Francesco Romeo - Marco Dall'Aglio - Marco Giacalone

Algorithmic Conflict Resolution

Fair and Equitable Algorithms in Private Law

IUSTITIAM COLIMUS

G. Giappichelli Editore

ALGORITHMIC CONFLICT RESOLUTION

FAIR AND EQUITABLE ALGORITHMS IN PRIVATE LAW

Francesco Romeo - Marco Dall'Aglio - Marco Giacalone

ALGORITHMIC CONFLICT RESOLUTION

FAIR AND EQUITABLE ALGORITHMS IN PRIVATE LAW

G. Giappichelli Editore

2019 - G. GIAPPICHELLI EDITORE - TORINO
VIA PO, 21 - TEL. 011-81.53.111 - FAX 011-81.25.100
http://www.giappichelli.it

ISBN/EAN 978-88-921-8923-2
ISBN/EAN 978-88-921-3131-6 (formato cartaceo)

This publication has received funding from European Union's Justice programme 2014-2020, under grant agreement No.766463. The content of this publication represents the views of the authors only and is his/her sole responsibility. The European Commission does not accept any responsibility for use that may be made of the information it contains.

G. Giappichelli Editore – Torino
Novembre 2019

Content

Francesco Romeo *

Equitative Algorithmic Justice. Use, Innovation and Limits in Law

Abstract

Equitative algorithms refers to a set of algorithms that can be used in the legal field for the resolution of conflicts in which it is possible for the parties to freely assess their own interests and values to be protected. The article is an introduction to the research of the CREA-Project on the subject and discusses some issues that arise in the legal field from the application of the Fair Division Theory to legal dispute resolution. The article aims to introduce the theoretical-practical legal basis that can make justice via equitative algorithms an instrument of general application in the legal field. Two main issues are discussed: the identification of law with a text and the identification of law with justice.

1. Equitative algorithmic systems and the law

The expression 'equitative algorithms' refers to a set of algorithms that can be used in the legal field for the resolution of conflicts in which it is possible for the parties to freely assess their own interests and values to be protected (Equitative Algorithms Justice, EAJ). The freedom of assessment is addressed both to the algorithm and to the legal system, as well as to the other parties involved. In other words, we are faced with EAJ whenever a dispute is algorithmically resolved and the parties, freely and independently of each other, have established their own order of values with respect to a set of assets and rights. It is possible that there are external limitations, coming either from the market or from the law or from the *de facto* relationships between the parties, but these can sometimes be taken into account by the chosen algorithm.

Equitative is a neologism in the English language, created by the CREA group, which launched the project with the same name [1]. The neologism helps for pur-

* Università degi studi di Napoli 'Federico II', Dipartimento di Giurisprudenza.

[1] The project CREA has received funding from European Union's Justice programme 2014-

poses of univocity of meaning. The words equity and equitable have a very long history behind them, which intertwines, and sometimes knots, with that of law and justice [2]. Since the second half of the last century, their meaning has been enriched with new dimensions thanks to the studies carried out in Decision Theory, Game Theory and Economic Analysis of Law. We considered it appropriate to find a new word to focus and bound this new branch of legal studies.

EAJ is daughter and debtor of fair division theory and algorithms [3] (FD), as outlined by Steve J. Brams and Alan D. Taylor (Brams 1990; Brams & Taylor 1996; Brams 2012). FD has an original approach, which naturally leads it to budding branches and secondary theoretical suckers in many disciplines. In fact, according to them, its methodological approach "involves

– setting forth explicit *criteria*, or *properties*, that characterize different notions of fairness;
– providing step-by-step *procedures*, or *algorithms*, for obtaining a fair division of goods or, alternatively, preferred positions on a set of issues in negotiations; and
– illustrating these algorithms with *applications* to real-life situations" (Brams & Taylor 1996, 1).

Beyond the considerations specific to each of the scientific fields involved, from Decision Theory to Social Sciences, from Economic Analysis of Law to Political Theory and Legal Science, Brams and Taylor's FD is important for bringing these three steps together in a single theoretical moment.

The FD is applied to conflict resolution, but lacks a theoretical-practical legal basis that can make it an instrument of general application in the legal field.

The problems that arise when comparing these procedures with traditional legal dispute resolution procedures are manifold. Among others, it is necessary to clarify immediately those arising from the meaning of fair and equity, which have, in the legal field, strong theories dating back a considerable length of time and which cannot be ignored.

