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Equality Beyond Needs-Satisfaction: An Empirical Investigation

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Abstract The moral value of distributive equality constitutes one of the most contentious debates in political philosophy. Following Frankfurt, many philosophers have claimed that the intuitive appeal of equality is illusory and that egalitarian intuitions are fundamentally intuitions about the importance of satisfying basic needs. According to this argument, our intuitions tell us that inequality ceases to matter once a certain threshold has been reached. Despite the widespread appeal to intuitions regarding this issue, few empirical studies have tried to assess whether Frankfurt and his followers are right in claiming the lack of intuitiveness of equality *per se*. In a series of three experiments, we show that experimental evidence does not allow us to settle the intuitiveness of each theory: laypeople are divided in the consideration of the respective importance of needs and equality. While our results do show that laypeople attach special importance to needs-fulfilment, it also seems that they are divided when it comes to the importance they grant to equality once needs are fulfilled. No theory is unanimously backed by participants, and it seems that, fundamentally, divisions among philosophers reflect deep divisions among people.

1. Introduction

At first glance, equality may seem an obvious ideal. Enshrined in many founding political texts of Western countries, equality is arguably the characteristic value of modern societies. In the field of political philosophy, both Amartya Sen and Will Kymlicka[1] have argued that all plausible theories of social justice are ultimately based on different interpretations of the idea of equality.

Despite this widespread attraction, the obviousness of the egalitarian ideal might be deceiving. While equality of respect does seem to have broad appeal, the intuitive appeal of equality of distribution is a trickier issue. While it is clear that we should equally *respect* all members of society, it is less clear that we should equally *distribute our resources* to all members of society. In an influential critique of egalitarian ideal, Harry G. Frankfurt has claimed that the intuitiveness of the idea of distributional equality is mostly illusory.[2] Frankfurt argued that seemingly egalitarian intuitions are in reality based on a fundamentally different principle, the principle of sufficiency. According to the principle of sufficiency, what really matters for social justice is not that the resources should be more *equally* distributed; what matters is that everybody has *enough*. Expressed differently, social justice requires that everybody is able to pass some threshold, above which he or she has enough resources to lead a meaningful life.

Advocates of sufficiency state that the moral value of equality evaporates above this threshold. This idea, according to Frankfurt, is the real foundation of pseudo-egalitarian intuitions. As Frankfurt puts it, what is intuitively objectionable 'is not the fact that some of the individuals [...] have less money than others but the fact that those with less have too little.'[3]

This claim has not remained unchallenged. Egalitarians often claim, for instance, that the principle of sufficiency is deeply counter-intuitive in that it fails to account for the moral requirement of procuring large benefits to people just above the sufficiency threshold, compared to people far above it.[4] Determining which of these theories captures folk intuitions remains controversial.

Using empirical methods, this article aims to assess whether Frankfurt's claims of superior intuitiveness for sufficiency are grounded on folk intuitions, and whether it is true that equality *per se* lacks popular appeal. We thus presented participants with different questionnaires about imaginary societies, asking them to give their opinion concerning the fairest policies for these societies.

In using psychological tools to clarify a philosophical debate, we aim to import to political philosophy the methods of experimental philosophy. Even though experimental philosophers have been increasingly active in epistemology or moral philosophy during the last 15 years, works in experimental political philosophy have been scarce so far.[5] However, we consider that lay intuitions regarding the value of political theories possess clear relevance to the practice of political philosophy. Of course, we don't think that popular intuitions by themselves determine whether a moral theory is right or wrong. More modestly, we consider that evidence about people's intuitions should intervene at least at two levels. First, people's intuitions can give evidence about which philosophy possesses *prima facie* plausibility. If a philosophical theory is shown to be opposed to people's intuitions, this theory's proponents have to explain why ordinary intuitions are systematically mistaken (that is: they have to put forward an adequate error theory). Second, we think that political philosophy should be seen as a public endeavour and that philosophers should know whether their conclusions are in accordance with or against popular opinion. This would allow philosophers to determine whether they should recommend the conservation, the elimination or the revision of popular views.[6]

2. Aims and Outline of the Article

This article will proceed in two steps. In a first theoretical part, we will summarise the main points of contention between partisans of sufficiency and equality, and show that most arguments used by partisans of sufficiency have been implicitly appealing to popular intuitions in their arguments against equality.

In a second part, we will present three experiments testing the respective importance of egalitarian and sufficiency intuitions. Each experiment presents an imaginary society characterised by different levels of equality and needs-satisfaction. In each experiment, we ask participants whether they think it would be fair to raise the minimum wage in this particular country. In Studies 1 and 2, we assess the importance of inequality and needs. In Study 3, we test whether participants still keep egalitarian intuitions in

societies characterised by an abundance of resources, where even those worse-off enjoy a more than comfortable lifestyle.

In this series of three experiments, we show that experimental evidence does not allow us to settle the intuitiveness of each theory: laypeople are divided in the consideration of the respective importance of needs and equality. While our results do show that laypeople attach special importance to needs-fulfilment, it also seems that they are divided when it comes to the importance they grant to equality once needs are fulfilled. No theory is unanimously backed by participants, and it seems that, fundamentally, divisions among philosophers reflect deep divisions among people.

3. Equality versus Sufficiency

Before tackling the issue of the relative intuitiveness of both egalitarianism and sufficientarianism, we begin by reviewing the major arguments advanced by each theory, and why they require empirical assessment. In this article, egalitarian theories refer to any theory that considers that fairness requires promoting the situation of the worse-offs, no matter how 'well-off' the worse-offs are. We will thus sidestep the distinction between egalitarian theories (which, in short, promote reducing the gap between the worse-off and the better-off) and prioritarian theories (which promote advancing the situation of the worse-off, independently of whether this move will lead to a reduction of the gap between the poorest and richest members of a society), as these two theories are equally opposed to the doctrine of sufficiency.[7]

In assessing equality and sufficiency's intuitiveness, we aim at clarifying the intuitiveness of two different claims made by partisans of sufficiency. The first claim, which we shall call (following Casal's seminal article)[8] the *positive claim*, asserts that the fulfilment of citizens' basic needs possesses a specific kind of moral significance. Fulfilling the needs of the citizens contains a special urgency. As Casal notes, an egalitarian thinker need not negate this positive claim, as a pluralist egalitarian may attach importance both to the reaching of a needs-fulfilment threshold and to strictly egalitarian considerations.

The second claim is what Casal has called the *negative claim*: it states that the moral importance of egalitarian considerations vanishes once a certain threshold has been reached. The negative claim is obviously the main point of contention between egalitarians and partisans of sufficiency. We have thus set ourselves two tasks: first, the assessment of the importance of needs-fulfilment for folk ideas of social justice (the *positive* claim); second, the assessment of the importance of equality once these needs are fulfilled (the *negative* claim). Partisans of sufficiency have provided a series of arguments to justify why promoting the interests of individuals above a certain threshold of wellbeing ceases to matter. We will focus here on three of the main arguments employed by the partisans of sufficiency: the argument of deprivation, the argument of luxury, and the strains of commitment argument. These arguments are particularly relevant to our task, as they all require, to a certain point, an empirical assessment.[9]

The deprivation argument states that the lack of needs-fulfilment presents a particular urgency. This is a brute appeal to intuitions about the importance of needs, and we will inquire whether this describes widespread intuitions. As this argument is in

fact an argument in favour of what Casal called the positive thesis (i.e. the thesis that satisfying needs possesses special moral importance), this argument can be adopted by a pluralist egalitarian who grants importance to ideals other than the pure satisfaction of equality.

