies use law and legal obligation to force persons to cooperate when they would prefer to defect. Law becomes the glue that holds a society together in times of crisis. At the same time, law spares defectors from the strong reciprocator's potential harshness.¹⁵⁹ Thus, despite the ability under customary international law to act in self-defense in the event of an armed attack, a state is restrained by the principle of necessity and proportionality. Its response must be necessary to its self-defense and proportional to the severity of the initial attack.

It follows that to act out of a sense of legal obligation is (from the perspective of a potential defector) to understand that to deviate from a

158. For Professor Tesón, legal obligation implies that a person will conform to a legal norm even when it is not in his or her interest to do so. Although, as I have discussed earlier, there is a close relationship between self-interest and legal norms and law often reflects self-interest, let us assume that Professor Tesón's view of legal obligation is right.

159. Law encourages, but at the same time tempers, pro-social behaviors, including strong reciprocity, the drive towards equality, and the tendency to treat other group members more favorably than outsiders, even at personal expense. See *supra* note 150. As this Article was being readied for publication, Theodore Seto published an article in which he makes a similar argument that law tempers the effects of harsh reciprocity. See Theodore P. Seto, *Intergenerational Decision Making: an Evolutionary Perspective*, 35 *LOY. L.A. L. REV.* 235, 253–54 (2001). Time does not allow me to fully assess Professor Seto's argument.

norm is to open one's self to possible sanctions. However, such sanctions are justified only when there is such deviation, and are not unlimited in scope. The state that engages in an armed attack can expect retaliation, but not complete annihilation. From the perspective of the strong reciprocator, who can be either an individual or in more complex societies, an institution, it is to understand that one can "punish" defections, but can only go so far.

Recall Professor Young's discussion of the bottom up emergence of the right-hand driving convention in Europe.¹⁶⁰ Inasmuch as successful strategies, like law, emerge from the interactions of agents within less complex social groups, one would expect people to try to replicate such strategies at the international level. It may be that such a strategy is vestigial at the international level, or it may be a strong basin of attraction that is gradually emerging from the large number of international interactions among international actors. International law, however, would nevertheless be based on strategies that at times require a member to cooperate when it would prefer to defect, thus meeting Professor Tesón's criteria for true legal obligation. The possible emergence of such adaptive strategies at the international level make it too early to conclude that states never act out of a sense of legal obligation, even from a game theoretic perspective.

V. FUTURE DIRECTIONS

Professors Goldsmith and Posner point out that a new theory is worthwhile if it carries with it the possibility of greater insight into previously little understood phenomena and opens up avenues for further inquiry and debate. Even though this Article has been somewhat critical of the conclusions that they have drawn from their theory, it should not be taken to minimize the contribution that has been made by their two articles. By asking readers to apply game theoretical concepts to the sources of international law, Professors Goldsmith and Posner use a discipline that, in its more modern forms, holds the possibility of describing in a rigorous way the interactions of individuals and states. This approach reaches far beyond the province of international law. In the future it may be possible to describe, through more advanced forms of game theory, the emergence of and potential disappearance of states, as well as what gives rise to law itself.

Of course, the legal community has heard these kinds of claims before and is thus justified if it is skeptical. Game theory is itself

160. See *supra* text accompanying notes 128-32.

undergoing change and many important questions are yet to be answered. The following areas need further research and development before scholars arrive at a truly robust theory.

More theoretical work needs to be done to model adaptive strategies that lead to the development of law and the other institutions that support it. It is unclear whether such a theory is possible. Game theoretic models of such institutions, let alone lawmaking, require a level of sophistication that has yet to be reached. As Professor Young puts it, however, “[j]ust as perfect spheres and frictionless planes are idealized but useful concepts for modeling mechanical interactions, we can view games and learning rules as primitives for modeling social and economic interactions.”¹⁶¹

Significant progress in game theoretic accounts of institutions would only be a first step in accounting for law. Here, I have suggested that law performs the pro-social functions typically performed by the strong reciprocator but ameliorates its harshness. In addition, game theoreticians have begun to describe other types of pro-social behavior, each of which, however, have certain negative aspects. It would be helpful to see whether law plays a role in both enhancing and ameliorating the effects of those pro-social behaviors.

