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Dissensus and Common Grounds in Negotiation: A Negotiation Analytic Perspective

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ABSTRACT: Negotiation analysis is a branch of mathematical decision theory involving a dialectical rationality standard for the resolution of dissensus. Negotiations are settings of group decision making where people cooperate to arrive at a joint decision representing a mutually acceptable solution of the negotiation problem. Criteria of what is mutually acceptable can be regarded as common grounds. They serve as stopping conditions for the argumentation process during negotiation. Fairness and efficiency are examples.

KEYWORDS: Acceptability, bounded rationality, efficiency, envy-freeness, equitability, fairness, heuristics, negotiation analysis, procedure.

INTROCUCTION

The estimation of the role and significance of *dissensus* and *common grounds* may benefit from the analysis of rationality models. This analysis will show that *dissensus* and *common grounds* are not restricted to the status of purely verbal concepts, but that they can –and should be – extended to mathematical concepts as well. This extension will be executed in the realm of negotiation analysis including fair division theory, which is part of decision theory. The extension draws on the existence of different models of rationality. There are four models to distinguish, each of which is introduced by a sketched portrait:

1. Bounded rationality (BR) BR addresses individual decision making or problem solving in a specific task environment under side conditions of limited time, money, knowledge, memory and other resources beyond social interaction. It relies on plausible reasoning based on heuristics exploiting domain specific expertise. Its characteristic *rationality criterion* is goodness of fit or the matching between heuristics and environment.

2. Consistency-rationality (CR) Its focus is on contradiction-free thinking (judging & reasoning). Reasoning is subjected to principles of formal logic or mathematics. Its characteristic *rationality criterion* is consistency. Principles of social-interaction beyond formal logic or mathematics do not affect reasoning.

3. *Social rationality (SR 1): rhetorical rationality* According to Aristotle, rhetorical rationality is concerned with influencing the decision making of another party (audience)

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via (re)presentational means (verbal, non-verbal). It is based on plausible reasoning, weight-of-argument enhancing reasoning, embedded into social interaction and, therefore, audience-directed and yesability-driven. *Rationality criterion* is acceptable reasoning.

4. Social rationality (SR 2): dialectical rationality It addresses joint (competitive & cooperative) problem solving or decision making by exchanging objections in a dialogical setting. Its logical surplus is captured by exchange-of-objection formats or dialogue games. The corresponding *rationality criterion* is mutual acceptability of moves and countermoves within a dialogue format.

Negotiation Analysis is of interest here because it invokes two of those rationality concepts: consistency-rationality and social- rationality: *Dissensus* and *common grounds* are embedded into the mathematical models of negotiation analysis and become basic analytical concepts. As a consequence, acceptability of solution concepts and agreement to solution - key SR-features of negotiations – become key features of negotiation analysis as well.

> *Dissensus* in Negotiation Analysis is represented by the so-called negotiator´s dilemma (Lax and Sebenius 1986, pp. 29-45) comprising the conflicting aims of creating and claiming value as the basic underlying conflict structure.
>
> *Common grounds* in negotiation analysis are concepts for the resolution of the negotiator´s dilemma that are mutually acceptable for the negotiating parties.

To resolve the negotiator´s dilemma amounts to solving two partial problems simultaneously (not in a temporal sense): the G-problem of creating joint gains and the Δ-problem of dividing or distributing the joint gain. Two types of *common grounds* come into play here: Efficiency for resolving the G- problem and fairness concepts for resolving the Δ- problem.

The interplay of dissensus and its resolution by common grounds in negotiation analysis can be studied most easily by studying the sub-problem of fair division. Fair division is something like the bones under the flesh of negotiation analysis.

The treatment of the subject here will be different from standard approaches to negotiation analysis or bargaining theory. Here the focus is on how different rationality models interact in the analysis of negotiation problems and, in particular, in fair division problems. This presentation mode aims at developing a new position within the rationality dispute of economic theory which is nourished by attacks of diverse schools of bounded rationality against the consistency-rationality models of classical economic theory. It will be argued that a fundamental rationality model, the model of social rationality with its two branches of rhetorical and dialectical rationality, was ignored or just forgotten in this dispute. Taking it into account, should alter the scene.