The second argument, the luxury argument, also appeals to intuitions, but this time to intuitions that run directly counter to the egalitarian ideas. The luxury argument states that we have a clear intuition that, above a certain threshold, differences of wealth or wellbeing don't matter. A specific version of this argument is the Beverly Hills case proposed by Crisp,[10] which states that we don't have any clear intuition about whether it would be morally preferable to give a bottle of expensive wine to people who are super-rich, or to people who are mega-rich. Temkin has explicitly denied the validity of such intuitions, claiming that we still have moral intuitions in favour of giving the bottle to the worse-off, even in a context involving only rich participants.[11] Determining whether folk intuitions favour the egalitarian or the sufficiency position is obviously relevant to this debate.

A third argument also directly requires an empirical assessment. Following Waldron,[12] the strains of commitment argument appeals to the idea that it is legitimate to maximise overall utility, as long as the inequalities present in the society are not sufficiently big so that they would destabilise the social order, and lead the worse-off to be so dissatisfied with their situation that they could only rebel against their position in the social system. According to Waldron, a society that fails to satisfy its citizen's needs is a society that would lead to widespread rebellion. However, Waldron conjectures that any society that provides a minimal threshold and promotes overall utility would be seen as legitimate enough as not to require any further egalitarian distribution. Waldron freely admits that his argument rests on sociological and psychological factors; as such, determining whether people would have egalitarian intuitions even in a society where needs are satisfied seems especially relevant.

Finally, it should be noted that egalitarians have often criticised partisans of sufficiency for the difficulty of determining what should count as an appropriate threshold.[13] As determining what counts as an acceptable sufficiency threshold is crucial for testing the intuitiveness of sufficiency, we will briefly present the version of the idea of sufficiency defended by Huseby, as it seems to us the most complete and plausible version of the theory.[14] Huseby, in an important article published in 2010, tried to defend a renovated version of sufficiency which would be immune to egalitarian critiques. He accepted the idea that multiple thresholds have to be used in any plausible sufficientarian theory. He thus proposed the distinction between a minimal sufficiency threshold and a maximal sufficiency threshold. The satisfaction of someone's basic needs corresponds to the minimal threshold. According to Huseby's version of the sufficiency doctrine, people who lie below this threshold should be given absolute priority compared to people above. The maximal sufficiency threshold, on the other hand, lies at a level at which people have a high probability of being content or satisfied with their life.[15] Again, Huseby considers that people below this maximal threshold have absolute priority over those above; within each of these thresholds, priority considerations apply. We aim to ascertain whether this distinction between minimal and maximal thresholds corresponds to a real distinction in lay people's view about justice.

4. Previous Empirical Works

The philosophical debate between partisans of equality and sufficiency meets recent research in the psychology of social justice. Many psychologists have expressed some doubts on the intuitiveness of the egalitarian ideals, to the point that the economist James Konow has claimed that empirical research has so far failed to show any popular support for equality under conditions of satisfied equality of opportunity.[16] Konow also claims that, in contrast to equality, the importance of needs-fulfilment has received constant backing. However, as we will presently see, the importance of equality for popular perceptions of social justice remains unclear.

Several experiments on the importance of equality were conducted between 1987 and 2003. In most cases, these experiments presented participants with several imaginary societies, gave some information regarding levels of inequality, and asked participants to rate each society.[17] These experiments were set up so that the participant's choices could be interpreted as favouring one of several principles of justice. In most cases, participants thus had the choice between maximising income (a principle akin to utilitarianism), maximising income with a floor constraint (akin to sufficiency), an egalitarian principle and Rawls's principle of difference. Overall, these experiments found consistent support for the idea of maximising income with a floor constraint, which has constituted the basis for claims stressing the lack of popular support for the idea of equality.

While these results seem favourable to partisans of sufficiency, they are in reality deeply ambiguous. Even though the support for a floor constraint can be interpreted as a desire to give everyone enough to fulfil one's basic needs, it can also reflect a compromise between egalitarian and efficiency considerations. To substantiate this point, we should note that, while most of the previous research had expected to find a major effect of the satisfaction of needs on social justice reasoning, they have so far failed to show any consistent support for this idea. A primary goal of our experiments is thus to distinguish more clearly the pure impact of needs-fulfilment and inequalities. We aim to assess the popular support for the positive and negative sufficiency claims: whether needs do have special importance for folk conceptions of social justice, and whether a concern for equality will survive even when confounding factors, such as the lack of needs-fulfilment, have disappeared.

5. Study 1: The Respective Effects of Needs-Satisfaction and Inequalities on Redistribution

5.1. Goal of the Study

In Study 1, participants were presented with imaginary societies and asked whether, and to which extent the minimum wage should be increased in these societies. We used four different societies, as we independently manipulated two factors: (i) the *degree of inequalities* present in each society (*low inequalities* versus *high inequalities*), and (ii) *needs-satisfaction*, that is: whether citizens' needs are fully satisfied (*satisfaction* versus *no satisfaction*). This resulted in four different scenarios: *satisfaction* with *low inequalities*, *satisfaction* with *high inequalities*, *no satisfaction* with *low inequalities*, and *no*

satisfaction with *high inequalities*. We chose to use these stimuli in order to translate general philosophical debates into a particular topic which matches common political debates in Western democracies.

Using these scenarios, our goal was to determine to which extent the degree of *inequality* and the absence or presence of *needs-satisfaction* would lead people to adopt more redistributive policies (by increasing minimum wage), and to which extent the degree of inequality would still matter once citizens' needs are fulfilled.

5.2. Predictions

Depending on whether people have *egalitarian* or *sufficientarian* intuitions, different predictions can be made with respect to their answers. Assuming that people have *egalitarian* intuitions, we should find an effect of the *inequalities* factor, with people being more willing to raise the minimum wage when inequalities are high. We should also predict that this effect will not depend on whether needs are satisfied and should be present both in societies with and without *satisfaction*. Furthermore, *needs-satisfaction* should also have an impact if people have egalitarian intuitions: the poorest participants are in a worse state if their basic needs are not satisfied, compared to a situation where their basic needs are satisfied.

If, on the contrary, participants have *sufficientarian* intuitions, we should predict two main things. First, we should find an effect of the *needs-satisfaction* factor, with people being more willing to raise the minimum wage when needs are not satisfied. Second, we should not find any effect of the *inequalities* factor in the scenarios in which needs are satisfied, since inequality in itself is morally irrelevant. This latter prediction is compatible with two different patterns of answers: either the *inequalities* factor has no effect at all (because people consider inequalities to be completely irrelevant), or it has an effect only in the scenarios in which needs are not satisfied (because higher inequalities allow for more redistribution to satisfy needs).

5.3. Participants

We recruited 318 participants living in the United States through Amazon Mechanical Turk.[18] Participants were paid $1.00 for their participation in our survey. After eliminating participants who failed at least one comprehension check, we were left with 196 participants (113 men, 82 women and 1 unidentified). Participants were on average 35.95 years old (SD = 11.27).

5.4. Material and Methods

After providing basic demographic information (age, gender), participants were given a description of a society and asked to give their opinion concerning this society's future policies.

The society came in four different versions, depending on the condition participants were assigned to. The society could either provide people with the resources needed to live a decent life (*Satisfaction*) or not (*No satisfaction*). The society in which needs were satisfied was called Alpha, and the society without sufficiency was called Beta. Then, in an orthogonal manipulation, inequalities between the lowest and highest

incomes could be high (*High inequalities*) or low (*Low inequalities*). This design allowed us to vary independently our two factors of interest: *Needs-satisfaction* and *Inequalities*, and to estimate the weight of each of them in participants' decisions about goods distribution and social justice.