Experimental game theory has made a valuable contribution to the field because it has yielded results not predicted by the standard theory, which in turn has led in some instances to a re-evaluation of that theory. Of course, experimental game theory is limited when it comes to states. It is unlikely, for example, that foreign-policymakers would be willing to play the ultimatum game under experimental conditions, and even if they were, it is unclear what would be learned about how states act in real strategic situations. Thus, research is required to determine what can be extrapolated from simulations or other proxies for actual state behavior.¹⁶²

The potential difficulties in designing experiments for international actors highlight the need for further historical research. Professors Goldsmith and Posner have made a serious attempt at determining whether the record of actual state behavior in a number of areas is consistent with their theory of behavioral regularities among states. More empirical research is needed to confirm that patterns of self-interested behavior are indeed present, as well as to discover other evidence of such patterns. If my arguments here are valid, there must be evidence of cooperation

161. YOUNG, *supra* note 119, at 149.

162. Some experimental work has been done with political decisionmakers. *See, e.g.*, Erique Fatás & Pilar Tamborero, *The Subject Pool Conjecture: Politicians and Rationality Failures in Simple Political Experiments* (Laboratory for Research in Experimental Economics Working Paper No. 21/00, 2000) (testing whether there are differences in the behavior of politicians and non-experienced subjects in making political choices).

among states that would arise even in situations where, under standard game theory, states would prefer to defect. I have alluded to possible examples of such cooperation, but such illustrations must be more fully fleshed out.

Many of the advances in modern game theory, particularly in its dynamic form, have been possible only with computer simulations and modeling. Computer simulations are beginning to appear in legal scholarship. Randal Picker has used such simulations to better understand how norms might spread through a given population.¹⁶³ David Post and Michael Eisen have used computer simulations to argue that legal reasoning itself might be fractal in nature.¹⁶⁴ Since actual experiments with states seem highly unlikely, computer simulations could be used to verify “in silico” the theoretical work that must be done to explain state behavior.

Finally, there are any number of issues that are specific to international law. More work needs to be done from a game theoretic perspective about the attempt of states to govern their relationships through law. If it is true that law replaces the strong reciprocator and that states have attempted to replicate what has worked for them at lower organizational levels, it must be determined whether this effect is vestigial or whether it is still robust.

In addition, I have approached the problem as if the only relevant actors on the international scene are states. Although states will continue to play an important, and perhaps primary, role in the ordering of international relations, the number of international actors has grown to include a multitude of non-governmental organizations, governmental sub-units, large business enterprises, and in some cases, individuals. One could account for these players by assuming that their actions, insofar as they affect states, are the kinds of external shocks that Professor Young describes in his best-reply model. It may be that because states continue to hold a monopoly over the machinery that recognizes and creates international law, such a model would be appropriate. The interaction of other international actors, however, may lead to the equilibria that states codify either in treaty form or what is eventually recognized to be a customary norm. Thus, a more accurate model would be one that makes the activities of such actors internal to the game.

163. Randal C. Picker, *Simple Games in a Complex World: A Generative Approach to the Adoption of Norms*, 64 U. CHI. L. REV. 1225 (1997).

164. David G. Post & Michael B. Eisen, *How Long is the Coastline of the Law? Thoughts on the Fractal Nature of Legal Systems*, 29 J. LEGAL STUD. 545 (2000).

CONCLUSIONS

Professors Goldsmith and Posner offer a game theoretic alternative to the positivist account of customary international law. Instead of a set of general and consistent practices, there are behavioral regularities that tend to arise from coincidence of interest and coercion, and sometimes from the repeated interactions of states. In no case, however, do states purely act out of a sense of legal obligation.

I have tried to show that in theory there are enough stable forms of “true” cooperation that they could serve as the basis for general and consistent practices. And, although the concept of *opinio juris* continues to pose difficulties, it is too early in game theory’s development to conclude that it does not exist. Still, I agree with Professors Goldsmith and Posner that game theory, particularly in its more sophisticated forms, opens new avenues for exploration regarding the behavior of states, including the making of international law, both in its customary and treaty forms.