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The Liberal Ethics of Non-Interference and the Pareto Principle

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April 22, 2014

Abstract

We analyse the liberal ethics of noninterference applied to social choice. A liberal principle capturing noninterfering views of society and inspired by John Stuart Mill's conception of liberty, is examined. The principle captures the idea that society should not penalise agents after changes in their situation that do not affect others. An impossibility for liberal approaches is highlighted: every social decision rule that satisfies unanimity and a general principle of noninterference must be dictatorial. This raises some important issues for liberal approaches in social choice and political philosophy.

Keywords: Liberalism, Harm Principle, Non-Interference, Impossibility.

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"The legitimate powers of government extend to such acts only as are injurious to others. But it does me no injury for my neighbour to say there are twenty gods, or no god. It neither picks my pocket nor breaks my leg" (T. Jefferson, 1785, *Notes on the State of Virginia*, ed.1982, New York, Norton, p.159)

1   Introduction

Liberal principles in philosophy and social choice express some notion of autonomy that individuals in society should enjoy. In this paper we examine a specific kind of autonomy, couched as a negative freedom. We argue that from a purely liberal perspective this freedom is justified (likely in conjunction with many additional freedoms). Our aim is to show that granting individuals this freedom is highly problematic. The difficulty takes on the form that is typical in social choice theory: if the freedom is granted, then either social choices are not Pareto optimal (social preferences contradict the unanimous agreement of all individuals), or there must be a dictator in society (social preferences always conform with those of one individual).

The main liberal principle is presented in section 2. It expresses the right of the individual to *veto* society from reversing its choices against her preferences after a change of circumstances that concerns (for the better or for the worse) *only* that individual and nobody else (in the sense that all the others are indifferent to whether the change takes place or not). We call this principle *Non-Interference*.[1] For example, suppose that x and y are two social states and that society strictly prefers x. Suppose that x' and y' are exactly the same as x and y except that individual i has suffered a damage (both at x and at y). For example, there has been a water infiltration in her house, either because of negligence or by sheer bad luck. All other individuals are indifferent (in terms of their self-interested preferences) between x and x' and between y and y'. In this case, according to Non-Interference, society should not switch strict preference to y' over x' against i's wishes.

The boundaries of Non-Interference are discussed in section 3. The principle is logically weak in that it does not constrain social choice in a number of situations. Society may or may not support a change that i would prefer to take place: the principle says nothing about that. The principle is also

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[1]In what follows, we use capitals in order to refer to our 'Principle of Non-Interference'. When we discuss liberal views in general, we write 'noninterference'.

silent if there exists even a single agent (except for i) who does not remain indifferent in the move from the unprimed to the primed alternatives. Non-Interference identifies a set of *minimal* conditions under which an individual has a right to make society remain passive after a change in her situation that leaves everybody else unaffected. Unlike Sen's [38] famous *Minimal Liberty* axiom, it does *not* assign absolute rights over pairs of alternatives: it does not identify a personal sphere over which individuals have a (positive) right to have their preferences respected, regardless of other agents' preferences.[2]

While Non-Interference captures a view that, we think, can hardly be rejected on liberal grounds, in section 4 we trace back the broad intellectual origin of the principle more specifically to a classical source, namely John Stuart Mill's essay '*On Liberty*' [27].[3] Non-Interference formalises some of the fundamental insights of the Harm Principle, namely the idea that society should not interfere with individual choices *whenever the latter have no (harmful) effect on others.* Mill insists that the reasons for the change in circumstances of the individual (such as neglect, irresponsibility, effort or luck) are not relevant information for social judgements, provided that nobody else is negatively affected. In its negative prescription, the Harm Principle captures a foundational aspect of liberalism, and one that is often endorsed even by people who do not subscribe to a liberal philosophy. For example, the much discussed notion of 'sustainable development' has a no-harm flavour when it is defined (in the Brundtland report) as "development that meets the needs of the present without compromising the ability of future generations to meet their needs" (Brundtland et al. [6], p.43).[4] And a key principle of modern criminal law is that nobody should be punished unless she causes significant harm (*nullum crimen sine iniuria*).[5]

In section 5, we prove that it is not possible to grant the negative freedom incorporated in the Principle of Non-Interference without infringing on the basic democratic principles of unanimity and non-dictatorship. Our analysis here continues a research programme we started in [23] and [24] within a welfarist framework. The arguments of this paper go significantly deeper,

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[2]For a more thorough discussion, see section 5.2 below.

[3]References to this work will be given in the text simply as (chapter.paragraph).

[4]Wolf [51] provides a thorough analysis of intergenerational justice from a liberal perspective. See also Wallack [49] for an approach based on the Harm Principle.

[5]In a recent contribution, Goodin and Jackson [14] argue that a concern for negative freedom rationally requires the maximisation of expected noninterference. See also the discussion in Sen [39].

as they dispense altogether with the welfarist assumption: individual utilities are not postulated to constitute sufficient information to derive social preferences. Once stripped of its welfare clothes, the nature of the conflict between principles becomes much starker. The key for this breakthrough is the understanding that a crucial aspect of the Harm Principle lies *precisely* in forbidding non-welfarist arguments to determine social preferences in certain circumstances. Hence, the assumption of welfarism turns out to be in fact redundant.

We also discuss many new conceptual points and in sections 6 and 7 we analyse the philosophical implications of the conflict of principles unveiled by the clash between Non-Interference and the democratic principles of unanimity and non-dictatorship. We argue that the impossibility result highlights important and difficult issues for liberal democratic approaches. In particular, we take it as showing that democratic social choices logically require us to consider some individual actions as relevant even when they do not affect others. In section 8, we suggest a possible way out of the impossibility by a weakening of Non-Interference that retains some important liberal intuitions, although at the cost of partially limiting the definition of the individual protected sphere.

2   The Principle of Non-Interference

We analyse the relation between liberal principles of noninterference and democratic rules in the standard social choice theoretic format of transforming individual preference orderings into a social preference relation over social states.[6] Before we present our main principle, two important points should be made, concerning the formal and conceptual framework of the analysis.

First, following standard practice in social choice theory, we interpret a social state x as providing a complete description of the world, which includes everything that may be relevant for individual and social evaluation.

Second, there are many possible interpretations of the statement "social state x is (individually or socially) preferred to social state y" and different concepts of individual and social preferences can be adopted.[7] In this paper we shall not opt for a specific interpretation and focus instead on the general formulation. Alternative approaches will lead to different interpretations of

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[6]We discuss the social choice theoretic approach to liberalism in section 6.2.

[7]See, for example, the classic discussion in Sen [41], [42].

the axioms, and of our main result. As Sen [41], [42] has forcefully argued, this versatility is a major *advantage* of the social choice theoretic framework, and we shall return to this issue in the concluding sections.

To illustrate the basic idea behind the liberal principle analysed in this paper, we break it down into two separate subprinciples, which are of independent interest. The first subprinciple is called the Individual Damage Principle. We use a simple example representing individual preferences over alternative social states.

The Individual Damage Principle

Consider a society with two individuals, Me and You, and four social states, x, y, x' and y'.[8] Our preference rankings over these states are indicated in the table below, where a higher listed state is strictly preferred to a lower listed one, and states at the same height are indifferent:

$$
\begin{array}{cc}
\text{Me} & \text{You} \\
x & y, y' \\
x' & x, x' \\
y & \\
y' &
\end{array}
$$

Consider first the social choice between x and y. Suppose that (for whatever, perhaps non-welfarist, reason) society agrees with me rather than with you, so that x is strictly socially preferred to y.[9] Now consider a change to states x' and y'. I am worse off at each of these states compared to the corresponding states x and y. You, on the contrary, are perfectly indifferent between y' and y, and between x' and x.

What should the social preference between x' and y' be?

We submit that in any noninterfering view of society, the following argument should apply. I suffered some sort of damage at x' and y' compared to x and y, respectively, while you are completely indifferent. The cause of such damage is not clarified. It might, or might not, have been a result of my

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[8]We consider two-person examples only for definiteness and with no loss of generality. *All* of our arguments continue to hold if 'You' is interpreted as 'everybody else'.

[9]The *initial* configuration of *individual* preferences over the alternatives in this example (and in all examples below) is arbitrary: it is chosen only as a concrete illustration of the principle. The key point is that *society* initially strictly prefers x to y but nothing depends on the fact that this coincides with my own preferences, or that it conflicts with yours.

negligence. Perhaps I did not work hard enough, or failed to insure myself. Perhaps it was just bad luck. Be that as it may, you were not involved either by my bad luck or by my negligence. As far as you are concerned, the choice between x' and y' is exactly the same as the choice between x and y. So, we argue, a liberal society should *not reverse* the strict preference between x and y to a strict preference for y' over x' unless this switch does not contradict my preferences. In this case, I prefer x' to y', so society should not choose y' over x'. Switching the social preference to y' in this case would imply a *further* damage for me in addition to the damage that I suffered because of the change from unprimed to primed social states. This would be a kind of social punishment: not only was I harmed by the change in social states, moving down in my preference ranking from x to x', but the *very act of choice by society implies additional harm*, making me move even further down in my preference ranking from x' to y'.

How could such a social sanction be justified? Only by examining the nature of the change in social states, and by construing an argument to the effect that I deserved the adverse change in social preferences (for example, because I was reckless, or because I caused social opprobrium). The point of a (Millian) liberal view is that such examination and argument are irrelevant whenever, like in this case, nobody else was harmed. In such cases, society should not interfere against me. In the situation depicted, the rest of society is completely indifferent, hence in particular it was not harmed.[10]

The Individual Benefit Principle

The Individual Damage Principle captures only part of the intuition behind Non-Interference. In fact, from a liberal point of view, there appears to be nothing special about the fact that I suffered a damage. Had I experienced a benefit, the same arguments made above would remain valid. The crucial point is that everybody else is entirely indifferent to the change in social state, be it good for me or not. That is, an Individual Benefit Principle should also apply.

