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Uniqueness and Symmetry in Bargaining Theories of Justice

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Uniqueness and Symmetry in Bargaining Theories of Justice

Abstract Contractarian theories of justice define justice as the result of a rational bargain. The goal is to show that the rules of justice are consistent with rationality. The two most important bargaining theories of justice are David Gauthier's and those that use the Nash's bargaining solution. I argue that both of these approaches are fatally undermined by their reliance on a symmetry condition. Symmetry is a substantive constraint on reasoning, however, not an implication of rationality. I argue that using symmetry to generate uniqueness undermines the goal of bargaining theories of justice.

Throughout the last century and into this one, many philosophers have modeled the main question of a theory of distributive justice as a bargaining problem between rational agents. Even those who did not explicitly use a bargaining problem as their model, most notably Rawls, incorporated many of the concepts and techniques from bargaining theories into their understanding of what a theory of justice should look like. This allowed them to use the powerful tools of game theory to justify their various theories of distributive justice. The debates between partisans of different theories of distributive justice has tended to be over the respective benefits of each particular solution and whether or not the solution to the bargaining problem matches our pre-theoretical intuitions about justice. There is, however, a more serious problem that has effectively been ignored since economists originally discussed it in the 1960s, the status and implications of the symmetry assumption in all major bargaining solutions.

I will argue that symmetry is a substantive normative constraint that is added into the bargaining procedure, not an implication of standard accounts of rational choice. Introducing such a substantive constraint into the bargaining problem effectively begs the question in favor of some solutions—assuming at the outset what these bargaining theories are attempting to prove. I show that the problems associated with symmetry are present not only in David Gauthier's well-known solution to the bargaining problem, but also in John Nash's solution to the bargaining problem.

1. Bargaining and Justice

All bargaining solutions seek a unique solution to the problem of how to rationally divide a surplus of goods. To understand the importance of a unique solution for the bargaining problem, it is helpful to look at how bargaining solutions have been used to justify various theories of distributive justice. These justifications, I will argue, do not succeed. They attempt to show that rational agents would uniquely chose one way to divide up a surplus of goods—that only one solution to a problem of division can be proven to be rational. To get a unique solution, however, these theories require the introduction of a symmetry requirement. This symmetry requirement, however, is not an implication of rationality, but is rather a constraint on rational bargaining. As such it can only be introduced as an output of a rational bargain, not as an input. To do otherwise would be to assume at the outset what theorists of justice who use a bargaining model are trying to prove, that rational individuals would agree to a specific distributive scheme on purely rational grounds.

Bargaining theories of justice require a unique solution to the bargaining problem, they require that there is one and only one rationally correct conclusion about how to divide the benefits and burdens of social life. I call this property *uniqueness*. Without a unique solution to this distributive question, it will be impossible to justify a particular distributive pattern as the just pattern of distribution. It will be one among many possible just distributions. Those who are not as well off under distribution A can legitimately argue that distribution B, from their point of view (assuming both A and B are possible solutions to the bargaining problem), is a more just or justified state of affairs. Imagine that both an egalitarian and a utilitarian solution to the bargaining problem are shown to be rational. Why should utilitarians be comfortable living under an egalitarian regime and vice versa? The goal of all roughly contractarian theories that deploy bargaining solutions is to show that their preferred solution is rationally unique.

Rawls recognized this point and even though he specifically rejected bargaining solutions to the problem of justice arguing, “to each according to his threat advantage is hardly the principle of fairness” (Rawls 1958, p. 177). Even so, Rawls recognized that something like the Pareto principle, which only specifies a range of Pareto optimal solutions and does not specify a uniquely optimal solution, would be deficient for a theory of justice. The bargaining problem generates a range of options on the Pareto frontier of two parties, a solution to this problem is supposed to show why a particular spot on that frontier is rationally required. Any approach that could not generate a unique solution would be incomplete.

