Interdependent Decisionmaking, Game Theory and Conformity

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Introduction

This paper examines conventions -- their genesis, their stability, and their effect on the decision process. As a review of the literature reveals, game theory figures prominently in explaining the emergence of conventions. Many times the solutions to game theoretic problems are indeterminate. A convention evolves more readily when some salient feature or asymmetry is recognized. Imagination on the part of the participants may be as important as rationality in discovering this.

The second section of Part I looks at exchange -- a convention described by a Prisoner's Dilemma situation. A problem arises when transactions do not occur simultaneously. The risk of default leads to mutual defection and a worse solution than could be achieved. In repeated games, a tit-for-tat strategy can lead to mutual reciprocity and a superior outcome. For an isolated game, the superior solution may arise under certain conditions, one being if some convention (or norm) exists that encourages cooperation. Thus, emergence of one convention may depend on the prior or concurrent establishment of others.

As mentioned, the Prisoner's Dilemma may result in a nonoptimal outcome. (It is usually identified with this.) The possibility of nonoptimality exists for other game theoretic situations as well. This is inconsistent with the neoclassical economic assumptions of rationality and maximization. Section three of Part I addresses maximization and rationality. It considers the works of Herbert Simon and of Harvey Leibenstein. Both relax neoclassical assumptions in order to address nonrational behavior. Simon redefines the economists definition of rationality to exclude the assumption of omniscience and to reflect adaptive behavior based on learning. In Leiberstein's work-wage model, workers may trade off wages for on the job leisure, the worst case being the work-effort level associated with the Prisoner's Dilemma outcome. This can be avoided by adherance to a peer-work convention, but the corresponding level of effort still may be suboptimal. The pressure of competition is a prerequisite for optimality, a result consistent with a (double) Golden Rule standard (enlightenment reciprocity). But the pressure of competition is felt through the price mechanism, which does not perform adequately unless property rights are properly defined. Again, one convention/norm (a Golden Rule Standard) may depend on another (convention of property) for its realization.

Conventions as described by game theoretical situations can emerge spontaneously. They need not be optimal, nor are they necessarily unique. This is inconsistent with Hobbe's claim that natural laws (such as property rights) are unique and can be deduced from self-evident propositions. Section four of Part I, shows that if efficiency is the determining criterion, the effect of privatization in inhibiting over-utilization is dependent

on the level of use. So the solution, "private property," is unique after some level of utilization is realized. The uniqueness of solution is, in this sense, contextual.

Part II revisits the Prisoner's Dilemma and asks how ethics (and other values) may enter the decision process. Robert Nozick's concept of symbolic utility is used in the analysis. It is found that if competing values are taken into account, length of sentence may not be an unambiguous measure of optimality.

Part III is concerned with the factors influencing conformity. The decision to conform to a convention, norm or other common practice may be rational. But why would one conform if it were not? One answer, among many suggested, draws from Nozick's notion of symbolic utility. Not conforming in one aspect may be considered symbolic of lack of conformity in others. To avoid this misleading generalization by others, an individual may feel compelled to conform in areas he would rather not. In the extreme case, a person might develop a habit of conformance.

In general, we do not observe lock-step conformance. There are pressures to conform. Are there countervailing pressures that oppose them? As seen in Leibenstein's model, competition in the economic sphere can lead to rational behavior (optimality) if certain pre-conditions exist (property rights). Is the same true in the field of ideas? Does competition in the marketplace of ideas result in the more rational ones surfacing and competing with the less rational, some of which may be founded in convention? Some argue in the affirmative. Still, reason takes effort. It is not automatic. And, even if rational conventions emerge, they may be unstable unless maintained by the persistent pursuit of reason.

I. Conventions and Game Theory

Game theory has been used to explain the establishment of conventions. Examined has been how conventions may evolve spontaneously, i.e., without human design, in a state of nature, i.e., without the presence of government or other external authority. Reliance has been upon games of coordination and of conflict. Coordination problems involve such questions as which side of the street to drive on and who has the right of way at an intersection. These are problems of interdependent choice in which there is a coincidence of interest in their solution. Other problems of interdependent choice involve greater conflict of interest. These relate to the emergence of exchange, the provision of public goods, and the establishment of property rights.

A coordination problem has more than one solution, which is what renders necessary some rule or convention. If no rule is imposed from without, a convention may spontaneously arise. David Lewis defines convention as the solution to a coordination problem. Since these problems involve little if any, conflict, the convention that results is one in which everyone (or almost everyone) has an incentive to conform.[1]

Rationality is essential to Lewis's solution. "Coordination may be rationally achieved with the aid of a system of mutual expectation, of first or higher order, about agents' actions, preferences, and rationality" (Lewis 1969, 33). Common knowledge of rationality forms the basis for each agent to do his part in reaching equilibrium. Robert Sugden, who

examines not only games of coordination in the establishment of convention but those of conflict as well, reveals that since more than one solution is possible deductive reasoning leads in a circle (Sugden 1986, 20). Solution requires imagination as well as logic. An insight he credits to Schelling (*ibid.*, 49, 92).

Learning through experience is important in establishing a convention, according to Sugden. Of course, this is useless when there is no prior experience to draw upon. Still, a player "must choose *some* strategy, whether rationally or not" (*ibid.*, 20). In repeated games, the player may spot a pattern. In the language of game theory, a pattern is a strategy (*ibid.*, 26). A self-perpetuating strategy defines an equilibrium. The strategy may be pure (the same in every game) or mixed. Games may be symmetrical or asymmetrical. In symmetrical games, "both players follow *the same strategy*" (*ibid.*, 30). In asymmetrical games, "they play different strategies, so long as each strategy is the best reply to the other" (*ibid.*).

A common definition of convention is that one exists if everyone, or almost everyone, in a group follows the same practice (*ibid.*, 32). A more technical definition as conceived by Sugden is "any stable equilibrium is a game that has two or more stable equilibria" (*ibid.*). A stable equilibrium is a self-enforcing rule. In order for a convention to evolve some players must "recognize that they are playing an asymmetrical game, and come to focus on the same asymmetry" (*ibid.*, 42). This is consistently the case for every game Sugden presents with the exception of the division game. One of the conventions that emerged from that game results in a symmetrical game in which each player claimed exactly half. This represents "a self-enforcing rule -- a convention -- of equal division"[2] (*ibid.*, 69).

Sugden's analysis is based on the assumption that individuals learn by experience; i.e., they will choose the most successful strategies over extended games (*ibid.*). But the most successful strategy for one player will depend on the strategies chosen most often by other players (*ibid.*, 19). In the long run the most successful strategy will be the one that yields the largest expected utility, which will generally be the one that yields the greatest total utility (*ibid.*, 21). Yet he also demonstrates that in some cases the strategy that yields the greatest utility can not be sustained (*ibid.*, 22).

Human behavior is often inconsistent with Von-Neumann-Morgenstern axioms concerning the maximization of expected utility under uncertainty. Even when made aware of this inconsistency, individuals may not modify their behavior (*ibid.*, 15). Sugden claims that he is uninterested in how people rationally play, but in how they actually play. His is not a theory of games, but an application of games in explaining the emergence of conventions in a state of anarchy (*ibid.*, 16). He examines conventions of coordination, of reciprocity, and of property, the latter two emerging from games characterized by conflicting interests.

Robert Axelrod's stated purpose mirrors Sugden's. Specifically Axelrod is interested in uncovering the circumstances under which cooperation would develop in a world without central government. He examines the problem from the perspective of a two by two Prisoner's Dilemma. In the single shot scenario the dilemma is that "what is best for

the individual leads to mutual defection, whereas everyone would have been better off with mutual cooperation" (Axelrod 1984, 9). As per Sugden, coordination example, rationality cannot be counted upon. In the single shot case, individual rationality leads to a solution, but the outcome is worse for both players than is possible. In the iterative scheme, Axelrod finds it unnecessary to assume that players are rational or that they try to maximize their payoffs (*ibid.*, 18). "Learning, imitation, and selection . . . produce a process which makes relatively unsuccessful strategies less likely to appear later" (*ibid.*, 50). Of course, even in the iterative case individuals may not choose strategies that produce the greatest possible rewards. Axelrod finds that strategies based on cooperative reciprocity, tit for tat, generally produce better outcomes. But one cannot cooperate in isolation. One must have someone with whom to cooperate. If the probability of individuals encountering each other again is sufficiently high, rules based on reciprocity are more likely to be effective (*ibid.*, 176). Whereas, "when players will never meet again, the strategy of defection is the only stable strategy" (*ibid.*, 92). Conditions that increase the probability of future interaction tend to promote cooperation based on reciprocity.

In Sugden's analysis, the provision of public goods can also develop under prisoner's dilemma-like strategies. A tit for tat strategy may be stable, particularly if the number of players is small (Sugden 1986, 137). Other games of conflict, e.g., the Hawk-Dove, Attrition, and Division games, can result in conventions of property. However, by no means are they assured as outcomes. In all but a single case, unless an asymmetry is recognized, a Hobbesian state of nature can result. Sugden's point is that conventions of property are possible. The Hobbesian state of nature is not inevitable. An added irony is that conventions of property can evolve spontaneously without conscious human design. The concept of property need not require nor be the outcome of conscious, deductive deliberation but may be established as the spontaneous conclusion to the interplay of forces existing in a state of nature as described by game theory.

Sugden points out that conventions, like natural laws, evolve spontaneously and arise out of the interdependent actions of individuals with conflicting interests. "In this sense, conventions of coordination, property and reciprocity are natural laws" (Sugden 1986, 146). To Hobbes such laws are simply rules individuals abide in pursuit of their own self-interest. To Hume these laws may have a moral dimension (*ibid.*, 147). The moral aspect of conventions, when it exists, is derived in part from the inherent conflict of interests from which it evolves. "Situations of conflict of interest are ones in which we typically invoke *justice*" (*ibid.*, 146). For Hume, justice is a virtue, albeit an artificial one. It evolves "from repeated interactions of individuals pursuing their own interests . . . "(*ibid.*, 147). Conventions, such as those of property, become norms because of the mutual benefits their bestow (*ibid.*, 169). This is why, in his words, we "annex the idea of virtue to justice" (*ibid.*). When conventions are violated, others feel harmed as well as wronged. Violators feel "uneasy" about their actions out of sympathy toward others (*ibid.*, 170). It follows that "conventions . . . are stable because once they have been established, it is in everyones interest to keep them" (*ibid.*, 147).

Lewis, too, maintains that conventions can become norms. His argument hinges upon two presumptions: the first being "that one ought to do what answers to his own preferences", and the other "that one ought to do what answers to other's preferences,

especially when they may reasonably expect one to do so" (Lewis 1969, 98). Lewis defines conventions as solutions to coordination problems, situations in which there is little, if any, conflict of intersts. Conformance follows from mutual expectations.

Sugden extends Lewis's analysis to conventions which are more dependent upon mutual obligation; those with inherent conflict. In these cases, some people may be better off in a state of nature than they are once the convention is established. However, once established it is to (almost) everyone's benefit to maintain it. Concerning conventions of property, Sugden says, "provided I own *something,* thieves are a threat to me" (*ibid.*, 159). Thus, a situation could result in which "a convention may acquire moral force without contributing to social welfare in any way" (*ibid.*, 166). He makes the following distinction:

> Notice a convention of property may become a generally accepted norm even though it cannot be justified in terms of any external standards of fairness. Having become a norm, a convention *becomes* a standard of fairness; but, on my account, it does not become a norm *because* it is seen to be fair (*ibid.*, 189).

Unlike Hume's, Sugden's argument rests not on sympathy but on the principle of cooperation; which, he concedes, is not the whole of morality but nevertheless carries moral weight (*ibid.*, 172). Axelrod, too, speaks of the *ethic* of reciprocity, which he finds slightly unsavory since it permits "no more than equity" (Axelrod 1984, 137). The Golden Rule would require unconditional cooperation (*ibid.*, 136), (apparently a morally superior alternative in his view).