EAJ, therefore, intends to apply the FD in the legal field, analysing and hopefully solving the legal problems related to its application.

As said before, the choice of the neologism, equitative instead of equitable or

2020, under grant agreement No. 766463. This book provides some of the most important achievements of the research, www.crea-project.eu.

[2] The history of the idea of aequitas is well investigated in literature. This research regains the connection between the emotionality of the parties and the rationality of the legal order in the formation of the judgment. In this insight, it is perhaps a return to the Roman concept of aequitas, before Irnerio and the school of glossators in Bononia.

[3] The origins of the FD, like every origin, are discussed and can be traced back to the starting point of European philosophy: the philosophers of ancient Greece, in particular Aristotle. (Moulin 2004).

equity, serves, in the legal field, to separate the concept from the traditional connection with ethical or historical legal issues, avoiding misunderstandings. It also avoids misunderstandings with the rigorous definition adopted by Brams and Taylor for equitable in the FD: "[a]n allocation is equitable for two players if each player thinks that the portion he or she receives is worth the same, in terms of his or her valuation, as the portion that the other player receives in terms of that player's valuation. If the two players have different entitlements, equitability means that each player thinks that his or her portion is greater than his or her entitlement by exactly the same percentage" (Brams & Taylor 1996, 241).

A proposed dispute resolution that can be accepted as fair by the litigants requires conditions that are often less stringent or limiting than those imposed by Brams and Taylor's equitability, since those required by envy-freeness are sufficient: "An allocation is envy-free if every player thinks he or she receives a portion that is at least tied for largest, or tied for most valuable and, hence, does not envy any other player" (Brams & Taylor 1996, 241).

2. What are these writings and this book for and who they are directed to?

This paper, as well as the whole book that the paper introduces very briefly, is mainly addressed to mathematicians and to those, among jurists and economists, who want to deepen and spread in law the equitative algorithmic systems.

It aims, therefore, at being an interface between different worlds and sets of knowledge, in which even methodological principles diverge, as well as basic and powerful concepts such as truth and reality, but also efficiency and justice.

It may sound bizarre that, in different branches of knowledge, the concepts of truth are different. Truth should be one, and only one, but we should always bear in mind that theory of law is a normative discipline or science, whose *raison d'être*, we might even say axiology, is the resolution of social conflicts, affording social peace in the society to which it is addressed. This is true in every legal system.

A normative science, such as legal science, therefore, provides guidelines and solutions for settling conflicts. Any reality is seen in this peculiar teleology and the decision on what is the legal truth about the past in which the conflict originated is, indeed, a decision, not a simple recognition. It is a decision with particular features because it comes from a single authority empowered to rule on it: the judge.

In the legal field, one may argue about the true interpretation of a provision of law or the truth about an event of the past, but the only true interpretation, for the law, valid for all citizens, is the one coming from the judge. Truth and authority

come together in an act, the judgment, which puts an end to uncertainty and creates social truth. In law, there is no truth without authority that establishes it.

As odd as it may seem to common sense, if you reflect with your mind clear of *prêt-à-porter* ideas, wondering how a judge thinks and how he or she reaches the conclusion, you may be able to approach this reality. Let us ask ourselves, for example, how to distinguish the judgment of a corrupt judge from that of a judge who, instead, honestly tries to judge according to objectivity, truth and exactitude. By no way can we do this, we can only induce it probabilistically by gathering evidence of that judge's corruption. But this means that we have no way to establish the truth of the judgment by analysing the judgment itself. Even the judgment of an honest judge can make a distorted use of the facts or an ideological use of the law, as well as that of a corrupt judge. These judgments are all true, because they all have the authority to sentence. Social truth is there, in the judgment, not in facts or laws. The judgment of a Supreme Court, in Italy of the Corte di Cassazione, is true and the judgment that has been overturned is false because of a principle of authority, nothing else. The truth is the product, not the origin nor the find out of the process.

This could lean to consider that no space is open to the algorithmic decision in the legal field, because it is not a decision coming from a judge and because the algorithm has no authority. But the question that should be correctly asked is which authority, if any, should be given to an algorithmic decision. The question of the authority is a matter of order and regulation, or a matter of social recognition.

This is a point of reflection on which legal theorists are currently confronting, not without contortions and pains of various kinds, but still looking for a solution that takes into account the existence of these new possibilities of decision. In fact, they prefer, rather, to talk about support for the decision.

