DFG Research Group 2104
Need-Based Justice and Distribution Procedures

Comparative and Noncomparative Measurement of Need-based Justice

Nils Springhorn

Working Paper Nr. 2017-15

http://bedarfsgerechtigkeit.hsu-hh.de/dropbox/wp/2017-15.pdf

Date: 2017-08

DFG Research Group 2104 at Helmut Schmidt University Hamburg
http://needs-based-justice.hsu-hh.de

Comparative and Noncomparative Measurement of Need-based Justice

Nils Springhorn*

Abstract: Need-based justice is an important principle within the framework of a pluralistic theory of justice. How can it be measured? Using the example of a measure of justice proposed by Jasso, a number of desiderata will be established that a measure of need-based justice has to comply with. The gaps that Jasso's measure shows in this regard will be closed through an extension of her measure. The resulting measure of need-based justice can be understood as a measure of avoidable undersupply.

Keywords: Need-based Justice, Measure of Justice, Comparative Justice, Noncomparative Justice, Jasso's Theory of Justice

---

* Department of Philosophy, Carl von Ossietzky University Oldenburg, 26111 Oldenburg, Germany, n.springhorn@uol.de. The author is a member of the research group *Need-based Justice and Distribution Procedures* (FOR 2104) funded by the German Research Foundation (DFG grant SI 1731/2-1).

1 Introduction

The goal of measuring need-based justice is to make precise statements about how just a distribution of goods within a group is regarding the individual needs of the group's members. In the case of a single individual, the corresponding question is how just his endowment is with regard to his need. Underlying this is the notion that one and the same endowment of a good can be just or unjust to varying degrees. If, for example, an individual has an endowment of 100 units, but has a need of 101 units, then from the perspective of need-based justice this case is generally evaluated differently from a case wherein an individual with the same endowment has a need of 200 units, for in the second case the individual is more strongly undersupplied than in the first case.

In the development and discussion of measures of need-based justice I follow an axiomatic approach, as it is known in measuring poverty (see e.g. Sen 1976, Seidl 1988, Kockläuner 2012). That is, a measure of need-based justice will be justified on the basis of axioms (or desiderata).

The starting point for the following considerations are the justice measures formulated by Jasso (Section 2). I follow her approach by first turning to the question of whether and how need-based justice can be measured on the level of *single* individual (see especially Jasso 1978). The main part of the paper at hand is devoted to this question (Section 3). In later works, Jasso extended her considerations to groups, and from the individual evaluation she derived a justice evaluation for a group of individuals (so-called aggregated evaluations) (see especially Jasso 1999). At the end of the paper there will be an outlook in this direction (Section 4).

What distinguishes needs from attitudes such as desires and wishes is its intersubjective nature. For something to become a need, its necessity has to be acknowledged by others. In this paper I will put the following definition to use:[1]

Definition 1 (Need) The need $n_g \in \mathbb{R}^+$ of an individual g is to be understood as an acknowledged need, i.e. as the result of a generally accepted procedure of need acknowledgement for which there is a consensus that the available endowment $e_g \in \mathbb{R}_0^+$ of an individual g should be at least as large as his need n_g, and for which individual features influence the level of need e_g.

An acknowledgement procedure can involve the agreement upon a catalogue of need-generating features $m_1, m_2, \ldots, m_m \in \mathbb{R}^+$ (such as the existence of a disability (categorially coded) or its degree (continuously coded)) completed by a weighting scheme $a_1, a_2 \ldots, a_m \in \mathbb{R}^+$ that determines to which extent these features shall be taken into account

[1] More comprehensive explanations of the concept of need can be found for example in Bauer 2017, Maslow 1943, Miller 1999.

when determining need. Then the acknowledged need of an individual g can be determined according to the function $n_g := a_1\ m_{1,g} + a_2\ m_{2,g} + \ldots + a_m\ m_{m,g}$. Typically, such acknowledgement procedures have certain objectives. For instance, needs are acknowledged whose fulfilment enable an individual's survival, a decent life, or taking part in social life.[2] In the following, I will assume that such an acknowledgement procedure has already taken place, and in this sense I consider needs as exogenously given variables.

For reasons of readability, I will often speak of justice in the following when in fact I mean need-based justice. Thereby I dispense with cumbersome formulations such as "just from the perspective of need-based justice" or "unjust concerning needs". If another or general concept of justice is meant, then this will be stated explicitly. This shall not mean that I assign a higher status to the principle of need-based justice as compared to other principles of justice, or that I intend to equate need-based justice with justice. I follow Konow and Schwettmann (2016) in that justice in a general sense results from the interplay of different justice principles, one of which is need-based justice (Konow 2001, 2003). That this principle is often given a special role, especially in cases in which the endowment of an individual is smaller than his need, is shown in empirical studies, for example in Frohlich et al. (1987), Frohlich and Oppenheimer (1992), or Traub et al. (2005).

2 Jasso's Measures of Justice

Starting in 1978, Jasso recommended justice measures for both the individual and aggregated levels, and in extensive publications these have been normatively and theoretically examined and substantiated (see e.g. Jasso 1978, 1980, 1983, 1988, 1990, 1996, 1999, Jasso und Wegener 1997) as well as empirically applied (see e.g. Jasso 1978, 1996, 2006, 2007, Jasso and Webster 1999, Jasso und Resh 2002, Jasso und Meyersson Milgrom 2008).[3] For an individual g, justice evaluations comply with the following function (Jasso 1978: 1417):

$$\text{Jasso}_g(a_g, c_g) := \ln\left(\frac{a_g}{c_g}\right).$$

a_g describes the actual endowment of the individual g, and c_g describes a comparative value acknowledged as just. According to Jasso, there is perfect justice if these values

[2] See, e.g., Schramme and Siebel 2017: "Claims of need are often expressed in the following, general way: A needs X in order to φ. 'A' is usually regarded to refer to persons, especially in the context of social justice. 'X' designates the object of a need, this can be a material resource, but also other goods, such as personal relationships. 'φ' can stand for individual actions, aims, achievements, etc. […] Within the debate on needs-based justice, the first aim is then to identify the basic goal at which instrumental needs aim. For instance, such a theory might basically aim at providing for agency (Schuppert 2013), a normal range of opportunities (Daniels 1981), a normal course of life (Braybrooke 1987), or 'leverage', meaning the capacity to acquire additional goods (Sher 2014)."

[3] A good introduction to the work of Jasso may be found in Liebig 1997: 131-141.

match and the function value is 0. If the actual value is smaller than what is regarded as just, the individual is said to be unjustly undersupplied and the function value is negative. If the actual value is larger than what is regarded as just, the individual is unjustly oversupplied and the function value is positive. The logarithm leads to non-linear growth of (in)justice: if in the case of undersupply there is a large difference between the endowment and the comparative value, then a small change in one of these variables has a larger influence on the justice evaluation than when the variables are close to one another, or even when the individual is oversupplied. Therefore, an undersupply is evaluated to be more unjust than a corresponding oversupply.