Sugden does not appear to share this particular reservation. He states that: "The morality that grows up around conventions . . . is a morality of *co-operation.* It is also a morality of *rights*" (Sugden 1986, 173). Furthermore, he explains that "any system of morality that rests on an idea of co-operation must incorporate some reference point from which benefit or disbenefit is to be measured" (*ibid.*). This reference, according to Sugden, is the status quo. As to whether the status quo should be the moral reference point, his position, following from Hume's Law that "'ought' statements cannot be derived from 'is' statements", is that it "can never be resolved by an appeal to reason" (*ibid.*, 153, 175). His concern "is not about the logic of moral propositions; it is about the psychology of morals" (*ibid.*, 153).

The Prisoner's Dilemma and Exchange

Conditions underlying exchange can be defined by the Prisoner's Dilemma. Russell Hardin illustrates:

> To see that the ordinal payoff structure of the Prisoner's Dilemma is precisely that of an ordinary exchange, one can suppose that x is your car and y is my $1,000. If it makes sense for us to trade, it must be the case that I prefer your car to my money while you prefer my money to your car. Obviously, as first preferences each of us would most like to have both the car and the money. As second preferences we would like to make the trade. Our third preference is to fail to trade and to remain at the original status quo. Our fourth choice

> would be to lose our own holding without gaining that of the other (Hardin 1988, 42).

A dilemma arises when the exchange cannot be transacted simultaneously, and one must rely upon the promise of follow-through on the part of the other. In a world without law or enforcement, for a single play Prisoner's Dilemma (one exchange) the determinant solution is the dominant strategy, which is not to cooperate (*ibid.*, 48). "If some external mechanism for enforcing agreements is made available to the players, the game becomes trivial" (Sugden 1986, 122). This is an important point. The game is of interest because it examines situations that might exist in a state of nature. Although it provides a useful framework for analysis, some of the conclusions result from restrictive assumptions which are, if not artificial or contrived, at least surmountable in some if not many cases.

As Hardin acknowledges, the solution to an isolated play of a Prisoner's Dilemma leads to a worse outcome than could be achieved -- both parties defect. Axelrod echoes this -- individual rationality (i.e., maximizing behavior) leads to worse results than could exist. From this, it is concluded, coercion may be needed in order to be free. To quote Axelrod:

> In fact, getting out of Prisoner's Dilemmas is one of the primary functions of government: to make sure that when individuals do not have private incentives to cooperate, they will be required to do the socially useful thing . . . This is a major part of what Rousseau meant when he said that government's role is to make sure that each citizen "will be forced to be free" . . . (Axelrod 1984, 133).

Hardin agrees:

> Many institutions, such as legal rights, are easily seen as responses to limits of reason. They are devices of institutional protection or intervention to achieve better outcomes than could be achieved by individuals acting without constraint (Hardin 1988, xvii).

As Hardin points out, in a Prisoner's Dilemma one cannot simply select what he wants. The opponent will block that choice and force both to a lesser outcome (*ibid.*, 69). In a single shot Prisoner's Dilemma, what one wants most is the theft (or default on payment) option, i.e., I get your car *and* keep my money. But then we end making no trade. (One could say that the isolated Prisoner's Dilemma has an inherent ethic in that theft is not permitted). Government can enforce agreements, thereby improving the outcome, but without central authority, no transaction will take place in the isolated Prisoner's Dilemma. Iterative games introduce other possibilities. Both Axelrod and Sugden devote considerable effort demonstrating that in extended games, cooperation is possible, even likely under certain circumstances.

Robert Nozick has shown that the cooperative solution (preference two, or exchange in the Hardin example) can prevail in the single shot case if each player thinks the other is relevantly similar to himself (Nozick 1993, 52). The relative size of the payoffs is a factor as well. If the reward for cooperation is great relative to the dominant payoff and

the alternate rewards are relatively slight, the cooperative solution is more attractive (*ibid.*, 53).

Nozick also introduces symbolic utility into the decision process. An action is symbolic if it represents something other than (and in addition to) what it ostensively stands for (*ibid.*, 26). Ethical principles, for example, may acquire symbolic meaning and become embedded in decisions involving certain actions. The symbolic utility of an action may thus change the payoff structure associated with a given decision (*ibid.*, 29). If one values cooperation and wants to be and/or thought to be cooperative, then this will give added weight to the cooperative alternative in a Prisoner's Dilemma situation. This alone will not guarantee the cooperative solution. The outcome will depend on whether both share the cooperative ethic. Common knowledge of rationality is also required. By Nozick's reasoning, the Prisoner's Dilemma solution becomes indeterminate -- more than one is possible. However, if an ethic has widespread appeal and one has a sense for the extent of its acceptance, he may be able to better predict the outcome.

Harvey Leibenstein points out that the Prisoner's Dilemma (dominant) solution may be avoided by adherence to a convention, ethic, or code of behavior, "so each side behaves according to convention instead of maximization" (Leibenstein 1987, 52). The failure to achieve optimality through adherence to convention exists in Leibenstein's work-effort model because the dimension of the matrix is greater than 2 x 2. If the matrix is 2 x 2, then if each side behaves in accordance with a convention (say, cooperation), then this can lead to maximization. Maximization can also be achieved when both sides adhere to a convention, ethic, or code, if it significantly changes the payoff structure of the matrix. Axelrod comments that in the original Prisoner's Dilemma, if both players belonged to gangs that retaliated for squealing (e.g., enforced the Mafia code of *omerta*), then this could change the payoff matrix and promote the cooperative solution; e.g, light sentences in reward for mutual silence (Axelrod 1984, 133). In fact, the matrix could be altered to such an extent that a dilemma no longer exists.

The reason that the code of *omerta* is effective is because it has teeth. The Prisoner's Dilemma problem arises in a state of nature because of lack of enforcement. Other codes that can reverse the direction of the Prisoner's Dilemma outcome, may rely less on retaliation than on reputation or integrity. Leibenstein illustrates that in the opera *Tosca,* if both parties had honored their word, each would have faired better (Leibenstein 1987, 47). The problem was not lack of agreement, but of commitment. Here again, as in the previous example, if both parties had honored the code, in this case honor, this would have affected the utility matrix, *ceteris paribus*, by weighting the cooperative alternative more heavily. An optimal result could have been achieved.

In Leibenstein's wage-work effort model, the decision between workers and managers can be categorized according to the following three standards: (1) the Golden Rule, in which management offers the best compensation possible and workers perform as well as possible; (2) the peer-effort standard, an average level of pay and performance; and (3) parametric maximization, where managers try to pay the least possible and employees put forth as little effort as possible (*ibid.*, 48-49). The third combination defines the Prisoner's Dilemma outcome. Leibenstein argues that this outcome can be avoided and the

peer-effort alternative attained, if some work effort convention, such as a fair day's work for a fair day's pay, exists.

There may be a number of peer-effort standards, any one of which is superior to the Prisoner's Dilemma outcome, but all of which are inferior to the (double) Golden Rule. Leibenstein believes the latter result (optimality) to be highly unlikely, however. He hypothesizes that work effort conforms to the Yerkes-Dodson Law; i.e., it increases in response to pressure up to an optimum level, then falls (*ibid.*, 20). In other words, there may be any number of suboptimal levels of worker performance.

Suboptimal performance is inconsistent with neoclassical theory, but is possible, even likely, in Leibenstein's model because of the relaxation of a number of assumptions underlying traditional theory. Included among Leibenstein's postulates are the existence of incomplete employment and imperfect competition (*ibid.*, 129) (see also Perlman 1990, 8-9; Francis 1990, 283-84; Frantz 1990a, 377-78). From these and other postulates, he reasons that intrafirm inefficiency, which he terms X-inefficiency to distinguish it from allocative inefficiency, is likely to result. A major source of this is non-optimal effort on the part of workers. Workers have an incentive to trade-off effort for on the job leisure; the worst case scenario being the effort level associated with the Prisoner's Dilemma standard.

Effort, however, increases with pressure. One source of intra-firm pressure is the peer-work convention. Such conventions are effective because of group sanctions, e.g., ostracization. There is an attraction toward conformance because of what Schelling calls the "pain of conspicuousness" (*ibid.*, 107). Even though wages may equal the marginal productivity of effort, peer worker performance will most likely be suboptimal.

Conventions tend to be stable. Peer work standards are a category of inert behavior (*ibid.*, 34). Inertia is characterized as a bounded area in which effort is routine (*ibid.*, 22). Within a certain range, there may be a significant change in the independent variable, pressure, before the dependent variable, work effort, responds. Thus, there is a ratchet effect in effort in response to pressure. This is particularly true in the short run. In the long run, most rigidities can be altered (*ibid.*, 33).

Another source of pressure, which is external to the firm, is competition. The more market pressure there is, the greater the likelihood of achieving the Golden Rule standard (i.e., neoclassical optimziation) (Frantz 1990a, 379). Thus, the Prisoner's Dilemma wage-work alternative is avoided by adherence to convention; what yields the better result is the pressure of convention. Still, conventions may well result in suboptimal effort. What determines the best outcome is the pressure of competition.

In Leibenstein's work-effort model, some method of enforcement is implicity understood. (This can be seen from his assumption concerning contracts.) The problem is not that they are unenforceable but that they are incomplete.) What Leibenstein's analysis serves to reinforce is the power of convention in overcoming or avoiding the Prisoner's Dilemma outcome, which was observed for the ethics of cooperation and codes of retaliation and of honor. All of these may depend more on the opinions of others than on one's opinion of oneself in influencing decision, but this too is a factor -- one must live

with oneself; i.e., there can be standards related to integrity that counteract the Prisoner's Dilemma if they are commonly held. For example, people do agree and agreement (coupled with commitment) can reduce uncertainty and risk.

If there is a high probability of default (e.g., people agree but lie -- truth is not valued), then risk is high even with agreement (assuming agreements cannot be enforced). But this element of risk affects the payoffs. The payoffs (to use Hardin's example, your car for my $1,000), then, would not be accurate representations because risk has not been factored in. Once risk has been considered the cooperative solution (exchange) may not be a solution at all. That is, it may not be rational to enter a transaction because risk changes the expected payoffs. The game thus transformed is no longer a Prisoner's Dilemma.

There are strong incentives to trade even when laws prohibit it. Illegal trade flourishes. There is a sizeable underground economy. Black markets emerge where trade is discouraged. There is smuggling of illegal commodities between countries. This exchange takes place without government enforcement of agreements, even when transactions do not take place simultaneously and even when parties do not see one another again (and at considerable risk not only of default but also dangers in the form of fines, imprisonment, and loss of reputation). Practices and/or conventions evolve in these cases to deal with the risk of default.

One reason why there is a strong incentive to trade are the long recognized gains from trade. Self-sufficiency costs. There are gains from specialization. It pays to produce those things for which one has a comparative advantage. If each party specializes (whether by design or destiny), there may be a difference in valuation for the goods one has relative to those one does not have (or has relatively less of); trade is encouraged. If a tailor has five coats but no food and a baker has several loaves of bread but no winter coat, there is a basis for trade.

If the tailor receives the bread first, he may choose to default and not clothe the baker, particularly if he is unlikely to see him again and if there is no way to enforce agreements. Yet, it is possible that some ethic may emerge based on the following reasoning. If the tailor does not clothe the baker, the baker may not last the winter and may not be around to produce food next season. This may not matter if the tailor never plans to transact with the baker again. But if he is able to abstract and generalize then he may reason that if this parasitic course becomes a general practice, the host will die. An ethic may emerge that encourages paying one's debts because it is the most rational long run course of action.

