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Admissibility and Feasibility in Game Forms

Abstract: This paper examines the exercise of individual or group rights within the game form approach. It focuses in particular on what it means for a strategy or action to be feasible and admissible. Admissibility is best discussed in relation to two basic distinctions among rights, passive and active rights on the one hand and negative and positive rights on the other. It is argued that while there are quite a few cases in which the *outcomes* of mutual rights exercising are to the fore, there are many situations where the *uninhibited exercise* of individual or group rights and not particular outcomes are what society is primarily interested in.

1. Introduction

The literature on liberty and rights in social choice theory and welfare economics has seen two major approaches of how to formulate individual rights. Sen's (1970a; b) seminal contribution is in terms of individuals' preferences over social states and social choice rules, where a social state is viewed as a complete description of each and every aspect of society that may be considered relevant. In Sen's formulation, individuals who hold rights over particular pairs of social states are decisive in the sense that whenever one of these persons strictly prefers x to y , let's say, alternative y must be eliminated from the set of socially chosen states. In this way, the exercise of individual rights can be viewed as a restriction on the social choice process. The other formulation originates from Nozick (1974) and was stated more explicitly by Gärdenfors (1981), Sugden (1985), Gaertner, Pattanaik and Suzumura (1992), Deb (1994) and Peleg (1994), among others. Under Nozick's conception, an individual by choosing from among alternative options fixes some features of the social states and thereby imposes some constraint on social choice. In the approach by Gaertner et al., individual rights are essentially identified with the admissibility of actions or strategies of the individuals,¹ and social

¹ Deb (1994, 168) notes that "the description of rights ... by specifying 'who can do what' without reference to motivations (i.e. preferences ... over outcomes) distinguishes this approach to rights from the traditional approach based on Sen (1970a; b)".

outcomes are the result of the (simultaneous or sequential) exercise of various n -tuples of permissible strategies, where n is the number of individuals who hold particular rights. Gärdenfors, Deb and Peleg are close to Nozick. They view rights in terms of what has been called α -effectivity, meaning that an individual or a group of agents is effective in achieving certain (features of) social outcomes. All these formulations use the so-called game form approach. Liberties and rights of the various individuals are defined by specifying a permissible set of actions or strategies for each person. Individual preferences only enter at the stage where games are considered.

In a recent paper, Sen (1995, 14) has argued that in the game form view, "there is . . . no need to examine or evaluate the resulting state of affairs, and no necessity to examine what states the individuals involved prefer". He speaks of "preference-independent, consequence-detached rights" which he contrasts with his own social choice approach to rights. He continues saying that even if rights can be nicely characterized by game forms in many instances, "there is a need to look at the likely consequences of different game form specifications and to relate them to what people value and desire" (14). The latter point is illustrated by a concrete example. "If . . . it appears that not banning smoking in certain gatherings (having the matter to the discretion of the people involved) would actually lead to unwilling victims having to inhale other people's smoke, then there would be a case for considering that the game form be so modified that smoking is simply banned in those gatherings. Whether or not to make this move must depend crucially on consequential analysis." (14–15)

We feel that there is practically nothing one can say against this assertion. Gaertner, Pattanaik and Suzumura have never held the position that the issue of individual rights and liberties should be reduced to a purely procedural view. Their joint paper focused on the formal structure of rights and, admittedly and perhaps regrettably, a discussion of the consequential aspects of individuals' rights exercising was reduced to a brief passage towards the end of their paper (1992, 174), but recent work by two of the three authors (Pattanaik/Suzumura 1993; 1994) clearly shows that consequences matter under the game form approach and that individuals, via their preference orderings, care about these. The point is more subtle. We shall try to show that there are some cases where outcomes are the primary focus and other cases where the proper and uninhibited exercise of rights, not particular outcomes are what society is primarily interested in. We shall see that this issue is closely related to the distinction between passive and active rights. The latter are fundamental categories of rights from which we shall derive specific admissions and prohibitions of actions or strategies (so that in the present approach, individual rights get a more basic foundation than in the formulation by Gaertner et al. 1992, for example).