As an aggregated measure for a group of individuals G, Jasso proposes the arithmetic mean of the individual justice evaluations (Jasso 1999: 144):

$$J1 := \frac{1}{|G|}\sum_{g\in G} \ln\left(\frac{a_g}{c_g}\right).$$

But she also identifies a significant problem: this measure displays perfect justice when one subgroup is undersupplied and another oversupplied and the individual evaluations are cancelled out to 0. She therefore introduces the arithmetic mean of the *absolute values* of the individual justice evaluations (Jasso 1999: 144):

$$J2 := \frac{1}{|G|}\sum_{g\in G} \left|\ln\left(\frac{a_g}{c_g}\right)\right|.$$

This measure takes the value 0 only if all individuals are perfectly just endowed. But other problems arise in a different area. This measure cannot differentiate between a group in which all individuals are undersupplied and one in which all individuals are oversupplied. Thus, it has the same function value for fundamentally different societies.

Jasso offers no further development and instead confines herself to deriving assertions from a combination of the two measures J1 and J2. If, e.g., J1 is smaller than 0 and the absolute values of J1 and J2 are equal, then all group members are unjustly undersupplied.

3 Measures of Need-based Justice

Jasso does not put any restrictions on c_g. In her empirical studies, she assumes that the comparative value recognized as just results from individual features such as age, education or work experience. Thus, her measures seem to be good candidates for measuring need-based justice. As the just comparative value the (acknowledged) need of an individual will be used, which is determined by the individual features that generate need, such as a disability. If the endowment of an individual is as large as his need, then this may be taken as just regarding his needs. If, on the other hand, endowment and

need differ from one another, then difficulties arise that are connected to the fact that, with the use of Jasso's measure as a measure of need-based justice, such differences are in any case unjust. In order to be able to picture these difficulties more easily, I distinguish between *need satisfaction* and *need-based justice*. The following definition serves to speak more neutrally about need satisfaction:

Definition 2 (Measure of Need Satisfaction S_g) For an individual g with an endowment e_g and a need n_g a measure of need satisfaction S_g is given by a mapping

$$S_g: (n_g, e_g) \rightarrow \mathbb{R}$$

satisfying the following requirements:

- There exists one and only one function value s_{exact}, so that for all g the following holds: $S_g = s_{exact}$ if and only if $e_g = n_g$.

- $S_g > s_{exact}$ if and only if $e_g > n_g$, and $S_g < s_{exact}$ if and only if $e_g < n_g$.[4] From here on, I use the following terminology: g is *over-satisfied* if and only if $S_g > s_{exact}$. g's *need is satisfied* if and only if $S_g \geq s_{exact}$. g is *under-satisfied* or g's *need is not satisfied* if and only if $S_g < s_{exact}$.

- S_g is strictly monotonically increasing in e_g and strictly monotonically decreasing in n_g. If S_g grows, then I speak of the satisfaction situation of g *improving*; if S_g shrinks, then I speak of the satisfaction situation of g *deteriorating*.

- S_g does not have a maximum, since the satisfaction situation always continues to improve with increasing endowment e_g.

- S_g does not have a minimum, since the satisfaction situation deteriorates not only due to a shrinking endowment e_g (which would suggest a minimum if $e_g = 0$) but also due to need n_g growing with constant endowment.

Simple examples for measures that fulfil these requirements are the ratio e_g/n_g or the difference $e_g - n_g$.

In line with this definition, one difficulty with the usage of Jasso's measure as a measure of need-based justice may be described in the following way. The concept of acknowledged need was connected to the requirement that the endowment of an individual should be at least as high as his need, or, in other words, that the individual's need should be satisfied. But this does not justify regarding cases of over-satisfaction as unjust with respect to needs. It would be especially implausible to regard cases in which

[4] Alternatively, it may also be required that $S_g > s_{exact}$ if and only if $e_g < n_g$, and $S_g < s_{exact}$ if and only if $e_g > n_g$. This can be the more plausible way depending on the choice of the codomain of the measure of need-based justice (see below). With such a choice, further considerations and requirements have to be adjusted accordingly.

all individuals are over-satisfied as unjust. In order to prevent misunderstandings, it should be stressed that the question here is not of evaluating overall justice. I think that over-satisfaction can in certain cases induce injustice, for instance, if an under-satisfied individual exists alongside an over-satisfied individual. However, I do not consider this unjust for the *over-satisfied* individual, only for the *under-satisfied* individual. Hence, I will situate the injustice accordingly and in this way integrate it into the overall evaluation.

In order to capture these considerations in a first desideratum, for an individual g we define an individual measure of need-based justice J_g by a mapping

$$J_g: (.) \rightarrow \mathbb{R} .$$

The arguments for this mapping will be discussed below. The claim is that exactly one function value j_{exact} exists so that for every g it holds that if $S_g = s_{exact}$ then $J_g = j_{exact}$. In the case of Jasso's measure, $j_{exact} = 0$. In order to retain the relation to Jasso's measure, I assume that $J_g < j_{exact}$ if and only if $S_g < s_{exact}$.[5] Then the first desideratum reads as follows:

Desideratum 1 (Maximum) In the case of an individual g's need satisfaction, i.e. in the case of $S_g \geq s_{exact}$, then $J_g = j_{exact}$. j_{exact} is thus the maximum of J_g.

The conflict between Jasso's justice measure and the requirement for a maximum is easily resolved: we set her measure for $S_g \geq s_{exact}$ to 0.

Yet, even in the case of under-satisfaction, I see a difficulty connected to the fact that Jasso's measure is purely noncomparative because it takes into account only the endowment and need of the given individual.[6]

If need-based justice were noncomparatively measured solely on the basis of the endowment and need of an individual, then this must also be possible for a completely isolated individual, such as a lonely castaway. Let us assume that the endowment of a castaway is 10 units and his need is 100 units. On this basis, the castaway is determined to be under-satisfied. In everyday usage, it is permitted to say that his endowment is not need-based in the sense of being not in line with demands. But here conceptual caution is required. If nothing more is to be expressed than that the castaways endowment does not satisfy his need, then this is unproblematic. This, however, would be a statement about the *satisfaction* situation, not a judgement of *justice*. As a justice judgement, the statement proves to be problematic. Let us assume that the situation of the castaway could not be avoided, being thrown into the unfortunate situation due to a chain of inevitabilities. In such a case of unavoidable under-satisfaction, I find it difficult to speak of

[5] Analogous to measures of need-satisfaction, it would be more plausible in certain cases to require that $J_g > j_{exact}$ if and only if $S_g < s_{exact}$ and adjust further considerations accordingly.
[6] For the distinction between comparative and noncomparative measures, see esp. Feinberg 1974.

justice or injustice. My impression is rather that one would be committing a categorical error. Neither unavoidable under-satisfaction nor unavoidable over-satisfaction can be designated as just or unjust. This also holds true in the more general case, namely if it cannot be ruled out that the situation has no alternative. In my view, only knowledge of viable alternatives permits a judgement of justice.