1. CR → SR: SOCIAL RATIONALITY´S GAINS FROM INCLUDING CONSISTENCY-RATIONALITY APPROACHES

Purely verbal SR-based treatments of negotiation, in splendid isolation from CR concepts and methods, soon encounter their genuine limitations. Consider, for example, Douglas Walton´s section on negotiation dialogue (Walton 1995, pp. 103-6). There, he correctly discriminates negotiation dialogue from critical discussion. The focus is no longer on conflict of opinion. Truth as the dominating value is replaced by money or other economic values. Part of the problem negotiators face is that they "cannot have all they want" (Walton 1995, p. 103). They aim at finding a compromise "acceptable to both parties" - SR rationality solution criteria are requested. Walton discriminates between four subtypes of negotiation dialogue. Three of them are particularly interesting in our context:

> *Distributive bargaining* where goals of the parties are "in basic conflict";
>
> *Integrative bargaining* "where there is no basic conflict" (Walton 1995, p. 104) between the negotiators´ goals, and " where the interests of both parties can be integrated, to some degree" (Walton 1995, p. 104).
>
> In *attitudinal structuring* the character of relationships matters significantly besides the "economic" dimension.

If we introduce CR concepts and methods from mathematical decision theory, the analytical and practical capacities will be improved significantly. The decisive new step is the introduction of numbers to express and measure the preferences the different parties have for the issues, options, or goods at stake.

By making use of the new analytical approach, it can be shown that – contrary to Walton´s assumption - both parties can get all they want. 100%-solutions are possible. For example, imagine a cake, half chocolate, half vanilla and two persons who want to divide it among them. Assume, as a first case, that both parties, Adam and Eve, do not know each other, that is to say, do not know their preferences. Adam likes chocolate and dislikes vanilla and Eve likes vanilla and dislikes chocolate. We introduce numbers by letting "likes" correspond to the attachment of 100 points to the object of concern and "dislikes" correspond to the attachment of 0 points. In the case of unknown preferences, a division giving each of them one half of the cake consisting of a 50%-vanilla and a 50%- chocolate zone would be regarded as fair. That is, Adam and Eve receive both a piece that is worth 50 points to them.

A better division is available if both know their preferences. Then a division respecting their preferences gives each 100% of what he or she likes: a piece of chocolate only for Adam worth 100 points to him and a piece of vanilla only for Eve worth 100 points to her. This division will be called *efficient* because there is no division which makes both parties better off. For this reason, the first division was inefficient.

Efficiency is a cornerstone concept of economic theory. By introducing numerical valuation schemes into the task of resolving *dissensus* in negotiation problems, the mathematical concept of efficiency becomes available as a new type of *common ground.* We will develop this idea further in the next sections.

Another gain from numerical valuation schemes is that they can be used to analyse the structure of the negotiation problem, that is, the structure underlying the conflict of interests. It defines the frame, the "space" where the parties move in to reach a solution. There are structure dependent a priori solution points which serve as attractors for the argumentation process of solving conflicts of interests. These points represent *good solutions.*

2. SR → CR: CONSISTENCY-RATIONALITY´S GAINS FROM INCLUDING SOCIAL RATIONALITY APPROACHES

There are also profits to be had in the opposite direction: mathematical bargaining and negotiation models also profit from the social rationality approach: The acceptability standard helps to explain how social actors coordinate their expectations for getting to an agreement.

Within the context of negotiation and fair division, resolution of dissensus is built on common, objective, grounds. Common grounds are interpretations and implementations of the social rationality standard of (mutual) acceptability. Common grounds guide the parties when they are required to coordinate their expectations of what may be mutually acceptable.

Mutual acceptability does not mean: each party regards only its own share or payoff as yesable but does mean: they each regard their own share and that of the other as acceptable, or in short, the complete allocation of shares or advantages. Thus, the standard of mutual acceptability involves social comparisons. This form of other-directedness is captured by social utility:

> Individual negotiators evaluate the acceptability of their own outcomes relative to the outcomes obtained by the other negotiators. This socially influenced preference structure is called "social utility". Negotiators concerned with socia1 utility will reject offers that represent significant gains for themselves on the grounds that the gains for the other side are disparately and unreasonably much larger (Raiffa et al. 2002, p. 280).