The outline of the paper is as follows. Section 2 introduces our concepts of feasibility and admissibility of individual strategies and defines the notion of a generalized game form. Section 3 depicts a couple of cases that illustrate the distinction between outcome orientation and strategy orientation. Section 4 discusses passive versus active rights and suggests the notion of an unhindered exercise of rights among individuals which we try to relate to the notion of equilibrium as used in economics and game theory. We end with some concluding remarks in section 5.

2. Individual Strategies, Feasibility and Admissibility

Let $N = \{1, 2, \dots, n\}$ be a finite set of individuals who form the society we consider in this paper. We examine situations where each individual chooses a strategy or an action out of a finite set of given strategies. Henceforth, we shall use the terms “action” and “strategy” interchangeably. This is purely for reasons of simplicity, admitting that in more general contexts, a particular action like expressing one’s opinion in public can be contained in several strategies, strategies that again comprise various actions. Alternatively, we could have considered a general social game, reduced to a one-shot affair, where each individual would have had to pick one single strategy containing many actions of various kinds. For the present purposes, we prefer to use a simple, i.e. less complex approach. Let A denote a finite set of actions that are conceivable, but not necessarily feasible for any agent i . Set A has to be thought of as being very large. It may contain, among many other items, an individual’s different ways how to dress, how to sleep at night, which religion to practice, for which party to vote etc. Agent i ’s feasible strategy or action set S_i is defined as a subset of A , viz. $S_i = \{s_i, s'_i, s''_i, \dots\} \subset A$. In the following, actions are assumed to be simultaneous, and no problem of timing and of sequence of actions is considered. Given strategy set S_i , the whole population’s joint strategy set S_N will be defined as $S_N = S_1 \times S_2 \times \dots \times S_n$, where $s_N \in S_N$ constitutes an n -tuple (s_1, s_2, \dots, s_n) , with $s_i \in S_i$ for all $i \in N$. Very often, we shall write (s_i, s_{-i}) instead of s_N , when we focus on a particular individual i . Given person i with her strategy set S_i , the other agents’ joint strategy set will be denoted by S_{-i} , with s_{-i} being a typical element of S_{-i} . Clearly, $S_{-i} = \prod_{\substack{j \in N \\ j \neq i}} S_j$. At a later point, we shall consider

groups of individuals. Given a group $I \subseteq N$, we shall write S_I (with $s_I \in S_I$) for that group’s joint strategy set and S_{N-I} (with $s_{-I} \in S_{N-I}$) for the joint strategy set of all the other persons not belonging to I .

In this paper, we use the notion of generalized game forms (see also Peleg 1994) in which the strategies or actions available to a particular individual may

be conditional on other persons' strategies. We shall see later on that there are situations where other people's duties (and, consequently, actions) are derived from the fact that they must render some strategy feasible for the right-holder considered. The interrelationship among actions also has a high plausibility in cases of economic scarcity. If a sufficient number of other people have decided to board a particular bus, it will no longer be possible for me to do the same. In other words, the generalized game form allows for the possibility that some vectors of strategies in S_N are not feasible. The subset of mutually feasible strategies will be denoted by F . When the other agents have chosen their joint strategy $s_{-i} \in S_{-i}$, the subset of feasible strategies for individual i , $F_i(s_{-i})$, is given by $\{s_i \in S_i \mid (s_i, s_{-i}) \in F\}$. For a group $I \subseteq N$, the set of feasible strategies for this group is defined by $F_I(s_{-I}) = \{s_I \in S_I \mid (s_I, s_{-I}) \in F\}$.