In this representation, the term ‘law’ refers to the result of a decision (the judgment) taken by a certain authority (the judge) of a certain legal order, and effective in a certain society.

But the term ‘law’ may also have other references. The citizen will look to the law in search of an unambiguous answer to predict or organise his or her own and others’ behaviour. In this case, the term law refers to a fictitious reality, existing and arising from the set of rules and judgments and legal acts and facts existing and in force in a given society. Here the law is not a decision, but a meaning contained in general and abstract descriptions or in behaviours. Also, from this path it is possible to reach authority: a social behaviour shared and repeated over time, a consolidated custom, or an interpretation confirmed by behaviours can be considered law because they rely on the authority (effectiveness) of social consensus.

3. The game of law

The judge's verdict is the result of a procedure, sometimes very long, in which the lawyers of the parties and the parties themselves, among themselves and with the judge, face each other. Here there are different roles that the parts play and purposes to which they tend; it is also different as to what they refer to as law. For the lawyers, the truth of the trial, the law, is built in the defence of the client; for the judge it is in the exact reconstruction of the fact, in the correct interpretation of normative texts, in deciding according to justice. The judge has a greater need for truth, objectivity and exactitude than the lawyer, who will need persuasion, not by any means, but almost.

But the law does not limit its scope to the trial, it is a point of reference in the activity of the Public Administration and of the citizen; the legal scholar, then, considers the analysis of law his job.

If it were possible to turn the behaviour of lawyers, judges, parties, citizens and administrators into game theory rules, there would be a set of different rules defining different games [Chiassoni 1999], some, for example, being games aimed at achieving knowledge and others at achieving a practical result [Chiassoni 1999, 89]. In all of them, however, it is a question of determining 'the law'. The concept of law also will depend on the role of the players and on the type of game being played.

The lawgiver too has a role to play in the game of law. The lawgiver should be the equivalent of nature in the natural sciences; he sets the laws that the player-judge must take into account, interpret and transform into acts modifying reality. But, while the scientist of nature is constrained by mathematical laws, chosen by him as a chain of inferences, in defining the laws of nature, the player-judge is constrained by human laws in establishing law. As everyone sees the two procedures are not isomorphic, there is no match between laws and realities observed in the two worlds; human laws do not take the place, in this metaphor, of the laws of nature, but of the inferential rules of mathematics.

4. The commonplace in law

This introductory paper is also intended to help avoid some commonplaces and misunderstandings about the law, facilitating a possible use of the EAJ, replacing or complementing some established legal procedures.

The commonplace is a shared, and frequent in use, opinion on something, which, while allowing a quick exchange of speeches and ideas, nevertheless hides and overlooks a number of issues. It means, therefore, an inadmissible inaccuracy in the scientific field. Commonplaces also differ between various cultural groups, so, for example, the commonplaces of mathematicians with re-

gard to law are often very different from those of engineers or economists.

There is little kinship or understanding between scholars belonging to different fields of knowledge, especially those who belong to a field considered as among the humanities hardly understand and, in turn, are poorly understood by those who deal with mathematics. The 'jurist' is often accused of carrying on arguments that do not hold from a formal point of view, or of not being reliable. How much these *clichés* are anchored in reality and how much in prejudice is difficult to assess.

However, mistrust is a sign of prejudice, where there are deep-rooted aversions that the individual, even of a good cultural level, is unable to remove; this happens because he or she would not like to remove them. They come from the personal emotionality, so are normally little known and recognised by the individual himself. Prejudices cradle and reassure people and removing them is like removing a part of oneself, extracting them just like extracting a tooth. One may think that this writing has the intent to disarm these 'rooted' convictions, aversions, prejudices and judgments.

Of course, jurists dress in a strange way, absolutely so here in Italy, with a tie, even in summer, and there could be the danger that a mathematician, in a scientific meeting with jurists, would be forced to wear a jacket and tie too, which would prevent him from wearing comfortable flip-flop sandals: which would not be efficient for an economist and would not be rational for a mathematician, but would give great authority to the jurist. Instead, a judge in flip-flops would need detailed investigation, including psychiatric ones.

Instead, I do not want to disarm anyone in his convictions and habits, I want here to analyse, for a brief moment, the law from a different point of view, and different also for the jurists. I want to just check if and where it is possible to insert the EAJ in an efficient way for the legal systems and advantageous for the users of them and justice in general and under what conditions. Equitative algorithms are new procedures that need to be ‘jurified’; this requires looking at the law with new eyes.