In all four conditions, the description of the given society followed a step-by-step procedure. Participants were sequentially presented with short paragraphs describing precise aspects of this society (values & jobs, wages, public services and wage range). At the end of each paragraph, participants were asked a comprehension question (for a total of 4 comprehension questions).

In all four conditions, the society was described as a democratic society. To keep constant participants' perception of desert and luck (which were not the purpose of the present study), it was also noted that, in this society, 'one person's income is almost always correlated with his or her abilities and efforts'.

This is where Alpha and Beta societies begin to diverge in our scenario. While, in Alpha society, the State ensures that all citizens lead a decent life, this is not the case in Beta. In Alpha, participants were told that the State provides cheap accommodation, clothing, food, and education, and health, so that earning $200 a month is enough to secure one's basic needs. In contrast, participants were told in Beta that $1400 is necessary to satisfy one's needs, an amount much above the minimum wage ($1000). Thus, while needs-satisfaction is ensured in Alpha, it is not in Beta. This way, the contrast between Alpha and Beta allows us to manipulate needs-satisfaction as a factor (*satisfaction* versus *no satisfaction*).

Another factor along which societies differ is the magnitude of income inequalities. After being introduced to the society's health and social systems, participants were presented with the range of incomes within this society. The inequalities between the highest and lowest income could be *high* or *low*, with the minimum wage kept constant across conditions ($1000). In *high inequalities* societies, the average income of the 25% richest citizens was $7500, while, in *low inequalities* societies, it was $5000. This contrast between high and low inequalities allows us to manipulate *Inequalities* as a factor.

In all four conditions, after reading the description of the corresponding society, participants were told that a debate concerning the minimum wage has become prominent in the target society:

> Some people defend the idea that since each worker in Alpha works hard and contributes to Alpha's prosperity, it is unjust that some should only earn $1000 per month for a full-time job. Other people defend the idea that the minimum wage should be lowered in Alpha because the workers who are more qualified should earn far more money than less-qualified workers. Because of this debate, some economists have looked at the different ways of modifying the wage the lowest-paid workers receive in Alpha. They have found various means of increasing the poorest workers' income without lowering Alpha's average income. However, this transfer in favour of the poorest workers can only be carried out by diminishing the other workers' income. Conversely, lowering the minimal income can lead to an increase of the other workers' income without lowering the mean income in Alpha.

Participants were then presented with tables summing up the different possible ranges of wages in the target society, depending on the policy that is implemented (see Tables 1 and 2). As can be seen, the policies have been designed so that redistributing goods by increasing (or lowering) minimum wage will not reduce the amount of goods available in the target society. This is to control for practical factors, such as the fear that redistributing income in favour of the poorest will undermine society's economy by weakening the motivation to work hard.

After answering a fifth comprehension question, participants were asked to rate their agreement (on a scale ranging from 1 = 'Totally disagree' to 5 = 'Fully agree') with the following statements:

- DECENT: 'Someone earning the minimum wage in Alpha [Beta] leads a decent life.'
- BASIC NEEDS: 'Someone earning the minimum wage in Alpha [Beta] is able to fulfil all his or her basic needs.'
- DESERT: 'In Alpha [Beta], each individual receives the pay he or she deserves.'
- EFFORTS: 'In Alpha [Beta], each individual's salary matches the efforts he or she invests.'

These statements were designed to probe the participant's understanding of the target society. After those, participants were finally confronted with our main question of interest:

According to you, what is the fairest choice for Alpha society

- Increasing the minimum wage.
- Keeping the minimum wage at $1000.
- Lowering the minimum wage.

Participants who chose either to increase or lower the minimum wage were then asked to indicate what would be a fair minimum wage, by selecting from the available policies.

Finally, as a conclusion, participants were asked a number of questions on their (self-assessed) education level and political orientation. They were also asked how similar the society described in the study was to the society they lived in.

5.5. Main Results

Our main interest was participants' decision (decreasing/keeping/increasing the minimum wage) across all four conditions, and how they were impacted by *Needs-satisfaction* and *Inequalities*. Results are summarised in Table 3 and Figure 1.

While more than half of participants (57.7%) were willing to raise the minimum wage in the Beta society (without needs-satisfaction), more than half decided to *keep* the minimum wage at its current level in the Alpha society (with needs satisfied). This overall difference indicates an effect of *Needs-satisfaction* on participants' decisions (logistic regression, $Z = 3.0$, $p = 0.003$). However, we did not find an effect of *Inequalities* (low versus high; $Z = 1.2$, $p = 0.23$). In fact, slightly more participants chose to increase the minimum wage in the *Low Inequalities* condition than in the *High Inequalities* condition.

Table 1. Description of wage range for different possible policies in *High Inequalities* societies in Study 1

Available option	Lowering the minimum wage: option 1	Lowering the minimum wage: option 2	Doing nothing: option 3	Increasing the minimum wage: option 4	Increasing the minimum wage: option 5	Increasing the minimum wage: option 6	Increasing the minimum wage: option 7
4th group	7600	7550	7500	7450	7400	7350	7300
3rd group	4600	4550	4500	4450	4400	4350	4300
2nd group	3100	3050	3000	2950	2900	2850	2800
Minimum Wage	700	850	1000	1150	1300	1450	1600

Table 2. Description of wage range for different possible policies in *Low Inequalities* societies in Study 1

Available option	Lowering the minimum wage: option 1	Lowering the minimum wage: option 2	Doing nothing: option 3	Increasing the minimum wage: option 4	Increasing the minimum wage: option 5	Increasing the minimum wage: option 6	Increasing the minimum wage: option 7
4th group	5100	5050	5000	4950	4900	4850	4800
3rd group	3100	3050	3000	2950	2900	2850	2800
2nd group	2100	2050	2000	1950	1900	1850	1800
Minimum Wage	700	850	1000	1150	1300	1450	1600

Table 3. Distribution of participants' decisions according to condition in Study 1

	Alpha (*Satisfaction*)	Beta (*No satisfaction*)	TOTAL *(Alpha + Beta)*
Low inequalities			
Increasing	38%	65%	51.0%
Keeping	56%	31%	43.9%
Lowering	6%	4%	5.1%
High inequalities			
Increasing	35%	51%	42.9%
Keeping	63%	43%	53.1%
Lowering	2%	6%	4.1%
Total (All inequalities)			
Increasing	36.4%	57.7%	46.9%
Keeping	59.6%	37.1%	48.5%
Lowering	4.0%	5.2%	4.6%

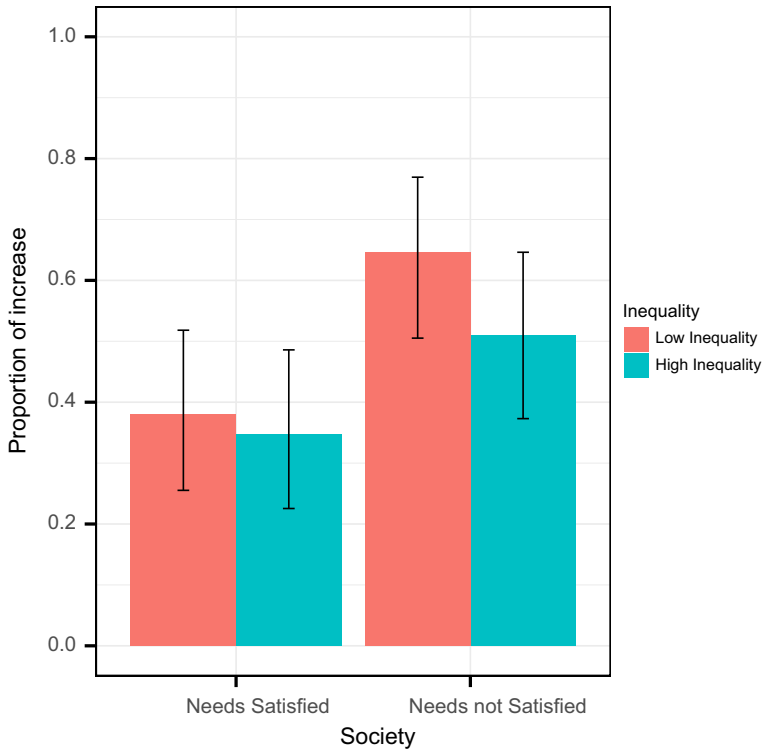

Figure 1. Proportion of participants who chose to increase the minimum wage in each condition (Study 1). Error bars are 95% Jeffrey's credible intervals. [Colour figure can be viewed at wileyonlinelibrary.com]