Social comparisons in this sense make up the basis of fairness concepts. Fairness concepts offer modes of coping with unacceptable differences. Thus, fairness concepts represent an important class of common grounds. In the next section, we shall see how they work as solution concepts in fair division problems.

Social comparisons have also an emotional impact in raising Δ-emotions, as I would like to dub emotions, like envy, that are stirred up by differences (see, for example, Aristotle`s Rhetoric, bk.II, ch.10). Fair solutions help to *quench the flames of envy* (Brams and Taylor 1996, p. 4).

In the individualistic setting of the alternating offers game, the players do not care about what the other side receives. Social comparisons do not play any role. In the common grounds interpretation of acceptability, they do. And as a consequence, fairness becomes a clue to the resolution of dissensus in negotiations and division problems. From the perspective of the conflicting parties, the fairness criteria are common grounds, that is, arguments which help them to coordinate their expectations on the mutually acceptable.

3. CR+SR: THE MERGER. THE Δ-G APPROACH TO DISSENSUS AND COMMON GROUNDS

Sections 1. and 2. made apparent that negotiation analysis and fair division involve a dual concept of common grounds: as mathematical solution concepts on one side, and as discourse arguments implementing the acceptability standard of social rationality on the other. Efficiency as well as fairness criteria are common grounds in this dual sense, mathematical solution concepts on one side, arguments on the other, which explain why these solution properties are effective in social interaction problem solving. They help the interacting parties to coordinate their expectations on them. And used as arguments in a discourse, they have the power to convince the problem solving parties to follow the solution path they suggest.

Before we put these concepts to work, a few preliminary remarks are in order.

The type of *dissensus* these concepts tackle are interaction problems of the negotiator´s dilemma structure.

A negotiator´s dilemma comprises two sub-problems that any negotiator faces: enlarging the "pie", the joint gain, and dividing it, that is, to distribute the advantages among the parties and determine their individual payoffs. The first sub-problem requires a cooperative spirit, the second solicits competition. Both sub-problems represent conflicting goals which must be realised simultaneously.

A solution must address both sub-problems, must solve each of them <u>and</u> the conflict between them.

Efficiency is a solution concept for the first sub-problem. It avoids that feasible joint gains for the parties remain on the table. But solving this sub-problem does not deliver a single solution, but a set of possible solution points with efficiency as their common property.

In order to single out a solution, the second sub-problem must be solved. This amounts to selecting that efficient solution candidate which determines a distribution of the whole joint gain such that each party accepts its allotted share. Fairness concepts are designed to guide this selection.

It must be noted that fairness and efficiency are independent solution concepts. Efficiency does not entail fairness, and vice versa. A fair solution may be inefficient (an example will be given) and efficient solutions may be unfair. Thus, the problem of solving both sub-problems simultaneously is by no means trivial.

Efficiency and fairness in a tandem package offer an attractive and convincing strategy to cope with *dissensus* of the negotiator´s dilemma type: Efficiency offers an incentive to cooperate, fairness abates the fear of getting a raw deal.

For convenience, I dub the first sub-problem as the G-problem (G for joint gains) and the second the Δ-problem (Δ for differences in shares).

In order to demonstrate how efficiency and fairness in tandem resolve the negotiator´s dilemma, I`ll introduce "tandem procedures", or Δ-G procedures, for the solution of fair division problems.

A procedure is a process structure which prescribes the steps from problem to solution. A Δ-G procedure is characterized by G-steps and Δ-steps.

An idealized version or skeleton of a Δ-G procedure comprises the following steps:

1. G-steps securing efficiency
2. Δ-steps or adjustment steps which reduce payoff differences between the parties
3. a stopping rule stopping the adjustment process and implementing a Δ-G solution, i.e., an efficient and fair solution
4. the agreement step as a final step where the parties add an explicit YES to the result of step 3, which was only accept*able*. It implements a SR-decision rule to ensure an unanimous acceptance of the solution.

We`ll study two fair division procedures by matching them with the skeleton procedure to understand their merits:

- Divide & choose
- Adjusted Winner

These procedures differ in their Δ- an their G properties. There are three Δ-properties or fairness concepts to be implemented procedurally: Proportionality, envy-freeness, and equitability.

Following Brams and Taylor`s parlance (1996, p. 9), proportionality means that each of two parties gets at least ½ of the cake measured in terms of its own valuation profile, provided that both parties have equal entitlements. (Another term used to capture this special case is *parity*.)