Everybody should keep their prejudices about jurists, economists and mathematicians, but let us now look at the law through Galileo's lenses.

What good is this book to a mathematician? To see what needs there are in the legal field, and what operating conditions, and, consequently, to identify the areas in which mathematical research can be usefully employed.

What can this book be used for as a jurist? To take a look at the law outside the schemes and trivialities of our days spent on algorithms, to afford a vison of what will probably be some future developments of legal systems. It could also be used by the jurist to restore the veritative function in the world that other sciences are taking away from him today.

Every theory of law gives it only a partial look, closed within the limits useful for the methodology's validity. The use and development of future EAJ systems is

possible only by giving the law an overall view; however, while new and wider boundaries are valid for EAJ, it still has to take all the necessary steps to transform FD systems into legal procedures. We cannot limit ourselves solely to the utterances, neither to their meanings, nor to their validity nor to the effectiveness alone. We need all of that.

Let's get the trumpeters and flag-waving flag bearers of immutability away from us and from the scientific desk. The law is far from immutable, it has manifested itself in human societies in the most varying ways, linguistic and not, rational and not, but always designated by the purposes that constitute its reason for existence in human societies: the resolution of conflicts.

The pivotal point in EAJ's systems, which differentiates them from other legal algorithmic systems, is the possibility of leaving it to the parties in establishing the order of interests, or, in general, of the values that they most prefer. Western legal systems have frequently taken away from the citizen the possibility to intervene in the process to modify the order of values established in the law, often even when this was not necessary for reasons of protection of the weaker party or for other constitutionally guaranteed reasons. Reasons of streamlining and speed of proceedings have supported this choice, or even the principle of uniformity of law. The judge, after hearing the parties, after hearing the experts, assesses and decides, attributing assets and rights according to his own evaluation, together with that of the experts.

EAJ systems, instead, allow a new kind of stating law or giving justice, in which the individual and subjective emotional and value part, different case by case, is present and often diverging from the one contained, as standard, in the legal texts.

In the representations of jurists on how Artificial Intelligence or even, simply, algorithms, would be inserted in the trial, the image that arose was always that of a replacement of the different actors of the trial, from the judge to the lawyer, with artificial systems able to carry out those mental operations that, until then, were considered peculiar to man. In our case, such representations don't hit the mark, they are misleading. The change can be much more radical. These algorithmic systems do not follow the legal solutions already socially and politically shared, but, instead, they create new ones. These systems do not simulate human action or the human mind artificially; they are not a copy of the human being, whether of the judge, the lawyer, the legal advisor, or the administrator. They find new solutions tailored to the parties, their needs, wants, interests and values.

Here the parties do not delegate to the legislator how to protect their own interests, because they decide, scale, order interests and values, remaining the legislators in their own right. It is immediately clear to the jurist that much discussion is needed here about the admissibility of these systems in Western legal systems. Justice would again become a justice of the individual case, where different orders of interests and values will lead to different legal solutions.

The contemporary state's paternalistic role would crumble, granting a generalised 'age of majority' to its citizens. At the same time, the right, the solution of the case, would be charged with all that emotionality that the parties, in the current procedures, must remove. It is an enrichment and an enhancement of the citizen to the acceptance of the solution.

5. First commonplace: the law is always in the wording, however formulated

A commonplace, perhaps the most deeply rooted, consists in identifying the law with a text, either of law or of previous case law. But these texts are only means of communication, forms in which, in the history of human societies, the legal ought has manifested itself. Other is the law itself, which closes the dispute, every specific controversy, determining new truths in the world of facts with the behaviour of the addressees of those laws and sentences. The ought to be of the law, is a different moment. It is that which communicates to people certain conditions that are desirable to respect in order to be part of what a future possible sentence, or decision, may decide as law. The first is a factual truth, the second is a hypothetical evaluation [4].

The law and the precedents used to decide a new dispute provide conditions for the decision of the judge. The judge's judgment becomes law for the case decided and in respect of everybody, the law is then manifested in the new order of interests that follows the judgment. In the example given above, an erroneous, ideologically distorted judgment or one from a corrupt judge still forms the law until it is reformed by another judgment and succeeds in causing social change. A newspaper article or an authoritative ethical or economic opinion is not enough to 'declassify' the judgment as an opinion. The ruling of the judge remains the formant of law, that which gives shape to law, and, with the good peace of opinion makers, their opinions remain as such.