Here too is the deeper reason for why, in the following case, I would consider the situation of the castaway g unjust. Let us assume the individual g is not stranded alone on an island, but as a member of a small group G, to which individual h also belongs:

(S1) Both group members have a need of 100 units. g has an endowment of 10 units and is therefore extremely under-satisfied. h has an endowment of 190 units and is therefore significantly over-satisfied.

From a perspective of justice that follows from equality, g's situation must be considered unjust. From the perspective of need-based justice, however, equality is neither a central nor by any means exclusive reference point, for then the judgement of justice would be decoupled from the satisfaction situation of the individual concerned: cases of extreme under-satisfaction as well as cases of extreme over-satisfaction would have to be considered equally (un)just insofar as all group members are equally well or poorly satisfied. From the perspective of need-based justice, I think the deciding reason for judging g's situation as unjust lies in the fact that g's need is not satisfied but *could* be satisfied along with h's need.[7] The combination of these two factors makes the situation for g in scenario 1 unjust.

Crucial is not that g's need could be satisfied but that his satisfaction situation could be *improved*. For even in the following scenario I regard g's situation as unjust:

(S2) Both group members once again have a need of 100 units. g has an endowment of 10 units. h, however, does not have an endowment of 190 units, but only of 80.

Even though in scenario 2 there is no explicit opportunity, as in scenario 1, to satisfy g's need, I am still of the opinion that g's situation is unjust. Again, this is clear from the perspective of equality. But from the perspective of need-based justice it is crucial that there is the opportunity to *improve* the satisfaction situation of g. That g is under-satisfied *and* that this opportunity exists makes g's situation unjust. Since the case of a situation in which need-satisfaction is possible is a special case of a situation in which

[7] At this point, it is worthwhile to point out that acknowledged needs entail a willingness for transfers. We would certainly have to attest for, if not a definitional, then at least a performative contradiction if society acknowledges that certain needs should be fulfilled but there is no corresponding minimum obligation of solidarity to contribute to that fulfilment, at least in certain cases and to certain extents. To this regard, there are strong similarities to the violation of reasonable expectation, such as discussed in Schramme (2006) under the heading "Formale Gerechtigkeit" ("Formal Justice").

stronger need-satisfaction is possible, the reasoning for the injustice in scenario 1 can be subsumed under the reasoning in scenario 2.

The opportunity in this situation is not to be understood as a hypothetical possibility, but as a viable opportunity. For an isolated individual such as the lonely castaway, any arbitrarily large endowment could be hypothetically assumed. But usually such alternatives are not viable. The crucial difference between an isolated individual and an individual who is part of a group is that viable alternatives for actual satisfaction situations can be clearly defined for a group member:

Definition 3 (Opportunity for Improvement) The total endowment of a group G is given by $E_G := \sum_{g \in G} e_g$. The viable endowments e'_g of a group member $g \in G$ are such that $0 \leq e'_g \leq E_G$. The viable satisfaction situations s'_g of a group member $g \in G$ are such that $0 \leq s'_g \leq S_g(n_g, E_G)$. I am speaking about the opportunity to *improve* the satisfaction situation of g if and only if an s'_g exists so that $S_g(n_g, e_g) < s'_g$. If the endowment of a subgroup of $G\backslash\{g\}$ increases / decreases, I speak of an increasing / decreasing opportunity to improve the satisfaction situation of g.[8]

If the opportunity to improve the satisfaction situation of an under-satisfied group member g increases, g's situation becomes more unjust. This happens in the following scenario in which the endowment for h has grown significantly as compared to scenario 1.

(S3) Both group members once again have a need of 100 units. g again has an endowment of 10 units. h, however, does not have 190 units, but 990.

With growing endowment, h would feel it less and less if a transfer to g's benefit were made. It is therefore more unjust for g when such a transfer is withheld. This is the argument for regarding scenario 1 as more unjust for g than scenario 2. In scenario 2 every transfer from h to g would increase the already existing under-satisfaction of h, so that the withholding of such a transfer is less unjust for g than in scenario 1. In this sense, it is to be regarded as even less unjust for g when a transfer from a less satisfied group member is withheld, as is the case in the following scenario:

(S4) The need of both group members remains unchanged at 100 units. g still has 10 units. h has only 9 units.

In order to prevent misunderstandings, it is to be emphasized again that we are merely dealing with the situation of g. This is not to be confused with transfer recommendations. According to all previous considerations, a transfer from h to g would obviously

[8] It is certainly conceivable that further opportunities for improvement are definable and can be accounted for. I understand the definition proposed here as a first step in the direction of taking into account viable opportunities in the justice evaluation.

increase the injustice for h in scenario 4. Moreover, from the point of view of an outside social planner, the loss of justice for h should outweigh any possible gain of justice for g, so that a corresponding transfer should be rejected. Accordingly, a measure that measures the justice of the overall distribution should, in the case of such a transfer, show a decrease. This is not in conflict with the statement that g's situation is unjust because g is under-satisfied and the opportunity for a larger endowment is viable. For g the situation in scenario 4 is less unjust than in all previous scenarios since the better satisfaction alternatives for g in scenario 4 would be accompanied by a greater burden for h as compared to the previous scenarios.

The considerations in scenarios 1 to 4 will be summarized in the following desideratum:

Desideratum 2 (Monotonicity in e_h) Given at least two group members g, $h \in G$. If a group member g is under-satisfied and the opportunity to improve his satisfaction situation exists, then the following applies to an individual measure of need-based justice J_g:

> J_g is strictly monotonically decreasing in e_h (if $S_g < s_{exact}$ and $\exists s'_g$: $S_g < s'_g$).

Without the restricting conditions, only the weakly monotonic statement applies:

> J_g is monotonically decreasing in e_h (that is not strictly monotonically increasing in e_h).

Desideratum 2 is probably the most important characteristic distinguishing a measure of need-based justice from a measure of need satisfaction. It corresponds with the impression that injustice grows when the rich (over-satisfied) become richer (and poor (under-satisfied) people exist). Together with Desideratum 1 (maximum), the following is described by Desideratum 2: The justice evaluation of the over-satisfied does not change when the endowment of the over-satisfied grows. But if under-satisfied people exist, it becomes more unjust for them when the endowment of the over-satisfied grows, so that the overall justice decreases.

Here is a last reflection on changing the justice evaluation for g resulting from changes in the endowment of h. Consider a scenario in which the endowment of h is reduced to 0:

(S5) As before, both group members need 100 units. g still has 10 units. The endowment of h is 0.

g's situation in scenario 5 is reminiscent of the case of the lonely castaway because there is no opportunity to increase his endowment using the available resources. In contrast to the case of a lonely castaway, however, the given alternative is the best possible alternative for g. This justifies the statement that, with respect to viable opportunities,

the injustice for g in scenario 5 is minimal because his satisfaction situation cannot be improved.