Envy-freeness means that the distribution is such that no party prefers another`s share to its own.

A distribution is equitable if the shares of the parties are equal in terms of their respective different valuation profiles

Envy-freeness, and equitability differ by the modes of comparison they imply. Envy-freeness is based on internal comparisons, that is, a party compares its own portion with that of others in terms of its own personal valuation profile. Equitability, by contrast, compares different portions in terms of the different valuation profiles as given by the parties under comparison.

4. TWO FAIR DIVISION PROCEDURES: DIVIDE & CHOOSE, KNASTER´S PROCEDURE, ADJUSTED WINNER (AW)

For the sake of simplicity, we restrict the discussion of procedures to fair division problems with two parties. For the numerical expression of the subjective significance or value the parties attach to the items to be distributed, we introduce two valuation modes: a point allocation scheme where 100 points have to be allocated between the items according to their relative subjective significance, and an auction scheme where the bids in Euro for one item in the pool measure their subjective significance for each party (it's just a bid and not the – intersubjective – market price!).

We´ll study the two procedures in solving the following inheritance problem where 10 items left to them by their father have to be divided by the siblings Klaus and Ingrid. The ten items (Brams and Taylor´s example (1996, p. 11), modified):

> A 12-foot aluminium row boat, a 3-horse-power outboard motor, a piano in fairly good shape, a one-year old flat screen TV set, a hunting rifle, a collection of Italian Opera records, a 1968 Hanomag tractor, an older pick-up truck, two 2 year old mountain bikes.

Because Klaus´ and Ingrid´s life circumstances, life styles and locations are different – Ingrid being a lawyer, mother of 2 teenagers, living in a village near Frankfurt, and Klaus, having no children, living with his wife in the rural coastal area near his parents` home, and making money with tourist services - the subjective values given to the same items differ.

Their assessments of the items are listed in monetary terms (Euro) and point scores:

Table1

	items	Klaus €	Ingrid €	Klaus %	Ingrid %
1	boat	2 000	600	14	6
2	motor	2 000	600	14	6
3	piano	300	2 000	2	17
4	TV set	150	2 000	1	17
5	rifle	600	400	4	4
6	records collection	300	600	2	6
7	tractor	3 000	200	21	2
8	pick-up	2 000	1 000	14	8
9	mountain bike	2 000	2 000	14	17
10	mountain bike	2 000	2 000	14	17
	total value	14 350	11 400	100	100

There are $2^{10} = 1024$ possibilities to divide 10 goods among 2 persons. Thus, the bargaining set consists of 1024 possible solutions. The task of the procedures is to identify those among them that satisfy the desired and prescribed criteria.

Divide & Choose

This procedure is the most simple one. Even children use it. There are two roles, that of a divider, and that of chooser. The divider allocates the goods to two packages. Then the chooser makes his or her choice. The decision who becomes divider and who chooser is nontrivial, but will not be discussed here.

Assuming that Klaus is the divider, he might compose the following two packages safeguarding him a 50%- share of the inheritance no matter how Ingrid makes her choice (the worth of each package for Ingrid is added):

Table 2. Divide and Choose. An example
divider: Klaus, chooser: Ingrid

P1:	boat	TV set	1 mountain bike	tractor			∑
Klaus	14	1	14	21	-	-	50
Ingrid	6	17	17	2	-	-	42

P2:	motor	piano	1 mountain bike	pick-up	records	rifle	∑
Klaus	14	2	14	14	2	4	50
Ingrid	6	17	17	8	6	4	58

Divide & choose generates a solution which is proportional, that is, it guarantees to each party what he or she perceives to be at least the half of "the pie". And, in the 2 persons case, it is also envy-free because neither player has a reason to think that the other party got a larger piece than he or she got. Thus, divide & choose is a fair procedure, but, in general, *not* efficient. Think of the vanilla-chocolate-cake example of the first section: if each party receives a cake`s half consisting equally of chocolate and vanilla parts, then such a division is envy-free, but inefficient, because a partition of the cake along the chocolate-vanilla "frontier" would make both parties better off.

In a sense, divide & choose is a dangerous procedure because of its simplicity. It´s just this simplicity which may easily seduce a party to agree to an utterly inefficient distribution. Call this the simplicity fallacy.