5.6. Additional Analyses

Size of Wage Raise

In a second analysis, we focused not on the number of participants deciding to raise, keep in its current state, or lower the minimum wage, but on the amount they preferred for the new minimum wage. The proportion of participants who chose each new amount is represented in Figure 2. An ANOVA was conducted with new average salary as a dependent variable and *Needs-satisfaction* (Alpha/Beta) and *Inequalities* (Low/High) as factors (participants who chose to keep the minimum wage at its current level were attributed a new mean salary of $1000 a month). We found a significant effect of *Needs-satisfaction* ($F(1,193) = 6.14$ $p = 0.01$) but no effect of *Inequalities* ($F(1,193) = 0.71$, $p = 0.40$). These results indicate that the participants chose to increase the minimum wage by a higher amount in the Beta condition, where basic needs were not satisfied, compared to the Alpha condition.

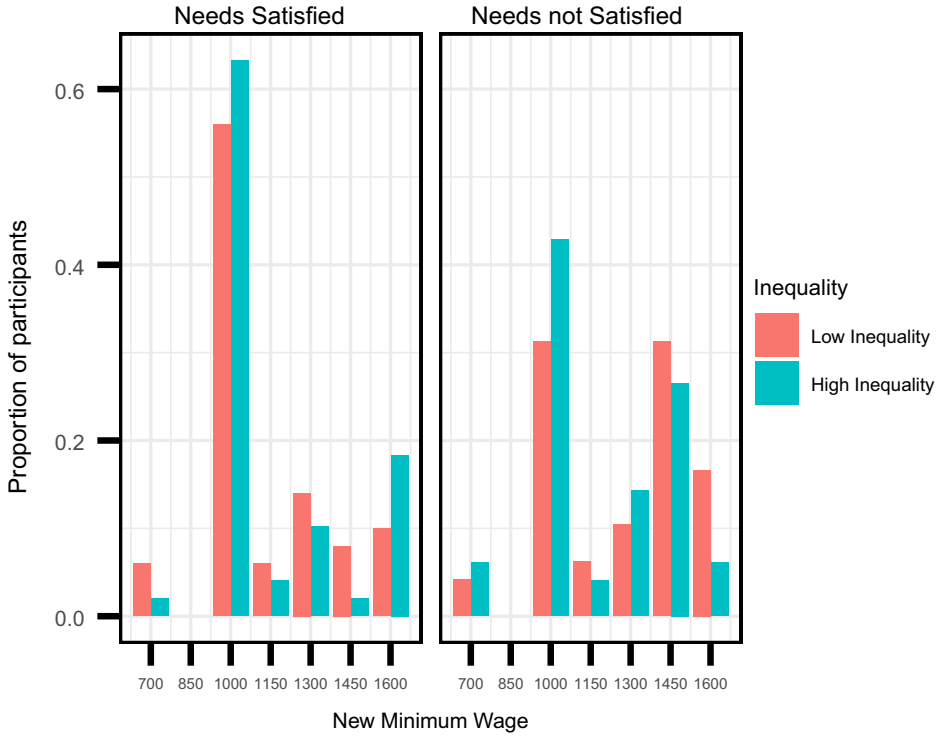

Figure 2. Proportion of participants who selected each amount for the new minimum wage to each possible level (Study 1). If the new amount is < 1000, this means that participants decided to decrease the minimum wage. If the new amount = 1000, this means participants decided not to change the minimum wage. If the new amount is > 1000, this means participants decided to increase the minimum wage. [Colour figure can be viewed at wileyonlinelibrary.com]

Modal Size of Wage Raise

A further result suggests that the minimum wage increase in the Beta condition was caused by the desire to have people being able to satisfy their basic needs. We stated in the instruction that $1400 per month was necessary to satisfy one's basic needs in Beta. In consequence, if people did increase the minimum wage to enable people to satisfy their basic needs, we should see a much larger number of participants who chose to increase the minimum wage up to a level of $1450, which was the first possibility we offered to increase the minimum wage above the $1400 threshold. That is exactly what we found (as shown in Figure 2). While only 5% of the participants chose to increase the minimum wage up to $1450 a month in the Alpha condition, 29% of participants made the same choice in the Beta condition. The difference is statistically significant ($Z = 4.0$, $p < 0.001$, in a logistic regression with inequality and society as predictors).

Participants' Interpretation of Scenarios

Overall, our results suggest that whether needs are satisfied has an impact on participants' decision to increase (or not) the minimum wage. But what kinds of difference do participants actually perceive between the Alpha and Beta conditions? To find out, we compared participants' answers to the four follow-up probes (DECENT, BASIC NEEDS, DESERT and EFFORTS) across conditions (see Table 4). Four Welch t-tests revealed that Alpha *(Satisfaction)* and Beta (*No Satisfaction*) differed along all four variables (DECENT: $t(190.79) = 8.40$, $p < 0.001$; BASIC NEEDS: $t(186.39) = 10.57$, $p < 0.001$; DESERT: $t(188.32) = 3.5$, $p < 0.001$; and EFFORTS: $t(189.55) = 2.35$, $p = 0.020$).

Thus, as we predicted, Alpha and Beta societies were perceived by participants as differing from each other along their ability to ensure their member's needs-satisfaction (DECENT and BASIC NEEDS probes). While participants tended to consider that people with the minimum wage in Alpha had enough to meet their basic needs and live a decent life (scores > 3), they tended to consider that the minimum wage was not enough to live a decent life and meet one's basic needs in Beta (scores < 3). However, we were surprised to see that participants also distinguished both societies along questions of desert (DESERT and EFFORTS probes) and were more likely to claim that people in the Alpha society received the salary they deserved, and a salary that matched the efforts they invested. This is all the more surprising that the *Inequalities* factor had no effect either on the DESERT $t(193.91) = 1.00$, $p = 0.32$) or the EFFORTS ratings ($t(192.36) = 0.07$, $p = 0.95$). Thus, it seems that, when

Table 4. Participants' agreement ratings with the four follow-up probes in Study 1. The difference between cases was tested using Tukey's post hoc tests. In rows, means that do not share at least one common superscript are significantly different ($p < 0.05$)

	Satisfaction + Low Inequalities	Satisfaction + High Inequalities	No Satisfaction + Low Inequalities	No Satisfaction + High Inequalities
Decent	3.94^{a}	3.63^{a}	2.56^{b}	2.49^{b}
Basic needs	4.34^{a}	4.04^{a}	2.19^{b}	2.69^{b}
Desert	3.90^{ac}	4.00^{a}	3.27^{b}	3.51^{bc}
Efforts	4.16^{a}	4.08^{a}	3.73^{a}	3.80^{a}

determining whether one receives the salary one deserves, people are more concerned with whether the salary allows one to live a decent life, rather than in the existence of inequalities.