Consider the same initial situation of choice between x and y as above, and assume again that society prefers x to y. Now consider a change to a

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[10]If the adverse change in my situation were caused by your choices, there may be some room for nonwelfarist concerns. However, the existence of actions taken by you that affect me, but do not affect you in any preference-relevant way, is highly implausible. Perhaps more importantly, even in such case, it would seem all the more desirable to impose that y' be not strictly preferred to x' as a *minimal* requirement of justice.

situation in which the choice is between two different states x'' and y'' in which I have gained some sort of benefit instead of suffering a damage, compared to the corresponding states x and y, while you are completely indifferent to the change. So, our preferences are now represented by the table below:

$$
\begin{array}{cc}
\text{Me} & \text{You} \\
x'' & y, y'' \\
x & x, x'' \\
y'' & \\
y &
\end{array}
$$

What should the social preference between x'' and y'' be? The ethical arguments provided to defend the Individual Damage Principle extend naturally (in a liberal view) to this latter example. The Individual Benefit Principle says that society should not reverse the strict preference between x and y to a strict preference for y'' over x'', possibly except when the switch accords with my own preferences - which is not the case here, since I prefer x'' to y''. In other words, I can veto society from switching to a state that is ranked lower in my preferences after a change that I prefer to the status quo and that does not affect anybody else in any preference-relevant way. Not to grant this veto power would allow a type of (harmful) social interference - without in exchange preventing any harm or granting any benefit to others - that runs exactly contrary to a liberal ethics.[11]

The Principle of Non-Interference

The Principle of Non-Interference is simply the conjunction of the Individual Benefit and the Individual Damage Principles.

Non-Interference is thus the principle according to which *an individual has the right of vetoing society from turning against her preferences in all circumstances of change (for the better or for the worse) for her with respect to which other individuals are indifferent.*[12]

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[11]We further discuss the Individual Benefit Principle in section 8 below.

[12]The Principle of Non-Interference is rigorously stated in section 5 below and it is translated into the formal language of social choice theory in appendix A.

3   A Victorian library example

To shed further light on the implications of Non-Interference, suppose that the examples above depict the social choice concerning access to public libraries in the Victorian era. We now represent preferences with ordinal utility functions and fix specific values. This is both for definiteness, and because it helps us to clarify the differences between the liberal noninterfering views incorporated in our principle, and alternative approaches in social choice (such as utilitarianism, Rawls's difference principle, and so on). Yet, to repeat, nothing in our analysis depends on the possibility of representing individual preferences with utility functions.

Let the previous individual preferences over x, y, x' and y' be summarised in the table below, whose entries are ordinal utility numbers:

	Me	You
x	10	α
y	7	β
x'	8	α
y'	6	β

Suppose that I enjoy reading, but I am poor and can only buy very few books: 10 is the (ordinal) utility number representing my preferences for state x where, among other things, access to public libraries is free, while 7 is the (ordinal) utility number representing my preferences for state y in which society takes an action I dislike, such as a restriction of access to public libraries - either in the form of a general policy (e.g., census-based membership, given that I am poor); or ad hominem (e.g., directly against me, for whatever reason). All other things, except access to libraries, are held constant at x and y.

Next, consider x' and y', and the corresponding ordinal utility numbers. They may arise in a number of possible ways: I have lost my job, due to a general economic downturn, and with no fault of my own; or my house has burnt down, and I had failed to insure myself; or perhaps I have found Charles Darwin's "The Origin of the Species" on a bench and read it. Then 8 is my utility in situation x' in which I have access to libraries, while 6 is my utility in situation y', in which society restricts my access to libraries. Note that I am worse off at x' and y' compared to x and y, respectively: this is obvious if I have been laid off, or my house has burnt down, but it

may happen even when I find the book, if, for example, reading it leads to a crisis in my religious and moral beliefs.[13] Observe further that the book is not borrowed from the library and thus the decision concerning access bears no direct relation with my reading the book.

Your preferences over x and y (and over x' and y') are analogously expressed by the ordinal utility numbers α and β, respectively, and we leave them unspecified. Perhaps you are rich and do not value reading very much, and so would rather have restricted access to public libraries ($\beta > \alpha$). But maybe not, and our preferences over the alternatives coincide ($\beta < \alpha$). Your ranking of the unprimed (and, indeed, of the primed) alternatives is not central for our liberal principle. What does matter is that you regard the choice between x and y in exactly the same way as the choice between x' and y': you are indifferent between situation x and x' (respectively, y and y') which both give you a ordinal utility of α (respectively, β).

Then, the Individual Damage Principle stipulates that *if* society chose open access when I was employed, or my house was still intact, or I had not read the book, then my bad luck, or negligence, or even my action of reading the book should not lead to a change in social preferences. In any case, I should not be penalised - for being unemployed, or for losing my house, or for reading the book - given that nobody is involved in any way that is preference-relevant.

Two key features of Non-Interference should be noted. First, crucially, the principle is not liberal in the sense of prescribing open access to public libraries, that is, it does *not* require that x be socially preferred to y. The choice between x and y may, or may not be in the individual's "protected sphere": Non-Interference is silent about that. Unlike Sen's [38] famous Minimal Liberty axiom, it does not assign absolute rights over pairs of alternatives.

Second, the principle aims to capture only *some* aspects of noninterfering

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[13]Or maybe, after reading the book, I utterly dislike it, or even if I do like it, some of my acquaintances decide to stop socialising with me (*even if* they are not directly affected by knowing that I read it), so that the net effect of reading the book on my welfare may be negative. In Mill's theory, generalised moral reprovation and enforcement via moral coercion following my reading the book are not justified, and the Harm Principle is meant to protect agents from the tyranny of public opinion as much as from legal coercion. Yet, people have no duty to interact with me and in reading the book I may incur "the inconveniences which are strictly inseparable from the unfavourable judgement of others" (*On Liberty*, IV.6).

views of society, and it does not impose any constraints on social choice in a number of cases. If social preferences over x and y were different, then the principle would be silent. If society originally preferred y over x, maybe it should *compensate* me for the damage by switching to a preference for x' over y'. But maybe not. Similarly, if I preferred y' to x', the principle would also be silent on whether I should be compensated by a switch in social preferences to coincide with my own. Further, the principle is silent in cases when *your* welfare changes, too: if you are affected, this may provide prima facie ground for interference. But maybe not. Because we do not aim to provide a complete liberal theory of government, the axiom is appropriately silent on these controversial cases.[14]

Let us emphasise once again a crucial point: we do not aim to provide a complete theory of liberalism. Non-Interference captures only *some* (in our opinion quite minimal) implications of liberal views. The principle is formulated as a purely negative prescription: it requires noninterference in a set of social settings, but it does not characterise all the situations in which noninterference is morally required, and thus it provides no guidance as to when interference is indeed legitimate.

For the Individual Benefit case, I prefer x'' and y'' to x and y, respectively. Maybe I won a lottery; or I have finally been able to solve a difficult mathematical problem; or I have found Gustave Flaubert's "Madame Bovary" on a bench and thoroughly enjoyed reading it. You, instead, are indifferent between x'' and x, and between y'' and y. As before, let us translate these preference statements into the ordinal utility statements summarised in the following table:

	Me	You
x''	11	α
y''	8	β

Then 11 describes my utility in state x'' in which I have access to libraries, while 8 describes my utility in state y'', in which society sanctions me - for winning the lottery, or for solving the mathematical problem, or for picking up the book and reading it - by restricting my access to libraries.[15] In any

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[14]For a discussion of the necessary and sufficient conditions for interference in classical liberalism, see, for example, McCloskey [25]; Berger [3]; Feinberg [10]; and Rees [32].

[15]Again, we assume that the book is not borrowed from the library and thus the decision concerning access bears no direct relation with my reading the book.

case, Non-Interference stipulates that *if* society chose open access when I had not won the lottery, or the problem was still unsolved, or I had not read the book, my good luck, or effort, or even my action of reading the book should not lead to a change in social preferences. I should not be penalised given that nobody else is involved in terms of preferences, so that, in particular, *no harm for others* was caused. Again, the principle is not liberal in the sense of prescribing open access to public libraries, that is, the principle does *not* require that x be socially preferred to y.

In the light of this discussion, it is important to emphasise that Non-Interference aims to incorporate some key liberal intuitions, and so it may conflict with different normative views on distributive justice. For there may be many *nonliberal* reasons for society to switch from a strict preference for x over y, to a strict preference for y' over x', or for y'' over x''. Our choice of translating preferences into ordinal utility numbers can help us to illustrate this point, in the above examples.

Suppose first that $\alpha = 1$ and $\beta = 3.5$. Then one may argue that although society strictly preferred x to y, it should strictly prefer y' to x'. This could be justified, for example, on classical utilitarian grounds, for the sum of individual utilities is higher at x than at y but it is lower at x' than at y'.

Suppose next that $\alpha = 7.5$ and $\beta = 20$. Then one may argue that although society strictly preferred x to y, it should strictly prefer y'' to x''. This could be justified, for example, on Rawlsian grounds, for the welfare of the worst off individual is higher at x than at y but it is lower at x'' than at y''.

In either case, Non-Interference may appear as an objectionable restriction as it requires ignoring all information concerning the size of the changes in welfare, and their potentially relevant implications for total utility or for the welfare of the worst off. The key point to note here is that Non-Interference is simply not meant to capture utilitarian, Rawlsian, egalitarian or other intuitions: it aims to incorporate some liberal views of autonomy and protection from interference. The individualistic and non-aggregative nature of Non-Interference (focusing on changes in the situation of a single agent while keeping everyone else indifferent) is precisely meant to capture widely shared liberal views. Indeed, from a liberal perspective, it is not even obvious that properties concerning informational invariance and comparability of utility should play any role. As Sen argues, the claims of liberty need not be "significantly contingent on interpersonal comparisons. The force of one's claims over one's private domain lies in the personal nature of that

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choice - not on the relative intensities of the preferences of different persons over a particular person's private life" (Sen [43], p.364).[16] For this reason we have formulated Non-Interference purely in terms of ordinal preferences.

4 The liberal roots of Non-Interference

It seems hard in general to find liberal objections to Non-Interference. But we think that Non-Interference does indeed positively capture some substantial aspects of classical liberal and libertarian approaches. This section outlines the conceptual relations between Non-Interference and a principle that is central in the liberal literature, namely John Stuart Mill's 'Harm Principle', and also some interesting links with entitlement theories of justice. The aim is not to show that Non-Interference is a full formalisation of the Harm Principle; nor that it captures all – or even most – of the tenets of liberal and libertarian approaches. Rather, we argue that Non-Interference incorporates some important intuitions shared by liberal and libertarian thinkers.