Considering all the facts and words that compose the law, it is easy to see that EAJ's systems can be introduced at various stages and in very innovative ways. They can be placed, for example, between the texts of law and the judgment, replacing the ought to be of the law and the judge with another ought to be, which comes from the litigants. The algorithm would still allow the decision to be reached in a completely rational way. The emotional, or irrational, part is present in the representation of the parties. It replaces the ought to be of the law as interpreted by the judge, but it represents, much more than the law and the judge do: it

[4] The difference between the two moments is generally recognized in legal literature, but the different schools do not agree on which part to recognize as their object of investigation. We need all the various moments that make up the law, both the factual and the evaluative ones. [Kelsen 1934].

represents the individual sense of the just, of what each subject, unlike any other, considers just and claims for himself.

Current procedural models give the judge a role of conclusion and synthesis of all the different moments, and, in this conclusion, he must use both his rationality and his emotionality. The values and principles present in the legal system are taken into consideration, but the graduation between them and the choice depend on the emotionality of the judge. On the other hand, he has to come to the decision on a rational path, which must be communicated in the judgement. The judge is, therefore, a third party sui generis, partly a normal human being and partly a legislator, as the bearer of personal and ordinamental values. This has been a necessary union in the history of law; the judge has always been an irreplaceable part of the process.

Now, in my opinion, the situation has changed. In EAJ, fair, true and rational come together in a new way for the law. In an EAJ system, the parties quantify or order their values and value judgments on conflicting assets and rights. It is an order that, in contemporary legal systems, is replaced partly by the assessments contained in the legal texts, to which the judge refers in order to arrive at the decision, and partly by the subjectivity and order of values of the judge himself.

The standardised assessment provided by the law has multiple reasons in its favour. It evolved in all human societies because it had a considerable evolutionary advantage: it made the behaviour of other individuals predictable, favouring cooperation between individuals within the group itself. A cooperative social group is a group that is more likely to replicate, or pass on, its cultural traits.

There are examples of standard legal forms that, in the history of the whole mankind, have crossed thousands of different legal systems unscathed. Sometimes, the conqueror in battle or war has seen his or her own legal system, or parts of it, replaced by parts of the won legal system. This is the case, for example, of the legal form of the contract in Roman law, today a universal instrument of private autonomy, which has come down to us almost unchanged, through dominances and empires over centuries of history.

This increased opportunity for cooperation, however, implies the need to ensure predictability in other people's behaviour. The provisions of law and previous case law fulfil this main function (Romeo 2010; Romeo 2012a; Romeo 2012b).

The linguistic form of all contemporary legal systems is grounded on this, but it cannot take the place of the entire legal phenomenon in human societies. Perhaps the most widespread theories on law today are those linked to the methodology of linguistic analysis.

However, this partialisation of scientific research excludes important parts of human judgement that also contribute to the decision, such as, for example, the entire emotional part. This limit is recognized and accepted theoretically, but its inclusion in the scientific analysis makes the results of this questionable. Instead,

EAJ offers a possibility of rational management of individual emotionality and personal value scales.

The introduction of EAJ's new tools should also be considered with regard to the functions performed by the regulatory provisions that would be superseded by the parties' disposition.

The greater predictability of citizens' behaviour is transformed into a greater possibility of restricting their freedom to choose and decide for themselves on their own behaviour or even on the values and interests to be pursued. Not everything can be attributed to the free evaluation of the individual without affecting that possibility of directing individual behaviours typical of legal systems.

Today these limitations to individual freedom are built up in the constitutional and political history of the community, and the different constitutions restrict their extent. For example, the realisation of the principles connected to egalitarian policies involves a series of normative interventions that may also impose limitations on the freedom of the citizen necessary to achieve an equality that otherwise the same citizen would not be pursuing (Machan 2002).

The constitutional values dimension is realised in the ordinary regulation and this fulfilment is also the realisation of a political-legal project, which the constitutions theoretically outline as rightful. This is a characteristic moment of contemporary Western legal systems and must be kept in mind in algorithmic formalisation. Some evaluations have a necessary bias deriving from the constitutional order and must be kept in mind. This is not an absolute barrier to formalisation and quantification, but it requires a preliminary step that can be solved, not with the FD itself, but with tree decision procedures, or other artificial intelligence tools, combined with the EAJ.