5.7. Discussion

The results of our first study seem to go in the direction of the claim that people do not care about equality, but care about needs-satisfaction. Indeed, while the presence or absence of needs-satisfaction had an effect on participants' decisions to raise the minimum wage, variations in the range of inequalities had not. However, the mere fact that we failed to detect an effect of inequalities does not mean there is none. Indeed, one possibility might be that our manipulation was too subtle and that the difference between the low and high inequalities was not enough to have an impact on participants who were not presented with both cases. In Study 2, we try to correct for this shortcoming by increasing the magnitude of inequalities.

6. Study 2: Increasing the Size of Inequalities

6.1. Goal of the Study

In Study 1, we failed to find an impact of degrees of inequalities on participants' willingness to raise the minimum wage. While these results seem to go against egalitarian intuitions, it could be that the degree of increased inequality was too weak to provoke a detectable effect. In Study 2, we use the same design as Study 1, but try to go beyond the shortcomings of Study 1 by introducing much higher levels of inequalities.

6.2. Predictions

Predictions are the same as in Study 1 (see section 7).

6.3. Participants

We recruited 346 participants living in the United States through Amazon Mechanical Turk. Participants were paid $0.90 for their participation in our survey. After eliminating participants who failed at least one comprehension check, we were left with 221 participants (121 men, 99 women and 1 unidentified). Participants were on average 38.95 years old (SD = 11.95).

6.4. Material and Methods

Study 2 followed the same design as a Study 1, with a few differences. First, inequalities were higher for the *High Inequalities* conditions. The corresponding paragraph was replaced by the following:

> WAGE RANGE – The minimum legal wage for a full-time job amounts to $1000 per month in Beta, while the average salary amounts to $17500. Beta's economists have divided Beta into four income groups, with each group

> including 25% of Beta's population. The first group's members, who are the poorest 25% of the citizens of Beta, earn $1000 a month: they all earn the minimum wage. The second group's members earn an average salary of $10000. The third group's members earn an average salary of $15000. Finally, the fourth group's members, who are the wealthiest 25% of the members of Beta, receive an average salary of $25000.

This changed the different available policies in the *High Inequalities* conditions. As a consequence, while the wage ratio between the lowest-paid workers and the highest-paid workers was only 1–5 in the *Low Inequalities* condition, it was 1–25 in the *High-Inequality* condition. Table 5 presents the new wage range for all possible options.

Additionally, we modified the paragraph describing how intensive training often leads to higher-paid jobs. Because we feared that participants might interpret this as meaning that those who earn minimum wage only do so because they are lazy, and thus deserve their fate, we added the following precision:

> This does not mean, however, that if all the lowest-paid workers chose to undergo an intensive training, they could all obtain better positions: the number of highest-paid jobs is limited, and the lowest-paid workers bring a necessary contribution, so that some people of Alpha [Beta] would have to do their jobs anyway. Earning a better salary thanks to intensive training courses is only possible because a limited number of people choose to seize this opportunity. No matter how hard people train, there will still be people that are the lowest-paid workers.

This is an important worry. Past evidence in social psychology shows that people are less willing to help those in needs if they judge them responsible for their fate.[19] Thus, if participants consider that people are responsible for not having a decent life, this might reduce their willingness to increase the minimum wage and thus mask their concern with sufficiency and equality. In line with this concern, among statements participants had to rate their agreement with, we added the following:

- RESPONSIBILITY: 'In Alpha [Beta], it is someone's own responsibility if he or she is not able to lead a decent life.'

6.5. Main Results

Our main interest was participants' decision (lowering/keeping/increasing the minimum wage) across all four conditions, and how they were impacted by *needs-satisfaction* and *inequalities*. Results are summarised in Table 6 and Figure 3.

We conducted a logistic regression to determine whether *Needs-Satisfaction* (Satisfied/Not Satisfied) or *Inequalities* (Low/High) had an impact on the number of participants deciding to increase the salary. As in Study 1, results revealed a significant effect of *Needs-Satisfaction* ($Z = 2.7$, $p = 0.008$), with more people deciding to increase the minimum wage in Beta, where needs were not satisfied, than in Alpha. This time, contrary to Study 1, we did find a significant effect of *Inequalities* ($Z = 2.3$, $p = 0.02$), with more people deciding to increase the minimum wage in the society with a high level of inequality, compared to the society with a low level of inequality. Even though a p-value of 0.02 does not provide highly convincing evidence in favour of an effect, it does

Table 5. Description of wage range for different possible policies in *High Inequalities* societies in Study 2

Available option	Lowering the minimum wage: option 1	Lowering the minimum wage: option 2	Doing nothing: option 3	Increasing the minimum wage: option 4	Increasing the minimum wage: option 5	Increasing the minimum wage: option 6	Increasing the minimum wage: option 7
4th group	25100	25050	25000	24950	24900	24850	24800
3rd group	15100	15050	15000	14950	14900	14850	14800
2nd group	10100	10050	10000	9950	9900	9850	9800
Minimum Wage	700	850	1000	1150	1300	1450	1600

Table 6. Distribution of participants' decisions according to condition in Study 2

	Alpha (*Sufficiency*)	Beta (*No sufficiency*)	Total *(Alpha + Beta)*
Low inequalities			
Increasing	42.9%	58.6%	52.1%
Keeping	57.1%	37.1%	45.4%
Lowering	0%	4.3%	2.5%
High inequalities			
Increasing	55.8%	76.0%	65.7%
Keeping	40.4%	24.0%	32.3%
Lowering	3.8%	0%	2.0%
Total (All inequalities)			
Increasing	49.5%	65.8%	58.4%
Keeping	48.5%	31.7%	39.4%
Lowering	2.0%	2.5%	2.3%

suggest that people were more likely to increase the minimum wage in response to a high level of inequality.[20]

6.6. Additional Analyses

Size of Wage Raise

In a second analysis, we focused not on the number of participants deciding to raise, keep in its current state, or lower the minimum wage, but on the amount they preferred for the new minimum wage. The new amounts are summarised in Figure 4. An

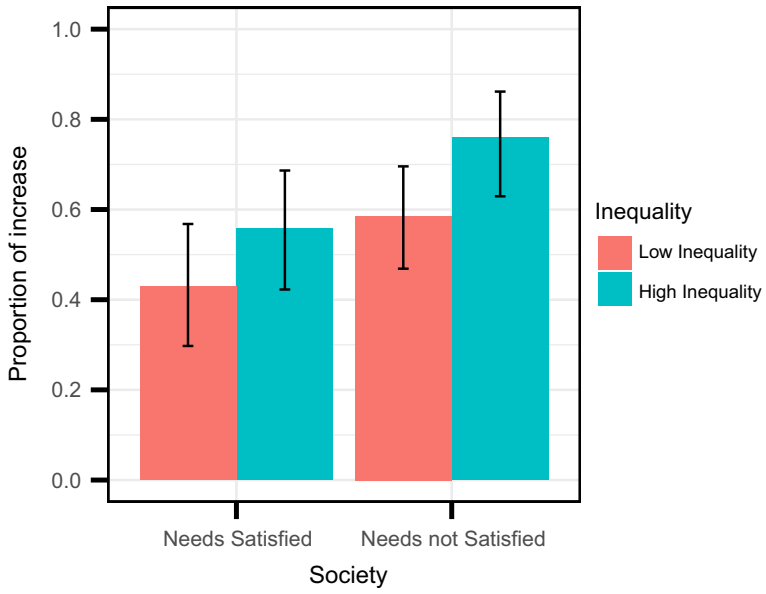

Figure 3. Proportion of participants who chose to increase the minimum wage (Study 2). Error bars are 95% Jeffrey's credible intervals. [Colour figure can be viewed at wileyonlinelibrary.com]

ANOVA was conducted with average salary as a dependent variable and *Needs-satisfaction* (Alpha/Beta) and *Inequalities* (Low/High) as factors. We did not find a significant effect of *Needs-satisfaction* ($F(1,217) = 2.40$, $p = 0.12$), but we found a significant effect of *Inequalities* ($F(1,218) = 10.54$, $p = 0.001$). Average new minimum wages per condition are presented in Figure 4.