For each vector of mutually feasible strategies, a particular outcome is achieved. Let G denote the set of possible social outcomes. Then $g : F \rightarrow G$ is the outcome function. The outcome function is defined for all co-feasible strategies. A generalized game form $\langle N, S_1, \dots, S_n, F, G, g \rangle$ is a specification of a set N of players, a set S_i of strategies or actions for each player $i \in N$, a set of mutually feasible strategies F , a set G of possible outcomes and an outcome function g .

Let R_i denote the set of admissible strategies for individual i . In section 4 of the paper, we shall try to explore in some detail potential criteria according to which one may characterize some action as admissible and another one as non-admissible, though a formal analysis of this important distinction will be left to a future paper. Let us just mention here that the basic human rights provide an important bench mark for this distinction. The subset of admissible strategies for person i will be denoted by $R_i(s_{-i})$ and may depend on the other individuals' strategies. Individual i 's strategy to go to j 's reception, for example, is only permissible if j has extended an invitation to person i . Individual i 's action to jog on j 's and k 's common property presupposes the permission of persons j and k to do so.² If action $s_i \in S_i$ means jogging and $s'_i \in S_i$ stands for playing soccer on the lawn belonging to j and k , it is possible that $s_i \in R_i(s_{-i})$, but $s'_i \notin R_i(s_{-i})$.

Let R denote the set of globally admissible strategies: $s_N \in R$ iff $\forall_i \in N$, $s_i \in R_i(s_{-i})$. For a given group $I \subseteq N$, the set of admissible strategies for this group is given by $R_I(s_{-I}) = \{s_I \in S_I \mid \forall_i \in I, s_i \in R_i(s_{-i})\}$. The reader should be aware of the fact that feasibility and admissibility are two totally distinct concepts. An action can be feasible but non-admissible (e.g. to invade the private property of another person) or admissible but not feasible (e.g. in cases of economic scarcity). When $s_i \in (F_i(s_{-i}) \cap R_i(s_{-i}))$, action s_i is both feasible and permissible, we shall write more succinctly $s_i \in RF_i(s_{-i})$.

² In these two examples a sequential formulation seems more appropriate, but as mentioned above, we shall abstain from this aspect in the present paper.

3. Different Cases

In the following, we wish to discuss a couple of situations which, we believe, are of exemplary importance for the analysis of rights exercising in the game form approach. In particular, we shall examine the issue of feasibility which, in the previous section, was defined in relation to strategies or actions. However, feasibility can also be viewed in relation to outcomes. The issue then is whether a particular outcome is guaranteed to an individual or a group of individuals. We shall see that there are situations where the achievement of a particular outcome or result is the focus of society's interest and situations where this is not (necessarily) the case.

We wish to introduce one more bit of notation. G denoting the set of possible outcomes for society, we want to define \bar{G}_i to be that subset of G in which person i achieves a particular feature or personal outcome for herself. We have to think of each element of G as a vector composed of private components of the various members of society and public components.³ So \bar{G}_i could, for example, denote the subset of social states in which person i is guaranteed a certain level of subsistence, let's say.

We shall distinguish between cases, where

- (a) feasibility of an action is guaranteed and feasibility of a particular outcome is guaranteed as well;
- (b) feasibility of an action or strategy is guaranteed, but there is no guarantee for a particular outcome;
- (c) feasibility of an action is guaranteed within the resource or wealth constraint of the individual considered, but there is no guarantee for a particular outcome;
- (d) there neither is a guarantee for feasibility of a strategy within the resource constraint nor a guarantee for a particular outcome.

(a) In most countries of the western hemisphere, individuals have a right to apply for social aid (an action), a right which is independent of the actual budget situation of the public authorities. Furthermore, the state guarantees that a certain subsistence fee (most often in money, sometimes in kind) is being allocated to a needy person, once her application has been processed. So if, for any i , \bar{S}_i is the subset of strategies in which i applies for public aid, the following holds: For all $s_i \in \bar{S}_i \cap RF_i(s_{-i}) (\neq \phi)$, for all $s_{-i} \in RF_{-i}(s_i)$, $g(s_i, s_{-i}) \in \bar{G}_i$, where \bar{G}_i denotes the subset of social states in which person i receives public aid. The same type of specification holds when \bar{G}_i denotes the subset of states in which person i is guar-