There may be a short run incentive to do otherwise. But this short run course has a cost. That is, there are consequences to actions which may result in future costs that are not reflected in the typical 2 x 2 Prisoner's Dilemma. Or, from a different and more telling perspective, the matrix does not capture future benefits derived from lack of default. The assumption implicit in its design is that what is produced in aggregate for any one time is a fixed pie that can be carved up once and for all. But production and exchange are continuous, dynamic processes with inherent incentives and costs. If this is recognized and if these future benefits (appropriately discounted) are factored into the payoff

structure, then exchange may be encouraged even under the very restrictive assumptions of the single shot case.

Rationality and Maximization

As we have seen, in game theory, attempts at maximization may be frustrated. A less than optimal position may result or the solution may be indeterminant. Both results are inconsistent with neoclassical economic theory. There perfect knowledge, frictionless and competitive markets, and assumptions of rationality guarantee an optimal and unique solution. The assumptions of rationality are simple ones. Individuals are assumed to be able to choose pairwise among commodities and to rank them transitively (Simon 1982a, 322). For identical products, the lesser priced is preferred. Producers are assumed to be motivated solely by profit.

In an effort to inject realism into the theory, Herbert Simon analyzes what can happen when some of these assumptions are relaxed. The existence of uncertainty he illustrates with a game theory problem (the Estes model) in which maximization would recommend consistently choosing the strategy associated with the greater reward probability. This assumes that the reward probabilities are known and constant. If unknown, the rational player will minimax his regret, which results in event matching. The latter is consistent with an adaptive learning strategy. However, Simon does point out that those schooled in game theory generally choose the maximization strategy (Simon 1982b, 271-73).

Simon believes the event matching solution important, not only because it demonstrates that individuals may not be maximizers in an uncertain world, but because it indicates how people learn (Simon 1982c, 294-95, 301, 304-6). Faced with an inductive problem, individuals seek patterns and form and test hypotheses about these patterns. "Man, in this view, is not only a learning animal; he is a pattern-finding and concept-forming anima" (*ibid.*, 306). (Fortunately, he is also a deductive animal and can, if sufficiently educated in game theory, choose a different course if it proves to give superior results.)

Game theory has also been applied to imperfect competition (Simon 1982d, 436). When the definition of competition is relaxed to include oligopoly, a market structure in which each firm's decision may be based on those expected of others, the possibility of a non-unique solution arises (Simon 1982a, 339-40).

Sometimes information is not so much uncertain as it is complex. This Simon illustrates with the game of chess (Simon 1982c, 413, 417; 1982d, 431; 1982f, 462, 469). For a forty move game, there are 10^{120} possible games (1982e, 418). Simon does not believe each player calculates the best move based on all possible moves, but makes a satisfactory choice. This fits his notion of satisficing behavior, a decision process based on aspiration levels in which search for solution (or information) continues until the aspiration criterion is reached, the latter adjusting as information is acquired (*ibid.*, 415). The constraints in chess are human computational ability and long term memory (1982d, 430; 1982f, 469). Neoclassical theory could be revised to handle the problem by introducing the cost of search as a constraint (1982c, 303). The results would be consistent with those of Simon. Simon states the following:

> A satisficing decision procedure can often be turned into a procedure for optimizing by introducing a rule for optimal amount of search, or, what amounts to the same thing, a rule for fixing the aspiration level optimally. Thus, the aspiration level in chess might be adjusted, dynamically, to such a level that the expected improvement in the move chosen, per minute of search, would just balance the incremental cost of search (1982e, 417).

So far as economic theory is concerned, some have argued that the distinction is unimportant. If, as psychological research has shown, aspirations tend to be revised toward the attainable, then in the long-run the aspiration level and the maximum attainable will be close to identical. Second, even if all firms do not maximize, so long as some do, the others will be pressured into either improving or going out of business in the long run (1982c, 297; 1982a, 333). One assumption here is that "the economic environment of firms changes slowly enough that the long-run position of equilibrium will be approached" (1982a, 333).

Simon, however, is not as interested in final outcomes as in the process by which decisions are made, independent "of whether the decision processes have any importance for the questions to which classical economics has addressed itself..." (1982d, 432). The relaxation of classical assumptions discussed above determines bounds to rationality. His interest, in part, is to model this decision process. "[T]he non-rational aspects can be embedded in the model as limiting conditions that 'bound' the area of rational adjustment" (Simon 1982g, 215).

He models a decision (e.g., whether to continue producing or to search) as being a function of the difference between a criterion and the current situation (*ibid.*, 219-20). Concepts of rationality can be related to the criterion used. One concept is defined by "the ability of the individual to discover a 'best' situation and to move toward it, either instantaneously (as in the static models) or gradually (as in the dynamic)" (*ibid.*, 219). This is the optimization model. A second model, the adaptation model, rests on the ability of the individual to distinguish a "better" position from a "worst" and to adjust his behavior toward the better. The two models are not mutually exclusive. They both may achieve optimal resuts. However, the adaptation model may achieve less than the optimum if something less is required; e.g., the minimum adaptation necessary for survival (*ibid.*).

These models are not only models of behavior but of thought:

> Optimization carries at least the connotation of conscious deliberation, foresight, and intention. Adaptation, on the other hand, more generally connotes appropriateness for survival, movement toward equilibrium. Now the two notions of optimization and survival are combined in the classical economic theory of pure competition in an ingenious fashion. But there is no reason why we cannot consider systems that are adaptive, in the sense of possessing a stable equilibrium position toward which the system continually moves, without postulating an optimizaing mechanism (in the conscious sense) that explains the adaptation (*ibid.*, 220).

The optimization and adaptation models correspond to the distinctions Simon makes between what he terms substantive and procedural rationality. The former is apropos to economics; the latter to psychology. "Behavior is substantively rational when it is

appropriate to the achievement of given goals within limits imposed by given conditions and constraints" (1982d, 425). Economics has been largely concerned with the results rather than the process of rational decisionmaking (Simon 1982h, 445). "Behavior is procedurally rational when it is the outcome of appropriate deliberation" (1982d, 426). Procedural rationality is situational and involves the process of gaining information for purposes of problem-solving and/or decisionmaking (*ibid.*, 427).

Operational research problems tend to be procedural in nature. The traveling salesman problem is an example of this (*ibid.*, 428; 1982f, 465). It involves a computational search for the shortest path. Programmatically, it either simplifies the problem so that an optimum is feasible or finds a satisfactory instead of an optimal solution. Simon regards both of these as satisficing outcomes. However, both can be thought of as optimizing outcomes if the marginal cost of search is taken into account (1982d, 435).

In general, he points out:

> Conceptually, of course, there is no reason why we need to treat the substantive decision problem and the procedural problem at arm's length, as though they were independent of each other. The global optimization problem is to find the least-cost or best-return decision, *net* of computation costs. We formulate this problem in terms of the trade-off between the marginal computational cost and the marginal improvement in the substantive improvement it is expected to produce . . . (1982f, 461).

Simon is interested in the cognitive process. Man is not omniscient. He lives in uncertainty. Whether the uncertainty of quantum mechanics is ultimately the nature of things is not the issue. "Uncertainty . . . exists not in the outside world, but in the eye and the mind of the beholder" (1982d, 437). In game theory, to predict behavior, one needs to know not only that the player is rational, "but also how he perceives the world -- what alternatives he sees, and what consequences he attaches to them" (1982b, 273). (And, perhaps, whether he is trained in game theory.) Man seeks patterns, relies on long-term memory to store them, but in significantly novel situations, experience may be of limited usefulness (1982f, 469). The solutions to differential equations are implied therein; the answers are there -- "if we only knew how to get to them!" Simon exclaims (1982c, 307). (Sometimes we do.)

Procedural rationality comes closer to addressing the process by which we deal with at least some of lifes uncertainties. "Learning phenomena are also readily handled within this framework", Simon tells us.

> A number of the changes introduced into planning and control procedures in eastern European countries during the 1960s were instituted when the governments in question learned by experience of some of the dysfunctional consequences of trying to control production by means of crude aggregates of physical quantities (1982e, 451).

Simon believes 'learning' in the form of reaction to perceived consequences is the dominant way in which rationality exhibits itself" (*ibid.*).

There are obvious commonalities between outcomes based on Simon's adaptation and Leibenstein's work-wage models as well as in their theoretical foundations (Weiermair 1990, 133). Both rely on the relaxation of assumptions underlying the neoclassical model. Uncertainty, transaction costs, and lack of competition may figure into either analysis in some degree. In both the differences between what is and what could be are an essential factor. In both there are worse, better, and best outcomes. The difference between what is and the best outcome is, in Leibenstein's work effort model, X-inefficiency. The difference between what is and what one aspires to is, in Simon's adaptation model, a signal to the decisionmaker to continue or to change behavior. The neoclassical optimal is attainable in both in the long run. However, both models are less concerned with the long run than the short run.

Both theories can be reconciled with the neoclassical model by imposing constraints on decisionmaking. One such constraint is the introduction of imperfect information with the accompanying costs associated with search. Another approach is recognition of utility maximization as part of the neo-classical solution. George Stigler's modification to neoclassical theory posts the firm as selling two commodities: its output and on the job leisure. Utility maximizing workers may trade off wages for on the job leisure. There is no X-inefficiency (Frantz 1990b, 48). Leibenstein acknowledges that the profit maximizing solution may not maximize the welfare of the individual worker, but his bull's-eye analogy illustrates the tautological nature of the utility maximizing argument (Leibenstein 1987, 242; Frantz 1990b, 51-52).

Simon recognizes that things other than profit may enter the decisionmaker's choice set but finds utility maximization ambiguous (Simon 1982a, 331). Scitovsky illustrated early on that profit and utility maximization "are compatible with each other only under the condition that the marginal rate of substitution of leisure for profits is zero" (Frantz 1990a, 375). (Also see Frantz 1990b, 51).

Of course, neither Leibenstein nor Simon were particularly interested in advancing neoclassical theory as such (Frantz 1990a, 375; Simon 1982d, 432). Both were interested in introducing the possibility of irrational behavior into the economic paradigm. Leibenstein calls such behavior "selective rationality". Borrowing from Simon, Dopfer suggests that it should be more appropriately called selective bounded rationality (Dopfer 1990, 188). Simon's concept of rationality is illustrated by an adaptation model in which information is imperfect and behavior is determined by the difference between what is and some aspiration level, the latter of which adjusts as information is obtained. Questions arise as to what factor(s) determine the aspiration level and, so long as the aspiration level continues to rise, what limits search? Simon describes the following for an individual seller with unknown probability distribution:

> First, he will probably limit the planning horizon by assuming a price at which he can certainly sell and will be willing to sell in the *n*th time period. Second, he will set his initial acceptance price quite high, watch the distribution of offers he receives, and gradually and approximately adjust his acceptance price downward or upward until he receives an offer he accepts -- (Simon 1982i, 257-58).

As to what causes the aspiration level to rise or fall, he offers the following:

> A vague principle would be that as this individual, in his exploration of alternatives, finds it *easy* to discover satisfactory alternatives, his aspiration level rises; as he finds it *difficult* to discover satisfactory alternatives, his aspiration level falls (*ibid.*, 251).

He suggests that difficulty and ease could be translated into cost terms.

Leibenstein's model is designed to explain intrafirm behavior. His interest is to make explicit the rigidities that may inhibit attainment of an optimum; one being that no single individual sees himself as capable of reaping positive benefits net of the costs that would be incurred to encourage others to change (Leibenstein 1987, 73). This is one factor explaining inertia, a concept central to his theory. Pressure plays an important role. Through the pressure of convention, the Prisoner's Dilemma solution is avoided. Sufficient market pressure (where competition can be more broadly defined as that of contestable markets), can overcome the inertia of conventions and lead to optimization (See Hatch 1990, 28).

Market pressure serves another function in Leibenstein's model; it encourages rationality. Some lament that since market pressure "forces" individuals to be rational, this amounts to a loss of liberty and free will on the part of workers. They are no longer free to be "sloppy, to act out of force of habit, to make poor decisions" (Frantz 1990a, 382). Competition forces individuals to set priorities and to reverse internal inconsistencies.