I argue in the next section that the introduction of mixed-strategies solutions into games creates a multiplicity of possible solutions. To generate a unique solution requires introducing various refinements to the traditional solution strategies. The most seemingly innocuous is the symmetry assumption used by Nash, Gauthier, and virtually every theory of rational bargaining. Symmetry only seems innocuous. In fact it has serious consequences for the contractarian project of showing that justice can be justified through a process of rational bargaining. To show this, I will look at two of the most prominent bargaining solutions, those proposed by David Gauthier and John Nash respectively.[1]

Gauthier contractarian theory of justice, developed in *Morals by Agreement*, is one of the most sophisticated complete contractarian theories. Around a decade after he published *Morals by Agreement*, Gauthier altered his theory in the face of criticism and adopted the Nash's bargaining solution (1993). Further, many contemporary contractarian theorist use the Nash bargaining solution.[2] Because the Gauthier's bargaining solution and Nash's both use a symmetry assumption, I will first look at the Gauthier solution and then turn to the Nash solution. Both are undermined by their shared use of symmetry. Before turning to each bargaining solution, however, it is important to clearly define what symmetry is.

2. Symmetry

In "The Final Problem" Sherlock Holmes is confronted with a strategic dilemma. Professor Moriarty, his arch-nemesis, is attempting to find and kill him. In the past, Holmes easily outsmarted his opponents, not so with Moriarty. Holmes is notoriously vain and unwilling to pile accolades on others, especially for intelligence. Of Moriarty, however, he says:

> He is the Napoleon of crime, Watson. He is the organizer of half that is evil and of nearly all that is undetected in this great city. He is a genius, a philosopher, an abstract thinker. He has a brain of the first order. He sits motionless, like a spider in the centre of its web, but that web has a thousand radiations, and he knows well every quiver of each of them (Doyle 1986 [1893], p. 645).

After being threatened and attacked by Moriarty, Holmes and Watson decide to flee to Europe. They board a train at Victoria Station bound for Dover. Moriarty sees them leaving and tries, in vain, to stop their train. Holmes realizes that Moriarty will rent a special train to overtake them at Dover, concluding that this is what he would

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1. David Gauthier's bargaining solution, what he calls minimax relative concession, is a variant of the well-known Kalai-Smorodinsky (1975). Throughout, I will treat these as if they are identical.

2. Those include, for instance, Ken Binmore (1994) and Ryan Muldoon (2012a, 2012b). Michael Moehler has defended a variant of the Nash bargaining solution, what he calls that stabilized Nash Bargaining solution (2010). H. Peyton Young also defends the Nash bargaining solution as being the most equitable bargaining solution (1994, p. 129).

do in a similar situation. Moriarty is just as smart and knowledgeable as Holmes so he can expect Moriarty to behave the same. This conclusion leads Holmes and Watson to get off the train before Dover at Canterbury to evade Moriarty's special train.

There is something incoherent in Homes's decision to get off at Canterbury. If Moriarty is really the equal of Holmes, why wouldn't he expect Sherlock to evade him by getting off the train early in Canterbury? This problem also puzzled one of the pioneers of game theory, Oskar Morgenstern.[3] Moriarty's decision is based on what he thinks Holmes will do. Holmes's decision is similarly related to what he thinks Moriarty will do. In considering the Holmes problem in his 1928 book, Morgenstern came to a striking conclusion:

> I showed in some detail in particular that the pursuit developing between these two [Moriarty and Holmes] could never be resolved on the basis of one of them out-thinking the other ("I think he thinks that I think! ! . . ."), but that a resolution could only be achieved by an "arbitrary decision," and that it was a *problem of strategy* (1976, p. 806 emphasis added).

John von Neumann took up this "problem of strategy" with Morgenstern and together they developed the basis of what would become game theory. In *The Theory of Games and Economic Behavior*, they modeled the Holmes-Moriarty problem as a zero-sum game (2007, pp. 176-178).[4]

The complexity of the example arises from the symmetry of the parties involved. Holmes cannot out-think Moriarty because Moriarty is effectively his rational twin. The solution to this problem is to break the symmetry by introducing randomness. If not even Holmes knows what he is going to do, Moriarty will not either. This is solution was developed into the idea of a mixed-strategy. In some games, it is beneficial for individuals to choose a strategy randomly. Randomness breaks the symmetry and makes one's action harder to predict. Mixed-strategies also

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3. For a discussion of the importance of this earlier work to his later collaborative work with John von Neumann see: (Morgenstern 1976, p. 806; Innocenti 1995).
4. Specifically, they modeled it as a form of "matching pennies." The normal form of the game is below:

		Holmes	
		Canterbury	Dover
Moriarty	Canterbury	(100, -100)	(-50, 50)
	Dover	(0,0)	(100, -100)

have the effect of introducing many potential strategies where there were none before. As such, it makes the search for a single optimal equilibrium solution more difficult.