Consider for example Mill's classic statement of the 'Harm Principle':

> "the only purpose for which power can be rightfully exercised over any member of a civilized community, against his will, is to prevent harm to others ... The only part of the conduct of anyone, for which he is amenable to society, is that which concerns others. In the part which merely concerns himself, his independence is, of right, absolute." (*On Liberty*, I.9).

What does 'exercising power against somebody's will' mean in our framework? It corresponds to society switching its ranking of social states in a way that is contrary to the individual's preferences. It is hard to deny that any exercise of power against one's own will runs against one's preferences. As Isaiah Berlin put it in his famous discussion of Mill's theory, "all coercion is, *in so far as it frustrates human desires*, bad as such" ([4], p.128, italics added).

In his examples, Mill focuses especially on instances of *damage* to the individual: "he already bears, or will bear, the whole penalty of his error; if

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[16]See also Sen [39], [40]. Indeed, one may argue that "libertarian rights clearly involve protection of the rightholder from the effects of interpersonal comparisons of intensity with respect to his private kind of utility" (Riley [33], p.1140).

he spoils his life by mismanagement, we shall not, for that reason, desire to spoil it further" (*On Liberty*, IV.7). In our terminology, he seems particularly keen on the Individual Damage Principle. But upon closer reading, Mill's Harm Principle itself has really nothing to do with whether changes are positive or negative for the individual concerned: his choice of examples is merely a rhetorical device that is related to the audience he was keen to persuade.

Mill's argument is that it is inappropriate to interfere with free individual choices even when they are objectionable (from another individual's viewpoint): the agent will be the subject of generalised disapproval, or disdain, but nothing else. He wants to make his point as stark as possible even in those cases that may have been more controversial for his Victorian readers.

In fact it is clear that Mill thinks that the Individual Benefit Principle should also hold, for example in the passage quoted earlier, when he says "In the part which merely concerns himself, his independence is, of right, absolute". Here he does not mention 'damage' at all, but merely the fact that the events under consideration concern *only* the individual himself (which we express formally with the indifference of everybody else to the change, except for the individual concerned). So a similar principle must apply, from a liberal perspective and almost certainly in Mill's view, to preference-enhancing decisions, acts, or events that do not affect others. This is captured by the Benefit part of Non-Interference.

There are, however, some important conceptual differences between Non-Interference and Mill's Harm Principle. In particular, because our principle prescribes that society should remain passive only in those situations when everybody else is *exactly indifferent* to changes in the circumstances of the individual, Non-Interference is logically weaker than the Harm Principle, in that it explicitly prevents intervention in a smaller set of social circumstances. In fact, a literal reading of the Harm Principle would prevent interference when everybody else is *benefitted* by the change and even in some situations in which changes in one individual's conditions negatively affect others, for not all changes to social states that are ranked lower in some individual's preferences count as harms in Mill's approach - for example, a simple distaste or dislike does not constitute 'harm' (Riley [34], pp.98-99; Arneson [2], section 1). In these cases, Non-Interference imposes no restriction on social choice, while Mill's Harm Principle requires society not to interfere, even though other individuals are not completely indifferent.

To be sure, these considerations are crucial in order to determine the

precise scope of liberal noninterfering views, and we grant that there may well be changes in social states to which other agents are not indifferent that a liberal would not count as harms, so that the conclusion that y' should not be strictly preferred to x' would stand. Yet our aim is to highlight a deep conflict between some key democratic values and the *core* of a liberal noninterfering view of society. For this purpose, we need not define the exact boundaries of the individual's protected sphere. On the contrary, it is desirable to focus on the logically weakest principle that captures one fundamental insight: whatever other situations there may be in which individuals should be protected, if all other agents are *indifferent* to the change in social states affecting an individual - *whatever its source* - then there is no ground for interference.[17]

Another aspect of Mill's description of the Harm Principle that our formalisation does not pay attention to is that the former is sometimes couched in *agency* terms, e.g.:

"the sole end for which mankind are warranted, individually or collectively, in interfering with the *liberty of action* of any of their number, is self-protection." (*On Liberty*, I.9, italics added).[18]

The agency aspect is not made explicit in our framework, but this is not essential to our analysis of the Harm Principle. Mill's analysis aims to establish a protected sphere for self-regarding *conduct*, a more general concept than action per se, and there are many forms of interference that are objectionable from a liberal, Millian perspective, which do not affect an agent's liberty of action or where the crucial agency decision does not rest with the individual herself (see, for example, Riley [34]; Jacobson [17]; and the discussion in Sen [42], pp.141-2). All relevant forms of unwanted interference will have some preference implications. Besides, as already noted, we aim to capture only *some* aspects of the Harm Principle. Our principle rules out interference only in a core of social situations, namely when interference runs

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[17]Our focus on this core of social situations also allows us to eschew all discussions of the difference between "private and public versions of the harm principle" (Danley [8], p.420) as well as between harm caused by action and harm caused by inaction (see, e.g., Berger [3], p.255ff and Wellman [50]). By assuming that the other agents are indifferent, the axiom assumes *all* types of harm away and makes these distinctions less relevant *in our analysis*. We further discuss the notion of harm in section 7.2.

[18]In the general context of Mill's theory, self-protection is not to be interpreted literally, and may be extensively understood to refer to well-being and not strictly to physical integrity only.

contrary to the individual preferences. Formally, Non-Interference admits interference that goes in the direction of the individual preference, in the form of a compensation or support, though even these forms of interference might be inadmissible in a liberal view.

The previous discussion highlights the broad conceptual relation between Non-Interference and Mill's Harm Principle. Yet, in closing this section, it is worth stressing again that the notion of noninterference is central in *all* classical liberal and libertarian approaches, and our axiom captures some widely shared intuitions. In libertarian theories, protection from interference is the essential ingredient of (legitimately acquired) private property, and negative rights (such as those incorporated in our axiom) are foundational (Nozick [29], [30]; Danley [8]; Wolf [51]; Arneson [2]). In Locke's theory, noninterference on property follows from noninterference on people's individual attributes and choices, as it derives from the rights correlated to self-ownership. In entitlement theories of justice, a central role is played by the so-called *Lockean proviso*, according to which the initial appropriation of natural resources in the state of nature is legitimate if 'there is enough and as good left for others' (Nozick [30]; Kymlicka [19]; Arneson [2]). The force of the proviso arguably derives from its being an application of the Harm Principle: if there is enough and as good left for others, then appropriation cannot possibly harm them, and thus nobody can complain or demand 'interference' on property claims.[19] Noninterference is also implicated in the transfer of property: if it is voluntary and without externalities, it causes no harm and therefore should not be interfered with.

A possible interpretation of the notion of noninterference in these approaches is the standard Paretian view: any voluntary transactions (without externalities) are definitionally Pareto-improving and so they should be protected from interference. In a social choice framework, if x is preferred to y by two transacting agents, while leaving everybody else unaffected, then x should be socially preferred to y. Indeed, the Lockean proviso itself may be reformulated as requiring that the appropriation of natural resources does not cause a state that is lower in somebody's preference ranking: in the Lockean state of nature, let x be the social state where private acquisition of some resource is allowed and let y be the social state where it is not. Then, the

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[19]As Wolf ([51], p.799) has persuasively argued, "The proviso functions to stipulate conditions in which this presumptive claim [to property] will be undefeated, or overriding, and will therefore impose *duties of noninterference* on others". See also Gibbard ([13], pp.28-30); Kymlicka ([19], p.308); and Arneson ([2], pp.329-330).

Lockean proviso could be interpreted as stating that private acquisition is legitimate if everybody prefers x to y (see, e.g., Miller [28] and Wolf [51]).[20]

Non-Interference is quite different and, in a sense, weaker in that it does not stipulate conditions for x to be socially preferred to y. Rather it imposes a form of consistency on libertarian judgements: whatever the (possibly non-welfarist) libertarian criteria that may lead to x being socially preferred to y, Non-Interference specifies some conditions under which the same (possibly nonwelfarist) libertarian criteria apply and social judgement should not change in a way that is adverse to individuals. Consider again the issue of the appropriation of natural resources in the Lockean state of nature. Suppose that the choice between x and y in the numerical examples in section 3 above is a choice between allowing me to appropriate a natural resource (x), or not (y). For example, I grab a plot of land and then subsist on it. *If* society prefers x to y, then it follows that whatever I get from the resource, or whatever luck (misfortune) I have with it, if nobody else is affected by my acts or decisions (due perhaps to the limited economic interactions and the abundance of natural resources in the state of nature), and if I still prefer to appropriate the resource, society should not actively prevent me from doing it. Given that everybody else is indifferent, the legitimacy of my acquisition would not be diminished by my spoiling or depleting the resource, regardless of the source of change in welfare for me from x and y to x' and y'.

5　The impossibility of Non-Interference

Consider a society with a set N of individuals. A generic individual in this society is denoted with the letter i. Let X denote the set of conceivable social states that must be ranked by society, and assume that each agent has a given preference ordering over alternatives in X, denoted generically as x and y, which represent conceivable social states. An alternative x in X provides an exhaustive description of the world, including everything that may be relevant for either individual or social evaluation. We conceive of the collective choice problem in the standard way: we aim to identify some

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[20]This could be imagined as the outcome of a sequential process in which one analyses private acquisition by one agent at a time and a series of Pareto-improving acquisitions take place; if some acquisition is not Pareto-improving - there is not 'enough and as good' left for others, - then the process stops and private property is not legitimate. Under transitivity, the two approaches are logically equivalent.

desirable properties that any social ranking of alternatives should satisfy, for a given set of individual preferences.[21]

The following two axioms are standard. They incorporate widely shared views on the democratic nature of social choice, namely the principle of unanimity in collective decision making and the idea that no individual shall have his or her own preferences prevail in all possible choices:

Weak Pareto: For any two social states x, y, if all agents strictly prefer x to y, then x must be strictly socially preferred to y.

Non-Dictatorship: For every agent i, there exist two social states x, y such that i strictly prefers x to y but society weakly prefers y to x.

Next, we introduce the main principle incorporating a liberal view of autonomy and noninterference:

Non-Interference: Starting from two social states x and y for which x is strictly socially preferred to y, consider two different social states x' and y' such that

(1) either agent i strictly prefers x to x' and y to y', or she strictly prefers x' to x and y' to y;

(2) everybody else is indifferent between each state x, y, and the corresponding primed state, x', y';

(3) agent i strictly prefers x' to y'.

