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Basic Needs Satisfaction as a Fundamental Distributive Principle: Evidence from the Lab and the Field

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Abstract
This paper provides clear evidence that concerns for basic needs satisfaction (BNS) represent a distinct distributional motive. Using a unified theoretical and experimental framework across five dictator-game experiments in Germany and Georgia (*N*=446), we disentangle BNS from motives such as maximin, selfishness, efficiency, generosity, and envy. A substantial share of participants displayed BNS-driven choices and were willing to forgo income and efficiency to satisfy others' basic needs. BNS remained robust across contexts, incentive schemes, and countries, and increased when needs satisfaction had strategic relevance. The results highlight the importance of BNS for understanding distributional preferences and policy design.

JEL-Classification: D31, D63, H23, C93, C91, D01, D91

Keywords: Basic Needs, Redistribution, Distributional Motives, Maximin, Public Policy, Field Experiment, Laboratory Experiment

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I. Introduction

The distribution of benefits and burdens among its members is one of society's most important and challenging issues. Emerging inequalities, often portrayed by the increased divergence of pre-tax income or wealth owned by those at the top and the bottom of the income or wealth distributions, are therefore a major concern of many economic scholars,[1] policymakers,[2] and international organizations.[3] The annual World Inequality Report introduces changes in inequality levels as an issue that "challenge(s) our most basic and cherished notions of justice and fairness" (Alvaredo et al. 2017a, 22). The topic is also at the heart of public discourse, with newspapers giving prominence to discussions of rising social inequality.[4]

Altering the skewed distribution of market incomes and wealth by redistribution from richer to poorer members of society is a key concern of public policy in many countries to establish more desirable outcomes (Durante, Putterman, and van der Weele 2014). Redistribution is typically achieved by tax and transfer systems, as well as by the provision of public goods such as education, health care, and public transport (Alvaredo et al. 2017b; Cutler 2002; Dur and Teulings 2003; Felbermayr et al. 2016; Guillaud, Olckers, and Zemmour 2020; Loder et al. 2024). Governmental spending for redistributive purposes comprises a huge share of total public expenditure. In 2022, for example, EU member states' expenditure on social protection benefits totaled 4307 billion EUR, a 3% increase from 2021. This expenditure represented 27.2% of the EU's GDP (Eurostat 2023).

Not least due to significant governmental redistribution, redistribution policy that is *just* in the eyes of society is indispensable for social cohesion (Alvaredo et al. 2017a). Whether redistribution policies are perceived as just depends on people's fairness considerations. Gaertner and Schokkaert asserted that "in a political democracy, it is nearly impossible to implement any theory of justice without sufficient support from the general public. This support will depend on the citizens' own values and preferences" (2012, 8). Saez and Stantcheva (2016) emphasized the crucial role of society's distributional fairness concerns for the design and evaluation of optimal taxation. Frohlich and Oppenheimer (1992) noted that fairness judgments can influence, for example, the perceived fairness of tax systems as mechanisms for implementing redistributive policies. This, in turn, can have severe impacts on the acceptance of these systems and, thereby, ultimately of the political regime as a whole.[5] It is, therefore, important to understand people's motives for redistribution (Gaertner and Schokkaert 2012).

Public redistribution expenditures are often justified by the moral obligation to satisfy basic needs, such as food, clothing, and shelter.[6] The International Labour Organization recommends basic

[1] See, for example, the World Inequality Database collecting and providing data on income and wealth inequality on a global level (https://wid.world/) coordinated by economists Facundo Alvaredo, Lucas Chancel, Thomas Piketty, Emmanuel Saez, and Gabriel Zucman, as well as numerous papers on inequality published by the latter (see, e.g., Alvaredo et al. 2017b; Piketty and Saez 2003; Saez and Zucman 2016) and Thomas Piketty's bestseller *Capital in the Twenty-First Century* (2014).