The pioneers of bargaining theory saw this as a problem. Their goal was to find one and only one rational solution to what they called "the bargaining problem." This is the problem of deciding how to divide a set of goods where no party has any antecedent claim and where any mutually agreed upon decision will be binding. Nash uses the example of a labor union negotiating with a firm as an example of such a problem (1950, p. 155). Nash's goal was to articulate a unique "solution" to this problem. He explains:

> It is the purpose of this paper ["The Bargaining Problem"] to give a theoretical discussion of this problem and to obtain a definite "solution" making, of course, certain idealizations in order to do so. A "solution" here means a determination of the amount of satisfaction each individual should expect to get from the situation, or, rather, a determination of how much it should be worth to each of these individuals to have this opportunity to bargain (Nash 1950, p. 155).

Nash proved that his solution to the bargaining problem uniquely satisfied four simple axioms (1950). John Harsanyi later extended Nash's solution and argued that it was mathematically equivalent to an earlier solution (1956; 1958). One of the axioms Nash used is what he called "symmetry." This assumption is very similar to the assumption that motivated the Holmes-Moriarty problem, namely that both parties are equally rational and well informed. This assumption rules out any asymmetrical solutions to the bargaining problem.

The symmetry axiom is defined progressively over the course of several of Nash's early articles. In his first paper on the bargaining problem, Nash defines symmetry laconically as expressing "equality of bargaining skill" (1950, p. 159). Nash clarifies and, importantly, changes this definition in his 1953 paper, writing:

> The symmetry axiom, Axiom IV, says that the only significant (in determining the value of the game) differences between the players are those which are included in the mathematical description of the game, which includes their different sets of strategies and utility functions. One may think of Axiom IV as requiring the players to be intelligent and rational beings. But we think it is a mistake to regard this as expressing "equal bargaining ability" of the players, in spite of a statement to this effect in "The Bargaining Problem." With people who are sufficiently intelligent and rational there should not be any question of "bargaining ability," a term which suggests something like skill in duping the other fellow. The usual haggling process is based on imperfect information, the hagglers trying to propagandize each

> other into misconceptions of the utilities involved. *Our assumption of complete information makes such an attempt meaningless* (Nash 1953, pp. 137-138 emphasis added).

Introducing randomness in the form of mixed-strategies breaks symmetry in non-cooperative games like the Holmes-Moriarty game and introduces a multiplicity of solutions. In bargaining problems theorists have the opposite problem; there are too many potential solutions. In order to find a unique solution, all but one needs to be ruled out. Symmetry helps do this. In effect, it turns every bargaining problem into the cooperative equivalent of the Holmes-Moriarty problem. The bargaining problem differs in that it is mutually beneficial, not zero-sum. We can think of the bargaining problem as Holmes bargaining with his brother Mycroft. Both are equally intelligent and equally knowledgeable. Since both are symmetric reasoners, solutions should also be symmetric. This simplifies the choice problem considerably. Once we know what the endowments are (specifying the threat point) and the surplus that the agents are bargaining over, we can show what it would be rational to agree to in the bargain.

So, in (some) non-cooperative games symmetry is the problem, whereas in the bargaining problem it is the solution to a problem. In some non-cooperative games with symmetry we often have no possible solutions so we introduce randomness to break symmetry. In the bargaining problem, however, any division of the goods that leaves each party better off than their initial threat-point is beneficial and, hence, a possible solution. The problem here is too many solutions. We can reintroduce a symmetry assumption to narrow down the range of possible solutions to one by modeling the bargaining parties as rational twins.[5] The introduction of symmetry in bargaining solutions is not a minor thing; it is essential to generating a unique solution. In the next two sections, I will look at two particular uses of symmetry in contrarian theories of justice. First Gauthier's use of the assumption in *Morals by Agreement* and then the Nash bargaining solution used by many other contemporary contractarian theorists.