While we do not get a significant effect of *Needs-satisfaction* on the average new minimum wage, this is probably due to low statistical power, as the effect is in the predicted direction and was significant in Study 1.

Modal Size of Wage Raise

As in Study 1, the *Needs-satisfaction* factor had a major impact on the participants' decision to increase the minimum wage at \$1450 per month, that is, above the sufficiency threshold. While only 5% of the participants chose to increase the minimum wage up to \$1450 a month in the Alpha condition, 28% of participants made the same choice in the Beta condition. The difference is statistically significant ($Z = 4.0$, $p < 0.0001$, in a logistic regression with inequality and society as predictors).

6.7. Discussion

Contrary to Study 1, we found an impact of both lack of needs-satisfaction and high inequalities on decision to increase the minimum wage. This result suggests that the null result found in Study 1 was due to the fact that our manipulation was too subtle to influence the participants. When confronted with a huge level of inequalities, participants are indeed more likely to increase the minimum wage.

It thus seems that both needs-satisfaction and equality have an impact on participants' perception of fairness. However, our experiments so far have not taken into account an important distinction between two kinds of sufficiency. Remember that Huseby, a partisan of sufficiency, made the distinction between two thresholds, a minimal and a maximal one. The minimal threshold corresponds to the satisfaction of one's basic needs. According to Huseby, people living below this threshold should be accorded an absolute level of priority. We did find that participants were sensitive to the lack of satisfaction of needs. However, Huseby, in line with most partisans of sufficiency, did not consider that fairness considerations should disappear above this minimal threshold; he just thought that they should be less sensitive. He did defend the idea, however, that egalitarian considerations should disappear once a second threshold is passed, a threshold corresponding to a high probability of contentment. We thus decided to test the intuitiveness of this distinction made by partisans of sufficiency, by presenting a new society where even the least-paid workers had a high level of prosperity. If the idea of sufficiency enjoys a broad popular appeal, then egalitarian considerations should vanish under this situation.

7. Study 3: The Importance of Inequalities in a Society with High Needs-Satisfaction and High Inequalities

7.1. Goal of the Study

In Study 2, we found that the presence of high inequalities led participants to raise wages and thus redistribute resources even in a society where basic needs were

satisfied. These results seem to go directly again the claim that participants do not value equality for itself, but only to the extent it contributes to needs-satisfaction. However, a partisan of the intuitiveness of sufficiency might explain these results away either by arguing (i) that these participants did not consider all needs to be satisfied, or (ii) that these participants value equality not for itself but only to the extent that it ensures everyone a high level of contentment. In Study 3, we put these alternative sufficientarian explanations to test by comparing the high-inequalities with needs-satisfaction case of Study 2, in which the minimum wage was \$1000 per month with a similar case in which the minimum wage is \$3000.

7.2. Predictions

In Study 2, we observed that a certain number of participants continued to raise wages in the high-inequalities with needs-satisfaction case, in which the minimum wage was \$1000 per month. If their answers do not reflect real *egalitarian* intuitions but *sufficientarian* ones, then participants should be less willing to raise money in a situation where the minimum wage is already \$3000, thus guaranteeing higher levels of needs-satisfaction and contentment. However, if these participants' answers reflected a genuine *egalitarian* commitment, we should not observe a difference between the two cases, as raising the minimum wage to \$3000 barely begins to bridge the gap between the higher and lower wages.

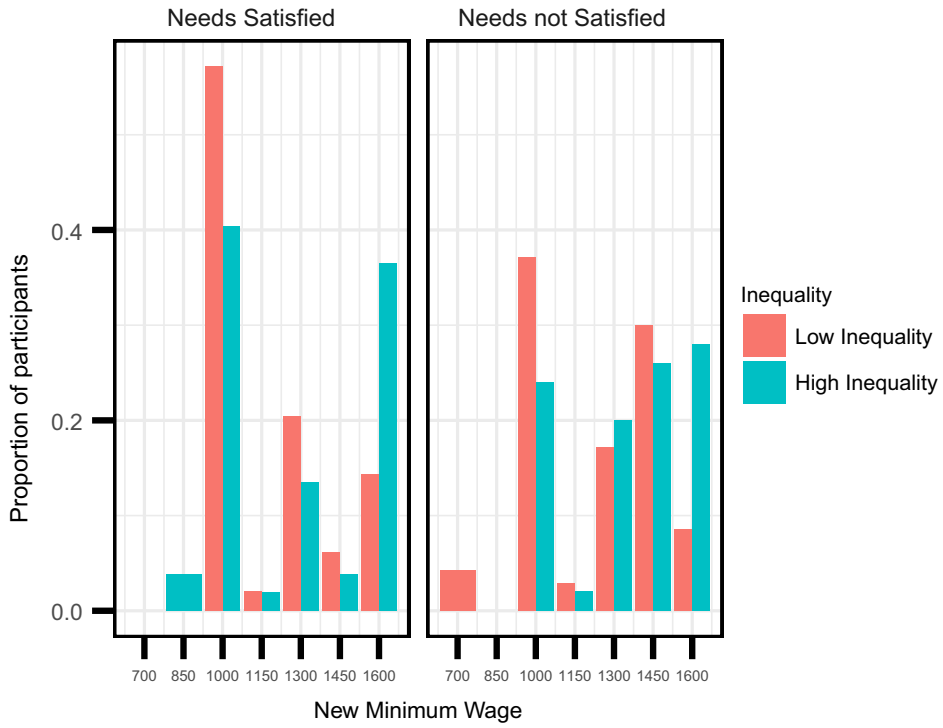

Figure 4. Proportion of participants who changed the minimum wage to each possible level (Study 2). [Colour figure can be viewed at wileyonlinelibrary.com]

7.3. Material and Methods

Study 3 was similar in design to Studies 1 and 2 but included only two conditions: the *$1000* and *$3000* conditions. Both conditions featured Alpha societies, in which the satisfaction of citizens' need is insured by the State, as 'a monthly salary of $200 is enough to cover all the needs regarding health, accommodation, clothing, food and education in Alpha society'. However, in one condition, the minimum wage was $1000, while it was $3000 in the other. We considered that $3000 a month, in a society where basic needs are already satisfied, constituted a reasonable operationalisation of the maximal sufficiency threshold. The wage range and available policies options for the $1000 condition were the same as for the *High Inequalities* cases in Study 2 (see Table 5). Wage range and available policies options for the $3000 condition are presented in Table 7.

7.4. Pre-registration

This research project was pre-registered on the Open Science Framework on 27 February 2016, under the name 'Intuitions about justice: Equality versus Sufficiency' (osf.io/679fk)[21] .

7.5. Participants

We recruited 327 participants living in the United States through Amazon Mechanical Turk. Participants were paid $0.90 for their participation in our survey. After eliminating participants who failed at least one comprehension check, we were left with 176 participants (106 men, 69 women, 1 unidentified). Participants were on average 35.53 years old (SD = 11.4).