[2] In 2013, ex-president of the United States of America Barack Obama described growing inequality as dangerous (Goldfarb 2013). In 2017, the Social Democratic Party of Germany (SPD) lead its electoral campaign with the slogan "Zeit für mehr Gerechtigkeit" (English translation "Time for more justice"), one proposal being higher taxes on top incomes (Böcking 2018).

[3] The OECD, for example, has published a series of major reports on the issue of inequality in the last decade (see "Growing Unequal" (OECD 2008), "Divided We Stand: Why Inequalities Keep Rising" (OECD 2011), and "In It Together: Why Less Inequality Benefits All" (OECD 2015).

[4] See, for example, Eidelson (2018), Hagelüken (2017), Marinić (2018), and Stellinga and de Koning (2017). These inequalities are viewed as unfair. German national television has aired a three-part documentary discussing the injustice of rising inequality in Germany at prime time; "Ungleichland" was aired on the public television channel WDR in 2018 and has received a lot of public attention (see, for example, Frank 2018; Gertz 2018; Küppers 2018).

[5] Norton and Ariely (2011) documented that people prefer a distribution of wealth that is significantly more equal than the actual one. Empirically, people's distributional fairness concerns have been shown to be related to, among other factors, their probability of engaging in tax evasion (Barth, Cappelen, and Ognedal 2013), political decisions (Fisman, Jakiela, and Kariv 2017), and political orientations (Almås, Cappelen, and Tungodden 2020). This allows them to directly or indirectly influence redistribution issues and instruments.

[6] In the Netherlands, for example, social assistance has the purpose of covering the "necessary costs of living" (in Dutch: "noodzakelijke kosten van het bestaan" (see § 1, 6(a). ABW [Algemene Bijstandswet]). The German social security code specifies that social benefits have the purpose of guaranteeing the basic necessities for subsistence to everybody who cannot

social security that guarantees that "all in need have access to […] basic income security which […] secure[s] effective access to goods and services defined as necessary at the national level" (ILO 2012, 3), and asserts that "basic income security should allow life in dignity" (ILO 2012, 4). Clearly, other motives that underpin fairness norms also give rise to redistribution policy but might have different implications for what policy is considered just. Since fairness judgments have a bearing on the acceptability and viability of social policy, and ultimately on social cohesion, the political debate about what is socially just should be based on an understanding of the prevalence of different—and possibly jointly existing—motives for redistribution.

We believe that it is crucial to disentangle the motives under consideration because different motives for distributional preferences may have very different implications for public policy. For instance, if the maximin motive is applied consistently, it would call for income transfers to approach income equality. In contrast, a concern for basic needs fulfillment implies redistribution until all basic needs are met beyond a defined threshold. If the motive of basic needs satisfaction is a pivotal element in how the fairness of a given public policy is perceived, policy discussions should revolve around questions about the threshold amount at which basic needs can be fulfilled, the quantification of unmet basic needs, and the number of people who have unmet basic needs, and the resulting implications, rather than about whether redistribution should take place at all.

Despite its importance, knowledge about the prevalence and relative importance of motives that give rise to redistribution is limited. In particular, little is known about the prevalence of the motive for basic needs satisfaction. The economics literature focuses on other motives, such as the maximin principle (e.g., Andreoni and Miller 2002; Charness and Rabin 2002; Engelmann and Strobel 2004, 2007), inequity aversion, which comprises generosity and envy (e.g., Blanco, Engelmann, and Normann 2011; Engelmann and Strobel 2004, 2007; Fehr and Schmidt 1999), and efficiency (e.g., Andreoni and Miller 2002; Charness and Rabin 2002; Engelmann and Strobel 2004, 2007; Fisman, Jakiela, and Kariv 2017), all of which make important contributions to a better understanding of people's distributional preferences.