Here, however, we're talking about wording, be it laws or sentences. Instead, the thread that links the decision of the judge of a contemporary Western legal system with the peacemaking decision of a group of hunter-gatherers, at the origins of human history, and with EAJ, is the peacemaking and convincing capacity of the decision, not necessarily accompanied by a text, but expressed in all the imaginative ways of human communication: smiles, songs, hugs, representations, dances, cave drawings, output of an algorithm (Goodall 1983; de Waal 1990; Frolik 1999; Guttentag 2009; Romeo 2010). Whatever it may be, whether this ability goes back to social sharing or to subjection to an authority, its only meaning is identified by the elimination of conflicts.

6. Second commonplace: the law is just or must pursue justice

Nor can law be confused with the sense of justice, individual and personal as well as the interests that animate it. My starting point fully accepts that of Hans Kelsen: “The lew as a moral category is tantamount to justice, the expression used

for a social ordering that is absolutely right, that fully achieves its objective by satisfying everyone. The longing for justice, considered psychologically, is the eternal longing of man for happiness, which he cannot find as an individual and therefore seeks in society. Social happiness is called 'justice' […] From the standpoint of rational cognition, there are only interests and thus conflicts of interests, which are resolved by way of an ordering of interests rhat either satisfies the one at the expense of the other, or establishes a balance, a compromise between the opposing interests. That only one ordering of interests has absolute value (which really means, 'is just') cannot be accounted for by way of rational cognition. If there were justice in the sense in which one usually appeals to it when one wants to assert certain interests over others, then the posirive law would be completely superfluous, its existence entireiy incomprehensible. Given an absolutely good social order emerging from nature, reason, or divine will, the activity of the legislator would be as foolish as artificial illumination in the brightest sunlight. The usual objection, however, is that although there is indeed justice, we cannot define it, or, what amounts to the same thing, we cannor define it unequivocally. This objection is a contradiction in terms, masking in typically ideological fashion the all too painful truth: justice qua absolute value is irrational. However indispensable it may be for human will and action, it is not accessible to cognition." (Kelsen 1934, 16-17).

Justice and irrationality accompany the claims of individuals and the choices of individuals are justified as just by the individuals themselves, by others as unjust; however, at the basis of individual behaviour and decisions there is a large irrational component.

The most convincing example is provided by the divisions of family assets in the event of divorce or inheritance. Family relationships are built on love and lack of love. Two strong emotions of human nature which lead to decisions that often conflict with the interests of the individual taking them. They are surrounded by a galaxy of interdependent emotions, feelings and behaviour. Altruistic behaviour, for example, is difficult to explain rationally and the problem of the evolution of an 'altruistic' gene is still one of the greatest challenges in evolutionism, but, in the family environment, altruism is definitely one of the drivers of behaviour (Boehm 1999).

The division of goods within the family is the best example of the emotional and irrational forces that can be triggered. It often marks the end of a relationship, which severs all ties in that emotional galaxy. The individual's behaviour becomes unpredictable and his decisions non-rational. Feelings such as reproach or resentment take over and lead to difficulties in the peaceful resolution or settlement of the dispute. It is not uncommon for one of the litigants to accept a solution, that is disadvantageous to him/her, only in order to harm other litigants. In such cases, what the party intends to obtain is not calculated on the assets obtained by the party itself, but on those obtained by the other parties. Vetoes and restrictions on the

circulation of assets are among the most common examples in such cases. One of the necessary prerequisites of game theory doesn't seem to apply, i.e. the necessary will to win by the players.

But, if we conceive the irrational attitude as part of the game when defining the rewards, then irrationality itself can be redefined as a kind of rationality updated on the subject (s), on its scale of values, an s-rationality. Now, the problem shifts only in the definition of the different s-rationalities for the definition of the payoffs, but this is a problem that has to be analysed with assumptions other than fairness.

I believe that the presence of widespread irrationality should not discourage and lead to think that they are irreducible to EAJ; however it may be, I firmly believe that EAJ systems can help even in these cases. While the positions of the parties can afford any irrationality and the legal decision may not be fair to many, it can gain a rational basis when it also includes the irrationality of the parties, calculating the optimum on this point.