³ At this point, we could have introduced the so-called issue approach which breaks up a social state into its private and public issues, where within each private issue every individual then selects his or her private feature. However, for the following discussion, we do not need such a detailed notation.

anted a certain number of years at school. Since there normally is more than one way to achieve ten years of schooling, let's say, we can specify a subset $\bar{S}_i \subset S_i$ such that for all $s_i \in \bar{S}_i \cap RF_i(s_{-i}) (\neq \phi)$, and for all $s_{-i} \in RF_{-i}(s_i)$, $g(s_i, s_{-i}) \in \bar{G}_i$; s_i now denotes i 's action (or, in most cases, i 's parents' acting on behalf of their child) to apply for instruction at school. Social aid for needy members of society and a certain amount of schooling for everyone are outcome-oriented issues in many countries, and the guarantee is given unconditionally, i.e. independent of how many other people file an application.

In former socialist countries, people had a right to being employed independent of the actual performance of the economy. Under these circumstances, for each i , there existed a subset of strategies \bar{S}_i such that for all $s_i \in \bar{S}_i \cap RF_i(s_{-i}) (\neq \phi)$, for all $s_{-i} \in RF_{-i}(s_i)$, $g(s_i, s_{-i}) \in \bar{G}_i$, \bar{G}_i now representing the subset of states in which person i obtains a workplace with earned income. In market economies, the situation is quite different. If there are too many people with the same qualification and too few job openings, it may happen that person i rests jobless. In other words, if $s_i \in S_i$, $s_i \in RF_i(s_{-i})$, is the strategy to hand in one's application to a job agency, then there may exist some $s_k \in S_k$, $s_k \in RF_k(s_{-k})$, $k \in N$, $k \neq i$, such that $g(s_i, s_{-i}) \notin \bar{G}_i$, where \bar{G}_i denotes, as above, the subset of states where person i has earned income and s_k is a component of vector $s_{-i} \in S_{-i}$. The interpretation of this situation is that it is always feasible and permissible for person i to apply for a job, but there is no outcome guarantee⁴. She may lose against some person k in the job competition. Whereas the guarantee for an earned income in former socialist countries is a case within our category (a), the job competition in market economies could either fall into case (b) or into case (d).⁵

(b) A clear case within this category is voting. Voting outcomes shape public features so that \bar{G}^p , for example, would represent that subset of G in which a particular tax program has been approved. No individual has a claim for a particular \bar{G}^p . However, the constitutions of most countries guarantee that every citizen beyond a certain age has the right to vote and many countries (not all of them) guarantee that casting one's vote is feasible under all circumstances. Economic scarcity or bad weather, or a lack of polling booths, for example, would not be an acceptable reason for denying some people their right to vote. So if $s_i \in S_i$ is person i 's strategy to cast a ballot, we have $s_i \in RF_i(s_{-i})$ for all $s_{-i} \in RF_{-i}(s_i)$.

At the outset of this paper, we stated that we wanted to equate the notions of strategy and action and not pursue the idea that a strategy contains several or even many actions. If we had done the latter, we would have had to require

⁴ See also Peleg 1994 for this kind of example.

⁵ We think that case (b) would apply if job application were viewed primarily as an institutionalized formality; case (d) would apply if job application were seen above all as a strategy to sell one's labour on the market.

that there be at least one (complex) strategy under which person i , let's say, casts a ballot, such that this strategy is both admissible and feasible for i , given the (admissible and feasible) strategies of all other agents. But if, except for the voting act, all (or some of) the other elements of this strategy were facing some threat of not getting feasible, our notation would have to become much more complicated in order to express the feasibility and guarantee of i 's voting act.