3. Gauthier and Symmetry

Symmetry is introduced formally as a condition of Gauthier's adaptation of the Kalai-Smorodinsky bargaining solution: minimax relative concession (Kalai and Smorodinsky 1975, pp. 513-518; Gauthier 1986, pp. 113-156). He describes symmetry as an "equal rationality" condition. Gauthier uses a bargaining model to represent his solution, but as Nash and Ariel Rubinstein have shown, the bargaining

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5. Binmore also uses the language of twins in his discussion of the "paradox of the twins" and the "symmetry fallacy" (1994, pp. 203-256).

problem can also be represented as a non-cooperative game (Rubinstein 1982).[6] A simple bargaining problem can be represented as an asymmetric coordination game where there is no unique solution, such as in the meeting game represented below. Both parties have reason to coordinate on the same solution. There is, however, disagreement about which solution is preferable. Consider the simple meeting game in Figure 1:

Figure 1 – Ordinal Meeting Game

	Bar	Park
Bar	I, II	III, III
Park	III, III	II, I

In this game, both parties prefer to meet but have different preferences over where they would like to meet. Their preferences are indicated by Roman numerals where I > II > III. Row, a lover of interesting and exotic beers, would rather meet at the bar. Column, who loves the outdoors, would rather meet in the park. Deciding where to meet in this situation will involve one party making a concession to the other.

If coordination is over issues concerning justice, for instance the choice of property regimes, the situation is similar. Each party may prefer some property arrangement rather than none at all.[7] Each party, however, has a preferred property system. As in the meeting game, concessions are required. Consider the example below where two agents are trying to coordinate on the basic institutions of their economic system, in this case two different systems of property ownership:

Figure 2—Ordinal Property Game

	Property A	Property B

6. In general, Rubinstein has shown that the Nash bargaining problem can be represented as a non-cooperative game. The basic idea that I am taking from Rubinstein is that solutions to bargaining problems can often be represented as equilibrium selection problems in non-cooperative games. Nash makes a different point in his 1953 article, but it is instructive that he also models one version of the bargaining problem as a multi-stage threat game

7. For Gauthier, the benefits of some system of constraint arise because of the probability of "market failures" in the use of individual reason that lead to prisoner's dilemma like situations (1986, pp. 84-85).

Property A	I, II	III, III
Property B	III, III	II, I

Here, the object of coordination is much more substantial than in the previous case. Row and Column are deciding over what rules for property holdings they should have. They must agree, in this game, to have any particular system of property. This excludes the non-coordination outcomes represented in the southwest and northeast quadrants. Row prefers property system A and Column prefers property system B. Given that someone will have to make a concession to generate agreement, how much concession is rational? Any theory of rational bargaining must give a unique answer to this question.

Most solutions, Gauthier's included, rely on a mixed-strategy solution to the bargaining problem. To introduce mixed-strategy solutions, we will need to represent the property game with cardinal utilities as in Figure 3 below:

Figure 3—Cardinal Property Game

	Property A	Property B
Property A	2, 1	0, 0
Property B	0, 0	1, 2

Each player's benefit is a representation of how they rank the respective outcomes, without the need for interpersonal comparisons. In the mixed strategy solution, each player gets their most preferred option 2/3 of the time and their least preferred option1/3 of the time. The payoffs for each player, as a representation of their preference orderings, are below in Figure 4:

Figure 4 – Cardinal Property Game Expected Payoff Table

	{A, A}	{B, B}	Mixed Strategy
Row	2	1	2/3
Column	1	2	2/3

The mixed-strategy solution breaks the symmetry of the two pure strategies by introducing a suboptimal mixed-strategy solution. This solution breaks symmetry by introducing randomness but it is also "symmetric" in another sense because each player receives the same payoff. It doesn't matter whether either player is Row or Column, each will receive the same payoff in the mixed-strategy symmetric solution.

Both players are worse off in the new symmetric solution, however, than they would be in any particular pure strategy solution.

Two problems arise, however, when we try to apply mixed-strategy solutions to questions of justice as in the property game above. How do we make sense of randomizing—either psychologically or in terms of rationally justifying a particular solution in the bargaining problem? In the Holmes-Moriarty game, the rationale for introducing randomizing is strategic. Holmes randomizes to keep Moriarty off balance. There is no analogue to this in the bargaining problem since coordination and agreement is the goal. This undermines the justificatory power of mixed-strategy solution to the bargaining problem. In addition, any proposed solution must also make sense; the contractors must be able to follow the line of reasoning that led to the solution (Pettit 1996, pp. 295-296; Pettit and Sugden 1989). Unlike in the zero-sum Holmes-Moriarty game, where the point is to evade one's opponent, in the coordination game the point is for two people to coordinate on the same solution. What could possible be the reasoning that would lead them to conclude that they should randomize their behavior so as to chose property system A some of the time and property system B the other percentage of the time, recognizing that they will miss each other altogether a non-negligible amount of the time. The real absurdity of this comes out clearly in Figure 4. Both would be better off agreeing to either of the pure solutions rather than agreeing to the mixed-strategy.