Emotionality about objects is another example of the distance between the value attributed by the law to goods and the subjective value. The affective value is non-existent for the sake of law, but a subject can attribute immense value to things of little importance for his/her own affective reasons. The legal systems generally fail to take adequate account of these individual needs, which, however, contribute to forming in the subject the perception of the just and unjust with respect to the specific act attributing the asset, as well as the approval with respect to the judgment.

That is the reason why many researchers argue that right or justice, tout court, is measured by social happiness, not just social wellbeing (Kelsen 1934, 16). Widespread social wellbeing can be accompanied by widespread social unhappiness; an increase in wellbeing does not imply a necessary increase in the sum of individual satisfaction, of social happiness. Even if we do not know any rigorous demonstration of this, the observation of the growth of radical dissent movements in the richest Western societies leads us to reflect on the differences between social wellbeing and social happiness. The one is measurable, the other only statistically observable and, as irrational, not easily to be discussed. The reduction of the subjective irrational to algorithmic procedures is and will be one of the main crossing points from FD to law. The greatest reflections on the point can be found on the mathematical front, rather than on the legal one (Moulin 2004).

EAJ try to encapsulate individual irrationality without diminishing practical decisive power and theoretical relevance. Individual irrationality establishes the assumptions of the calculation, algorithmic rationality does the rest. After all, even this can be considered a fair division between the two.

There is an oft repeated question in our field, which asks whether it would be preferable to be judged by a judge or by an algorithm. Personally, if I were guilty, I would answer by a judge and, if I were innocent, I would answer by an algo-

rithm. In the former case, I would look for human complicity or empathy, in the latter for rationality; in the first case I'd look for the judge's emotions, in the second I'd look for his rationality while maintaining my values and emotionality, avoiding those of the judge. In civil matters it doesn't change that much.

References

Boehm Ch., (1999) *Hierarchy in the Forest. The Evolution of Egalitarian Behavior*, Harvard University Press, Cambridge (MA).

Brams S.J., (1990), *Negotiation Games, Applaying Game Theory to Bargaiing and Arbitration*, Routledge, Oxon.

Brams, S.J.; Taylor, A.D. (1996), *Fair division: from cake-cutting to dispute resolution*. Cambridge University Press, Cambridge (MA).

Brams S.J., (2012), Game Theory and the Humanities. Bridging two worlds, The MIT Press, Cambridge (MA).

Chiassoni P. (1999), *Interpretive Games: Statutory Construction Through Gricean Eyes*, in *Analisi e diritto. Ricerche di giurisprudenza analitica*, Comanducci P., Guastini R. Eds., Giappichelli, Torino, pp. 79-100.

de Waal F.B.M. (1990), *Peace Keeping among Primates*, Harvard University Press, Cambridge (MA).

Frolik L.A. (1999), W. Fikentscher, G. Dieker, Eds., *Law & Evolutionary Biology. Selected Essays in Honor of Marharet Gruter*, Gruter Institut for Law and Behabioral Research, Portola Valley.

Goodall J. (1983), *Order without law*, in Gruter M. & Bohannan P., Eds., *Law, Biology & Culture. The Evolution of Law*, Ross-Erikson, Santa Barbara, 50-62.

Guttentag M. D., (2009), *Is there a law instinct?*, in *Washington university law review*, Vol.87, 269-328.

Kelsen H. (1934), *Reine Rechtslehre. Einleitung in die Rechtswissenschaftliche Problematik*, Franz Deuticke, Wien; translation into Englisch by B.Litschewski Paulson and S.L.Paulson, *Introduction to the Problems of Legal Theory*, Oxford University Press, New York 1992.

Machan, T.R. (2002), *Liberty and equality - A Question of Balance?*, Hoover Institution Press, Stanford (CA).

Moulin H. 2004, *Fair Division and Collective Welfare*, The MIT Press, Cambridge (MA).

Romeo F. (2010), *A Coevolutive Hypothesis on the Origin of Law,* in: i-lex, 10, 2010, pp.1-20; http://www.i-lex.it/articles/volume5/issue10/romeo_en.pdf.

Romeo F. (2012a), *Antropologia Giuridica, un percorso evoluzionista verso l'origine della relazione giuridica*, Giappichelli, Torino.

Romeo F. (2012b), *Geni, popoli, diritto e lingue*, in D.M.Cananzi, R.Righi. *Ontologia e analisi del diritto. Scritti per Gaetano Carcaterra*. vol. 8, p. 1235-1249, Giuffrè, Milano, 2012.