7.6. Results

To begin with, in order to determine whether participants perceived any difference between our two cases, we analysed their agreement with the five statements about Alpha society. Five Welch t-tests revealed no difference between the two cases for the RESPONSIBILITY ($t(172.01) = 0.66$, $p = 0.51$), DESERT ($t(173.94) = 1.27$, $p = 0.20$) and EFFORT ($t(173.4) = 1.03$, $p = 0.31$) questions. However, there was a significant difference between the two cases for the DECENT ($t(170.58) = 2.00$, $p = 0.05$) and BASIC NEEDS ($t(165.19) = 2.50$, $p = 0.01$) questions. Participants were more likely to agree with the claim that people with the minimum wage could live a decent life in the $3000 ($M = 4.03$, $SD = 1.05$) than in the $1000 case ($M = 3.70$, $SD = 1.18$) and that everyone's basic needs were satisfied in the $3000 ($M = 4.49$, $SD = 0.89$) than in the $1000 condition ($M = 4.11$, $SD = 1.10$). Thus, overall, participants were more likely to think that sufficiency was ensured in the $3000 than in the $1000 case.

Did this difference have an impact on participants' decisions? A chi-squared test on the decision to increase the minimum wage revealed no significant difference between the two distributions ($p = 0.37$). Similarly, a Student t-test comparing the amount by which participants augmented the minimum wage between both conditions revealed

Table 7. Description of wage range for different possible policies for the $3000 case in Study 3

Available option	Lowering the minimum wage: option 1	Lowering the minimum wage: option 2	Doing nothing: option 3	Increasing the minimum wage: option 4	Increasing the minimum wage: option 5	Increasing the minimum wage: option 6	Increasing the minimum wage: option 7
4th group	75100	75050	75000	74950	74900	74850	74800
3rd group	45100	45050	45000	44950	44900	44850	44800
2nd group	30100	30050	30000	29950	29900	29850	29800
Minimum Wage	2700	2850	3000	3150	3300	3450	3600

no significant difference ($t(173.81) = 0.35$, $p = 0.73$). The average augmentation was \$201.7 ($SD = 271.5$) in the \$1000 case and \$187.1 ($SD = 287.2$) in the \$3000 case. Thus, it seems that using a strong manipulation to ensure sufficiency did not significantly reduce the number of participants deciding to increase the minimum wage. It should be noted, however, that the non-significant effect was in the predicted direction: fewer participants chose to increase the minimum wage when its level was \$3000 a month than when it was at \$1000 a month (39.3% compared to 46%). Using Jeffreys's method to compute credible intervals, the credible interval goes from 30% to 50% of participants choosing to increase the minimum wage in a case where needs are clearly satisfied, with a minimum wage at \$3000 a month. Even if we accept the lower bound of the interval (30%), a substantial minority of participants would still make judgments opposed to intuitions prescribed by the sufficiency theory.

8. General Discussion

8.1. Summary of the Main Results

Both partisans of equality and sufficiency have claimed that folk intuitions about social justice would follow the theory they advocated. Our results show that each of them was partly right, in that both the ideas of equality and sufficiency seem to play some role in folk perception of justice. However, neither of the theories could claim universal backing from the participants' answers.

Remember that Huseby had defended the importance of a minimal threshold, coinciding with the satisfying of needs, as a cornerstone of social justice. We did find strong evidence for the importance of needs satisfaction in our experiments. In both studies 1 and 2, the lack of basic needs satisfaction led to a 20 percentage point increase of the number of participants willing to increase the minimum wage. This increase was particularly concentrated above the threshold for needs satisfaction. This willingness to take into account the lack of needs satisfaction was not universal, though. Roughly one-third of participants in both experiments still considered that the lack of needs-fulfilment did not constitute a sufficient ground for increasing the minimum wage, showing that other considerations (probably of merit) could trump considerations of needs.

Huseby, as a partisan of sufficiency, also defended the idea that social justice considerations stopped occurring above a maximal threshold, interpreted as a situation where people had a reasonable probability of being contented. We found very weak support for this idea. Participants showed a similar willingness to increase the minimum wage in a society where the minimum wage was around \$1000 per month, and in a society where it was around \$3000 per month. Since basic needs were satisfied in both societies, the latter scenario arguably corresponds to a situation where someone should be content with one's material situation. Egalitarian considerations thus do not seem to evaporate above a certain threshold, belying the intuitiveness of what Casal called the 'negative' claim of sufficiency. However, it should be noted that this appeal of egalitarianism was not universal: about half of the participants chose not to increase the minimum wage in societies where needs were satisfied, even when inequalities were large (Studies 2 and 3).

Equality in itself does seem to have some intuitive appeal, at least for some part of the US population. However, one could claim that it might not be an egalitarian concern in itself, but rather a concern for relative deservingness that is leading participants to try to reduce inequalities in a situation of high inequality. The best-paid members of these societies arguably do not deserve to be paid 25 times more than the poorest workers. While this is certainly a possibility, one should note that participants did tend to agree that members of these societies were paid in proportion to their efforts, which suggests that participants agreed that these societies were meritocratic.

8.2. Limitations

While our study sheds some light on the folk perception of the importance of needs and equality, three major limitations should be noted. First, this study was limited to participants living in the United States, thus limiting the possible generalisation of our claims. For instance, it is possible that European participants, who have long-term experience of a strong welfare state, might give more importance to the satisfaction of needs than American participants. Testing the generalisability of our findings in different geographic areas could constitute a fertile ground for future research.

Second, our third study chose a particular operationalisation of the higher sufficiency threshold: a salary of $3,000 a month, in a society with no unemployment, and where the State takes in charge the costs associated with education and healthcare. Of course, other operationalisations, associated with a higher income, are possible. If people consider that the living conditions we described were too low to be satisfying, then this could explain the apparent egalitarian answers we observed in Study 3.

Third, we must note that the idea of sufficiency does not constitute a unified theory. Most relevant for our purpose, some sufficiency theorists consider that inequality should be taken into account when evaluating whether someone has enough.[22] As a consequence, it is not obvious that every possible sufficiency theory would consider that equality no longer matters in a society where basic needs are satisfied and the minimum wage is at a very high level. A sufficiency theorist could thus reply that even our Study 3 doesn't represent a fair test of sufficiency theory.

We acknowledge that our study didn't provide a test of each and every possible sufficiency theory. However, we think that it does cover most reasonable or specific theories, as can be seen by an examination of the two main reasons why some partisans of sufficiency think that inequality matters.

First of all, even in a sufficiency framework, income inequality can matter if it allows the richest people to have privileged access to some specific goods that should be distributed equally, such as political power, or if inequality causes some groups to be rejected or despised.[23] We have tried to prevent this concern by specifying, in all our experiments, that the different countries were well-functioning democracies and that there was a consensus around the idea that everyone is performing a useful job. While we wish we had done more to specify that income inequality was not a threat to anyone's basic rights, we think that our vignettes did give the impression of a society where everyone was treated as equal.

Secondly, some authors[24] have claimed that income inequality matters because, due to social comparisons and psychological dispositions, people find it harder to be fully satisfied if other people are much richer than they are. While this is certainly a possible

rejoinder to our studies, this position faces three issues. First of all, it represents a minority position among sufficiency theories. Second, it flies against some of the original motivations in favour of sufficiency, such as Frankfurt's idea that social comparisons represent a distraction from what is truly important, that is, one's absolute level of wellbeing. Third, we consider that this philosophical position is partly self-contradictory, since it indulges feelings of envy that are deprived of the legitimacy that egalitarian theories of fairness could confer to the feeling.

8.3. Further Research and Practical Implications

Our results thus present a moderate support for pluralist theories of social justice, like the one defended by David Miller. In *Principles of Social Justice*,[25] Miller defends the idea that people's moral ideas are organised around three principles of justice: needs, desert, and equality. While each of the principles does seem to contribute to explaining people's intuitions, we do not find any consensus on their relative importance, or on the way to implement them harmoniously. There is no decisive intuitive support for either equality or needs-satisfaction, as both concerns seem to partly (but only partly) capture people's intuitions.