Adjusted Winner

Adjusted winner is a procedure developed by Steven Brams and Alan Taylor in 1996 (Brams and Taylor 1996, pp.65-75). It is a procedure with remarkable properties: it is efficient, envy-free, and equitable. Equitability involves external, interpersonal comparisons. It may be characterized by the following question:

> Is your announced valuation of what you received equal to your opponent's announced valuation of what he or she received? (Brams and Taylor 1996, p. 71)

The steps:

1. efficiency: determine an efficient interim solution by giving each item to that party who values it most. The party who gained the most points at this step is the temporary winner.
2. to prepare the adjustment steps, calculate the rates of substitution for each item, that is, divide the Ingrid point score by the Klaus point score, or vice versa, and rank the rates of substitution from least to largest
3. adjustment steps: transfer the item with the first ranking rate of substitution from the temporary winner to the temporary loser. Repeat this step along the ranking of the substitution rates until the temporary loser´s point score exceeds the temporary winner´s score.

4. stop rule, last adjustment step: divide the last item from step 3 such that both parties end up with equal point scores.

Table 4. Adjusted Winner. An Example

1. Efficiency step

	item	Klaus	Ingrid	Rates of substitution (ranking)
1	boat	14	6	
2	motor	14	6	
3	piano	2	17	17/2 = 8.5 (5)
4	TV set	1	17	17/1 = 17 (6)
5	rifle	4	4	4/4 = 1.0 (1)
6	record collection	2	6	6/2 = 3.0 (4)
7	tractor	21	2	
8	pick-up	14	8	
9	mountain bike	14	17	17/14 = 1.2 (2)
10	mountain bike	14	17	17/14 = 1.2 (3)
	total value	100	100	
	received value	63	78	

Ingrid is the temporary winner of step 1.

Adjustment steps:

2. Equitability adjustments preserving efficiency

Ingrid → Klaus: rifle (1)	+ 4	- 4
adjusted point score	*67*	74
Ingrid → Klaus: mountain bike (2)	+ 14	- 17
adjusted point score	81	*57*

3. Final adjustment step: the zero difference step

Tying the score: $67 + k\cdot 14 = 57 + (1-k)\cdot 17$
$k = 7/31$ (22.6%)

mountain bike share (values)	3.2	13.2
received point total	70.2	70.2

This solution is efficient, because the adjustment process preserves efficiency realised at the interim solution step. And it is envy-free because no party has an argument to change the allotted packages. And it is equitable because no (further) transfer is justified.

Its drawback: like Knaster´s procedure it is open to misrepresentation of preferences – theoretically-, but practically it is rather robust because a slight mistake in assessing the scoring of the other side can have a disastrous boomerang effect.

The dual character of the stopping rule:

Mathematically: calculate a convex combination to determine the solution point ($\Delta = 0$).
Socially: stop the difference reductions where "differences" disappear.

Why is the final step of adding a SR-decision rule necessary? A SR-decision rule is necessary because the mathematical procedures end up with an *acceptable* solution only. The task of the decision rule is, therefore, to manage the transition from *acceptable* to *accepted*.

The standards which make up the solution are valid in general, but the payoffs for the players, induced by the standards in the special case at stake, are something individual. Between the general and the individual is a gap that must be closed. This is managed via individual agreement. The decision rule captures this aspect.

The step from acceptability to acceptance, from Yesability to Yes, is a communicative act, a genuine act of social rationality. It may take the form: *To each negotiating party: communicate your personal YES to the solution.*

These mutual Yeses transform the solution into a commitment or agreement.

5. THE NEW MODEL OF CR+SR VS. BR: THE SURPLUS

We are now in a position to demarcate the new CR+SR approach against the paradigm of bounded rationality (BR), inaugurated by Herbert Simon and developed further, among others, by Gerd Gigerenzer and Reinhard Selten. To characterize their perspective on BR, the following quotation will be helpful. It facilitates the comparison between the two approaches. Gigerenzer and Selten specify models of bounded rationality the following way:

> We mentioned at the beginning that, so far, there is no complete theory of bounded rationality. Nevertheless, we can specify three classes of processes that models of bounded rationality typically specify:
>
> 1. Simple search rules. The process of search is modelled on step-by-step procedures, where a piece of information is acquired, or an adjustment is made (such as to increase running speed to keep the angle of gaze constant), and then the process is repeated until it is stopped.
> 2. Simple stopping rules. Search is terminated by simple stopping rules, such as to choose the first object that satisfies an aspiration level. The stopping rule can change as a consequence of the length of search or other information, as in aspiration adaptation theory […]. Simple stopping rules do not involve optimization calculations, such as computations of utilities and probabilities to determine the optimal stopping point.
> 3. Simple decision rules. After search is stopped and a limited amount of information has been acquired, a simple decision rule is applied, like choosing the object that is favored by the most important reason – rather than trying to compute the optimal weights for all reasons, and integrating these reasons in a linear or nonlinear fashion, as is done in computing a Bayesian solution.
>
> The process of search distinguishes two classes of models of bounded rationality: those that search for alternatives (e.g., aspiration level theories such as satisficing […]), and those that search for cues (e.g., fast and frugal heuristics […]) (Gigerenzer and Selten 2002, p. 8).

Two aspects should be added:

1) The BR model is a problem-solving model (or metaphor), based on a conception of thinking as heuristic search, as opposed to the reasoning model (or metaphor):

> The reasoning metaphor views goals as described by sentences, derived from other sentences by processes similar to the processes of logic. The problem-solving metaphor views goals as achieved by sequences of moves through a problem space (Simon 1990, p. 12).

The CR+SR model unites both strands, as the "+" character already indicates.

2) Similarly, the thesis that "bounded rationality is procedural, not substantive rationality" (Simon 1997, p. 271), is opposed by its CR+SR counterpart: The CR+SR approach invokes procedural <u>and</u> substantive rationality.

The main lines of comparison:

Different understandings of "problem" BR- problems concern individual problem solving. Problems of concern are the search for alternatives or the search for cues. For example, if the task is to estimate whether city A is larger than city B or vice versa, a discriminating cue may be "premier league soccer team". If A has one and B not, A may be estimated to be the larger city.

In contrast, CR+SR problems address problems of social interaction, social conflict, appearances of *dissensus* like the negotiator´s dilemma.

Different understandings of "solution" All CR+SR solution concepts implement the acceptability norm of social rationality whereas BR solutions are bound to individual aspiration levels as solution standards.

The CR+SR approach relies on intersubjectively jusitifiable standards or *common grounds.*

Furthermore, the CR+SR approach admits optimal solutions, if attainable by simple procedures, whereas the BR approach dispenses with optimizing in favour of "satisficing" (Simon). From the CR+SR stance, this seems to be unnecessary. "Satisficing" expresses a solution standard which is alien to the spirit of the CR+SR model. CR+SR solution concepts/ procedures are required to be acceptable. Acceptable solutions are able to terminate dissensus, a dispute, a conflict. The acceptability standard solves the coordination problem for social agents. They represent a focus for coordinating the expectations of different brains.

"Satisficing" is an inappropriate concept for resolving conflicts of interest. Thus, optimal & acceptable solutions, provided by simple CR+SR-procedures like Adjusted Winner, oppose satisficing BR-solutions provided by BR-heuristics.

As a consequence of the merger of consistency-rationality and social rationality, CR+SR solution concepts/ procedures combine (dialectical) reasoning & (mathematical) problem solving instead of opposing them, as BR does – thus replacing their exclusive-OR-relation within bounded rationality by an AND.

A further consequence of the merger and advantage of the CR+SR model is that it aligns procedural with substantive rationality, compared to BR which dissects them ("Bounded rationality is procedural, not substantive rationality". (Simon, 1997, 271)). The CR+SR-procedures implement a priori solution concepts like fairness and efficiency which make up the normative, intersubjectively pre-existing substance, the stuff for the resolution of *dissensus*.