(c) This category covers situations which have most often been discussed around Sen's liberal paradox (1970a; b) where the issue is "to shape the Millian circle" around every individual human being, in other words, where each person is free to shape her personal sphere in whatever way she likes. She has, for example, a right to dress in whatever way she likes, given her resources, but she has no claim against any other individual or any public authority to wear a long black dress, if that black dress does not already belong to her vector of endowments (i.e. is hanging in her wardrobe or can easily be purchased from her money or wealth holdings). Nor is there any claim that the person considered be the only person to wear a long black dress (which she owns) on a particular night. So if \bar{G}_i denotes the subset of social states in which person i alone wears black where $s_i \in S_i$ denotes i 's action to wear a long black dress, we obtain: $\exists s_i \in S_i, s_i \in RF_i(s_{-i})$ and $\exists s_k \in S_k, s_k \in RF_k(s_{-k})$, such that $g(s_i, s_{-i}) \notin \bar{G}_i$, s_k being a component of vector $s_{-i} \in S_{-i}$. There are hundreds of examples of this kind (or should we say, millions?): the way one chooses to wear one's hair, the way one chooses to sleep at night, the choice of religion, the kind of books one borrows from a library etc. Feasibility of the person's strategy is guaranteed as long as that person's endowment constraint is met. As Gaertner et al. (1992) have said, a person has a right to fix a particular feature concerning herself, and civilized societies guarantee that this be rendered possible. However, no particular social outcome is guaranteed nor is this in the focus of any democratic public authority.⁶

(d) In market activities, an individual may actually get what he or she originally desired so that notional demand and effective demand then coincide, but often this is not the case. The market outcome hinges on the buying and selling decisions of all agents, their endowments and the set of relative prices. So even within an individual's resource constraint, there is no guarantee that a certain strategy to buy or sell a particular commodity, let's say, is rendered feasible. So for any person i with $s_i \in R_i(s_{-i})$, there exists $s_{-i} \in RF_{-i}(s_i)$ such that $s_i \notin F_i(s_{-i})$. Consequently, a particular commodity allocation for

⁶ One could, perhaps, argue that also in this case there is a certain guarantee of an outcome, viz. of a private outcome (wearing black in our example). But isn't this private outcome almost indistinguishable from the strategy to wear black? And the fact that under case (c), the public authorities do not meddle with the private decisions is not an outcome in itself, but the consequence of a correlative duty, as we will see in the following section.

person i , planned to be the result of the exercise of action s_i , would not come about. Here again, there is no focus on a particular social outcome and the infeasibility of some individual's buying or selling strategy is not one of society's worries. Notice that in all cases discussed above, our primary focus was on the issue of feasibility though, generally, admissibility was an important precondition. We shall now explore in more detail various criteria according to which some action is deemed to be admissible and another one is regarded as inadmissible.

4. Basic Distinctions Among Rights

Following Feinberg (1973), we define a *passive* right of an individual as a right that implies certain obligations of other agents or the society to do or refrain from doing something without providing the individual considered with any power to do or to have or to be anything specific. Steiner (1994, 89) speaks of "a set of categorically compossible duties" and "duties of forbearance in others" in this context. Passive rights are outcome-oriented. However, the focus is not on a particular outcome, but rather on a subset of outcomes. An *active* right of an individual provides the individual with a certain power to do, to have or to be something specific which usually accompanies certain obligations of other agents to do or to refrain from doing something. Active rights require that some strategy or action be available to the agents considered. A second distinction which is often made is the distinction between negative and positive rights. A negative right is a guarantee against interference ("refrain from doing something") from another person's or group's actions, whereas a positive right is a guarantee against any kind of obstruction by another person or group, be it via an action or an inaction ("certain obligations of others to do something"). While a negative right is usually costless, a positive right, in contrast, may entail quite substantial costs.