From Mark Perlman: "survival pressures, to paraphrase Dr. Johnson, 'powerfully clarify the mind.' A measure of the presence of X-efficiency may be an inverse measure of personal liberty" (Perlman 1990, 20). With regard to personal liberty, it would seem that, on the contrary, what increased competitive pressure may do is reward greater effort with higher pay which would in turn make the implicit price of on the job leisure greater. Since more expensive, workers may choose less of it. One is just as free to choose between work and leisure in the firm (and to choose irrationally, if so inclined), however, regardless of what one decides, the opportunity cost of leisure would be higher and fewer (rational) workers would opt for as much of it, other things equal.

Are there pressures, other than competition, that could push a firm closer to optimality (i.e., to a position with less X-inefficiency)? Morris Altman makes the case that a government enforced increase in wages may result in improved efficiency without necessarily a loss in employment (Altman 1992, 179). Even though theoretically possible (as is a Giffen good), Leibenstein points out that there is no reason to suppose an increase in wages will cause workers to increase their effort (Leibenstein, 1983, 823).

Another alternative to market pressure in attainment of an optimum would be a Golden Rule convention. Leibenstein sees a number of obstacles that inhibit negotiating a (double) Golden Rule position (Leibenstein 1987, 53-54). Even if one were negotiated, he believes it would be difficult to maintain because it requires acceptance by the culture. And he believes this standard, which he regards as altruistic, to be no longer supported by Western religion or culture (*ibid.*, 53). Based on previous discussion, it would seem to follow that the double Golden Rule (which is more akin to "enlightened" reciprocity)

would be encouraged by market pressure; which, in turn, would be served by a relaxation of impediments to trade (tariffs, taxes, licensing, etc.).

Could the Golden Rule alone, i.e., without the pressure of competition, result in optimality? First, one must consider what is meant by market pressure. The effects of market pressure are felt through changes in prices/costs and profits. In order for these market mechanisms to perform their function, property rights must be clearly defined. Recasting the above question: Can efforts to achieve optimization rely solely on the force of convention (such as the Golden Rule); irrespective of property rights. Weiermair claims:

> Whether social norms that facilitate exchange exist and persist and whether they are viewed as pure means or ends should therefore affect both transaction costs and effort motivation irrespective of property rights arrangements (Weiermair 1990, 131).

Weiermair is referring to human property rights within organizations. But for purposes here the statement is an intriguing one when viewed from the perspective of a nonhuman resource. If that resource is common property, there is the potential for overutilization. It could be rebutted that this is an allocative problem not one of X-inefficiency (i.e., one internal to the firm in which it is not on its prodution function). However, if a resource is common property, and there are efforts to maintain a Golden Rule, where workers work as hard as possible and managers pay as much as possible, these efforts will be frustrated. After a certain point greater effort will lead not to greater output but less. Managers will be forced to offer less not more pay.

If property rights are not properly defined, competitive pressure does not lead to maximization. It is not just the pressure of competition that encourages greater work effort and a movement toward a more optimal level of output in the Leibenstein model, it is the pressure of prices and costs and the incentive of profits in a market system based on private property.[3]

Of course, the effect of the market mechanism on allocative efficiency is widely recognized. Simon observes that in the Post Office, rising per unit costs and poor service are the result of excessive demand from offering some services for virtually nothing. "The crisis in the Post Office . . . calls for a thoroughgoing application of price and market mechanisms" (Simon 1982j; 175). "An initial distrust of prices and market mechanisms" was also blamed for the lack of success Eastern European countries had with production quotas in the sixties. He likens their experience to the American steel experimentation with quota incentives (Simon 1982h; 451). Both learned by responding to consequences; his definition of rationality.

In Simon's adaptation model, individuals adapt to their environment through experience and change their aspiration level accordingly. But if a resource is owned in common, what is the lesson learned once the point is reached at which output falls as more effort is applied? Does one reduce his level of effort in response? If no one else restrains their effort, then reducing one's own will insure that by doing so he receives nothing instead

of less. Since everyone reasons thus, no one cuts back. There is no incentive to curtail. Yet, that is the rational and most productive course of action.

Sugden considers the emergence of the convention of property in a state of nature. In reality, most existing property rights arrangements are determined by governments. One of the fundamental differences between the government of Eastern Europe and the U.S. has been property rights arrangements. In the example cited above, concerning production quotas, the difference between the two is that the former required governments to learn; the latter depended upon learning by owners/management. Simon's concern is the process by which individuals learn. This process may be contextual. One's aspiration level and how one adapts to it may be driven, in part, by underlying institutions (e.g., private property).

Returning a moment to the efficacy of pressure in the Leibenstein model, one can observe that it manifests itself quite differently on governments than it does on private firms. The latter respond "automatically" (i.e., without intervention by central authority) to signals provided by the marketplace. A "convention" (quota rule) was overturned by the governments in Eastern Europe; by firms in the U.S. other inefficient rules have until recently remained in place in Eastern Europe, however. This was less true in the U.S. because of its greater reliance on the market.

Not only does the market impose pressure in the form of changing costs and prices to reflect scarcity and demand conditions, it also provides an incentive in the form of profits. Thus, market pressure may not only affect costs by encouraging greater work effort, it may also promote cost-saving through innovation. The effect of innovative technology change in costs is evidenced in natural resources (Barnett and Morse 1963; Johnson and Bennett 1980).)[4] It could be charged that technology's contribution in this instance is in the allocative realm. Still, it serves to illustrate the power of technology in reducing unit costs.

Innovation can also improve a good's quality. Francis notes:" it is now argued by many authorities that competition among goods and firms occurs much more on the basis of innovative features than on the basis of price for standard items. X-inefficiency in innovation is thus more significant than in the production area" (Francis 1990, 286).

Here again, Simon believes the decisionmaker rationally satisfices, not optimizes. That is, he finds not the best innovation, but one that is "good enough" (Simon 1982k, 396-97). It is doubtful that the inventive process itself is described by the incremental learning method featured in Simon's adaptation model. As for which inventive technique or process a firm adopts, costs are a significant factor. The best may not be utilized because costs are prohibitive.

How quickly inventions are adopted may depend on the underlying economic system and property rights arrangements. Simon illustrates the importance of innovation in improving the productivity of doctors in North America, who in 1890 spent 90% of their time traveling on horseback. The automobile, at a minimum, doubled (and as much as

quintupled) their productivity (Simon 1982l, 111). The transition to automobiles was accomplished in a matter of a few decades.

In the Middle Ages, invention of the nailed horseshoe and the modern harness in 900 made the horse twice as productive as two oxen. Still it took 200 years for the horseplough to become commonplace in Northern Europe (Spiegel 1971, 50-51). One must look at incentives to understand why this innovation took so long to become widespread. In the Feudal system, the landlord had the right to use land, but the title was held by the king. Serfs were tied to the land and received subsistence for their efforts. The landholder received part of the product as rent; the balance was paid as tribute to the sovereign. There was no real estate market, no labor market, no financial market. Nor was there a commercial market in agriculture. The agrarian revolution did not occur until the twelfth century with the enclosure movement, which privatized common grazing land (*ibid.*, 49-50).

Thus, it would appear that the institution of private property matters by providing the foundation for the operation of the market mechanism, which, in turn, promotes the efficacy of certain conventions such as the Golden Rule work-wage standard, encourages a more efficient (both allocative and "X") use of resources, and stimulates innovation -- an additional antidote to sub-optimal conventions. Whether conventions of property can arise spontaneously in a state of nature is a question addressed by Sugden and will be discussed next.

Rationality and Natural Law

In his discussion of games of commitment, Sugden restates Schelling's paradox "that it can be an advantage to have no freedom of manoeuvre" (Sugden 1986, 80). The cost of commitment is that "to maintain credibility you must carry out your threat even though from a short-term point of view you might be better off not doing so" (*ibid.*, 81). It would seem to follow that to have freedom one must give it up.

But freedom is not the freedom to do anything at all. Freedom is the freedom of choice. Given that one has a plot of land on which to garden, he may choose among a variety of vegetables to grow, but if he wants to grow tomatoes he cannot plant pumpkin seeds. This is not a limitation; it is reality. A decision once made necessarily limits one's actions. Of course, some decisions are not only for the present but also for future courses of action. If one decides to quit smoking, this does not mean that one simply does not smoke the current cigarette under consideration but all future cigarettes as well. Still, the same principle regarding freedom and limitation of action applies. If one decides not to smoke, it is in the nature of decision that the person's actions are constrained. The freedom is in the choice one makes.[5] One does not have the freedom to bake a chocolate cake using a recipe for pineapple upside down. The freedom comes in which cake to bake, not which recipe to use once a choice has been made.

If one were to focus on the solution to the single shot Prisoner's Dilemma, it might appear to follow that for society as a whole coercion (in the form of central government) may be needed to bring about a better outcome. It is in this context that Sugden remarks

> Hobbes seems to be claiming that this problem has no solution within the state of nature; agreements can be made only if there is a "common power" set over all individuals with sufficient force to compel them to keep agreements. This is why, according to Hobbes, everyone will agree to subject himself to some sovereign power, provided that everyone else does the same; once this agreement has been made, the state of nature is at an end (*ibid.*, 163).

Of course, Sugden is much more optimistic than Hobbes was about the evolution of cooperation in a state of nature. The thrust of his study is to demonstrate how conventions can arise in just such a state.

As Sugden (as well as Lewis and Hardin) points out, conventions are arbitrary in the sense that there is more than one solution.[6] This does not mean that just any convention may arise. Take, for instance, the oligopolists' decision to limit market share. Oligopolists may agree to limit output, and they may be successful for a while in doing so, but there is an incentive for each to produce more than his agreed upon share, particularly if he can do so anonymously. Similarly, individuals may agree to voluntarily limit their use of a common property resource, but there is an incentive to do otherwise. Public spirited businessmen may agree to freeze their prices, but with an increase in demand pressure their resolve will erode.

Agreements outside the economic realm may be difficult to maintain as well. Many speak of abstinence as a method of controlling the spread of the AIDS virus. Of course, on examination, these advocates are usually speaking of abstinence for specific groups -- not abstinence for themselves. (The undisputed focal group are those with the virus, but others have also been targeted such as high risk groups, teenagers, and unmarried adults.) *Total* abstinence might eliminate the spread of AIDS, but such an agreement would be impossible to reach or maintain. (How stable agreements are may also depend upon the rapidity with which a situation changes. The decision of whether to drive on the right or left side of the road, once established may endure for a very long time. Other situations are much more dynamic and, thus, resistant to convention.)

Such agreements go against other laws; those that govern the economy; those that govern biology. The same is true not only of voluntary agreements to which individuals may enter, but also of laws that may be imposed upon the governed. Concerning "the man of system," Adam Smith says in *The Theory of Moral Sentiments:*

> He seems to imagine that he can arrange the different members of a great society with as much ease as the hand arranges the different pieces upon the chess-board. He does not consider that the pieces upon the chess-board have no other principle of motion besides that which the hand impresses upon them; but that, in the great chess-board of human society, every single piece has a principle of motion of its own, altogether different from that which the legislature might choose to impress upon it. (1759, Part 6, Section 2, Ch.2) (Sugden 1986, 5).

So a convention may be arbitrary in that more than one solution exists, but it cannot be *anything* (no matter how much the parties to the agreement may wish it to be so). Sugden, however, does not believe as Hobbes that natural laws can be found by reason since this would mean such laws would necessarily be unique.

> Hobbes's natural laws are found out by reason. The idea seems to be that natural laws can be *deduced* by a chain of logic from a few self-evident first principles. This is in marked contrast to Hume's idea that natural laws *evolve* and are *learned* by *experience*. If natural laws can be found out by reason, then presumably there is a unique code of natural law that can be discovered by any rational person in any society. This leaves no room for the possibility that some natural laws might be conventions -- rules that have evolved in particular forms in particular societies, but that might not have evolved otherwise (Sugden 1986, 162).