The second problem is that Nash only proved that there is *at least* one solution to non-cooperative games—often there are many. In some games, there are a huge number of solutions.[8] For contractors to have a reason to make a particular concession, the theorist needs to show that there is a uniquely rational solution where each contractor is making exactly the appropriate concession and no more. Much of bargaining theory is driven by the need to show that a particular solution is uniquely rational; 20th century political philosophers continued this project, sometimes unknowingly. Gauthier, for instance, claims that his solution—minimax relative concession—is uniquely rational (Gauthier 1986, p. 139). Ken Binmore disagrees and thinks a version of the Nash bargaining solution is uniquely rational (2005). Rawls had a different solution.[9] Each theory has its own *uniquely rational* solution. There are many ways to solve the bargaining problem; Gauthier's is one among many. It is

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8. Consider the ultimatum game or the Nash demand game where every matching solution is a Nash equilibrium.
9. Of course, Rawls claimed that the difference principle is not the result of bargaining in the traditional sense. This is partly because choice from behind the veil of ignorance is the choice of one person. He continues to use the language of "parties" left over from earlier formulations, however. In §3 of *Theory*, he claims "the principles of justice are the result of a fair agreement or bargain" (1999a, p. 11).

not even the most popular. That honor goes to the Nash solution, which even Gauthier later adopted (1993). Without a unique solution, no party has a reason to prefer one and only one solution. Even if a solution were reached, it would not be rationally defensible and would lack normative force. Unless the solution is rationally defensible, it will not be clear why these and not some other concession are justifiable. It would not show "you and me" why we have reason to endorse and adopt a disposition to be constrained by the rules agreed upon by the contractors. Or, put differently, if we imagine the bargainers as our representatives, even if they reach an agreement we will not have reason to endorse or ratify their agreement. This is why uniqueness is so important and why all attempts to generate rational determinacy in agreement seek a unique solution. The traditional way to solve the uniqueness problem is to introduce refinements to the model of rationality to help choose between multiple bargaining solutions or equilibria.

In *Morals by Agreement,* Gauthier introduces what he calls a joint mixed strategy as a possible way of solving this problem (Gauthier 1986, p. 120). Each party agrees to take their most preferred solution 1/2 of the time. The payoff table for this approach is below in figure 5:

Figure 5 - Joint Mixed Strategy Expected Payoff Table

	{A, A}	{B, B}	Joint Mixed
Row	2	1	1 ½
Column	1	2	1 ½

The basic idea is to turn the simple property game into a two-stage game.[10] In the first stage, the parties agree to use of public mechanism for generating correlation. In Gauthier's case, this could be the public flip of a coin. Both could agree on Property system A if the coin lands on heads and Property system B if it lands on tails. In the second stage of the game, after the coin is flipped, each chooses the property system based on what the correlating mechanism (coin flip) indicates. If they do this, they

10. This solution is similar in some ways to the correlated equilibrium solution that Herbert Gintis has proposed to solve similar indeterminacy problems in another context. Gintis introduces the solution concept to solve certain problems that arise when common knowledge does not obtain and it is appropriate in his context, but is inappropriate here (2009; 2010).

will get their preferred outcome half of the time and their less preferred outcome the other half of the time. More importantly, they will avoid the missing each other (the non-coordination outcome) altogether, unlike in the mixed strategy solution. This makes the joint strategy preferable to the symmetric mixed strategy. The problem, however, is that the joint solution is a combination of two games: a game to decide on the conditions of correlation and the original property game (Binmore 1993, pp. 137-138). The solution to the first game is just as problematic as the solution to the second game. To solve the first game, Gauthier must also rely on a symmetry condition.

As we can see, symmetry becomes essential to solving this bargaining problem. Both Harsanyi and Rawls—in different ways—also concede that a symmetry assumption is necessary.[11] For Rawls and Harsanyi this assumption is less problematic because they are explicitly modeling fair or reasonable agreement. Symmetrical solutions will seem fairer because they do not privilege one party over another.