In this paper, we focus on the motive of *basic needs satisfaction* (BNS) as a fundamental separate distributive principle. We assess the existence and prevalence of concerns for basic needs satisfaction within a theoretical and experimental framework that allows us to disentangle this motive from the above-mentioned motives. Although a small set of studies has explored the role of basic needs fulfillment as drivers of behavior in dictator games (e.g., Aguiar, Brañas-Garza, and Miller 2008; Brañas-Garza 2006; Cappelen et al. 2013a; Konow 2010) and in non-incentivized vignette studies (Bauer et al. 2022; Faravelli 2007; Gaertner, Jungeilges, and Neck 2001; Konow 2001; Weiss, Bauer, and Traub 2017), it remains unclear whether results in these studies are driven by a concern to fulfill basic needs or by other distributional motives, such as maximin or generosity. Furthermore, in some of these studies, no concrete threshold of need satisfaction was introduced; the participants were simply informed that the recipients were "poor." If a need threshold was provided, the decisions under investigation were not incentive-compatible with respect to actual needs.

To the best of our knowledge, this paper is the first comprehensive attempt to provide clear evidence for the existence of concerns for basic needs satisfaction as a distinct distributional motive. Using a consistent framework that contains incentive-compatible experiments, we disentangle this motive from other key distributional concerns, such as maximin**,** efficiency, selfishness, generosity, and envy. In five experiments—two laboratory experiments conducted in Cologne, Germany, and two field experiments and one laboratory experiment conducted in Tbilisi, Georgia (N=446)—we employ five-person dictator games (Engelmann and Strobel 2004) where participants choose between three different

afford these necessities on her own in order to enable recipients to lead a decent human life (see §§1, 27(1), 27a(l) SGB [Sozialgesetzbuch] XII).

allocations of payoffs among themselves and four other persons.

In the German laboratory experiments, participants received standard incentives typical for laboratory settings. In contrast, the Georgian studies examined the allocation of substantial financial resources, with field experiments involving monthly salaries representative of the Georgian context. Across experiments, the allocations were constructed such that a dictator's choice of a particular alternative implies that they attach a positive weight to a particular motive, such as basic needs satisfaction or maximin. In a first set of basic choices, we systematically disentangled concerns for basic needs satisfaction from each of the above-mentioned other motives. We then exposed participants to various sets of additional choices in which we systematically altered the trade-off between concerns for basic needs satisfaction and the other motives. This approach allowed us to identify participants' distributional concerns and assess the relative importance of each motive.

To introduce basic needs into the experimental framework, we informed participants in an introductory text about the monetary amount required to meet basic needs. The text also referred to the other distributional motives mentioned above and provided relevant income figures or context. In addition to our five main one-shot experiments, we conducted a complementary experiment to examine the prevalence and predictive power of basic needs satisfaction concerns in a repeated interaction setting. In this strategic scenario, players had an incentive to satisfy others' basic needs to ensure joint survival.

Our main findings are as follows: i) A substantial proportion of individuals were motivated by basic needs satisfaction. Overall, 34% of participants made at least one choice consistent with this motive in five basic choice tasks; 9% consistently selected allocations that implied that they attach a positive weight to basic needs satisfaction. ii) Participants were willing to sacrifice personal income, efficiency, and utility in terms of envy to satisfy basic needs. iii) In line with previous literature, we found that selfishness and the maximin principle were also prevalent motives, whereas only a small proportion of our participants were primarily motivated by efficiency, generosity, or envy. iv) Concerns for basic needs satisfaction remained important even in situations where they led to similar predictions to maximin, suggesting they are not merely a proxy for it. v) Participants tended to prioritize fulfilling the total shortfall in basic needs rather than minimizing the number of people below the basic needs threshold. vi) The motive for basic needs satisfaction was insensitive to variations in relative prices in terms of different motives, across different incentive schemes, and between countries. vii) Where there was a strategic incentive to satisfy others' basic needs to ensure joint survival, the prevalence of basic needs fulfillment increased significantly. In these situations, not only participants previously identified as being motivated by basic needs fulfillment but also otherwise selfish individuals or those who were driven by other motives than BNS showed concern for other people's basic needs.

The remainder of this paper is organized as follows. Section II introduces the conceptual framework of concerns for basic needs satisfaction and the basic experimental implementation. Section III outlines the design of our experiments, our identification strategy, and the experimental procedures. Section IV presents the results. In Section V, we discuss our findings.