Is this accurate? If a principle of natural law were to be found by reason, would it necessarily be unique and could it evolve spontaneously? Consider the notion of property. What qualifies as property and why? When something is abundant, it is not scarce in an economic sense. It is not a "resource." It may have value in the "intrinsic" sense, but it commands no explicit price. Oil was considered a nuisance in the last century. Now it is a scarce resource. Long before the Europeans arrived in North America, land was relatively abundant. Economics is concerned with the allocation of scarce resources among alternative ends. When something is relatively abundant it does not qualify as a resource nor does it present an economic problem.

As something is used more or consumed more relative to its availability, it becomes relatively scarce. As various uses for oil were discovered, the demand for it increased. As population increased relative to land, land became relatively scarce. Both became economic resources, but, at least initially, neither were "property."

The concept of property (ownership) is more readily applied to small, transportable items (that are relatively scarce). In a state of nature in which everyone stands ready to fight, small items are more easily concealed, stored (if not perishable), and transported. It is not surprising that they are among the first items exchanged. They, thus, soon acquire the status of property -- items that can be acquired, used, and disposed of. With land it is more difficult in a state of nature to determine who uses it, how it is to be divided among users, and it is more difficult to protect. Nor is it transportable. Sugden presents a number of possible scenarios based on game theoretic approaches in which conventions of property may evolve in a state of nature. But is the notion of property as applied to land always immediately apparent?

Take for instance the tragedy of the commons. Without private ownership of grazing land, there is no incentive to conserve. Because there is no ownership, there is no price mechanism. Adam Smith's invisible hand does not exist and cannot perform its rationing function. The explicit cost of grazing is zero even though the implicit cost may be much greater than this. There is no problem when grazing land is abundant relative to sheep, but as the sheep population increases, efficient allocation of land becomes a problem. Land may be used (overused, in fact), but it cannot be acquired (exchanged). It does not have the status of property.

The same applies to overfishing. Because fish are a common property resource, they carry no explicit cost to the fisherman. There is no built in incentive for fishermen to curtail fishing after a certain point. Given sufficient demand pressures, fish may be caught beyond the point at which reproduction would replenish the stock. This could eventually cause extinction and put fishermen out of business.

In the case of common property resources (land, fisheries, etc.), it has not always been immediately apparent that privatizing the resource (establishing property rights) was the solution. Without establishment of property rights, the price mechanism fails to perform its rationing function and the resource may be overused (depleted). This can be demonstrated theoretically. But the economic models on which this theory is based are not self-evident.[7]

It may be observed empirically, but at least initially, the phenomenon of overuse -- overgrazing, for instance -- may be thought an isolated incident; one that exists because of the refusal on the part of some to restrain themselves. Voluntary restraint may be agreed upon, at least temporarily. But there are strong incentives to cheat. Once a common property resource acquires the status of scarcity, it is easy to see why Hobbes would regard the state of nature as one in which every man stands ready to fight since overuse of a common property resource is fertile ground for aggressive action.

Sugden presents several possible ways in which the convention of property might be established; some of which are peaceful, others of which are less so. The point here is that until land becomes a scarce resource, there is no incentive or reason for property rights to be established. So different societies may have different relationships to land depending upon its relative abundance or scarcity. Even in those instances in which it becomes scarce in an economic sense it may not be recognized as property, at least initially. Once it is recognized as such, either by a process of theoretical reasoning and/or empirical observation, property rights might not be (immediately) established.

It is also possible that the notion of property may develop because land becomes generally recognized as useful as well as scarce, and some are able to appropriate it by force. There is no particular chain of logic here on the part of the appropriator, just a desire to gain exclusive control over the use and disposition of a piece of land for one's own benefit. Still the chain of logic with respect to land's efficiency in use once property rights are established applies.

That private property encourages efficient use of a resource is an economic reality once property rights are established. The solution to the overuse of a resource is *unique*. But the strategy by which property rights are established may be *arbitrary* in the sense that more than one approach is possible. Not all strategies are equal. This is true of Sugden's examples. In his examples, all men are evenly matched (Sugden 1986, 59). In reality, some have bigger guns than others (which may be the salient factor). In some instances, ownership of property may be established by conquest. Might may make rights. Still, Sugden's observations that once property rights are established, it is in (almost) everyone's interest to see that they are upheld probably applies regardless of the way in which they are established.[8]

The question remains, can we always count on spontaneous solutions to establish conventions of property or does government have a role in establishing solutions? The fact that we have overfishing and overwhaling problems as well as other problems dealing with the overuse of common property suggests that the use of these resources has increased more rapidly than conventions have emerged to deal with them (at least in many cases).[9] As was noted earlier, land has different characteristics than the small, transportable items that were first recognized as property. Similarly, water, air, and endangered species have characteristics unlike land. This does not mean that property rights are impossible to establish in these cases, only that conventions may not spontaneously evolve rapidly enough to deal with some common property problems, not the least of which is that first the need for establishment of property rights must be generally recognized.

II. The Prisoner's Dilemma: Symbolic Utility in Decisionmaking

As has been shown, in some cases conventions can solve (provide a unique solution to) the Prisoner's Dilemma. In Leibenstein's work-effort model, many outcomes are possible. Adherence to a peer effort convention can result in an outcome superior to that of the Prisoner's Dilemma. Still, this outcome may not be optimal. Conventions tend to have an inherent stability. The sub-optimal position may endure. Competitive pressures could force an optimal outcome. However, market pressure is defined by changes in prices and profits. The "invisible hand" of the marketplace is ineffective unless property rights are well-defined. Without the "convention" of private property, other conventions may be ineffective in assuring optimization (the Golden Rule standard).

Within the framework of the original Prisoner's Dilemma, based on a 2 x 2 matrix, a convention can (depending upon the nature of it) result in a better outcome -- which is also the best outcome -- if both participants share the same convention. For a norm, ethic, or convention to guarantee a (unique) solution, it must have widespread (unanimous) acceptance.

Many norms, ethics, and conventions have less strength than that. Many times an individual is faced with a conflict or trade-off between two competing values. His decision will depend on the relative strength of each. The final outcome will depend not only on what he chooses but on what his opponent chooses as well as their mutual expectations about how each will decide. This section will examine how a person's values enter a Prisoner's Dilemma decision. It will draw from Nozick's example. It is assumed that ethics and other values enter by way of symbolic utility. This is not a necessary assumption, but it is useful and is consistent with Nozick's analysis.

The solution to the single shot Prisoner's Dilemma is the dominant action (mutual defection) in which both parties are worse off. Nozick presents another line of reasoning for the single shot case. If common knowledge of rationality is assumed then that permits us to further assume that both players will reason the same and therefore perform the same action (Nozick 1993, 54). Thus, if player one believes the dominant action is better, so will player two. If one thinks the cooperative is preferred, so will the other. It follows that since the cooperative is the better outcome, that is what both will choose.

The following is a decision matrix for two prisoners: Prisoner II

		Don't Confess	Confess
	Don't Confess	(a) 2, 2	(b) 12, 0
Prisoner I			
	Confess	(c) 0, 12	(d) 10, 10

The dominant solution is (d); both prisoners confess. It is sub-optimal, or non-Pareto optimal, in that a better solution exists. Cooperative action would lead both not to confess and end up at the more preferable position (a) (Nozick 1993, 51). A person's choice may shift between the two decisions as the payoffs in the 2 x 2 matrix change. The point at which the shift occurs will depend in part upon the extent to which (measured in probabilities) the person believes his opponent is likely to act the same as he (*ibid.*, 53).

When an action's symbolic utility is taken into account, the responses of the two prisoners and the outcome will depend on how cooperative or independent a person is (or would like to be thought) and how cooperative or independent he thinks the other person is. Introducing symbolic utility into the Prisoner's Dilemma problem results in responses that "are governed, in part, by our view of the kind of person we wish to be and the kinds of ways we wish to relate to others" (*ibid.*, 57).

The assumption in the Prisoner's Dilemma is that the prisoner's decision is determined by outcome only, i.e., the number of years of incarceration. Implicit in this assumption is that physical freedom is the most important thing to the two prisoners and the only factor guiding their decision. The objective is focused on outcome -- how to achieve the lowest sentence possible. It is measurable and is measured in terms of prison years.

However, when symbolic utility is introduced, the symbolic utility of the action becomes or can become a factor in the decision process. This relaxes one of the assumptions of the Prisoner's Dilemma (Hardin 1988, 68-69). Nozick limits the analysis to whether the prisoners want to be (or want to be thought of as) cooperative or independent. But other motivations may affect their responses. For example, suppose that Prisoner I is innocent and believes that he must tell the truth. It follows that he will not confess and neither (c) nor (d) will be in his decision set. He would, of course, prefer (a) to (b), but the outcome will depend on Prisoner II's decision. (The same would apply if Prisoner I were guilty but wanted to appear to be innocent and therefore would not confess.)

If the only symbolic choices guiding Prisoner II's decision were whether he wished to be (or appear to be) independent or cooperative (as in Nozick's example), then the result would be (b) if he chose the dominant action and (a) if he chose the cooperative.

Is it realistic to assume that one prisoner would act on principle (i.e., ethical standard) while the other one would try to achieve a shorter sentence as his motivating principle

(i.e., objective)? It is assumed that Prisoner I values truth. He also values his freedom (he prefers (a) to (b)). But he values truth more. In the above example he is assumed to be not guilty so since truth is his overriding motivating principle he chooses not to confess. One could argue that the incentives built into the decision matrix favor pleading guilty (confessing). If he does not confess, the probability of being set free without imprisonment is zero. Serving time is a certainty. If he confesses, it is 50 percent (without applying any expectations about Prisoner II's response). If he does not confess and Prisoner II doesn't either, he will serve two more years than if he confessed. If he does not confess and Prisoner II confesses, again he will serve two more years than if he confessed.

Of course, it is much easier to tell the truth if it is rewarded. It is more difficult to do so when it is not. This is when the importance of (ethical) principles enters in. It is assumed in the above example that Prisoner I's overriding principle is that he values truth and is willing to suffer the cost of certain incarceration of 2 to 12 years to follow that principle.

(Of course, there is a distinction between wanting to be truthful and/or be thought as such and wanting to appear innocent. It may be (socially) acceptable to plead guilty in an effort to get a lower sentence, then claim to be innocent. Some, even a majority, may believe the claim. But if one wants to be a truthful person (or to be thought of as such), then if one pleads guilty to accept a lesser sentence, others may regard him innocent if he later claims to be so, but his credibility is destroyed. The relative value placed on truth and freedom in a society is important in this regard. If society places a high value on truth, then if one pleads guilty, others are more likely to believe him guilty because truth is the dominant principle. So later claims of innocence will likely fall on deaf ears. If one wants to appear innocent (even when one is not), he then must plead not guilty.)

It is assumed in the above example that Prisoner II values his freedom. If he values truth at all, the value he places on it is not enough to affect his decision. He is motivated only with regards to length of sentence. Why should he assume that Prisoner I places the same value on freedom as he? Expectations about behavioral tendencies are partly dictated by culture. A society may value both truth and freedom, but value freedom more. In which case, based on cultural tendencies alone (i.e., without any other knowledge about Prisoner I), Prisoner II would expect Prisoner I to be motivated by length of sentence. Culture can play a significant role in both shaping behavior and forming expectations about behavior. For instance, most cultures value life. Yet some regard suicide acceptable and even value it in some circumstances (they may value life but with certain caveats; to put it (overly) simplistically, "life with dignity"). Whereas according to other beliefs, suicide is a mortal sin and if undertaken negatively impacts one's afterlife.

So, if, in general, a culture places a high value on personal freedom, it would not be unrealistic to assume Prisoner II to be motivated by length of sentence and for him to expect Prisoner I to be likewise motivated, i.e., his expectations and, therefore, his decision will be guided by cultural norms. This evidential argument presupposes knowledge about prevailing social attitudes and expectations that are assumed to influence the decisions of both prisoners in the Nozick example, but only Prisoner II in this example. Prisoner I is acting contrary to the social norm and may even be aware that he is doing so, but Prisoner II is not aware that Prisoner I is doing so.