Of course, for those concerned with the contractarian justificatory problem like Gauthier, the fact that symmetrical solutions are fairer does not justify symmetry. To do so would only beg the original question of what system of justice rational individuals would agree to. Gauthier admits as much when he writes, "were I to become convinced that an appeal to equal rationality [symmetry] was either a concealed moral appeal, or inadmissible on some other grounds, then I should have to abandon much of the core argument of *Morals by Agreement*" (Gauthier 1988, p.186).[12] Gauthier later saw that his particular "equal rationality" or symmetry assumption really was unjustified and he rejected it along with his bargaining solution in favor of the Nash solution (1993, p. 180). Gauthier and many contemporary contract theorists believe that the Nash solution does not have a similarly unjustified assumption, that symmetry in Nash is somehow different from symmetry in Gauthier. As I will argue in the next section, this is unwarranted. Symmetry in Nash is just as problematic as it is in Gauthier's theory, with the same effect.

4. Nash and Symmetry

Contemporary contract theorists contend that the Nash solution is immune from the problems that plagued Gauthier. For instance, Ken Binmore, Michael Moehler, Ryan Muldoon, and H. Peyton Young all argue that the Nash bargaining solution or some related variant is appropriate for modeling justice (Binmore 1994; Binmore 2005; Moehler 2010; Muldoon 2012a; Muldoon 2012b; Young 1995, chapter 7). While, for

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11. Harsanyi is explicit about this (1982, p. 49) and Rawls makes it clear he is relying on symmetry in Political Liberalism (1996, p. 106).
12. I thank an anonymous referee for alerting me to this point.

Gauthier, symmetry is clearly a moral constraint representing something like fairness or impartiality and is hence in conflict with his project, these thinkers believe that in the Nash solution symmetry is not a moral premise but an implication of rationality. This is complicated since Gauthier's bargaining solution is a variant of the Kalai-Smorodinsky bargaining solution that explicitly uses Nash's symmetry axiom. If Gauthier's theory is susceptible to problems based on symmetry, Nash's should be as well. The difference might be with Gauthier's justification of symmetry in terms of an equal rationality assumption, which he admits is moralized and goes beyond the implications of rationality (1993, p. 180). Many seem to assume, however, that there is some fundamental difference between Gauthier's symmetry assumption and Nash's. There is no warrant for this assumption, as I will show in the rest of this section. Any problem with Gauthier's bargaining theory that arises from the symmetry assumption should apply equally to a theory that uses the Nash solution.

The Nash solution's symmetry assumption, according to this interpretation is not an assumption of "equal bargaining power" as it is described in Nash's early article, but rather a rational condition of any bargaining solution that the solution not vary based on the names or the labels of the bargainers involved. The implication is that the symmetry condition in Nash's solution is fundamentally different from Gauthier's equal rationality assumption. This claim is mistaken. Nash's solution, as many early commenters noted, does employ a symmetry assumption that goes far beyond any straightforward understanding of rationality, something that John Harsanyi clearly understood and defended (Harsanyi 1961, Harsanyi 1982). It is not a demand of rationality, but is a substantive *constraint* on rationality. As such, it should properly be part of the output of a rational contractarian bargain, not one of the inputs.

Recall Nash's expansion of his definition of symmetry quoted above. Nash explains that Axiom IV (symmetry) postulates both perfect information and rationality between the bargainers. This excludes the "usual haggling process" involved in typical negotiations, which Nash describes as "meaningless" (1953, p. 138). As Harsanyi developed the idea, this assumption has the effect of restricting the variables that are taken into account in the bargaining decision rule. Harsanyi writes:

> As any theory must apply to both players, if the two players happen to be equal with respect to all relevant independent variables they must be assigned full equality also with respect to the dependent variables, i.e., with respect to the outcome. But this is precisely what the symmetry postulate says. Different theories of bargaining may differ in what variables they regard as the relevant independent variables but, if the two players are equal on all variables regarded by the theory as relevant, the theory must allot both players the same payoffs (Harsanyi 1961, p. 189).

The purpose of restricting the relevant variables to the bargaining solution is to generate a unique result. As he writes in the same paper, "the symmetry postulate has to be satisfied, as a matter of sheer logical necessity, by any theory whatever that assigns *a unique outcome* to the bargaining process" (Harsanyi 1961, p. 188 emphasis added). We can agree with Harsanyi that symmetry is necessary for generating a unique solution without thinking that the symmetry assumption is thereby justified or logically necessary. The question here is whether symmetry is a natural implication of rationality or whether it is an antecedent constraint on rationality.

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