Different understandings of "procedure" BR in the Gigerenzer-Selten-Simon sense is based on heuristics, a weaker form of algorithm than it is invoked by the CR+SR approach. Heuristics in this sense are not sufficient in the context of social rationality. Due to the demands of social rationality, CR+SR-procedures must be and are intersubjectively jusitifiable. Otherwise, they will not be accepted by the involved parties. Because they are designed to implement a priori solution concepts of social rationality – because of the characteristic alignment of procedural and substantive rationality – they guarantee a solution with the predetermined properties. Because they implement a priori solution concepts, CR+SR procedures do not map processes of search for a solution. It`s only the payoffs of the parties in the problem context at hand, which are unknown and have to be computed according to the solution concepts. That is why CR+SR procedures exceed the power of mere heuristics, the cornerstone of BR, which always bear the risk of providing no solution, a wrong solution, or a low quality solution. Because of their weaknesses, heuristics, if transferred to the context of social interaction, may invite exploitation of the weaknesses by other actors. Theoretically, even CR+SR procedures like Knaster`s procedure or Adjusted Winner, are open to fallacious use and exploitation, but, practically, the exigencies of manipulating them successfully are rather high. Thus, the practical risk of being exploited is tolerable.

The BR approach is characterized by a trade-off between simplicity and precision. Heuristics express the merits of this deal. They are simple, resources saving, mental bounds respecting "good enough" problem solving devices. The presented CR+SR procedures are also simple, save resources, respect mental bounds, reduce complexity, but are more precise than heuristics–and are appropriate for resolving problems of social interaction by incorporating *common grounds*, problems of *dissensus* as characterized by the antagonistic tendencies of the negotiator`s dilemma, the requirement to cooperate and to compete simultaneously.

CONCLUSION

The goal of the present paper is to demonstrate that *dissensus* and *common grounds* mark off types of problems and solutions which cannot be captured by the bounded rationality approach in its Gigerenzer-Selten-Simon appearance. They are fundamentals of social rationality which cannot be reduced to bounded rationality. Though distinct from consistency-rationality, social rationality can be combined with consistency-rationality modelling to provide simple and frugal procedures for the solution of negotiation and fair division problems.

link to commentary

REFERENCES

Aristotle. (1926). *The "Art" of Rhetoric*. J.H. Freese (Trans.). Loeb Classical Library.

Arrow, K., Mnookin, R.H, Ross, L., Tversky, A. & Wilson, R. (Eds.). (1995). *Barriers to Conflict Resolution*. New York/ London: W.W. Norton.

Brams, S.J. & Taylor. A.D. (1996). *Fair Division. From Cake-Cutting to Dispute Resolution*. Cambridge, New York, Melbourne: Cambridge University Press

Camerer, C. (1998). Bounded rationality. *Experimental Economics*, 1, 163-183

Gigerenzer, G. & Selten, R. (2002). Rethinking rationality. In G. Gigerenzer & R. Selten (Eds.), *Bounded Rationality. The Adaptive Toolbox* (pp. 1-12). Cambridge, MA: the MIT Press.

Gigerenzer, G. (2000). Adaptive thinking. *Rationality in the Real World*. Oxford: Oxford University Press.

Gigerenzer, G. (2002). The adaptive toolbox. In G. Gigerenzer & R. Selten (Eds.), *Bounded Rationality. The Adaptive Toolbox* (pp. 37-50). Cambridge, MA: the MIT Press.

Lax, D.A. & Sebenius, J.K. (1986). *The Manager as Negotiator*. New York/ London: Free Press.

Raiffa, H. (1982). *The Art and Science of Negotiation*. Cambridge, MA: The Belknap Press of Harvard University Press.

Raiffa, H., with J. Richardson & D. Metcalfe. (2002). *Negotiation Analysis. The Art and Science of Collaborative Decision Making*. Cambridge, MA: The Belknap Press of Harvard University Press.

Raith, M.G. & Welzel, A. (1998). *Adjusted Winner: An Algorithm for Implementing Bargaining Solutions in Multi-Issue Negotiations*. University of Bielefeld. Institute of Mathematical Economics. Working Paper No. 295.

Simon, H.A. (1990). Invariants of human behavior. *Annual Review of Psychology*, 41, 1-19.

Simon, H.A. (1997). *Models of Bounded Rationality*. Vol. 3: *Empirically Grounded Economic Reason*. Cambridge, MA: The MIT Press.

Walton, D. (1995). *A Pragmatic Theory of Fallacy*. Tuscaloosa, AB: University of Alabama Press.

Young, P.H. (1994). *Equity: In Theory and Practice*. Princeton, NJ: Princeton University Press.

Young, P.H. (Ed.). (1991). *Negotiation Analysis*. Ann Arbor, MI: The University of Michigan Press.