Scenario 5 presents a challenge in light of the question whether g's situation can be regarded as unjust at all. If one follows my reasoning for the injustice for g up until now, according to which under-satisfaction is unjust insofar as a satisfaction situation can be improved, then this question has to be answered in the negative. But to conclude that g's situation is just would, according to the reasoning already mentioned with regard to the lonely castaway, be counterintuitive. One possible way of dealing with this difficulty is to leave the weak statement in place, so that in scenario 5 the injustice for g with regard to viable opportunities for improvement is minimal, but the under-satisfaction still generates injustice. In light of my already formulated concerns, considering unavoidable under-satisfaction – as seen in scenario 5 – to be unjust, this solution does not strike me as convincing. To me it seems more convincing to consistently separate need satisfaction and need-based justice, and to observe need-based justice from the perspective of injustice. Measures of need-based justice therefore answer the question of how *unjust* a given satisfaction situation is from the perspective of need-based justice. If an individual is under-satisfied and his satisfaction situation could be improved, then this is unjust, but it is not if there is unavoidable under-satisfaction.

In this sense, measures of need-based justice can be understood as measures of avoidable under-satisfaction. Both in the case of satisfaction meeting need and in the case in which the under-satisfaction is unavoidable, no injustice can be prescribed. Whichever case is present is recognizable in combination with a measure of need satisfaction. The measure proposed below can best be understood in this sense. Since, however, even alternative answers to the related questions are possible, I will avoid formulating corresponding definitions or desiderata. Furthermore, it should be taken into consideration that the problem only arises in the very special case in which a group member holds the entire endowment (of the group), and then only for this particular group member. The situation for all other group members is unjust because they are under-satisfied and their satisfaction situation can be improved. In the extreme case in which the endowment of all group members is 0, I would speak of a categorical mistake again if one tried to speak of justice or injustice because the situation for all group members is without an alternative. The following considerations are more relevant, and possibly less controversial.

In the previous scenarios, the injustice for g was based on his satisfaction situation and the opportunity of improving this situation. The latter was attributed to the endowment of h. In this regard, it was already pointed out that a transfer from h to g is variably burdensome depending on the size of h's endowment. It was possible to restrict this to the endowment of h because the same need was assumed for g and h. In the case of varying need, however, it would not be enough to consider the endowment of h alone. For in-

stance, if in scenario 1 h was not to have a need of 100 units, but of 1900, then h would not be over-satisfied with an endowment of 190 units but under-satisfied. Neither would h be more satisfied than g. If the measurement of the satisfaction situation were based on the ratio e/n, then both g and h would be equally under-satisfied. If the measurement were based on the difference e - n, h would be even worse off than g. Thus, g's situation would be evaluated differently than in scenario 1. A transfer to the benefit of g would burden h even more, in the sense that his already large under-satisfaction would increase, and not, as in scenario 1, that his large over-satisfaction is reduced. The exclusion of a transfer and the related non-viability of a better satisfaction situation would therefore be less unjust for g. This consideration can be generalized. The endowment of another group member h creates a larger injustice for the under-satisfied group member g when h has a smaller need. If the need of the other group member h grows, then the injustice for the under-satisfied group member g decreases; if the need of h shrinks, then the injustice for an under-satisfied group member g increases:

Desideratum 3 (Monotonicity in n_h) Given at least two group members g, h∈G. If a group member g is under-satisfied and the opportunity to improve his satisfaction situation exists, then the following applies to an individual measure of need-based justice J_g:

> J_g is strictly monotonically increasing in n_h (if $S_g < s_{exact}$ and $\exists s'_g$: $S_g < s'_g$).

Without the restricting conditions only the weakly monotonic statement applies:

> J_g is monotonically increasing in n_h (i.e. not strictly monotonically decreasing in n_h).

Obviously, a purely noncomparative measure such as Jasso's satisfies neither Desideratum 2 nor Desideratum 3. Jasso's measure would evaluate the situation of g in all previous scenarios to be equally unjust. This seems implausible to me, especially considering the quite different opportunities to improve g's satisfaction situation (whereas in scenario 3, h would, even after a transfer that meets g's need, still be significantly oversatisfied, an improvement in g's satisfaction situation is impossible in scenario 5). Differences of this kind cannot be captured in measures whose only influencing variables are the endowment and need of the individual for whom a judgement of justice should be given. A measure of need-based justice therefore has to take into consideration the given satisfaction situation of an individual alongside viable alternatives. Here is the comparative element of a measure of need satisfaction located. In the case of an individual's membership in a group, the viable satisfaction alternatives and their resulting conclusions for the justice evaluation can be attributed (among other things) to the satisfaction situation of other group members. In this way, the comparative element can also be considered in the comparison of the satisfaction situation of the individual with the satisfaction situations of the other group members.

Even if Jasso's measure of justice fails to do this, Jasso points in the right direction. In a scenario, in which g is under-satisfied, the justice evaluation should behave according to her measure if, *ceteris paribus*, either g's endowment or g's need changes. If, for example, g's endowment in scenario 1 were to grow, then the injustice for g would decrease; and if g's endowment were to decrease, it would be more unjust for g. This can be generalized:

Desideratum 4 (Monotonicity in e_g) Given at least two group members g, $h \in G$. If a group member g is under-satisfied and the opportunity to improve his satisfaction situation exists, then the following applies to an individual measure of need-based justice J_g:

> J_g is strictly monotonically increasing in e_g (if $S_g < s_{exact}$ and $\exists s'_g$: $S_g < s'_g$).

Without the restricting conditions only the weak monotonic statement applies:

> J_g is monotonically increasing in e_g (i.e. not strictly monotonically decreasing in e_g).

Analogously, if the need of g grows, then it is more unjust for g; if g's need reduces, then the injustice decreases for g:

Desideratum 5 (Monotonicity in n_g) Given at least two group members g, $h \in G$. If a group member g is under-satisfied and the opportunity to improve his satisfaction situation exists, then the following applies to an individual measure of need-based justice J_g:

> J_g is strictly monotonically decreasing in n_g (if $S_g < s_{exact}$ and $\exists s'_g$: $S_g < s'_g$).

Without the restricting conditions only the weak monotonic statement applies:

> J_g is monotonically decreasing in n_g (i.e. not strictly monotonically increasing in n_g).

Just like Jasso's measure, a measure of need-based justice should also fulfil the sensitivity characteristic:

Desideratum 6 (Sensitivity) Given at least two group members g, $h \in G$. If a group member g is under-satisfied and the opportunity to improve his satisfaction situation exists, then the less satisfied g is, the greater is the change of need-based justice J_g with each change in need satisfaction S_g. This is given if J_g is a concave function that increases strictly monotonically in S_g, that is, if the first partial derivative from J_g to S_g is larger than 0 and the second partial derivative from J_g to S_g is smaller than 0:

> $\partial J_g / \partial S_g > 0$ und $\partial^2 J_g / \partial S_g^2 < 0$ (if $S_g < s_{exact}$ and $\exists s'_g$: $S_g < s'_g$).