In the previous example, it was assumed that the only symbolic action guiding Prisoner I's decision was his desire to be (or appear to be) truthful. This limited his decision to pleading not guilty. The final outcome, therefore, was determined by Prisoner II and whether he followed the independent or the cooperative course. Now it may be true that Prisoner I is innocent and he prefers to tell the truth, but there may be some trade-off between his willingness to confess and the number of years of imprisonment he is willing to serve. That is, although he may prefer to be truthful, he will do so only up to a certain point. After that point, the greater wrong in his estimation would be to serve a more lengthy sentence. In order to proceed with the analysis it would be necessary to know the weights Prisoner I applies to freedom and truthfulness under the various conditions.[10] Suppose that we know those weights and that once they are factored in his direction of preference is (a) to (c), (c) to (b), and (b) to (d). That is, he would still prefer to plead not guilty and serve two years than to confess and go free, but he prefers confession and freedom to being incarcerated for twelve years. Still, he would rather be imprisoned for twelve years and plead not guilty than to confess and serve ten years in prison. Now his decision will depend on what he thinks Prisoner II will do.

It is assumed, again, that Prisoner II values freedom alone and makes his decision solely on the basis of length of sentence. Since it is assumed that the prevailing social attitude supports this, Prisoner I believes Prisoner II will make his decision based only on length of sentence. (It is assumed that being (or being thought) cooperative or independent is unimportant to Prisoner I, i.e., it has no symbolic utility. He decides solely on the basis of how cooperative or independent he thinks Prisoner II is or wants to be). If he thinks "II" will choose the dominant action, "I" will not confess. If "II" does, in fact, confess, the outcome will be (b). If he thinks "II" will choose the cooperative position, "I" will not confess. If "II" does not confess, they will end up at (a). In the final analysis, "I" does not confess, not because he is unwilling to do so entirely (he is willing after a certain point dictated by the weights he applies to truth and freedom), but because of how he expects "II" to decide.

If, unlike cases one and two, Prisoner I is guilty, then if he values truth and feels he must confess, his possible outcomes will be limited to (c) or (d) only. He will prefer (c) to (d) since he also values his freedom. Like example one, the final outcome will depend on Prisoner II's response. If "II" chooses the dominant action, the result will be (d). If he chooses the cooperative, it will be (c).

Like example two, Prisoner I may feel that although he is guilty and would prefer to confess, there is some trade off he is willing to make between truth and years of incarceration. Clearly, he would prefer (c) to (a) and (d) to (b). But to know if he prefers (a) to (d), it would be necessary to know the weights he places on truth and freedom. If the weights were such that he did prefer (a) to (d), then his direction of preference would be identical to that of Nozick's example but for different reasons. If it is assumed that Prisoner II's decision is based on length of sentence only, then the outcome would depend on whether the cooperative or dominant solution prevailed.

In these four examples it has been assumed that the actions by the prisoners had symbolic utility and that in turn affected outcome. Prisoner II was, as in the Nozick

example, motivated by outcome (sentence), but to achieve that he could choose the dominant response or the cooperative one, depending upon whether he wanted to be independent or cooperative. He was assumed to believe that Prisoner I valued freedom in the same way he did. It was assumed that Prisoner I valued freedom, but truth had more symbolic utility for him. More information was needed to know what the possible outcomes would be under these circumstances. It was necessary to know if Prisoner I was willing to trade-off truth for freedom and the weights he placed on both.

If assumptions were relaxed further and both prisoners were permitted to value truth and freedom in varying degrees as well as independence and/or cooperation, then even more information would be required. The point here is that the introduction of symbolic utility can open the decisionmaking process to a number of motivations. Although length of sentence is still a factor affecting response, it is no longer the only factor and its measurement is not an unambiguous reflection of "optimality." This is not unlike the income maximizing wage earner, who, although he values income, is willing to make nonmonetary trade-offs (geographic location, job satisfaction, so on). Other things equal, for two jobs identical in all respects, he prefers the one that pays more. In that sense, he is an income maximizer. But if the jobs were not identical in all respects, say one was located in a geographic location with a milder climate and suppose further that it paid less than the other, then if an individual chose the lower paying job, it would not necessarily mean he was not "optimizing." A mild climate may have some value to him that is nonmonetary in explicit terms (but to which he may be able to impute a monetary value).

A final application of symbolic utility to the Prisoner Dilemma has to do with outcome rather than action. Suppose that Prisoner I is motivated by a desire to be relatively better off than Prisoner II.[11] The comparative motivation in income and consumption has long been recognized. Thorstein Veblen is credited with developing the notion in *The Theory of the Leisure Class*.[12] Poverty and wealth are in a real sense relative terms. The same kind of phenomenon could apply to length of sentence.

If Prisoner I wants to feel relatively better off than Prisoner II, then the absolute length of sentence becomes less important to him. If the relative length of his sentence to Prisoner II's is all that matters, then absolute length is of no importance. Clearly Prisoner I would prefer (c). He would be indifferent between (a) and (d) since in both of these cases the difference between the sentences of the two prisoners is zero. Of course, (b) would be the least preferable outcome. Prisoner I would choose to confess since only by confessing will he have any chance of getting the preferred outcome (c). He has very little incentive to cooperate, since cooperation would not lead to outcome (c). To Prisoner I the "cooperative solution" (a) is no more attractive than (d).

If Prisoner II is unconcerned with relative difference in sentence length but is motivated by trying to minimize length of sentence, then the final outcome will be (d) if he chooses the dominant action and (c) if he chooses the cooperative. He would only choose the cooperative action, of course, if he believed Prisoner I was motivated by the same objective as he.

Of course, it is probably unrealistic to assume Prisoner I has no preference between (a) and (d). In all likelihood the absolute number of years of freedom from incarceration has some utility for him. His response will then depend on the weights he places on the relative length of sentence relative to the absolute length. Although he may prefer (c) to (a), (a) to (d), and (d) to (b), whether he chose the cooperative action or not would depend on those weights as well as his expectations concerning Prisoner II's response.

The point to this example as to the previous ones is that symbolic utility can broaden decisionmaking options. It may be derived from and attached to social norms and individual ethics. The utility of the action (pleading guilty or not guilty) may be more important than the outcome (years of imprisonment) or may be weighted so heavily as to change the direction of preference and possibly the outcome. Years of sentence alone may not be an unambiguous indicator of what the prisoners regard as the most favorable outcome. Similarly, relative preference may be introduced. Here outcome (years sentenced) is important in determining response but only relative to the other prisoner. Thus, prisoners may be indifferent between serving two years or ten so long as the other prisoner does as well. The latter assumption may be unrealistic. Once it is relaxed, response and outcome are more difficult to determine without further information. In the case of relative preference, as in the others, length of sentence is not the only factor determining a more preferred solution.

Still, if the prisoner's preferences are sufficiently similar (as guided by a social norm), and there is common knowledge of rationality, they will choose the same action; i.e., the outcome can be predicted. Conventions and norms figure strongly in many decisions. The next section will examine some of the reasons for this.

III. Conformity and the Decisionmaking Process

At times in the previous sections, convention, norm, and ethic have been used almost interchangeably, as if they were identical concepts. Of course, they are not. However, it has been shown that they may emerge by similar processes and may have similar psychological effects on the decision process. A convention is a generally accepted rule of behavior (which may, under certain circumstances become a norm). A norm is a generally accepted standard of behavior. An ethic is a standard of behavior but it need not be generally accepted.

Conventions and norms may emerge spontaneously with no apparent reasoning process accompanying or validating them. Yet, some may argue that they have been empirically validated in the sense that they have passed the test of reality. Nozick expresses the following:

> Sometimes it is rational to accept something because others in your society do . . . . For a wide range of situations, the mean of a larger sample of observations is likely to be more accurate than one randomly selected individual observation . . . . About such matters, then, you should correct yourself to move closer to the consensus view, unless you have some special reason to think others have been misled and you are different (Nozick 1993, 129).

Hardin believes social testing of a principle may be "a better guide for our action than is abstract deductive reasoning" (*ibid.*, 16, 17).

This section will not argue that social testing *is* a better guide and that one *should* conform to social norms or conventions. It will instead examine why individuals conform and one of those reasons may be that they believe that social testing is a good guide. This does not imply that what is is what ought to be. Nor does it mean that the is-ought gap cannot be bridged. Ayn Rand reasons: "The fact that a living entity *is*, determines what it *ought* to do (Rand 1964, 17). To quote Tibor Machan:" [T]he broad domain of value appears with the emergence of life per se" (Machan 1982, 41). Reality imposes the standard by which one understands moral questions.

The existing *social* reality seems to be a factor in determining the emergence and stability of certain norms. Sugden and others ask how conventions may emerge in a state of nature. However, certain norms may be more likely to exist if certain other conventions are in place. Recall that Leibenstein's Golden Rule standard was buttressed by the pressure of competition. But market pressure is expressed via prices/costs and profits. If property rights are ill-defined, those signals will be erroneous. If property rights are properly defined, then the Golden Rule standard will be reinforced. Furthermore, the Golden Rule standard is also synonomous with optimality under this circumstance. This economists identify with (economic) rationality. Thus, a norm (Golden Rule), optimization, and (economic) rationality are linked. But the link may be severed if property rights are ill-defined.

Conventions need not be optimal or rational. Leibenstein demonstrates this in the economic sphere. Sugden and others have shown the same with regard to other social conventions. Leibenstein recognizes that market pressure can encourage more optimal and (economically) rational behavior. As for conventions unrelated to economics, those that are less than rational may be displaced through competition with other more rational ideas. Allan Bloom comments as follows:

> Freedom of the mind requires not only, or not even especially, the absence of legal constraints but the presence of alternative thoughts. The most successful tyranny is not the one that uses force to assure uniformity but the one that removes the awareness of other possibilities, that makes it seem inconceivable that other ways are viable, that removes the sense that there is an outside. It is not feelings or commitments that will render a man free, but thoughts, reasoned thoughts. Feelings are largely formed and informed by convention (Bloom 1987, 249).

Fundamental to (volitional) choice is the decision to think. Ronald Merrill relates: "It is noteworthy that Ayn Rand located volition, not in thinking choices, but in the basic decision to think" (Merrill 1993, 83). Some advocate that adherence to a convention or a norm may require little or no thought. Hardin shares the following view:

> As Whitehead remarks, "Civilization advances by extending the number of important operations which we can perform without thinking about them" -- we do not have to think about them because others have done the practice thinking and testing before us (Hardin 1988, 17).

When one acts in accordance with a norm or convention, it could be argued that no decision is made. It would follow that a decision is made only when one chooses to deviate from the norm. Leibenstein says: "Under those psychological states that are accepted as the norm -- no decision need be required (Leibenstein 1987, 27). He divides thinking into two categories: inertial and noninertial. The former is passive thinking associated with routinized activities, which would include personal habits and conventions (which he calls social habits) (*ibid.*, 36). Thus conformance to convention may be considered a nondecision. This would seem to imply indifference. Yet, Bloom regards adherence to convention as being driven by emotion. What factors underlie the attraction to conformance?

In hypothesis testing, the burden of proof is on the alternative hypothesis. The null hypothesis is equated with the status quo. It is reasonable that new ideas should be subjected to some standard for acceptance. If the status quo was established using the same scrutiny, then attachment to it would be understandable and need not involve emotion. But as has been shown, some generally accepted ideas and practices were not established by a process of reason. Then if an individual were to find a convention unreasonable, why might he be reluctant to challenge it.?

One obvious answer is that for many conventions one cannot or should not change his behavior in isolation (for instance, by driving on the wrong side of the road). In order to change his behavior he must convince everyone (or almost everyone) else to change theirs as well. The costs of doing so would in most cases be large relative to the benefits that would accrue to him alone as a result of such a change. There is also the risk that he would not be able to carry it out.