Then society should *not reverse* the strict preference between x and y to a strict preference for y' over x'.

The three conditions defined so far are incompatible.

Theorem 1 *: There is no social preference ordering that satisfies Weak Pareto, Non-Dictatorship, and Non-Interference.*

A formal proof of Theorem 1 is in appendix A, but the logic of the impossibility result can be illustrated by means of the following two-person example.

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[21] At a formal level, it is worth noting that our impossibility result is demonstrated in the context of a given profile of individual preferences - the so-called '*single-profile*' setting - rather than in the classical Arrovian 'multi-profile' framework with many varying individual preference profiles (see Fleurbaey and Mongin [12] and Feldman and Serrano [11]). None of the conditions of our impossibility result (Weak Pareto, Non-Dictatorship, and Non-Interference) cuts across different preference profiles. We discuss some implications of our framework in section 7.1 below.

5.1 The neighbouring (almost) desert islands

Andrea is young, vegetarian, and loves hiking and meeting new people (but she does not wish to live with anyone). Bob is middle-aged and does not enjoy company, but has a passion for beer and fishing. They live in two different islands and each of them is the only inhabitant of their island. The two islands are sufficiently far apart that, on the whole, they can live their lives independently, but they are sufficiently close that a number of decisions must be taken collectively.

In particular, Andrea and Bob have to take two decisions concerning the management of the canal between the islands.

Consider first the choice between two social states x and y, where the only difference between the two states is that in x a boat with a large number of young people partying is allowed to sail along the canal, whereas in y it is barred from the canal. Let the following utility profiles represent individual preferences over the two states (as before, this is only for definiteness and illustrative purposes, and utility numbers are a mere representation of ordinal preferences).

The boat trip

	Andrea	Bob
x	25	12
y	10	23

Next, they have to choose between two social states p and q, where the only difference between the two states is that in q Bob is allowed to fish in the canal, whereas in p he cannot. We represent the agents' preferences over these states with the following utility profiles.

Fishing in the canal

	Andrea	Bob
p	15	18
q	7	27

When it comes to choosing between x and y, and between p and q, their preferences conflict: Andrea would like the boat to sail in the canal, and to ban fishing, while Bob ranks the options in exactly the opposite way.

They reject dictatorial social arrangements and so decide to adjudicate these conflicts so that each of them has their most preferred choice respected once. Without loss of generality, suppose that Andrea's preferences dominate in the choice between x and y, while Bob's preferences are relevant in the choice between p and q. Hence, they decide to allow Bob to fish in the canal *and* the boat to sail by.

In other words, x is (strictly) socially preferred to y and q is (strictly) socially preferred to p.[22]

Now consider a change from states x and y to two different states x' and y' *which affects only Andrea*: perhaps she has broken her leg while hiking in a well-known dangerous spot; or maybe she has been forced to hunt due to a disease that has destroyed all edible plants in her island. Thus, she prefers each of the original states x and y compared to the corresponding profiles x' and y'. Bob, instead, does not care at all whether the state is x' or x, and whether the state is y' or y:

	Andrea	Bob
x'	14	12
y'	9	23

Similarly, consider a change from states p and q to two different states p' and q' *which affects only Bob*: perhaps a hurricane has destroyed his dwelling; or maybe he has fallen ill after trying to distil an alcoholic drink from a plant growing in his island. He prefers each of the original states p and q to the corresponding new states p' and q'. Andrea, instead, does not care at all whether the state is p' or p, and whether the state is q' or q:

	Andrea	Bob
p'	15	16
q'	7	21

What should the social preference between the alternatives be? Can Andrea and Bob design a liberal democratic social decision rule that incorporates both unanimity and a noninterfering view?

Because they had decided to allow Bob to fish in the canal, then by Non-Interference they should not switch to forbidding it. To do this after

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[22] As proved in appendix A, the assumption that q is strictly socially preferred to p and that x is strictly socially preferred to y entails no loss of generality because by Non-Dictatorship and Weak Pareto two such pairs always exist.

Bob has fallen ill, or has seen his dwelling destroyed would be an unjustified punishment for Bob, given that Andrea is unaffected. Therefore q' should be (weakly) socially preferred to p'.

Similarly, by Non-Interference, deciding to forbid the boat to sail by after Andrea has broken her leg, or has had to hunt against her vegetarian convictions would be an unjustified punishment for her, given that Bob is unaffected. Therefore x' should be (weakly) socially preferred to y'.

Observe, however, that they would unanimously strictly prefer p' to x', and y' to q', and this brings them to a deadlock. For they end up with a social preference cycle: p' is strictly preferred to x' (by Weak Pareto), which is weakly preferred to y' (by Non-Interference), which is in turn strictly preferred to q' (by Weak Pareto), which is - finally - weakly preferred to p' (by Non-Interference).[23]

5.2   Non-Interference and Minimal Liberty

It is instructive to compare our result with Sen's [38] classic contribution. In Sen's [38] *Minimal Liberty* axiom, liberalism is formalised as the requirement that an individual has a sphere of complete control on society's preferences over minimal subsets of social states. Sen's *Impossibility of the Paretian Liberal* can thus be interpreted as identifying a contradiction between the Pareto principle as a democratic rule (unanimity) and a respect for absolute libertarian rights (Riley [33]). We follow Sen by identifying a conflict between democratic rules (the unanimity principle and nondictatorship) and a liberal right (to Non-Interference), but unlike Sen the conflict is *not* due to a pre-assigned physical sphere which is of exclusive competence of the individual. In our approach it is not the nature of the social states that defines individual freedom: it is the fact that the rest of society does not care about certain social states.

Conceptually, Sen's axiom captures individual autonomy by defining a sphere of *positive* freedom, overriding in principle concerns about other people's preferences. This is an important difference from our Principle of Non-Interference, which embodies a notion of personal autonomy in terms of *negative* freedom, namely as the protection from interference under certain

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[23]The 'Neighbouring (almost) desert islands' example is only meant to illustrate the impossibility and it is based on a specific initial configuration of individual preferences. As argued in appendix A, the same conclusion holds for *any* initial configuration of individual preferences.

circumstances not involving others (that is, in the language of preferences, circumstances to which others are indifferent). Similarly, if Sen's Minimal Liberty axiom is understood as a "social choice formulation of rights" (Sugden [45], p.128ff), then it can be interpreted as assuming the existence of a personal sphere over which individuals have a right to have their preferences respected, regardless of other people's preferences. In the language of rights, the Principle of Non-Interference would capture a different, and arguably weaker type of right, namely the right to be protected from adverse changes in strict social preferences, when others are unaffected in any preference-relevant way.

Formally, one way to read Non-Interference is as a 'local decisiveness' condition. Sen's Minimal Liberty, for example, asserts that an individual i must be decisive *at least* on one pair of alternatives. Non-Interference asserts that an individual i must be decisive on *every* pair of alternatives that is reached through certain 'precedents' (society has already demonstrated a strict preference between x and y *and* the only change involved concerns i alone). The individual is decisive not because of the nature of the alternatives but on the basis of the ranking of society itself in another situation which is *identical* to the one under consideration when seen from the viewpoint of all other members of society. Once again, observe how the required individual's decisiveness is weak since she cannot prevent society's indifference in the face of her strict preference.

A final point worth noting is that in the interpretation (but not in the formulation) of Minimal Liberty, if two states x and y are in individual i's protected sphere, they are identical except for something that only concerns i. In a sense, Non-Interference makes this 'ceteris paribus' intuition explicit by laying out the condition that everybody else be indifferent except i. But the difference between the two axioms incorporating liberal principles is by no means purely conceptual. A social decision rule that declares *all* conceivable alternatives, x, y, to be indifferent violates Sen's Minimal Liberty in that it rules out the existence of a minimal protected sphere over which individual *strict* preferences are respected. However, it satisfies Non-Interference because - definitionally - it never switches strict social preferences against any individual.

6 The axiomatic approach to noninterference

We have formalised a Principle of Non-Interference applied to social choice and studied its implications. Theorem 1 proves that there is an inconsistency between liberal approaches to social decision making, as captured by the Principle of Non-Interference, and the basic democratic principles of unanimity and non-dictatorship. The next question, then, concerns the implications of this inconsistency for liberal approaches. For "The impossibility ... just brings out a conflict of principles ... The really interesting issues relate to the implications of the conflict. There are implications both for the evaluation of outcomes and for choice of decision procedures" (Sen [41], p.28).

One possible answer is that the impossibility actually has no significant implications for liberal democratic approaches. Two alternative lines of argument can be adopted to that effect. One may deny that our axiomatic framework is relevant to analyse the liberal doctrine of noninterference. Alternatively, even granting that the conceptual framework of the analysis is appropriate, one may argue that the specific axioms adopted do not adequately capture our liberal or democratic intuitions, and can be dropped or easily weakened, thus yielding possibility results.

In this section, and in the next, we analyse the two objections in turn and defend the relevance of Theorem 1 for liberal democratic approaches.

6.1 The existence of self-regarding acts

It might be objected that all meaningful individual acts have an effect on others,[24] and so Non-Interference is empirically irrelevant. In Mill's own words: "No person is an entirely isolated being; it is impossible for a person to do anything seriously or permanently hurtful to himself, without mischief reaching at least to his near connections, and often far beyond them" (*On Liberty*, IV.8). In the Victorian library example in section 3 above, other agents - for example, people holding strong views on morals, - might be affected by my reading the book, or by my not having insured the house, or maybe even by my being unemployed, and therefore they would not remain indifferent between the (primed and unprimed) alternatives.

This criticism is not specifically aimed at our principle, though, and it is typically moved to all liberal views based on some version of the Harm

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[24]See, for example, the discussion in Rees ([32], pp.171ff).

Principle. If correct, it would indeed be quite damaging for such liberal approaches but, if anything, from a theoretical viewpoint it would reinforce our critical analysis. Perhaps more importantly, ours is a *logical* inquiry into the consistency of liberal approaches accepting one of their core premises, whereas the criticism focuses mostly on an empirical issue, which aims at disputing the relevance of the premise itself.