Finally, in order to rule out that justice is measured in the unit of the considered good (e.g. Euros or kilograms) or that the justice evaluation changes with changes in scale (e.g. from Euro to Dollar or kilogram to gram), measures of need-based justice have to be both unit- and scale-invariant (see Jasso 1978: 1403):

Desideratum 7 (Scale and Unit Invariance) If two scenarios S1 and S2 are given, and if for all group members holds that $e_{g,S2} = a\ e_{g,S1}$ and $n_{g,S2} = a\ n_{g,S1}$, where $a \in \mathbb{R}^+$, then $J_{g,S2} = J_{g,S1}$. Furthermore, J_g is without unit.

The question now is whether and how Jasso's measure can be extended to include the comparative element without losing the characteristics of her measure that are also desirable for a measure of need-based justice. One way of achieving this lies in a weighting. A weighting that is especially plausible results from the following basic idea. Measured according to Jasso, the injustice for an under-satisfied group member increases when the satisfaction situation of a better off (especially an over-satisfied) group member improves, and the injustice decreases when the satisfaction situation of a less satisfied member deteriorates. For a group member g the corresponding weighting function

$$W_g\colon (\mathbf{e}, \mathbf{n}) \rightarrow \mathbb{R}_0^+$$

is given by the following arithmetic mean:

$$W_g(\mathbf{e}, \mathbf{n}) := \frac{1}{|G|\text{-}1} \sum\nolimits_{h \in G \setminus \{g\}} \frac{e_h/n_h}{e_g/n_g}.$$

Here G is the set of group members, $\mathbf{e} := (e_1, \ldots, e_{|G|})$ and $\mathbf{n} := (n_1, \ldots, n_{|G|})$. With $S_h = e_h/n_h$ the satisfaction situation of a group member h is related to the satisfaction situation of g, i.e. $S_g = e_g/n_g$. $S_h/S_g = (e_h/n_h)/(e_g/n_g)$ is larger than / equal to / smaller than 1 if the satisfaction situation of h is better / equally good (bad) / worse than g's. In order to close the definition gap for $e_g = 0$, we define in agreement with Jasso's measure $W_g(\mathbf{e}, \mathbf{n})|_{e_g=0} := \lim_{e_g \rightarrow 0} \ln(e_g/n_g) = -\inf$. Combining this weighting function multiplicatively with Jasso's justice measure $\ln(e_g/n_g)$, the following function results:

$$J_g(\mathbf{e}, \mathbf{n}) := \min\left\{0, \ln\left(\frac{e_g}{n_g}\right) \times W_g(\mathbf{e}, \mathbf{n})\right\}$$

$$= \min\left\{0, \ln\left(\frac{e_g}{n_g}\right) \times \frac{1}{|G|\text{-}1} \sum\nolimits_{h \in G \setminus \{g\}} \frac{e_h/n_h}{e_g/n_g}\right\}$$

(the minimum function sets the new measure for $S_g \geq s_{exact}$ to 0, so that the requirement for a maximum is satisfied). This function satisfies the desiderata for a measure of need-based justice.

Proof:

Desideratum 1 (Maximum): Follows directly from the minimum function. Interestingly, J_g not only assumes its maximum if $S_g \geq s_{exact}$ but also – as discussed – if $\sum_{h \in G \setminus \{g\}} e_h = 0$ so that there is no opportunity for the situation of g to improve.

Desideratum 2 (Monotony in e_h): If $S_g < s_{exact}$ and $e_g > 0$, then for $e_h > 0$:

$$\frac{\partial J_g}{\partial e_h} = \ln\left(\frac{e_g}{n_g}\right) \times \frac{1}{|G|-1} \times \frac{1/n_h}{e_g/e_g}.$$

For $S_g < s_{exact}$ the following holds: $\ln(e_g/n_g) < 0$. For $e_g > 0$ the following holds: $(1/(|G|-1)) \times ((1/n_h)/(e_g/n_g)) > 0$. This means $\partial J_g/\partial e_h < 0$.

Desideratum 3 (Monotony in n_h): If $S_g < s_{exact}$ and e_g, $e_h > 0$, the following holds:

$$\frac{\partial J_g}{\partial n_h} = \ln\left(\frac{e_g}{n_g}\right) \times \frac{1}{|G|-1} \times \frac{-e_h/n_h^2}{e_g/n_g}.$$

For $S_g < s_{exact}$ the following holds: $\ln(e_g/n_g) < 0$. For e_g, $e_h > 0$ the following holds: $(1/(|G|-1)) \times ((-e_h/n_h^2))/(e_g/n_g)) < 0$. This means $\partial J_g/\partial n_h > 0$.

Desideratum 4 (Monotony in e_g): If $S_g < s_{exact}$ and $\sum_{h \in G \setminus \{g\}} e_h > 0$, then

$$\frac{\partial J_g}{\partial e_g} = \left(\frac{n_g - n_g \times \ln\left(\frac{e_g}{n_g}\right)}{e_g^2}\right) \times \frac{1}{|G|-1} \sum_{h \in G \setminus \{g\}} \frac{e_h}{n_h}.$$

For $S_g < s_{exact}$ the following holds: $\ln(e_g/n_g) < 0$, and therefore $(n_g - n_g \times \ln(e_g/n_g))/e_g^2 > 0$. For $\sum_{h \in G \setminus \{g\}} e_h > 0$ the following holds: $(1/(|G|-1)) \times \sum_{h \in G \setminus \{g\}} (e_h/n_h) > 0$. This means $\partial J_g/\partial e_g > 0$.

Desideratum 5 (Monotony in n_g): If $S_g < s_{exact}$ and $\sum_{h \in G \setminus \{g\}} e_h > 0$, then

$$\frac{\partial J_g}{\partial n_g} = \left(\frac{\ln\left(\frac{e_g}{n_g}\right) - 1}{e_g}\right) \times \frac{1}{|G|-1} \sum_{h \in G \setminus \{g\}} \frac{e_h}{n_h}.$$

For $S_g < s_{exact}$ the following holds: $\ln(e_g/n_g) < 0$ and therefore $(\ln(e_g/n_g) - 1)/e_g < 0$. For $\sum_{h \in G \setminus \{g\}} e_h > 0$ the following holds: $(1/(|G|-1)) \times \sum_{h \in G \setminus \{g\}} (e_h/n_h) > 0$. This means $\partial J_g / \partial n_g < 0$.