The right of an individual not to be physically attacked by another person (a passive right) implies the obligation of other persons to abstain from any action or strategy that could violate the physical integrity of the first person. Analogous cases are the moral integrity of a person or the protection of private property. Feinberg (1980, 134) calls rights correlative with duties of respect, i.e. rights to other people's abstentions or noninterference, negative *in rem* rights.⁷ Positive *in rem* rights which he circumscribes as "rights of community membership" (135) subsume, for example, the duty of care that every member of society is said to owe to any and every other person in a position to be

⁷ "An *in rem* right holds, not against some specific namable person or persons but rather, in the legal phrase, against the world at large." (Feinberg 1980, 134)

injured by his negligence, or the duty that every citizen has to come to the aid of accident victims (135).

Prominent examples in the category of active rights are the right to free speech, the right to practise any religion, the right to move around freely, the right to vote etc. These rights are strategy-oriented, no particular outcome is considered. Other individuals have to observe their correlative duties. It would be inadmissible for them to prevent person i from entering a church, for example. Nor would it be tolerable if they harassed that person because of her openly declared belief in God. While other individuals would have to observe their duty of non-interference, the public authorities would have to do whatever is in their power to guarantee that person i can practice her religion. The right of an individual to criticize the state is another active right. So obstruction from either other people or the state must not occur. The public authorities not only have the obligation not to imprison, persecute or execute the individual for his or her criticism in public, they would also have the duty of care for the criticizing individual which may be tantamount to incurring high costs of protection (the obligation to do something in the sense of a positive right). So if \bar{G} denotes the subset of social outcomes in which there is criticism of the government and if $s_i \in S_i$ is i 's active right to criticize, we would want to require that $g(s_i, s_{-i}) \in \bar{G}$ for all $s_{-i} \in R_{-i}(s_i)$, which is only possible if $s_i \in RF_i(s_{-i})$.

Let $\bar{S}_i \subseteq S_i$ be individual i 's strategy subset related to passive rights. Then the action to live one's private life unharmed both physically and psychically could, for example, be represented by $\bar{s}_i \in \bar{S}_i$. Analogously, let $\bar{S}_{-i} \subseteq S_{-i}$ be the strategy subset of passive rights and correlative duties of all the other members of society and $\bar{s}_{-i} \in \bar{S}_{-i}$ be the strategy of correlative duties corresponding to \bar{s}_i . Furthermore, let \bar{G}_i be the subset of social states in which the person under consideration remains unharmed both physically and mentally. Then we can state the following: For $\bar{s}_i \in \bar{S}_i$, there exists $\bar{s}_{-i} \in \bar{S}_{-i}$ such that $\bar{s}_i \in RF_i(\bar{s}_{-i})$ and $\bar{s}_{-i} \in RF_{-i}(\bar{s}_i)$; furthermore $g(\bar{s}_i, \bar{s}_{-i}) \in \bar{G}_i$. If this holds for all $i \in N$, i.e. for all $\bar{s}_i \in \bar{S}_i$, there exist $\bar{s}_{-i} \in \bar{S}_{-i}$ such that $\bar{s}_i \in RF_i(\bar{s}_{-i})$ and $\bar{s}_{-i} \in RF_{-i}(\bar{s}_i)$, we have a situation of a frictionless exercise of a particular passive right (viz. living unharmed both physically and psychically) which we might call a state of unhindered rights exercising and correlative duties. It is a state characterized by co-admissibility and co-feasibility of individuals' strategies and the respect of a basic (passive) right simultaneously. This congruence need not necessarily hold. There could, for example, be a situation in which a joint strategy vector s_N is co-admissible but some basic right is not respected because the system of legal rules does not correctly enforce that fundamental human right.⁸ However, we shall not pursue this line of thought any further in the present paper.

⁸ Some countries declare that they are in support of basic rights but their legal system is such that it provides inadequate safeguards for basic freedoms.