From a logical viewpoint, it is certainly possible to draw a meaningful distinction between self-regarding and other-regarding conduct, and the idea that *all* conceivable events or acts have significant effects on others is not plausible. It would be odd to care about the toothpaste brands used by other people (with the possible exception of the marketing director at Colgate). All the classical *normative* Sen examples of others' activities that people *should* not care about according to a liberal view could be used in a *positive* sense: it is a matter of fact that people normally do not care about whether others sleep on their belly or what colour they paint their walls. Many actions of this type acquire significance only because they are attached a moral or symbolic value, while continuing to materially leave other people unaffected: imagine that sleeping on one's belly contravened some religious obligation.

Many liberals have defended the view that an empirically meaningful distinction between self-regarding and other-regarding acts exists.[25]

6.2   The social choice approach to rights

A different objection may be that the Principle of Non-Interference does not properly capture an essential aspect of liberal views. In particular, as in the case of Sen's *Minimal Liberty* axiom, it may be argued that the social choice interpretation of (liberal) rights is inappropriate (see, e.g., Sugden [45] for an articulate critique[26]). On this view, liberal approaches require a purely procedural formulation of rights and thus cannot be captured in a social choice framework, especially in a preference-based context. "Rights do not determine a social ordering but instead set the constraints within which a social choice is to be made, by excluding certain alternatives, fixing others,

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[25]See, for example, the discussion in Berger ([3], p.243ff) and Riley ([34], chapter 9). One context in which the distinction seems particularly meaningful concerns intergenerational justice since not *all* actions of the present generation have effects on removed generations (certainly not on predecessors, but likely also on successors).

[26]See also McQuillin and Sudgen [26] for a state of the art mathematical formulation of the procedural approach to rights.

and so on" (Nozick [29], p.62). This is not the place for a thorough review and discussion of the criticisms of social choice theoretic analyses of liberal approaches.[27] But three points should be made here to suggest that they are not conclusive in general, and in particular that they do not provide solid ground to reject Non-Interference.

First, it is doubtful that textual evidence supports the idea that all of the relevant aspects of Mill's theory can be properly captured only by a purely procedural formulation of rights, where "the focus of attention is on the procedures of social choice and not on the outcomes of those procedures" (Sugden [45], p.132). In many passages in which Mill argues for liberty he explicitly rejects this view. In the opening pages of his essay, Mill writes that "It is proper to state that I forego any advantage which could be derived to my argument from the idea of abstract right as a thing independent of utility" (*On Liberty*, I.11). Even more explicitly, Mill goes on to say that "I regard utility as the ultimate appeal on all ethical questions; but it must be utility in the largest sense, grounded on the permanent interests of man as a progressive being" (*On Liberty*, I.11). And although the consistency between his analysis of liberal principles and his utilitarian approach has been questioned, a number of scholars have forcefully argued that Mill is best interpreted as a "utilitarian liberal" (see, e.g., Riley [33], [34], Gray and Smith [15], Wallack [49]). Furthermore, in Mill's own formulation, the Harm Principle is concerned with actions that affect other people's welfare, and not only their rights or freedoms, and "the formula 'coercion to prevent coercion' used by some liberals is distinct from Mill's 'coercion to prevent harm'" (McCloskey [25], p.147).[28]

Therefore, while Mill obviously did not take a position on the social choice analysis of liberal rights, such an analysis seems at least consistent with Mill's overall philosophical approach and can capture some key aspects of his doctrine of liberty, even granting that it does not capture it in its entirety. Our formulation of Non-Interference, for example, is precisely meant to incorporate the consequentialist, if not straight welfarist (or preference-based) aspects of Mill's approach. Consider the alternatives x and y in the antecedent of the axiom. It may well be that x was strictly socially preferred to y because of the nature of the alternatives (and not merely because of the preferences

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[27]The literature here is too vast for a comprehensive list of references. We refer the reader to the excellent discussion in Sugden [45] and the references therein.

[28]After all, according to Mill, "liberty consists in doing *what one desires*" (*On Liberty*, V.5, italics added).

or utility configuration). Hence, in principle, as the choice between x' and y' involves different alternatives, a non-welfarist might well prefer to switch to a preference for y' over x'. What Mill is saying is that, in the circumstances described, certain non-welfarist arguments are not valid: whatever non-welfarist argument was given to socially prefer x to y, this argument must still stand for x' and y', *given* that all other individuals are unaffected. The lack of harm to others (note well, an itself welfarist, or preference-based proposition) possibly justifies ignoring certain non-welfare features of the social states (e.g. the moral opprobrium inherent in the actions that cause them).[29]

Second, the defence of a *purely* procedural formulation of rights is not entirely convincing. Even in deontological approaches such as Nozick's, considerations about outcomes do play an important (albeit possibly implicit) role, and this is true in particular for those aspects that relate to noninterference. Consider, for example, the Lockean proviso, according to which the initial acquisition of unowned resources is justified as long as 'enough and as good is left for others' of the resources appropriated. Locke himself defends the relevance of the proviso by claiming that, given the abundance of natural resources at his time, acquisition could take place "without straitening anybody" (*Second Treatise on Government* [20], Chapter V, Sect. 36), which naturally lends itself to a preference-based, if not straight welfarist interpretation.

Miller ([28], p.406-7) actually argues that the relevant part of the proviso is 'as good', rather than 'enough', and that 'as good' should be interpreted in welfarist terms. In Nozick's theory, "the crucial point is whether an appropriation of an unowned object worsens the situation of others" (Nozick [30], p.175) and many authors have argued that a (broadly defined) preference-based approach provides the most promising interpretation of the proviso, which solves a number of conceptual difficulties, such as those related to heterogeneous land or to the rights of future generations (see, e.g., Sanders [36]; Wolf [51]), which would make it virtually impossible to satisfy the proviso.[30]

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[29]As noted in section 4 above, not all changes in social states that adversely affect agents' in terms of their preferences count as harms in Mill. However, this is not relevant for our discussion here because insofar as nonwelfarist considerations count in Mill's Harm Principle, they make it logically stronger than our Principle of Non-Interference. Hence, whatever its philosophical relevance, this argument cannot provide a strategy to avoid the impossibility result.

[30]See, for example, Miller ([28], pp.406ff) and the discussion in Kymlicka ([19], pp.308ff).

In general terms, the rationale of the Lockean proviso may be stated as requiring that "no individual be made worse off (in some appropriate sense) by the appropriation (compared with the situation before appropriation)" (Vallentyne [47], p.7).[31],[32]

Third, even granting the importance of procedural aspects in the definition of liberal noninterfering principles, nothing prevents them to be incorporated into a social choice theoretic framework. As Sen [41], [42] has convincingly argued, in fact, the interpretation of the social preference relation need not focus exclusively on the intrinsic characteristics of the social states and can incorporate a social judgement of the process yielding certain outcomes. "One of the advantages of the general social-choice formulation of liberty is the opportunity that the representational flexibility of social choice gives to bring in alternative interpretations, depending on the nature of the problem being discussed" (Sen [42], p.144).

Thus, the Principle of Non-Interference can be interpreted consistently with the libertarian emphasis on procedures if, for example, the social preference relation reflects also a judgement about procedures, or if one adopts a "normative-choice interpretation" (Sen [41], p.6). In the former case, Non-Interference should be interpreted as saying that, given the way in which society arrived at the decision between x' and y', - including, crucially, the other agents' indifference to the change from the unprimed states, - then y' should not be regarded as strictly better than x'. In the latter case, the interpretation in terms of *liberty as control* (Sen [41], p.17) is even clearer: Non-Interference says that decision making in society should be so arranged

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Sanders ([36], p.380, fn.18) actually argues that "Nozick suggests an interpretation that might make use of indifference curves" .

[31] A welfarist approach is even more cogent in *left-libertarian* approaches, which strenghten the proviso by requiring that compensatory payments be made. See, e.g., Steiner [44] and Vallentyne [47].

[32] This is not to say that procedural aspects are irrelevant in the analysis of liberal noninterfering views. As Sen [43] argues, one should distinguish an opportunity aspect of liberty (liberty helps us achieve what we would choose to achieve in our private domains); and a process aspect of liberty (liberty leaves us directly in charge of choices over private domains, no matter what we may or may not choose). The opportunity aspect (characteristic of the social choice approach) is certainly not sufficient but "It is also important to avoid the opposite narrowness of concentrating exclusively only on the process aspect of liberty ... Important as processes are, this cannot obliterate the relevance of the opportunity aspect which too must count. Indeed, the importance of effectiveness in the realization of liberty in one's personal life has been recognized as important for a long time" (Sen [43], p.364).

that an individual has the right of vetoing society from choosing against her preferences in all circumstances of change for her to which other individuals are indifferent.

In summary, we come back to the point that Non-Interference does not capture all that is relevant in a liberal, or libertarian, approach. Rather, by focusing on a very specific and restricted set of configurations of alternatives, and thanks to the versatility of the social choice theoretic framework, Non-Interference does incorporate some core liberal insights concerning the right of individuals to be protected from unjustified interference.

7   Objections

Even if one accepts the social choice theoretic framework as appropriate to analyse rights and the liberal notion of noninterference, it may be objected that the specific axioms chosen do not adequately capture the key tenets of liberalism and the essential aspects of democratic procedures, and can be dropped or easily weakened, thus yielding possibility results reconciling the key intuitions of liberal and democratic approaches. In this section, we analyse various possible objections to our axioms and show that they do not provide the foundations for satisfactory ways out of the impossibility result.

7.1   Democratic procedures

One reason why the conflict of principles identified by Theorem 1 might be deemed not very damaging for liberal democratic approaches is that our conception of democratic procedures is considered inadequate or too stringent. We shall examine three sets of objections.

Completeness

One way to avoid the inconsistency is to drop the requirement that the social preference relation be able to rank all possible alternatives. This may be a way of acknowledging that in societies characterised by significant heterogeneity of preferences and values, there may well be choices that are extremely difficult to adjudicate. Yet, at a theoretical level, this does not represent a *solution* to the conflict of principles. It is rather a way of bypassing it by declaring society unable to choose in those situations that create the conflict. A similar objection can be moved to any attempt to avoid the

impossibility by weakening or dropping the transitivity of the ranking, or our condition that the economic environment be sufficiently 'rich' (see appendix A).