Desideratum 6 (Sensitivity): Due to the definition of a measure of need satisfaction, we can assume without loss of generality that $S_g = e_g/n_g$. If $S_g < s_{exact}$ and $\sum_{h \in G\setminus\{g\}} e_h > 0$, then

$$\frac{\partial J_g}{\partial\left(e_g/n_g\right)} = \left(\frac{1\text{-}\ln\left(\frac{e_g}{n_g}\right)}{\left(\frac{e_g}{n_g}\right)^2} \right) \times \frac{1}{|G|\text{-}1} \sum_{h \in G\setminus\{g\}} \frac{e_h}{n_h} .$$

For $S_g < s_{exact}$ the following holds: $\ln(e_g/n_g) < 0$ and therefore $((1 - \ln(e_g/n_g))/(e_g/n_g)^2) > 0$. For $\sum_{h \in G\setminus\{g\}} e_h > 0$ the following holds: $((1/(|G|\text{-}1)) \times \sum_{h \in G\setminus\{g\}} (e_h/n_h) > 0$. This means $\partial J_g/\partial(e_g/n_g) > 0$.

$$\frac{\partial^2 J_g}{\partial\left(e_g/n_g\right)^2} = \left(\frac{2 \times \ln\left(\frac{e_g}{n_g}\right) \text{-} 3}{\left(\frac{e_g}{n_g}\right)^3} \right) \times \frac{1}{|G|\text{-}1} \sum_{h \in G\setminus\{g\}} \frac{e_h}{n_h} .$$

For $S_g < s_{exakt}$ the following holds: $\ln(e_g/n_g) < 0$ and therefore $(2 \times \ln(e_g/n_g)\text{-}3)/(e_g/n_g)^3 < 0$. For $\sum_{h \in G\setminus\{g\}} e_h > 0$ the following holds: $(1/(|G|\text{-}1)) \times \sum_{h \in G\setminus\{g\}} (e_h/n_h) > 0$. This means $\partial^2 J_g/\partial(e_g/n_g)^2 < 0$.

Desideratum 7 (Scale- and Unit-Invariance): Since e_g/n_g and e_h/n_h are scale- and unit-invariant, J_g is also scale- and unit-invariant.

□

The proposed measure of need-based justice belongs to a more general class of measures of need-based justice that can be understood as weighted measures of need satisfaction:

$$J_g: (S_g, W_g) \rightarrow \mathbb{R}.$$

In the measure of need-based justice presented, Jasso's measure takes on the role of a measure of need satisfaction. It satisfies the corresponding conditions[9] and, through the

[9] Proof:

- $S_g = s_{exact} = 0 \leftrightarrow e_g = n_g$
- $S_g > s_{exact} = 0 \leftrightarrow e_g > n_g$
- $S_g < s_{exact} = 0 \leftrightarrow e_g < n_g$
- $\partial S_g/\partial e_g = 1/e_g > 0$ für $e_g > 0$
- $\partial S_g/\partial n_g = -1/n_g < 0$
- $S_g \rightarrow$ inf for $e_g \rightarrow$ inf
- $S_g \rightarrow$ -inf for $n_g \rightarrow$ inf

□

logarithm, possesses the sensitivity characteristic that is inherited by the weighting function to the measure of need-based justice. It will be the task of further research to investigate this class of measures by comparing corresponding measures with one another. Of special interest here is their aggregation (see below).

Finally, we will take a look at the scenarios discussed above. It was criticized that, in very different scenarios, Jasso's measure provided identical judgements of justice for g. By contrast, the maximum as well as the supplementing monotonic characteristics of a measure of need-based justice lead to differing judgements. In the case of the measure proposed here,

$$J_g(\mathbf{e}, \mathbf{n}) := \min\left\{0, \ln\left(\frac{e_g}{n_g}\right) \times \frac{1}{|G|-1} \sum_{h \in G\setminus\{g\}} \frac{e_h/n_h}{e_g/n_g}\right\},$$

we get for $n_g = n_h = 100$, $e_g = 10$, $e_{h,S1} = 190$, $e_{h,S2} = 80$, $e_{h,S3} = 990$, $e_{h,S4} = 9$, $e_{h,S5} = 0$ (the second index marks the scenario) the following values of the weighting function:

$W_{g,3} = (e_{h,S3}/n_h) / (e_g/n_g) = 99 >$
$W_{g,1} = (e_{h,S1}/n_h) / (e_g/n_g) = 19 >$
$W_{g,2} = (e_{h,S2}/n_h) / (e_g/n_g) = 8 > 1 >$
$W_{g,4} = (e_{h,S4}/n_h) / (e_g/n_g) = 0{,}9 >$
$W_{g,5} = (e_{h,S5}/n_h) / (e_g/n_g) = 0.$

Since, for $n_g = 100$ and $e_g = 10$, Jasso's measure $\ln(e_g/n_g)$ takes on the value -1 in all scenarios, this leads to the following gradations:

$$J_{g,S3} = -99 < J_{g,S1} = -19 < J_{g,S2} = -8 < J_{g,S4} = -0{,}9 < J_{g,S5} = 0.$$

This means that the injustice for group member g is the largest in that scenario in which h is the most over-satisfied. If g takes the entire overall endowment and there is thus no opportunity for his satisfaction situation to improve, then no injustice can be established.[10] If the satisfaction situation of h improves, then the injustice for g decreases. It was this gradation that was worked out in the discussion on the above scenarios.

[10] Whoever may not come to terms with the latter feature, may consider the measure

$$J'_g(\mathbf{e}, \mathbf{n}) := \min\left\{0, \ln\left(\frac{e_g}{n_g}\right) \times \left(1 + \left(\frac{1}{|G|-1} \sum_{h \in G\setminus\{g\}} \frac{e_h/n_h}{e_g/n_g}\right)\right)\right\}.$$

This measure has basically the same characteristics as J_g, but in cases in which the satisfaction situation of g cannot be improved it takes on the value from Jasso's measure, thereby identifies the injustice for g with the under-satisfaction of g.

4 Aggregated Measures of Need-based Justice – An Outlook

An aggregated measure of need-based justice is a measure deriving a justice evaluation for an entire group from the evaluations for the single group members. The discussion of such measures proves to be very complex because there are many interdependencies emerging from the weighting for the under-satisfied group members. If the satisfaction situation of any group member changes, then this leads to a change in the justice evaluations of all under-satisfied group members. Especially qualitative changes, such as changes in the satisfaction status or rank, call for a multiplicity of case-by-case analyses. This is the object of current research, and for that reason only a brief outlook shall be given here that concentrates on the fundamental differences to Jasso's aggregated measures. If, following Jasso, one chooses the arithmetic mean of the single evaluations in order to come to a measure for a group G, the result reads as follows:

$$J_G(\mathbf{e}, \mathbf{n}) := \frac{1}{|G|}\sum_{g\in G} J_g$$

$$= \frac{1}{|G|}\sum_{g\in G} \min\left\{0, \ln\left(\frac{e_g}{n_g}\right)\times\frac{1}{|G|\text{-}1}\sum_{h\in G\setminus\{g\}}\frac{e_h/n_h}{e_g/n_g}\right\}.$$

This measure exhibits the following important characteristics. (These can be understood as desiderata for aggregated measures of need-based justice; however, due to the choice of the arithmetic mean for aggregation, they are given by the desiderata of single evaluations.)[11]

i) If all of the group members' needs are satisfied (that is, exactly satisfied or over-satisfied), then this is not unjust and the function value of J_G is 0 (compare this to the comment on the concept of acknowledged need above).

ii) If at least one under-satisfied group member g exists whose satisfaction situation can be improved, then this is unjust not only for the under-satisfied individual. Even the situation as a whole will be assessed as unjust. The function value of J_G is negative.

iii) If at least one under-satisfied individual g exists and the satisfaction situation of another over-satisfied group member h improves, then the overall justice decreases.