Does the situation of an unhindered exercising of (passive) rights represent an equilibrium? Not in the sense in which economists are used to apply this notion. Since we have not introduced the agents' preferences at this point, we can neither speak of an equilibrium in strategy space nor of an equilibrium in outcome space. Once we know the individuals' preferences, it could even be the case that some or many of them would prefer a state of some meddling intervention to a state of frictionless rights exercising. On the other hand, a situation of an unhindered exercise of passive or active rights where all agents use their admissible strategies and correlative duties, respectively, has, at least in some intuitive sense, 'the flavour' of a state of equilibrium.

If the other individuals do not follow their correlative duties and resort to a strategy $\hat{s}_{-i} \in S_{-i} - \bar{S}_{-i}$, $\hat{s}_{-i} \notin R_{-i}(\bar{s}_i)$ obtains if the legal rules are such that they guarantee the respect of i 's right. If $\hat{s}_{-i} \in F_{-i}(\bar{s}_i)$ holds, $\bar{s}_i \notin F_i(\hat{s}_{-i})$ and, consequently, outcome \bar{G}_i will not come about. In such a case, person i would have to ask for help from the political authorities and appeal to their correlative duties or, if this does not help, go to court and sue the person(s) who has (have) intruded her sphere. The object of this measure would be to re-install the status quo.

As said before, passive rights focus on outcomes. The right to education which in case (a) of section 3 we classified as outcome-oriented (much stronger indeed, since we spoke of a guarantee) is a positive *in rem* right. So is a child's claim to be fed and to be given medical care. A complicated case arises when for some $\bar{s}_i \in \bar{S}_i$ with $\bar{s}_i \in R_i(s_{-i})$, there exists $s_{-i} \in S_{-i}$, $s_{-i} \in RF_{-i}(\bar{s}_i)$ such that $\bar{s}_i \notin F_i(s_{-i})$. Imagine that person i wants to exercise her right to breathe fresh air (a passive right, since nothing specific is at issue), but it is permissible for her neighbours to store their garbage in the backyard and burn their garden waste. Here we have a clash between positive and negative rights, an infringement of personal freedom occurs which can only be settled via some collective decision (Pattanaik/Suzumura 1993; 1994). External effects like the ones above have had an important impact on environmental laws and legislation in recent years. Consequently, the concept of what an admissible action means in the presence of externalities has undergone some significant changes. The collective decision has to be such that frictionless rights exercising becomes possible again. This could mean that $\bar{s}_i \in R_i(s_{-i})$ will no longer be accepted or, more probably, that $s_{-i} \in R_{-i}(\bar{s}_i)$ is no longer found tolerable. The chances for the latter verdict increase when the group who is creating the negative externalities has an alternative strategy which would avoid creating these externalities.

Finally, consider the following two cases when the argument that a clash between rights occurs hinges on numbers. Situation 1 is the case of conscientious objection to military service which we consider as an active right. The following situation may now come about: $\exists s_I \in S_I$, $s_I \in RF_I(s_{-I})$ such that

$g(s_I, s_{-I}) \notin \bar{G}^p$ for all $s_{-I} \in S_{-I}$, where \bar{G}^p denotes the subset of social states in which the society considered is able to defend itself against military aggression from outside and s_I denotes group I 's action to object to being drafted. This active right clashes with the passive right of individuals to live a life in which one feels secure against a military intervention or assault from outside, a fear which many Europeans shared during the Cold War era. Here, we have expressed this passive right in terms of an outcome; alternatively, we could have expressed it by specifying the strategy $s_{-I} \in S_{-I} \cap R_{-I}$ of "all the others" to lead a life without fear. However, $\exists I' \subset I$ such that for $s_{I'} \in S_{I'}, s_{I'} \in RF_{I'}(s_{-I'}), g(s_{I'}, s_{-I'}) \in \bar{G}^p$, so that the size of group I can be viewed as the critical size (critical mass) in order to render \bar{G}^p impossible. This situation is complex and problematic since a collective decision to possibly abolish or restrict the individual right to conscientious objection apparently hinges on the number of people who resort to this claim. A similar argument can be constructed for the consumption of drugs. If too many persons turn to drugs, the damage to society may become intolerable (both in terms of a loss in productivity and in terms of a significant increase in health care costs). On the other hand, it is often argued that a democratic society should tolerate a certain number (clearly not well-defined) of drug-addicts.