If convention is defined as the solution to a coordination problem, per Lewis, then it is in everyone's interest to abide by it and no reason for dissent. Sugden's more encompassing definition includes situations in which there is a conflict of interests. Still, once the convention is established it is in (almost) everyone's interest to conform to it. There may be deviants. People make mistakes; conventions must be learned. There may be a short run temptation to act contrary to convention. In a Prisoner's Dilemma situation, there is a short-run incentive to defect. In the single shot case (where the short run is all there is), it may pay to defect (Sugden 1986, 148).

However, because others may be hurt by nonconformance to conventions, one may feel obliged to conform and entitled to expect others' to conform. This is Sugden's argument. Sugden claims he is "not presenting a moral argument". He does not claim that we ought to behave according to convention, but that we believe we should (*ibid.*). We tend to believe we ought to conform to others' expectations, and when we do not we feel guilt (*ibid.*, 153).

In some areas it is clear that others will be hurt by one's own lack of conformance (driving down the wrong side of the road). However, one may feel obligated to conform to a social practice even when his best interests are not served and no one is harmed if he were to do otherwise. One explanation for this draws upon Nozick's concept of symbolic utility. An action or belief may have symbolic meaning. It may affect how one is perceived. Symbolic meaning has an emotional dimension as well; how one feels about how one is

perceived. The utility associated with this may factor heavily into a decision. When evidence is weighted in favor of feeling, the decision may be more expedient than rational. Expediency and rationality are not necessarily mutually exclusive, particularly with regard to some of the more minor matters of taste and etiquette. But in matters of morality and truth, the expedient course may not be the best (and therefore the most rational) one.

Still, why would one care how others perceive him? If one's behavior does not impact on another in any significant way, why should their feelings enter into his decision set? Asch's famous experiment on conformity found that the majority of test subjects tended to agree with (incorrect) group responses. Deutsch and Gerard (1955) offered two reasons individuals conform: informational, i.e., they accept the information provided by others as correct, and social (normative), i.e., they desire to be socially accepted (McGee and Wilson 1984, 490-91).

Why would one "accept the information provided by others as being correct"? We learn in many ways. We learn by doing and by reasoning, but much of what we learn we receive from others. And a good deal of that is learned early in life before development of a refined critical faculty.[13] We do not question everything we learn, it would be far too time consuming. So, early on we learn to learn from others, and we learn to do much of it without question.

But why do we believe what others are telling us is the truth? Human beings have a basic respect for the truth because they know it is fundamental to their survival -- both as individuals and as a species. Most people recognize the importance of truth in their lives and try to pass on to others, to the best of their ability, what they regard as the truth.

This may explain why we have a tendency to accept what others tell us as the truth; still it does not explain why one would say that he agrees with others when, in fact, he does not. This is where the desire for social acceptance becomes a factor affecting one's decision. There is a seduction to conformity. We are inclined to conform in matters of social behavior, taste, and ideas. Belonging to a group can give one a sense of security, of community, of family, that helps shape one's identity and define who one is.

Conformity can also be efficient (Nozick 1993, 128). It can save time, energy, money, and sometimes a lot of explanation simply to "go along with the crowd." In matters of taste, if one conforms he is more likely to be able to purchase things more cheaply. Since those things that are more widely accepted are produced in greater abundance, they can oftentimes be mass produced instead of custom made. Those with eclectic tastes run the risk of nonavailability, of paying more if available, and of not being able to share one's tastes with others. Conforming is easier, less expensive, less thought is required.

And less explanation is expected. This too is time consuming. When one differs from the norm, others oftentimes want to know why. They want to know why for purely informational purposes, to understand another's ideas or behavior. This may have a psychological dimension -- they want to know what motivates another person. They may want to find out if there is a better or more accepted way of doing something. They may want to determine if they should be concerned about the person, about other aspects of his behavior. When a person deviates from the norm, a red flag may go up, so to speak.

The nonconformist is put in the position of having to explain his behavior. Those who do conform do not -- to others or themselves. There is also safety and strength in numbers. An innate herding instinct may be a factor here.

Those are some of the more attractive features of conforming -- a sense of identity, the feeling of belonging, the time and effort it saves, the real or imagined sense of safety one feels. There are also negative reasons that people conform. These have more to do with fear than desire. They stem from the coercive pressure to conform on the part of the group. Whether real or simply perceived as such, this pressure can generate fears associated with the decision not to conform. Sometimes the pressure is real. Because the group is the majority, they may regard themselves as right and resent (even fear) someone who differs with them. A dissenter may also force the group to question if they are, indeed, right. This can threaten the foundation of the group, of what they hold to be the truth.

With respect to convention, there may be a logic behind why others feel entitled to expect one to conform. By not conforming to a convention (say, by driving on the wrong side of the street) one may harm (or wrong) others. This reasoning may be (erroneously) extended to other accepted practices. Some conventions may legitimately carry with them entitlement. Other common beliefs or practices may or may not. Yet people may feel as if they are entitled to expect others to conform. As a result they may feel (unjustifiably) wronged when others do not.

There may also be envy involved on the part of members of the group toward an individual who differs with them. Because there is oftentimes considerable pressure to conform (and, at times some form of retaliation, if one does not), it can take a certain amount of courage to take a separate stand. Others may envy or resent that courage because they feel cowardly in comparison.

A group may be threatened by someone who is different because they may perceive him as potentially (physically) dangerous. Being different means deviating from the norm. This may be equated in some minds with being abnormal, deviant. When one differs from the group in one aspect of his life, even one that is nonthreatening, it may be speculated that he also differs in other (more dangerous) ways in which the group is not aware.

Because there is (or can be) strength in numbers, these fears manifest themselves in a collective coercive pressure on any one individual who may be or want to be different. Of course, these pressures usually do not go unnoticed by the individual who may be considering pursuing a different course. His response to these pressures (perceived or otherwise) may be realized in a number of fears. One obvious fear is that of being wrong. The burden of proof is on the nonconformist. If one goes against the status quo and is wrong, there could be reprecussions. Even relatively minor fears, such as being gullible or looking foolish, may inhibit dissenting actions.

Even if one is certain he is right, there is still the fear of being labeled wrong by virtue of being different. Being perceived as being wrong can be as devastating as being wrong. One's reputation can be affected. This can affect social, familial, and professional

relationships. In some cases one's livelihood can be affected. Leibenstein informs that in Japanese culture:

> The greatest shame or dishonor for an individual is to be ostracized from the group as such. Thus, everything possible is done to avoid such ostracism. Hence loyalty to the group is easily obtained. . . . Thus, for the traditional Japanese, acting alone is likely to be seen as verging on treachery since it is likely to involve behavior that does not consider the group as such (Leibenstein 1987, 193).

Conventions as defined by Lewis, Sugden, and Hardin spring from the interdependence among decisionmakers. To achieve a given objective, each has a preference to conform to a certain action conditional upon the expected conformance of others. A stable equilibrium is a self-enforcing rule. It is the nature of a stable equilibrium that the strategy cannot be invaded by a small group of deviants. In Axelrod's iterative Prisoner's Dilemma scheme, he demonstrates that labels, stereotypes, and social hierarchies have a tendency to be reinforcing. This is true whether the labels are justified or not; i.e., they may have no basis in reality. For example, if the policy or strategy is to cooperate with one's own kind (however that is determined) and to defect with those who are not, then deviants will be forced to return to the roles expected of them. One cannot cooperate in isolation. Labels will tend to stick. Stereotypes will be self-confirming. There is nothing one person acting alone can do to break out of a stereotype or social hierarchy. Any action he takes will be self-defeating (Axelrod 1988, 146-50).

If one has felt the sting of retaliation in the past when trying to deviate from a convention (say, by driving on the wrong side of the road), then one may fear it in cases when interdependence of choice or action is not a factor and retaliation will not result. One may feel a dependency on others, even when the need is for independent choice. One may erroneously generalize (because of symbolic fear) that any deviation will be punished; that all independent action is self-defeating. In the extreme case, one might develop a habit of conformance. This generalization from one aspect of one's behavior to others can be explained using Nozick's notion of symbolic utility. Any area in which one may differ from the majority may be viewed as representative of other ideas or behavior to which he may or may not subscribe. This can attribute additional (negative) weight to any one area in which he may be considering not conforming. If he fears that differing in this one area may label him in other areas (particularly if it is a negative label and one that is untrue), then this may sway his decision toward conformity with regard to the area under consideration.

There are other less extreme fears of not conforming -- such as the fear of not being perceived as a team player or a good sport. There is the fear of being snubbed, of being envied, of being resented, of offending others. There is the fear of being alone -- if only for the instant it takes to disagree.

Given all these fears it is easier to see why some do not embrace new ideas, techniques, or procedures, even when there is strong evidence that they are right or they work or are better. For example, sometimes doctors are criticized for failing to readily embrace a new treatment even after it has been shown to be effective. It is often speculated that their reluctance stems from the investment they've made in the existing procedure.

An investment has been made in equipment, training, and so on, and, presumably the desire is to make this pay off.

But, as has been discussed, there may be other reasons that a doctor may not readily adopt a new procedure. One is that he may believe the old procedure to be the better or the right one. If others share this belief that gives his added weight in his own mind. Or he may cling to the old for fear of having to admit that he has devoted his life, study, and practice to an inferior procedure. If he abandons the old procedure, there may be the fear of the negative opinion of his colleagues based on their suspicions of the new. There is the effort that must be expended learning something new, of explaining it to patients; the fear of malpractice if one is wrong. There is the fear of appearing gullible, of tainting one's reputation, of ultimately losing one's practice and livelihood. Although these fears may be exaggerated, any one deviation can have symbolic meaning. It may be thought representative of others and any fear that may be associated with it may therefore carry excessive weight in one's decision process. There may also be an inability to see. Our ability to see is partly influenced by what we have learned. As Kuhn pointed out in *The Structure of Scientific Revolution,* this can affect our ability to see new ideas.[14]

But, of course, new medical procedures are accepted and adopted. There may at time be resistance to change, but we do change. A great deal of advertising is spent trying to change habits and encouraging consumers to form new ones. Fashions change and people quickly conform to them. Millions of dollars and countless hours are spent on research designed to discover new knowledge. Laws change, as does technology. We like novelty. Conformity is comforting, but novelty is stimulating. There have been long periods of dormancy, such as during the Dark Ages. But with increased freedom came competition and the pressure to adopt new and better ideas. A freer society encourages individuality, advances in knowledge, technological change.[15] These pressures can offset (but not nullify) some of the pressures to conform.

In a freer society there may be fewer norms for society as a whole.[16] Still there is pressure to conform to those that do exist. Fundamental to many if not most decisions is whether to conform or not. (As noted previously, it could be argued that only when one is considering not conforming is a decision being made. Willing conformity requires little thought.) There may be overwhelming evidence that a belief is true. However, if this belief is contrary to the norm (or if it is perceived as such) a number of desires and fears associated with conformity may be factored into the decision of whether to accept the belief as true because of their impact on the decisionmaker's expected utility. Not the least of these may be the symbolic meaning attached to the decision not to conform to a (socially) accepted belief and what it implies about how one is perceived.

Many of these fears may seem rational. Conformity may be the expedient thing to do. So long as one goes with the majority, there is usually little explanation required and even no apparent consequences, at least in the short run (except for those related to integrity). But the rational decision considers long run consequences. To those who have dared to be different, we owe our growth in knowledge, industry, the arts. The Golden Mean between cowardice and foolhardiness is courage. Courage is needed only when there is something at risk. Many may go through their lives unchallenged, living their lives

by halves. It takes integrity, effort, ability, and courage to know what is right and do it. The rest of us -- accept.