Proof:

i) For all $g\in G$, $J_g = 0$. Therefore, it also holds that $J_G = (1/|G|)\times\sum_{g\in G} J_g = 0$.

ii) For all $g\in \{k\in G: S_k < s_{exact}\}$, $J_g < 0$. For all $g\in G\setminus\{k\in G: S_k < s_{exact}\}$, $J_g = 0$. If at least one $g\in \{k\in G: S_k < s_{exact}\}$ exists, then it holds therefore that $J_G = (1/|G|)*\sum_{g\in G} J_g < 0$.

[11] Two further aggregated measures of need-based justice may be found in Siebel 2017 and Traub et al. 2017.

iii) Due to the definition of a measure of need satisfaction, we can assume without loss of generality that $S_g = e_g/n_g$. For all $g \in \{k \in G: S_k < s_{exact}\}$, the following holds: if $e_h > 0$, then $\partial J_g/\partial e_h < 0$ and $\partial J_g/\partial n_h > 0$ and therefore $\partial J_g/\partial(e_h/n_h) < 0$. For all $g \in G \setminus \{k \in G: S_k < s_{exact}\}$, $\partial J_g/\partial(e_h/n_h) = 0$. Therefore, if at least one $g \in \{k \in G: S_k < s_{exact}\}$ exists, then $\partial J_G/\partial(e_h/n_h) < 0$.

□

Thus, the difficulties Jasso herself mentioned with her aggregated measures J1 and J2 do not appear for the given aggregated measure of need-based justice. In contrast to J1, over- and under-satisfied individuals cannot cancel each other out. Over-satisfaction rather increases injustice if under-satisfied individuals exist. Furthermore, since only under-satisfied group members contribute summands unequal to 0 and the satisfied group members contribute summands equal to 0, the indistinguishability of under- and over-satisfied groups connected to J2 cannot occur.

5 Summary

In order to make judgements about the need-based justice of individual's endowments, the satisfaction situation of an individual must be factored in. On the other hand, however, viable satisfaction alternatives in cases of under-satisfaction have to be considered. Starting from the concept of acknowledged need, the need-fulfilling satisfaction situations are, independently of the degree of need-fulfilment, considered equally just (or not unjust). Under-satisfaction is unjust only if there is a viable opportunity to improve the satisfaction situation by enlarging the endowment. Such an opportunity exists if the individual is a member of a group including further members who have endowments that can be transferred to the under-satisfied member. The larger the endowment of the other group members, the larger the injustice for the under-satisfied member is. This means specifically that under-satisfaction is unjust when over-satisfied group members exist, and the injustice grows when the satisfaction situation of over-satisfied group members improves.

Purely noncomparative measures of justice, such as Jasso's, are able to measure the quality of the *satisfaction* situation for a group member. But since they do not take into account the satisfaction situations of other individuals and the corresponding alternative satisfaction situations of under-satisfied group members, they are not suited as measures of need-based *justice*. They may, however, be extended through weighting functions, so that they satisfy the comparative requirements of a measure of need-based justice.

While the considerations in this paper are primarily geared towards working out that measures of need-based justice have to account for comparative elements, further re-

search will compare differing measures of need-based justice and their aggregation. As already touched upon, aggregated measures of need-based *justice* fundamentally show different characteristics from those aggregated measures that result from *noncomparative* single valuations. The reason for this is that, following from the concept of acknowledged need, over-satisfaction cannot be considered unjust per se but enters into the judgment of under-satisfaction. The concomitant interdependencies on the aggregated level cause measures resulting in very similar outcomes on the individual level to deliver quite different results on the aggregated level. It is therefore to be expected that single measures coming from the aggregated level are more-or-less suitable for measuring need-based justice on the individual level.

Bibliography

Bauer, A. M. (2017): Monotonie und Monotoniesensitivität als Desiderata für Maße der Bedarfsgerechtigkeit, MA thesis, Oldenburg.

Braybrooke, D. (1987): *Meeting Needs*, Princeton, NJ: Princeton University Press.

Daniels, N. (1979): 'Wide Reflective Equilibrium and Theory Acceptance in Ethics', *Journal of Philosophy* 76 (5), 256-282.

Feinberg, J. (1974): 'Noncomparative Justice', *The Philosophical Review* 83 (3), 297-338.

Frohlich, N., J. A. Oppenheimer and C. L. Eavey (1987): 'Choices of Principles of Distributive Justice in Experimental Groups', *American Journal of Political Science* 31 (3), 606-636.

Frohlich, N. and Oppenheimer, J. A. (1992): *Choosing Justice. An Experimental Approach to Ethical Theory*, Berkeley: University of California Press.

Jasso, G. (1978): 'On the Justice of Earnings: A New Specification of the Justice Evaluation Function', *American Journal of Sociology* 83 (6), 1398-1419.

Jasso, G. (1980): 'A New Theory of Distributive Justice', *American Sociological Review* 45 (1), 3-32.

Jasso, G. (1983): 'Fairness of Individual Rewards and Fairness of the Reward Distribution: Specifying the Inconsistency Between the Micro and Macro Principles of Justice', *Social Psychology Quarterly* 46 (3), 185-199.

Jasso, G. (1988): 'Principles of Theoretical Analysis', *Sociological Theory* 6 (1), 1-20.

Jasso, G. (1990): 'Methods for the Theoretical and Empirical Analysis of Comparison Processes', *Sociological Methodology* 20, 369-419.

Jasso, G. (1996): 'Exploring the Reciprocal Relations between Theoretical and Empirical Work', *Sociological Methods & Research* 24 (3), 253-303.

Jasso, G. (1999): 'How Much Injustice is There in the World? Two New Justice Indexes', *American Sociological Review* 64 (1), 133-168.

Jasso, G. (2006): 'Factorial Survey Methods for Studying Beliefs and Judgments', *American Sociological Methods & Research* 34 (3), 334-423.

Jasso, G. (2007): 'Studying Justice: Measurement, Estimation, and Analysis of the Actual Reward and the Just Reward', *IZA Discussion Paper* 2592.

Jasso, G. and E. M. Meyersson Milgrom (2008): 'Distributive Justice and CEO Compensation', *Acta Sociologica* 51(2), 123-143.