Unanimity

The Pareto principle is widely considered as a fundamental principle capturing both a notion of economic efficiency and a basic tenet of democratic decision-making. Yet, the clash between Minimal Liberty and Weak Pareto has been famously interpreted by Sen as suggesting "the unacceptability of the Pareto principle as a universal rule" (Sen [39], p.235). On this basis, he argues against the "mechanical use of the Pareto rule irrespective of context" (Sen [39], p.219): Weak Pareto embodies a (limited) welfarist perspective and does not incorporate any information concerning the sources of preferences (and utility) and the motivations underlying them. The classic example concerns sadistic preferences, but more generally, following Dworkin ([9], p.234) one may distinguish two types of preferences of an individual: "a *personal* preference for his own enjoyment of some goods or opportunities, or an *external* preference for the assignment of goods and opportunities to others." Then one may argue that only personal preferences should have moral weight, while external preferences (whether based on political, moral or purely psychological motives) should be discarded. More generally, "The fundamental issue really is whether individual preference orderings alone provide enough of a basis for a social judgment without going into the causation of and the motivation behind these preferences" (Sen [39], p.226).

A comprehensive discussion of Sen's criticism of the Pareto principle and of welfarism, and of the vast literature it has generated goes well beyond the boundaries of this paper; but two points should be made here that are directly relevant to our discussion.

First of all, it is not immediately clear that a compelling case for abandoning the Weak Pareto principle can be easily provided. Or, more precisely, that such argument can be constructed *within the (classical) liberal approaches analysed in this paper.* One basic liberal principle is precisely respect for people's autonomously developed views and tastes, and the idea of preference autonomy is fundamental in liberal (and not only) approaches (Rawls [31], p.448; Harsanyi [16], p.55) and it is foundational in Mill's own rejection of paternalism and in his defence of the Harm Principle: "He cannot rightfully be compelled to do or forbear because it will be better for him to do so, because it will make him happier, because, in the opinions of others,

to do so would be wise or even right" (*On Liberty*, I.9).

Of course, respect for individual preferences does not mean that society should necessarily act on those preferences when it comes to collective choices. "The reasons ... for excluding 'moral' and 'antisocial' preferences from the determination of individual utility functions are not strictly inconsistent with [the Pareto] principle, because they do not assert that the fulfillment of these preferences is not good for the individuals in question. All that is asserted is that these preferences 'have no claim on us' - that is, on society - for their fulfillment. Denying that they have such a claim need not involve 'telling people what is good for them' - it represents a moral judgment, not a judgment of value that is in conflict with theirs" (Scanlon [37], p.28).

The moral force of this argument, however, arises in situations when individual interests conflict. We may ask what preferences give rise to a moral claim when the interests of different individuals clash and some are required to make a sacrifice for others, or the satisfaction of external preferences would harm (in some relevant sense) others. But the key point here is precisely that there is no such conflict in the case of a Pareto improvement (especially in the sense of *Weak* Pareto): no one requires anyone else to make a sacrifice and no one needs to assert a moral claim over anyone else.

"To reject a Pareto superior outcome [x] for a Pareto inferior outcome [y] because we disapprove of the preferences that make [x] the Pareto superior outcome would fail to show liberal respect for the principle of preference autonomy. We would be telling individuals that they should not seek to satisfy their preferences, *even if no one objects*, because we do not respect their preferences. This intrusion into individuals' intrapersonal comparison of values would seem inconsistent with liberal principles" (Chang [7], p.211, italics added).

Second, Sen's [38] impossibility of a Paretian liberal raises doubts on Weak Pareto because it uncovers a direct conflict between a non-welfarist axiom incorporating a minimal view of liberalism and the Pareto principle, *and* because the conflict arises from meddlesome preferences. Neither issue arises in our analysis. For, at the logical level, Non-Interference and Weak Pareto are not in conflict: the adoption of the liberal principle does not automatically lead to the violation of unanimity, and so unlike in Sen [38], there is no direct trade-off between the two axioms. At the conceptual level, the impossibility result does *not* arise from the clash between a non-welfarist liberal principle and the weak form of welfarism embodied in Weak Pareto because, as we have argued above, Non-Interference itself incorporates some

relevant welfarist (or, more precisely, preference-based) considerations.

Moreover, it is unclear that the type of preferences that individuals have plays any role in the impossibility uncovered in Theorem 1 above. Formally, unlike in Sen [38], our result does not depend on the Unrestricted Domain assumption, which requires that all logically conceivable combinations of preferences are possible, and which yields Sen's impossibility result when some individuals have meddlesome preferences. Our framework is a 'single-profile' one: instead of assuming a social decision rule that converts all preference profiles into a social ordering (while respecting some desirable properties that possibly cut across different profiles), we have fixed a set individual preferences. Our properties apply to that given profile, but our result holds for *any* given profile, provided the set of alternatives is sufficiently rich: meddlesome preferences, or indeed any preference externalities play no role in the analysis. More generally, the impossibility result would still stand if we interpreted agents' preferences as 'laundered preferences' to exclude all morally objectionable, meddlesome, nonliberal views. But then, unlike in Sen's case, it is not clear what criterion one might adopt to qualify the Weak Pareto principle: certainly not any weakening would do, while an unqualified abandonment seems undesirable.

As Sen himself forcefully put it, "there is something very central in the idea that preferences unanimously held by all members of a community cannot be rejected by that community" (Sen [39], p.235).

Dictatorship

A different objection is that not all dictatorships are problematic in our single-profile framework. In the standard Arrovian context, the existence of a dictator implies that there is an agent whose ranking between any two pairs of alternatives prevails *for any possible profile of preferences* - an obviously undesirable property. In a single-profile world, instead, there are situations in which the presence of dictators does not seem in contrast with a democratic ethos. For example, according to our *Non-Dictatorship* axiom, agents who are indifferent between all alternatives are trivially dictators, and so are all agents in society whenever they all have exactly the same preferences and Weak Pareto is satisfied. Similarly, under majority voting, if a majority of the population have identical preferences, they are all dictators according to our axiom. These forms of dictatorships seem hardly objectionable and may raise doubts on the implications of our results, or - more deeply - on whether our *Non-Dictatorship* axiom properly captures our intuitions on democratic

procedures.[33]

This conclusion is unwarranted and the implications of Theorem 1 maintain all of their normative force. At a general theoretical level, it is true that in a single-profile world there may be - in principle - some preference profiles such that dictators are not of great moral concern. This happens when the dictator has no real influence on social outcomes, for example, because there is no real conflict of interest as all agents have identical preferences, or the dictator actually has no strong views about alternative allocations. Yet Theorem 1 continues to hold in situations in which people do have strong views about social choice and desirable allocations, and their preferences are in conflict, and the existence of a dictator is indeed problematic in these cases. Formally, our analysis holds *for any given profile of preferences*, and "while in some cases an innocuous dictatorship is acceptable, in many other cases it is very much unacceptable" (Feldman and Serrano [11], p.22).

Moreover, our assumption on the structure of alternatives rules out the innocuous dictatorships: by assuming the context in which choices are made to be sufficiently rich, we can focus on the core situations of interest for democratic approaches, namely those where democratic procedures are necessary to adjudicate deep conflicts due to significant heterogeneity.

Therefore, as in the standard Arrovian context, dictatorships involve "(1) in politics, an extreme sacrifice of participatory decisions, and (2) in welfare economics, a gross inability to be sensitive to the *heterogeneous interests of a diverse population*" (Sen [43], p.351, italics added).

7.2   Harmless wrongdoings

Even if one concedes that the social choice approach to liberal rights is not fundamentally misguided *in general*, one may still object *specifically* to the standard consequentialist reading of the Millian doctrine of liberty in terms of harm to others - which underlies also our Principle of Non-Interference - and question harm-based approaches in favour of a rights-based approach to liberalism. In particular, various authors have recently argued that Mill's theory does not depend on the possibility of acts that have no impact on others: Mill holds that certain acts are within individuals' rights, because they are of a type with regard to which individuals need liberty in order

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[33]The discussion of 'Innocuous dictatorships' in this subsection draws from the thorough analysis in Feldman and Serrano [11].

to develop their individuality, which is a prerequisite to human happiness.[34] The fact that some acts do or do not harm others is irrelevant in order to determine whether they belong to the individual protected sphere (Berger [3], especially chapter 5; Vernon [48]; Jacobson [17]; Ripstein [35]).

The rights-based approach to the liberal doctrine of liberty raises many complex and important issues, both exegetical and philosophical. In the rest of this section, we shall discuss only those aspects of the rights-based approach that are directly relevant for our discussion.

Two preliminary points should be made in this respect. First, exegetical issues are not central for our arguments, for our aim is not to provide a complete formal interpretation of Mill's doctrine of liberty. The Principle of Non-Interference captures *some* important (and widely shared) liberal and libertarian intuitions, and it is of sufficient interest in itself to warrant investigation. It is important to note, however, that the discussion in section 4 above is well grounded exegetically and Non-Interference has clear liberal roots that can be traced back to Mill's theory. Indeed, as admitted also by critics, the consequentialist reading of the Millian doctrine of liberty in terms of harm to others (which underlies our Principle of Non-Interference) represents the *standard interpretation* of Mill.[35]

Second, whether or not harmful acts are *sufficient* as prima facie grounds for intervention is certainly an important issue in a liberal theory of the state (Jacobson [17]) and specifically in criminal law (Ripstein [35]). But it is totally irrelevant, both formally and theoretically, in our analysis. The Principle of Non-Interference identifies a *necessary* condition for interference (in a liberal perspective) and the conflict with the democratic principles of unanimity and the absence of dictators does not arise from the specification of conditions under which the state should intervene in individual affairs.[36]

The fundamental question, then, is whether harm is a necessary condition for individual acts to be prima facie subject to social scrutiny, as in the stan-

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[34]See the discussion of Mill's concept of "experiments in living" by Anderson [1].

[35]In the standard interpretation: "From a Millian perspective, so-called 'harmless wrongdoing' is an incoherent phrase. ... Purely self-regarding acts, harmless to other people, are properly beyond morality. If there is no perceptible damage to others against their wishes, there can be no immoral act or wrongdoing. Rather, there is a moral right to absolute liberty of self-regarding conduct" (Riley [34], p.206).

[36]And our focus on necessary conditions for interference is consistent with the standard interpretation of the Harm Principle, which is only part of Mill's utilitarian liberalism and "It is properly viewed as stating a necessary but not sufficient condition for justified coercion" (Riley [34], p.191).

dard interpretation of Mill. According to critics, this is not the case and there are harmless acts that may warrant intervention. In our context this is relevant as it can be interpreted as supporting a weakening of Non-Interference: even if no harm is done, there may be no right to a protected sphere and so the condition in the consequent of the axiom may be violated, with a switch in society's strict preferences against the individual. In principle, this may provide a liberal way out of the impossibility result in Theorem 1.