How are we to explain this division in people's adoption of egalitarian and sufficiency ideas? While we don't have any knock-out explanation, we want to consider one possibility. Our results don't prove that people don't care at all about equality, or, for that matter, about needs satisfaction. Indeed, our results are compatible with the idea that people who chose not to increase the minimum wage have some weak preference for egalitarian societies, but a weak preference that can be overridden by considerations of merit or by the importance of preserving the status quo. This interpretation is reinforced by the fact that some prior studies have shown such a general preference for egalitarian societies.[26] Participants may thus consider that, ideally, a more egalitarian society would be better, but that, since the society is described as meritocratic, the society is good enough so that any change to the status quo can't be justified by any additional income for the worse-off. As a respondent to our survey claimed: 'if [a society] is working well, don't mess with it'. Further research would be needed to determine whether this underlying weak preference for equality exists.

On a practical level, of course, the division of participants we highlighted regarding ideal societies should not translate into political divisions about immediate political choices. Our experiments showed that, even in a highly meritocratic society, a large majority considers the satisfaction of basic needs to be primordial. Current political divisions about the role of the Welfare State are in all probability not divisions about what an ideal society would look like, but divisions about empirical facts, such as whether increased State intervention is the best instrument to promote a fairer society. Ultimately, whether pushed by egalitarian or sufficiency motivations, most people would argue that a more egalitarian distribution of income would lead to a better society.

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NOTES

1 See Amartya Sen, *Inequality Reexamined* (Cambridge MA: Harvard University Press, 1995); and Will Kymlicka, *Contemporary Political Philosophy: An Introduction*, 2nd edn. (Oxford: Oxford University Press, 2001).
2 See Harry Frankfurt, 'Equality as a moral ideal', *Ethics* 98,1 (1987): 21–43.
3 Ibid., p. 32. He also added: 'We tend to be quite unmoved, after all, by inequalities between the well-to-do and the rich; our awareness that the former are substantially worse off than the latter does not disturb us morally at all.'
4 For instance, see Paula Casal, 'Why sufficiency is not enough', *Ethics* 117,2 (2007): 296–326.
5 See Nicole Hassoun, 'Meeting need', *Utilitas* 21,3 (2009): 250–75; Nicole Hassoun, 'Experimental or empirical political philosophy' in J. Sytsma & W. Buckwalter (eds) *A Companion to Experimental Philosophy* (Wiley Online Books, 2016); Matthew Lindauer & Christian Barry, 'Moral judgment and the duties of innocent beneficiaries of injustice', *Review of Philosophy and Psychology* 8 (2017): 671–86, for notable exceptions.
6 For a discussion of revisionist, conservative and eliminativist perspectives in the context of free will, see John Martin Fischer, Robert Kane, Derk Pereboom & Manuel Vargas, *Four Views on Free Will* (Malden MA; Oxford: Wiley-Blackwell, 2007). Of course, not all philosophers agree that lay intuitions should be considered. For a sceptical take on the value of empirical knowledge regarding popular philosophical intuitions, see for instance Timothy Williamson, 'Philosophical expertise and the burden of proof', *Metaphilosophy* 42,3 (2011): 215–29. Even though we are personally convinced of the importance of folk intuitions to build plausible philosophical theories, we do not aim to settle the debate here.
7 In the same way, we will side-step the debate about the currency of justice, be it welfare, resources, or opportunities, since this particular debate is irrelevant to the opposition between sufficiency and egalitarian theories.
8 See Casal op. cit.
9 These three arguments are identified by Casal op. cit. We don't consider a fourth argument that Casal also mentions, the argument of scarcity, as it is specific to Frankfurt's version of sufficiency, and does not rely on intuitions. Of course, other arguments could be adduced in favour of sufficiency. For instance, for a defence of sufficiency based on it promoting citizens' freedom, see David V. Axelsen & Lasse Nielsen, 'Sufficiency as freedom from duress', *Journal of Political Philosophy* 23,4 (2015): 406–26.
10 Roger Crisp, 'Equality, priority, and compassion', *Ethics* 113 (2003): 745–63.
11 Larry S. Temkin, 'Egalitarianism defended', *Ethics* 113 (2003): 764–82.
12 Jeremy Waldron, 'John Rawls and the social minimum', *Journal of Applied Philosophy* 3 (1986): 21–33.
13 Casal op. cit., presents the most detailed and cogent version of this criticism.
14 See Robert Huseby, 'Sufficiency: Restated and defended', *Journal of Political Philosophy* 18 (2010): 178–97.
15 In various guises, this is the most common threshold used by partisans of sufficiency. For instance, Frankfurt op. cit., proposes a similar definition for sufficiency.
16 See James Konow, 'Which is the fairest one of all? A positive analysis of justice theories', *Journal of Economic Literature* 41 (2003): 1188–1239.
17 See Norman Frohlich, Joe A. Oppenheimer & Cheryl L. Eavey, 'Choices of principles of distributive justice in experimental groups', *American Journal of Political Science* 31,3 (1987): 606–36; Philip A. Michelbach *et al.*, 'Doing Rawls justice: An experimental study of income distribution norms', *American Journal of Political Science* 47,3 (2003): 523–39; Gregory Mitchell *et al.*, 'Judgments of social justice: Compromises between equality and efficiency', *Journal of Personality and Social Psychology* 65,4 (1993): 629–39; Lisa D. Ordóñez & Barbara A. Mellers, 'Trade-offs in fairness and preference judgments' in B. Mellers &

J. Baron (eds) *Psychological Perspectives on Justice, Theory and Application* (Cambridge: Cambridge University Press, 1993); John T. Scott *et al.*, 'Just deserts: An experimental study of distributive justice norms', *American Journal of Political Science* 45,4 (2001): 749–67.

18 The data and materials for all studies are accessible on the *Open Science Framework*: https://osf.io/679fk/.

19 See Linda J. Skitka & Philip E. Tetlock, 'Allocating scarce resources: A contingency model of distributive justice', *Journal of Experimental Social Psychology* 28 (1992): 491–522.

20 As a robustness check, we have also analysed the same results, but this time including the participants who have failed to pass only one out of five attention-check questions. Results by Adam J. Berinsky, Michele F. Margolis & Michael W. Sances, 'Separating the shirkers from the workers? Making sure respondents pay attention on self-administered surveys', *American Journal of Political Science* 58 (2014): 739–53 (see Figs. 4 and 5), suggests that participants can make a single mistake, while still paying attention to the materials. If we include these participants, our sample size becomes 307 participants. The effect of *inequality* remains significant with this larger sample ($Z = 3.2$, $p = 0.002$), as well as the effect of *sufficiency* ($Z = 3.1$, $p = 0.002$), suggesting that both effects are real.

21 We specified in the pre-registration that we would conduct a sequential analysis; that is, we planned to recruit participants in several batches to increase power and reduce the costs associated with conducting the study. See Daniël Lakens, 'Performing high-powered studies efficiently with sequential analyses', *European Journal of Social Psychology* 44,7 (2014): 701–10. However, after recruiting a first batch of participants and analysing the results, we discovered that recruiting a new batch of participants was unlikely to change the significance of the results, and we thus stopped for futility. We also recruited more participants than planned (176 instead of 100), due to experimenter error.

22 See for instance Axelsen & Nielsen op. cit.; Huseby op. cit.

23 See for instance Michael Walzer, *Spheres of Justice: A Defense of Pluralism and Equality* (New York: Basic Books, 1984); Axelsen & Nielsen op. cit.

24 See for instance Huseby op. cit.

25 See David Miller, *Principles of Social Justice* (Cambridge MA: Harvard University Press, 2001).

26 See Michelbach *et al.* op. cit.