The second case is similar to the first one in some sense. It is about health impairment of people in downtown areas. So it concerns the passive right of living unharmed which collides with the active right of unrestricted movement. The standard example is the traffic congestion in downtown areas which over the years made the levels of pollution and noise increase considerably. As a consequence of this, the health of those living in the inner cities has been negatively affected. Here, there is a collision between the passive right of health preservation (to breathe fresh air and not to be exposed to a constant high level of noise) and the active right to move around freely in one's car. Again, the size of a particular group matters. So if group I is the group of people who drive downtown regularly (action $s_I \in S_I$) and \bar{G}_{N-I} denotes the set of social states in which $N - I$, the group of people living downtown, is not exposed to any considerable health impairment, we have: $\exists s_I \in S_I, s_I \in RF_I(s_{-I})$ such that $g(s_I, s_{-I}) \notin \bar{G}_{N-I}$. However, there exist $I' \subset I$ with $s_{I'} \in S_{I'}$ and $I - I'$ with $s'_{I-I'} \in S_{I-I'}$ such that $g(s_{I'}, s'_{I-I'}, s_{-I}) \in \bar{G}_{N-I}$, where the group $I - I'$ has abstained from exercising its right to drive downtown. Again, some social decision is needed in order to settle the issue of conflicting individual rights. Actually, public authorities have devised several ways of how to reduce health impairment or, in more general terms, of how to restore the right to live in a healthier environment. In most cases, the admissible set $R_I(s_{-I})$ has been redefined.

5. Concluding Remarks

We feel that we are just at the beginning of understanding a bit more clearly and formulating somewhat more precisely what mutual and interactive rights exercising really means in a formal model of societal decisions. For a long time, social choice theorists have been too vague, perhaps too 'global' on these issues. Gaertner, Pattanaik, and Suzumura (1992) spoke of a specification of the admissible strategies for each agent and the freedom of each agent to pick any of the admissible strategies and/or the obligation of the agents not to choose a non-admissible strategy (173). While this formulation was adequate in their work, the present analysis required a more detailed specification.

In section 4, we have discussed at greater length the notion of an unhindered exercise of rights under which each member of society is able to pick some strategy $\bar{s}_i \in RF_i(\bar{s}_{-i})$ and everybody else chooses a strategy of correlative duties $\bar{s}_{-i} \in RF_{-i}(\bar{s}_i)$. If such a situation holds for many types of actions (in the sense of exercising both passive and active rights), we have a configuration of wide-spread compatible and non-conflicting rights exercising. Each and every person in society is able to secure particular private features, whatever the final social state may turn out to be. We have emphasized that such a situation is not an equilibrium in the sense in which economists and game theorists use this term. However, it has many of the features of an exceptional or outstanding state. Such a situation can at least serve as a benchmark for cases where the mutual exercise of rights is not frictionless. To be very clear, we are not talking about those instances in which one or several individuals are using non-admissible strategies. Those situations are cases for a trial before court. The situations we are thinking of are instances which involve major externalities. Each person can make the legitimate claim that she is choosing one of her admissible strategies. The societal outcome, however, is characterized by the fact that some individuals' rights are violated or that a public feature has changed in a way which is thought to no longer be tolerable for society. These cases necessitate deliberation and public debate. At the end, a scheme of mutually compatible rights exercising has to emerge in order to avoid further conflict.

We are very well aware of the fact that by equating strategies and actions, we have artificially reduced the complexity of rights exercising in real life. Modeling a general social game with individuals exercising strategies that extend over several periods during which the game is being played, would be closer to what is actually being observed. We have also been vague towards the possibility that the system of legal rules may be at odds with the set of basic rights, i.e. does not correctly enforce one or several of the fundamental human rights. All this is left for future work.

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