Unfortunately, it is unclear that the types of *harmless conduct* analysed in the literature (including harmless wrongdoings and positive obligations) raise significant doubts on the relevance of harm as a necessary condition for interference *in the conceptual and axiomatic framework adopted in this paper*.[37] Consider the central example of harmless wrongdoing, analysed by Ripstein [35], namely harmless trespass. "Suppose that, as you are reading this in your office or in the library, I let myself into your home, using burglary tools that do no damage to your locks, and take a nap in your bed. I make sure everything is clean. I bring hypoallergenic and lint-free pajamas and a hairnet. I put my own sheets and pillowcase down over yours. I do not weigh very much, so the wear and tear on your mattress is nonexistent. By any ordinary understanding of harm, I do you no harm" (Ripstein [35], p.218). Nonetheless, argues Ripstein, most people would object to the trespass: "Your objection is to my deed, my trespass against your home, not to its effects" (Ripstein [35], p.218). Harm is irrelevant, and the harmless act nonetheless asks for state intervention to protect private property.

The example raises some deep issues, but in the context of our discussion it is less than conclusive. We first note that, even if one accepts the basic premises of the example, including the relevant notion of harm, it is not clear that it supports the rejection of the Harm Principle. The example highlights a potential conflict between our moral intuitions on property and the Harm Principle. But we concur with Bird [5] that the complete absence of harm suggests that perhaps our moral intuitions on property should be revised instead. Indeed in many countries harmless trespasses conceptually analogous to Ripstein's rather extreme example, are not forbidden.[38]

But perhaps more importantly, the force of the example crucially rests

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[37]An earlier authoritative discussion of harmless wrongdoings is in Feinberg [10].

[38]Indeed, in Mill the liberty principle is conceptually distinguished from laissez-faire and the protection of property, and "the principle of individual liberty is not involved in the doctrine of free trade" (*On Liberty*, V.4). For a thorough discussion see Riley ([34], pp.116ff).

on a notion of harm that is more restrictive than mere welfare losses (or moves to less preferred alternatives). Ripstein does not provide a thorough explicit definition of the relevant notion of harm, but he can conclude that the nap is harmless because he excludes the possibility that I can harm you simply "by upsetting you when you learn of my deed, or by leading to fears that people will do this sort of thing to others" (Ripstein [35], p.220), and a fortiori by causing you a mere welfare loss. Negative effects in terms of individual preferences, according to Ripstein, are not sufficient to identify harmful acts. The reason is that if harm is interpreted more broadly (to include all acts and choices that have adverse effects in terms of individual preferences), then the Harm principle "is not a liberal principle. If those harms count, the harm principle underwrites many of the prohibitions it is supposed to exclude" (Ripstein [35], pp.221-222).

In the analysis of necessary *and sufficient* conditions for state intervention, and a liberal approach to criminal law, an excessively broad notion of harm encompassing all welfare losses (including mere dislike or distaste) may well be objectionable. Yet both the nap example and our Principle of Non-Interference focus specifically on harm as a *necessary* condition for individual acts to be prima facie subject to social scrutiny. From this perspective, a broad notion of harm that encompasses mere subjective welfare losses is logically and conceptually consistent with a liberal approach: if, even under the broadest possible notion of harm, an act has no harmful effect on others, then this provides strong liberal ground to avoid interference. Indeed, in the analysis of necessary conditions for state intervention, one may argue that a broad notion of harm is necessary in order to capture the kernel of liberal noninterfering views. This intuition underlies our formulation of Non-Interference and, as shown by Theorem 1, it has rather surprising and substantive implications.[39]

If, consistently with our focus on necessary conditions for interference, a broad notion of harm is adopted, it is rather unclear that my nap represents a harmless wrongdoing. The point is not so much that the action would be *harmful* in the sense that my trespass would cause a welfare loss for you and so it should be outlawed (although it is indeed likely that my act will

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[39]This by no means implies that the notion of harm underlying our Principle of Non-Interference corresponds to Mill's, nor does it suggest that it is the appropriate notion in a liberal theory of the state. In defining the boundaries of state intervention, Mill clearly holds a stronger notion of harm (see, for example, *On Liberty* I.12, IV.5, IV.12). For a thorough discussion, see Ten [46], Berger [3], and Riley [33], [34].

have an adverse effect on you in terms of your preferences). Rather, contra Ripstein, and consistently with our approach, the example could be used to argue that *if* it is really the case that my act has absolutely no preference-relevant implications on you - in the sense of leaving you indifferent, - then it is *not a wrongdoing* and the trespass should indeed not be interfered with, consistently with the standard interpretation of the Harm Principle (and with our formulation of Non-Interference). After all, my act has no effects whatsoever on you, and you are completely indifferent, so there is no ground for state interference. If you do not care, why should the state?

It may be objected that there are some acts that are harmless even under the broad construal - acts with no preference-relevant implications - and that still raise morally relevant questions, such as acts that the offended party is unaware of. In the nap example, if you are unaware of my trespass, you are not going to be affected in any preference-relevant way, and would plausibly remain indifferent. Even granting, for the sake of argument, these examples to be relevant in the definition of criminal law, they are rather unconvincing in our analysis of liberal principles in political philosophy and normative economics.

As noted above, both individual and social preferences are defined over social states, where each state provides a *complete* description of the world, including *everything* that may be relevant for individual and social evaluation. This assumption is appropriate given that we aim to analyse some desirable properties of *ideal* social arrangements. From this perspective, no ideal moral theory should be based on the agents' unawareness or ignorance, of key aspects of social states (see Sen [41], pp.19ff). This indirectly reflects the standard insistence in liberal approaches on "free, voluntary, and undeceived consent and participation" (*On Liberty*, I.12).[40]

Indeed, nothing in our discussion of Non-Interference or in our examples depends on your *ignorance* of what occurs to me. In other words, the fact that you (everybody else) remain indifferent does not depend (either formally or morally) on your being ignorant of what has occurred to me in moving from the unprimed states x, y to the primed states, x', y'. But then, given a broad definition of harm, the examples of wrongdoings that are harmless *only* because of lack of information or awareness discussed by Ripstein [35]

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[40]Indeed, in his moral theory, Mill takes what Sugden ([45], p.140) defines a *synoptic* viewpoint where moral judgements "are made as if from a single, God-like vantage point, from which every component of the good of the world can be seen in its proper proportion".

lose much of their normative relevance - at least for our Non-Interference axiom. If ignorance is not assumed, however, then it is highly implausible to assume that people who are wronged would remain indifferent, and so the examples do not apply.[41]

We conclude this section noting that in principle positive obligations are structurally different from the nap example, as they concern the duty to provide a *benefit* to society and there is a potential (moral) asymmetry in the treatment of harms as opposed to (lack of) benefits (Jacobson [17]; see also Wellman [50]). Yet, in our social choice theoretic analysis, and given the broad notion of harm adopted in our formulation of the Principle of Non-Interference, this asymmetry is not relevant in making binary comparisons between alternatives. Indeed, similar arguments as above can be put forward to suggest that, whatever issues positive obligations raise for a comprehensive liberal theory of the state, Non-Interference does capture one *necessary* condition for legitimate interference.[42] This is all that is needed for the impossibility in Theorem 1 above.

8   A possible way out? Damage vs. Benefit

The previous discussion suggests that it is not easy to dismiss the conflict of principles highlighted in Theorem 1 as irrelevant for liberal doctrines by rejecting our main axioms altogether on either empirical or theoretical grounds. Non-Interference does capture relevant aspects of liberal approaches and Theorem 1 does highlight a deep conflict between liberal noninterfering views and the democratic principles of unanimity and the absence of dictators.

From this perspective, we interpret our arguments and the theorem "as guideposts to the creation of a more acceptable theory of liberal democracy" (Riley [33], pp.1135-6). In particular, we take them as a demonstration that it is impossible to take social choices in democratic institutions without somehow considering at least some individual actions as relevant even when they only affect only one individual. Social judgements cannot treat individuals as

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[41]Ripstein ([35], p.218) notes that in Mill "harm can be identified independently of knowing how it came about". Given our broad interpretation of harm, this is entirely consistent with our argument here which only stresses the awareness of the *harm itself*, not knowledge of its *origin*.

[42]It is extremely unlikely, to say the least, that if I do not meet a positive obligation, this has no preference-relevant effect on you.

separate entities even if these individuals themselves do nothing to interfere with others.

Short of giving up unanimity, then, the question is how to weaken Non-Interference so as to retain some key liberal intuitions. Let us focus on the Individual Benefit Principle. One possible objection is that this part of Non-Interference contradicts some liberal intuitions. Consider the example in section 2 above. Imagine that alternatives x and y are such that in y I am taxed, whereas in x I am not, and suppose that (for whatever reason) x is strictly socially preferred to y. Suppose next that I suddenly become richer due to brute luck and with no effort on my own part: on the basis of the Individual Benefit Principle, I could resist any attempt to pay even one penny of taxes on my additional income.

This may seem prima facie unreasonable and one may object that the Individual Benefit Principle fails to properly capture liberal views. For one may argue that, while agents can keep the fruits of their labour and efforts, pure windfalls should be shared. There are two reasons why this objection appears unconvincing to us. First, it is worth emphasising again that I have a rather weak veto power which indeed allows for the possibility that in the end - perhaps after a fair coin toss - society does opt for taxation (y') because Non-Interference *does not rule out the possibility of a switch to indifference* after my windfall gain.

Second, the view that individuals are not entitled to any gains due to brute luck is common in *some* liberal egalitarian approaches but it is far from being salient in classical liberal and libertarian views, especially if one notes, once again, that whatever change occurs to me does not affect anybody else. For "the libertarian accepts the idea that no one, no state, has a moral right to enforce a redistribution of wealth or property" (Danley [8], p.419).