Jasso, G. and N. Resh (2002): 'Exploring the Sense of Justice about Grades', *European Sociological Review* 18 (3), 333–351.

Jasso, G. and M. Webster Jr. (1999): 'Assessing the Gender Gap in Just Earnings and Its Underlying Mechanisms', *Social Psychology Quarterly* 62 (4), 367-380.

Jasso, G. and B. Wegener (1997): 'Methods for Empirical Justice Analysis: Part 1. Framework, Models, and Quantities', *Sociological Justice Research* 10 (4), 393–430.

Kockläuner (2012): *Methoden der Armutsmessung*, Berlin: Logos.

Konow J. (2001): 'Fair and Square: The Four Sides of Distributive Justice', *Journal of Economic Behavior and Organization* 46, 137-164.

Konow : 'Which is the Fairest One of All? A Positive Analysis of Justice Theories', *Journal of Economic Literature* 41 (4), 1186-1237.

Konow, J. and L. Schwettmann (2016): 'The Economics of Justice', in: C. Sabbagh and M. Schmitt (eds.): *Handbook of Social Justice Research*, New York: Springer, 83-106.

Liebig, S. (1997): *Soziale Gerechtigkeitsforschung und Gerechtigkeit in Unternehmen*, München: Hampp.

Maslow, A. H. (1943): 'A Theory of Human Motivation', *Psychological Review* 50, 370-396.

Miller, D. (1999): *Principles of Social Justice*, London: Harvard University Press.

Schramme, T. (2006): *Gerechtigkeit und soziale Praxis*, Frankfurt/New York: Campus.

Schramme, T. and M. Siebel (2017): 'Need-based Justice from the Perspective of Philosophy', in: B. Kittel an S. Traub (eds): *Need-bases Distributive Justice: An Interdisciplinary Perspective*, Heidelberg: Springer (in print).

Schuppert, F. (2013): 'Distinguishing Basic Needs and Fundamental Interests', *Critical Review of International Social and Political Philosophy* 16 (1), 24-44.

Seidl, C. (1988): 'Poverty Measurement: A Survey', in D. Bös et al. (eds.): *Welfare and Efficiency in Public Economics*, Heidelberg: Springer.

Sen, A. K. (1976): 'Poverty Measurement: A Survey', *Econometrica* 44 (2), 219-231.

Siebel, M. (2017): 'To Each According to His Needs. Measuring Need-Based Justice', Hamburg: *FOR 2104 Working Paper* 2017-14.

Traub, S., M. Bauer, M. Siebel, N. Springhorn and A. Weiß (2017): 'On the measurement of need-based justice', Hamburg: *FOR 2104 Working Paper* 2017-12.

Traub, S., C. Seidl, U. Schmidt and M. Levati (2005): 'Friedman, Harsanyi, Rawls, Boulding – or Sombody Else? An Experimental Investigation of Distributive Justice', *Social Choice and Welfare* 24 (2), 283-309.

DFG Research Group 2104
– Latest Contributions

2017:

Neuhofer, Sabine, Paetzel, Fabian, Schwaninger, Manuel and Traub, Stefan: Recognition of needs in a dictator game: Experimental evidence on information-sensitive giving behavior. Working Paper Nr. 2017-10.
http://bedarfsgerechtigkeit.hsu-hh.de/dropbox/wp/2017-10.pdf

Chugunova, Marina, Luhan, Wolfgang and Nicklisch, Andreas: When to Leave the Carrots for the Sticks: On the Evolution of Sanctioning Institutions in Open Communities. Working Paper Nr. 2017-09.
http://bedarfsgerechtigkeit.hsu-hh.de/dropbox/wp/2017-09.pdf

Tepe, Markus, Lutz, Maximilian, Paetzel, Fabian and Lorenz, Jan: Leaky bucket in the lab. The effect of system inefficiency on voting on redistribution. Working Paper Nr. 2017-08.
http://bedarfsgerechtigkeit.hsu-hh.de/dropbox/wp/2017-08.pdf

Pritzlaff-Scheele, Tanja and Zauchner, Patricia: Meeting Needs. An Experimental Study on Need-Based Justice and Inequality. Working Paper Nr. 2017-07. http://bedarfsgerechtigkeit.hsu-hh.de/dropbox/wp/2017-07.pdf

Paetzel, Fabian, Lorenz, Jan and Tepe, Markus: Transparency diminishes framing-effects in voting on redistribution: Some experimental evidence. Working Paper Nr. 2017-06.
http://bedarfsgerechtigkeit.hsu-hh.de/dropbox/wp/2017-06.pdf

Schwaninger, Manuel, Neuhofer, Sabine and Kittel, Bernhard: Offers Beyond the Negotiating Dyad: Including the Excluded jn a Network Exchange Experiment. Working Paper Nr. 2017-05.
http://bedarfsgerechtigkeit.hsu-hh.de/dropbox/wp/2017-05.pdf

Kittel, Bernhard, Neuhofer, Sabine and Schwaninger, Manuel: Need-based Justice in Social Exchange Networks. Working Paper Nr. 2017-04. http://bedarfsgerechtigkeit.hsu-hh.de/dropbox/wp/2017-04.pdf

Diederich, Adele and Wyszynski, Marc: Need, framing, and time constraints in risky decision making. Working Paper Nr. 2017-03. http://bedarfsgerechtigkeit.hsu-hh.de/dropbox/wp/2017-03.pdf

Kittel, Bernhard, Kanitsar, Georg and Traub, Stefan: Knowledge, Power, and Self-interest. Working Paper Nr. 2017-02. http://bedarfsgerechtigkeit.hsu-hh.de/dropbox/wp/2017-02.pdf

Traub, Stefan and Krügel, Jan Philipp: Risk Taking and the Welfare State: Some Experimental Evidence. Working Paper Nr. 2017-01. http://bedarfsgerechtigkeit.hsu-hh.de/dropbox/wp/2017-01.pdf

2016:

Guo, Lisa, Trueblood, Jennifer S. and Diederich, Adele: Thinking Fast Increases Framing Effects in Risky Decision-making. Working Paper Nr. 2016-04. http://bedarfsgerechtigkeit.hsu-hh.de/dropbox/wp/2016-04.pdf

Paetzel, Fabian and Sausgruber, Rupert: Entitlements and loyalty in groups: An experimental study. Working Paper Nr. 2016-03. http://bedarfsgerechtigkeit.hsu-hh.de/dropbox/wp/2016-03.pdf

Nicklisch, Andreas, Grechenig, Kristoffel and Thöni, Christian: Information-sensitive Leviathans. Working Paper Nr. 2016-02. http://bedarfsgerechtigkeit.hsu-hh.de/dropbox/wp/2016-02.pdf

DFG Research Group 2104 at Helmut Schmidt University Hamburg
http://needs-based-justice.hsu-hh.de