Conclusion

This paper has reviewed how conventions arise in a state of nature. Examined were conventions of coordination, exchange, and property. The application of game theory offered a framework for understanding ways in which they may come about. In many cases, if not all, deductive reasoning on the part of participants was found inadequate. More than one solution exists. Sugden demonstrated that recognition of some asymmetry is needed for a convention to be established. Solution may depend upon imagination.

Conventions may oftentimes gain the status of norms. Sugden found that they may have the force of moral imperatives, but qualified that he was not concerned with the logic but the psychology of morals. Still, if conventions acquire the stature of norms, the Hobbesian argument that they are unique and are found by a process of deductive reasoning would seem to be weakened, according to Sugden.

In response, this paper examined the "convention" of property. So long as property is abundant relative to its use, it is not scarce in an economic sense. However, at some point use will encroach upon it and it will become an economic resource. However, this may not be immediately obvious. As an unowned resource it will command no explicit price. Conventions may arise to avoid overuse, but tendencies inherent in the situation will make them unstable. Establishment of property rights will, through the incentive of the price system, stem overuse and permit a more efficient use of the resource. This can be shown deductively. Still, it may take some time before this is recognized.

So, if efficient utilization of a resource is the choice criterion, then a unique property convention (private property) may be preferred after a certain level of utilization has been reached but may not be required below that level. And that particular convention may or may not emerge spontaneously, at least not immediately.

Conventions may or may not be optimal. In the economic realm, Leibenstein argued that the pressure of wage-work conventions may be useful in avoiding the Prisoner's Dilemma outcome within a firm. This important insight, that norms (which is synonomous with the American usage of conventions) could form solutions to Prisoner Dilemma and coordination problems, was first recognized by Edna Ullman-Marglit (1977) (Leibenstein 1987, 66). (Von Neumann and Morgenstern recognized that "standards of behavior" could solve game theory problems (*ibid.*, 63)). Thus, if one were aware of prevailing social norms/conventions and their strengths, one might better predict the outcome of such problems. (The emergence of some conventions may, then, depend on the existence of others.)

In Leibenstein's model there are many possible outcomes. To achieve the optimal solution, the Golden Rule standard, the pressure of the market is needed. The latter promotes not only optimality, but rationality (in the economic sense) as well. Leibenstein was interested in what forces may limit rationality and optimality. He introduced the concept of inertia, a characteristic of conventions. Although a convention may lead to a

better result than the Prisoner's Dilemma outcome, once established it may inhibit movement toward optimality. Conventions, for many reasons, encourage conformity and stifle change.

Simon was similarly interested in the "bounds" of rationality. He relaxed the assumption of omniscience on the part of economic man. His concern was cognitive realism in decisionmaking. He devised an adaptation model based on learning theory developed in the field of psychology which exemplified what he termed procedural rationality. Although his theory can be reconciled with the neoclassical model, Simon regards his as more realistic; a better basis for explaining economic behavior. That behavior is assumed to be driven toward the attainment of some aspiration level; a level which adjusts as the individual moves toward it.

It is possible for both the Simon and Leibenstein models to achieve optimality in the long run under certain conditions, but both are more concerned with short run behavior. Pressure is important in the Leibenstein model. The pressure of the market promotes optimality. This, however, is predicated on the institution of private property, otherwise the market will transmit the wrong signals. These signals encourage firms to become more cost effective; i.e., reduce x-inefficiency. They also encourage firms to innovate.

There is evidence that innovative technology has been instrumental in reducing per unit resource costs over time. Invention is an antidote to convention. Much about invention remains a mystery because much remains unknown about the creative process of the human mind. But we do know something about incentives. Invention and innovation is more likely to take place where impediments to independent thought and new ideas are few, where development of ideas in the form of invention is protected through patents and other property right arrangements, and where innovation is rewarded.

The question arises, is rational (and creative) thought a foregone conclusion in freer societies. We have seen that there are incentives for such thought in the economic sphere. There may be similar competitive pressures in the marketplace of ideas. But reason takes effort. It is not self-evident. It is not automatic. It is, to borrow from Leibenstein, not inertial. There are tremendous pressures to conform to the status quo. And the status quo may not be rational. Bloom, referencing Toqueville, warns us that there also pressures to embrace the emergent. Society, he believes, risks less by opposing the new. Whether the pressures are to conform to tradition or public opinion, the pressures to conform exist. It takes a measure of courage to challenge the majority. There is nothing automatic about choosing the rational course, particularly if it meets with public resistance or disapproval.

Simon described how Eastern European countries abandoned less rational planning quotas for better production methods during the 1960s. The governments learned that quotas were not the most productive course. Still, they did not choose the most productive course. Freer societies learn these lessons a little more readily. Why then are there not more of them?

This question is beyond the scope of this paper. Its purpose was to examine the emergence of conventions in a state of nature and some of the ways in which convention may enter the decisionmaking process. However, some discussion of governments has been unavoidable since comparisons between theory and reality are inevitable and we live in a world of governments. In a recent interview with Milton Friedman he stated that he believed free societies to be fundamentally unstable (Doherty 1995, 35). This may be the more interesting question. My guess is that whereas freedom may promote reason, its survival depends on it. This, of course, is not an answer.

Notes

1. Not all of Lewis's examples are pure coordination problems; e.g., the rowing, land division, and cartel problems (Lewis 1969, 42-50).

2. In this particular game: "Disputes are always resolved without fighting (although, of course, everyone stands ready to fight for his half share: this is why the rule is self-enforcing)" (Sugden 1986, 69).

3. Although economics purports to be value-free (a positive instead of a normative science), it comes very close to judging based on the criterion of efficiency. A value judgment regarding over-utilization of a common property resource is nearly unavoidable. Since the same level of output can be produced with two levels of (the variable) input, one greater than the other, it would seem to follow that the lesser would be preferred. But there is no built-in incentive inhibiting overuse. The" tragedy of the commons" results.

A market system based on private property discourages, through the price mechanism, overuse. A free market system does not, however, guarantee efficient use of resources in all cases. Property rights must be clearly defined or externalities result. Public goods may be underproduced. These issues aside, there remains that of imperfect competition. The "evils" of under-utilization are less clear than over-utilization. Perfect competition is a model that is unachievable in reality but serves as a point of comparison. Other static models are more realistic, but most describe an underutilization of resources. Some texts take the position that this is price necessary for product differentiation in imperfectly competitive markets (Salvatore 1993, 411). Also recognized is that oligopolies and monopolies may experience economies a large number of small firms could not (*ibid.*, 429). Competition has been more broadly defined to depend on the existence (lack of) barriers to entry (contestable markets) and market share (*ibid.*, 416-17). Firms that may appear oligopolistic when viewed from the perspective of a single county may be more competitive when seen globally. From this broader perspective, what is relevant to competitiveness is largely dependent upon artificial barriers to entry (impediments to trade and production). The improvement in economic performance in the U.K. post-1979, is attributed by Arthur Francis to an increase in competitive pressure (and, he speculates, a reduction in X-inefficiency) (Francis 1990, 284).

4. Barrett and Morse found that per unit extraction costs declined over the period 1870-1957. Johnson and Bennett updated their finding for the period 1957-72 and found:

> According to B & M, two factors are primarily responsible for the decline in relative scarcity, namely, technological advances in resource conversion and extraction technology and, because of demand pressures, a shift from less to more plentiful resources. . . . Evidently, these forces continued to operate during the post-1957 period also, because of the continuing decline in resource scarcity (Johnson and Bennett 1980, 48).

5. In a real sense, principles limit one's choice set. Because of one's principles, a given action may be excluded from a person's set of alternatives. One might conclude from this that principles, therefore, limit freedom of choice. Here, one could say that the freedom

of choice is in the principle(s) one chooses. Principles are guides to actions, not the actions themselves. If a person values his health he may choose as a guiding principle to "say no to drugs." Yet if he develops an illness he may choose to take a drug on doctor's orders he would refuse to take on an ordinary basis. Nozick suggests that principles may save time and effort of calculation for a person of "limited rationality" (Nozick 1993, 14). It may be rational, however, to limit one's choice set until a particular alternative (such as taking a prescribed drug) becomes relevant.

6. Stephen Boydstun makes the observation that: "One apparent defect of Sugden's detailed model of the strategic bases of convention is its implications that only a single convention will emerge for a recurrent circumstance in a particular population . . . " (Boydstun n.d., 5).

7. For examples of fishery models see Chapter 13 of *Natural Resource Economics* by Charles W. Howe (Howe 1979, 256-75).

8. I am not suggesting that private property is the only institution that can arise, only that it is the most efficient in that it has an inherent mechanism (the price system) that discourages overuse. I am also not suggesting that in establishing property rights conquerors have a (valid) right to the property thus acquired. Sugden posits that possessors of property may have an advantage in a fight to establish property rights because they attach more value to the property than their opponent and thus may fight harder (Sugden 1986, 87-103). Boydstun adds that "possession might be taken as an indication of victories in past fights" (Boydstun n.d., 6). Furthermore, "[s]ocial utility ought also be admitted as a plausible reason for convergence upon property rules that favor possessors rather than challengers of possessors" (*ibid.*, 7). My point is only that if the challengers have more firepower on their side this could tip the scales in their favor. Even if this is the less preferred (i.e., unfair) outcome, however, once (private) property rights are established, future ownership will be acquired through exchange rather than conquest (so long as rights are upheld).

9.This is merely suggestive and in no way exhausts this topic. One hypothesis could be that government regulations have inhibited the spontaneous emergence of property rights in some instances of common property depletion.

10. Symbolic utility here is not a separate factor, but a weight attached to a course of action (confessing or not) (Nozick 1993, 55).

11. Axelrod demonstrates that in an iterative Prisoner's Dilemma if players follow a comparative strategy it can be self-destructive. He concludes that: "There is no point in being envious of the success of the other player, since in an iterated Prisoner's Dilemma of long duration the other's success is virtually a prerequisite of your doing well for yourself" (Axelrod 1984, 112). In the analysis that follows I am not suggesting that envy is rational, only that it may affect one's decisionmaking.

12. Concerning "pecuniary emulation," Veblen remarks:

> If, as is sometimes assumed, the incentive to accumulation were the want of subsistence or of physical comfort, then the aggregate economic wants of a community might conceivably be satisfied at some point in the advance of industrial efficiency; but since the struggle is substantially a race for reputability on the basis of an invidious comparison, no approach to a definitive attainment is possible (Veblen, 39).

13. This is not meant to imply that children accept all information without question. As Koestler points out, children go through a significant "why" stage when they first discover causality. "The child's concept of 'becauseness', i.e., causality, will undergo a series of changes, but not the verbal symbol which refers to it" (Koestler, 618). However, in addition to questioning the reasons for things, the child may also be questioning the source of his information.

14. Kuhn discusses an experiment in which anomalous playing cards (e.g., red six of spades, black four of hearts) were readily identified as normal. Even after forty exposures, ten percent of the anomalous cards were incorrectly identified. Generalizing, Kuhn comments: "In science, as in the playing card experiment, novelty emerges only with difficulty, manifested by resistance, against a background provided by expectation" (Kuhn 1971, 64).

15. Bloom warns of society that embraces "the emergent, the changing, and the ephemeral" (Bloom 1987, 253). New ideas are not necessarily better ideas. It is the task of reason to determine which are.

16. In an article entitled "Uncommon Culture," Virginia Postrel observes that, "America exists quite comfortably with numerous enduring subcultures" (Postrel, 68). Immigrants assimilate partly by "willful self-fashioning" rather than by conforming to a common-culture norm. "America," Postrel says, "is not a finished artifact but an irresistible process" (*ibid.*).

Concerning the changing role of television on America's culture with the increased number of options available, Charles Oliver projects: "In the future, Americans will not be united by a bland, one-size-fits-all culture. But they will not be divided into multitudes of tiny subcultures either. They will be united by a common cultural bazaar, where hundreds, perhaps thousands, of merchants compete for their attention, and in the end, we will be tied together by the best the market has to offer" (Oliver, 38).

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