Although we do not think that one can reject the Individual Benefit Principle on general *liberal* grounds, and no distinction between the Damage and Benefit parts of the Harm Principle can be found in Mill, there is nevertheless a sense in which going against an individual's preference after she has been damaged is different from doing the same thing after she has benefitted. The first course can only be construed as a punishment or as a sadistic exercise, while the second could take a form of a 'correction' to someone's gain. While not liberal, this form of interference could be easier to accept for a liberal than the other, especially from a non-welfarist perspective that allows one to scrutinise the source of the gains. As noted earlier, liberal egalitarianism, for example, admits that pure windfalls to an individual should be shared. In

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a welfarist, level comparable setting, we have demonstrated that this leads straight to an unusual conclusion from the liberal point of view, namely welfare egalitarianism ([23]). In the non-welfarist context of this work, no such conclusion is granted or even meaningful. It remains an open question to study what limitations to social choice the Individual Damage Principle implies in this context.

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A   The impossibility result

We focus on societies with $N = \{1, 2\}$ agents because they illustrate the conflict of principles in the starkest and clearest form, and without any unnecessary technicalities. All results can be straightforwardly, if laboriously, generalised to societies with more than two agents.[43]

Let X be the set of social states. Individual preferences are denoted $\succcurlyeq_i$ for $i \in N$ and are assumed to be reflexive, transitive and complete binary relations on X. A social preference relation is denoted $\succcurlyeq$ and it is also assumed to be an *ordering*, that is, a reflexive, transitive and complete binary relation on X.

Let $\mathcal{R}$ ($\mathcal{R}_{++}$) denote the set of (positive) real numbers. We suppose that the set of social states X can be written as $X = T \times (M_1 \times M_2)$, where $M_i \subseteq \mathcal{R}_{++}$ is the set of possible quantities of a special commodity called 'money' that agent i may own, while T is an arbitrary nonempty set of social states described entirely except for the money allocation. A social state $x \in X$ is thus a triple $x = (t, m_i, m_j)$ (note the (i, j) notation). For every $x = (t, m_i, m_j) \in X$, and for every $m \in \mathcal{R}$, we write

$$x \circledast_i m \equiv (t, m_i + m, m_j) \in X$$

to denote the modification of alternative x consisting of giving (or taking away) m extra units of money to agent i, such that the modified alternative is still in the feasible set. The following assumptions together define a *rich* economic environment:

Richness (R):

- *Indifference to other's money (R1).* For all $x \in X$, all $i, j \in N$, and all $m \in \mathcal{R}$ such that $x \circledast_i m \in X$: $x \circledast_i m \sim_j x$.

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[43] Analogously to the way in which our earlier welfarist results were easily generalisable from the two-agent case. See Mariotti and Veneziani [23], [24]. See also Lombardi and Veneziani [21], [22], which extend the analysis of liberal social welfare orderings to economies with an infinite number of agents.

- *Desirability of own money (R2)*. For all $x \in X$, all $i \in N$, and all $m \in \mathcal{R}$ such that $x \circledast_i m \in X$: $x \circledast_i m \succcurlyeq_i x \Leftrightarrow m \geq 0$.

- *Divisibility of own money (R3)*. For all $i \in N$ and all $x, y, z \in X$ such that $x \succ_i y \succ_i z$ there exist $m, m' \in \mathcal{R}$ such that $x \circledast_i m \in X$, $z \circledast_i m' \in X$, $y \succ_i x \circledast_i m \succ_i z$, and $x \succ_i z \circledast_i m' \succ_i y$.

Some comments are in order concerning our *Richness* assumption. R1 entails a society in which there is neither 'money envy' nor 'money sympathy': therefore our impossibility result is not due to any externality of this sort. In general, unlike in Sen [38], meddlesome preferences play no role in our result. R2 imposes a mild monotonicity assumption on individual preferences. R3 implies some sort of Archimedean continuity of individual preferences: it states that it is always possible to vary the amount of money possessed by an individual in such a way as to alter the ranking of any physical alternatives. This assumption is satisfied if, for example, money becomes progressively more valuable as its scarcity increases.

At a more general level, our *Richness* assumption plays a conceptually similar role to the standard '*Diversity*' assumptions used in the literature on single-profile Arrovian impossibility results (see, for example, Feldman and Serrano [11]) in that it guarantees a sufficiently large space of alternatives for a given profile of individual preference relations. At a formal level, our economic environment is similar to that analysed by Kaplow and Shavell [18] in their pioneering study of nonwelfarist social welfare functions.

Finally, our three basic axioms for $\succcurlyeq$ can be formally stated as follows:

Weak Pareto (WP): For all $x, y \in X$, if $x \succ_i y$ for all $i \in N$, then $x \succ y$.

Non-Dictatorship (ND): For all $i \in N$, there exist $x, y \in X$ such that $x \succ_i y$ and $y \succcurlyeq x$.

Non-Interference (NI): Let $x, y \in X$ be such that $x \succ y$, and let $x', y' \in X$ be such that, for some $i \in N$,

$$x' \succcurlyeq_i x \Leftrightarrow y' \succcurlyeq_i y$$
$$not\,(x' \sim_i x)$$
$$x' \sim_j x \text{ and } y' \sim_j y \text{ for } j \neq i$$

Then $y' \not\succ x'$ whenever $x' \succ_i y'$.

We can now prove the main impossibility result.

Theorem 1*: Suppose that the set of social states satisfies R. There is no social preference ordering $\succcurlyeq$ that satisfies WP, ND, and NI.*

Proof: 1. By R2 and R3, for all $i \in N$ and all $x, y \in X$ such that $x \succ_i y$, there exist $m, m' \in \mathcal{R}$ such that $x \circledast_i m \in X$, $y \circledast_i m' \in X$ and $x \succ_i x \circledast_i m \succ_i y$ and $x \succ_i y \circledast_i m' \succ_i y$.

2. We prove that if $x, y \in X$ are such that $y \succ_1 x$ and $x \succcurlyeq y$, then there exists a social state $x^{12} \in X$ such that $y \succ_1 x^{12}$, $x^{12} \succ_2 y$ and $x^{12} \succ y$.

To see this, consider $x, y \in X$ such that $y \succ_1 x$ and $x \succcurlyeq y$. By WP, it must be $x \succcurlyeq_2 y$. By step 1, there exists $m_1 \in \mathcal{R}$ such that $y \succ_1 x \circledast_1 m_1 \succ_1 x$. By R1, $x \circledast_1 m_1 \sim_2 x$, and so $x \circledast_1 m_1 \succcurlyeq_2 y$. Moreover, by R2, for all $m_2 > 0$: $(x \circledast_1 m_1) \circledast_2 m_2 \succ_2 x \circledast_1 m_1$. Let $x^{12} \equiv (x \circledast_1 m_1) \circledast_2 m_2$. By R1, $x^{12} \sim_1 x \circledast_1 m_1$. Hence, by transitivity of individual preferences, $y \succ_1 x^{12} \succ_1 x$, $x^{12} \succ_2 y$, and $x^{12} \succ_2 x$. Therefore, by WP and the transitivity of $\succcurlyeq$, it follows that $x^{12} \succ y$, as sought.

3. By ND, there exist $x, y \in X$ with $y \succ_1 x$ and $x \succcurlyeq y$ and there exist $p, q \in X$ with $p \succ_2 q$ and $q \succcurlyeq p$. By step 2, we can assume, without loss of generality, that $x \succ_2 y$, $q \succ_1 p$, $x \succ y$, and $q \succ p$.

4. There are in principle sixteen mutually exclusive, relevant cases to consider, according to whether (i) $p \succ_1 x$ or $x \succcurlyeq_1 p$; (ii) $y \succ_1 q$ or $q \succcurlyeq_1 y$; (iii) $p \succ_2 x$ or $x \succcurlyeq_2 p$; (iv) $y \succ_2 q$ or $q \succcurlyeq_2 y$.

Suppose first that $p \succ_1 x$, $y \succ_1 q$, $p \succ_2 x$, and $y \succ_2 q$. Then by WP $p \succ x$ and $y \succ q$, which, by the transitivity of $\succcurlyeq$, immediately leads to the contradiction $p \succ p$.

The proof of all other cases consists of showing that, starting from any initial configuration of preferences, it is always possible to arrive at the latter configuration after suitable perturbations of the alternatives.

Consider, for example, the case with $x \succcurlyeq_1 p$, $y \succ_1 q$, $p \succ_2 x$, $q \succcurlyeq_2 y$.

By R3 and step 1, there exist $m_1, m_1' \in \mathcal{R}_{++}$ such that $q \circledast_1 m_1, p \circledast_1 m_1' \in X$ and $y \succ_1 q \circledast_1 m_1 \succ_1 x$ and $q \circledast_1 m_1 \succ_1 p \circledast_1 m_1' \succ_1 x$. By R1, $q \circledast_1 m_1 \succ_1 q$ and $p \circledast_1 m_1' \succ_1 p$, and by R2, $q \circledast_1 m_1 \sim_2 q$ and $p \circledast_1 m_1' \sim_2 p$. Therefore, by NI and the completeness of $\succcurlyeq$, $q \circledast_1 m_1 \succ_1 p \circledast_1 m_1'$ implies $q \circledast_1 m_1 \succcurlyeq p \circledast_1 m_1'$.

Let $q' \equiv q \circledast_1 m_1$ and $p' \equiv p \circledast_1 m_1'$.

By R3, there exist $m_2, m_2' \in \mathcal{R}_{++}$ such that $x \circledast_2 m_2, y \circledast_2 m_2' \in X$ and $p' \succ_2 x \circledast_2 m_2 \succ_2 q'$ and $x \circledast_2 m_2 \succ_2 y \circledast_2 m_2' \succ_2 q'$. By R1, $x \circledast_2 m_2 \succ_2 x$ and $y \circledast_2 m_2' \succ_2 y$, and by R2, $x \circledast_2 m_2 \sim_1 x$ and $y \circledast_2 m_2' \sim_1 y$. Therefore, by NI and the completeness of $\succcurlyeq$, $x \circledast_2 m_2 \succ_2 y \circledast_2 m_2'$ implies $x \circledast_2 m_2 \succcurlyeq y \circledast_2 m_2'$.

Let $x' \equiv x \circledast_2 m_2$ and $y' \equiv y \circledast_2 m_2'$.

By NI, we have shown that $q' \succcurlyeq p'$ and $x' \succcurlyeq y'$. However, by WP $p' \succ x'$ and $y' \succ q'$ leading again to the contradiction $x' \succ x'$ by the transitivity of $\succcurlyeq$.

It is not difficult to show that, for all other initial configurations of preferences over p, q, x, y, a contradiction is obtained with a similar reasoning. ∎