II. Conceptual Framework

A. Theoretical Background

The principle of basic needs satisfaction plays a prominent role in philosophical deliberations and normative theories of distributive justice. Philosophers including Karl Marx and Martha Nussbaum have placed normative reflections on the fulfillment of basic human needs at the center of their work. Marx analyzed the social and economic conditions necessary for fulfilling basic human needs (Marx 2018), while Nussbaum's approach highlights the importance of securing fundamental human capabilities, such as health, education, and social belonging, as essential to leading a fulfilled life (Nussbaum 2011). In psychology, basic needs were also prominently addressed by Maslow, who described how individuals

must satisfy their basic needs (Maslow 1943), and by Ryan and Deci (2017), who argued that the fulfillment of basic psychological needs is important to healthy psychological and behavioral functioning.

To evaluate a distribution according to the principle of basic human needs, two elements are essential: (i) a definition of what constitutes a *need* that can serve as the basis for a moral claim, and (ii) normative rules for assessing whether a given distribution adequately satisfies such needs (Miller 1999). Regarding the definition, Shue (1996) advocated the view that the guarantee of subsistence is a basic (moral) right. He defined subsistence as a minimum level of economic security, which consists of having "available for consumption what is needed for a decent chance at a reasonably healthy and active life" (Shue 1996, 23), like water, air, food, clothing, shelter, and health. Beyond biological necessities, basic needs can also be grounded in social factors determined by social expectations that must be fulfilled to avoid social harm and participate in society without shame (Miller 1999). For instance, wearing clothes deemed socially appropriate may be necessary to access the public sphere without shame (Smith 1976, as cited in Miller 1999). The sum of these biological and social claims constitutes the *threshold of basic needs satisfaction*. This threshold, above which basic human needs are satisfied, serves as a normative benchmark for evaluating the fairness of a distribution (Miller 1999). Importantly, what counts as a basic need, and thereby the level of the threshold, is determined contextually within the society in which these claims arise.

In the following, we provide a formal definition of the principle of basic needs satisfaction. Individuals who act according to this principle are said to exhibit *concerns* for basic needs satisfaction (henceforth BNS). We define the basic needs threshold, denoted by t, as the monetary amount that is required to fulfill a person's basic needs. We model concerns for basic needs satisfaction as the disutility an individual i experiences when basic needs—either their own or those of others—are unmet. This concern enters the individual's utility function as a distinct component. We assume that an individual's distributional preferences are shaped by various motives, of which BNS is one (cf. Konow 2001).

For simplicity, we first consider the two-person case. The utility of an individual who values their own payoff (i.e., has a selfish motive) and also cares about BNS is modeled as follows:

$$U_i(x) = \alpha_{1i} x_i - \alpha_{2i} max\big(t - x_j, 0\big)\,, \quad (1)$$

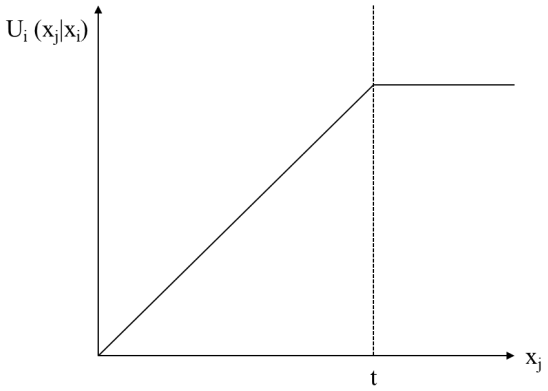
where $x_i \geq t$ is individual i's own income, and x_j is the income of person j. The parameters α_{1i} and α_{2i} represent the weights that individual i attaches to their own payoff and to the satisfaction of person j's basic needs, respectively. We assume that utility is linear and monotonically increasing in x_i, and in x_j when $x_j < t$. The functional form implies that individuals who are concerned with basic needs satisfaction derive disutility if not all needs of person j are fully met.

Fig. 1 depicts the utility of individual i as a function of person j's income, assuming $x_i \geq t$. When $x_j < t$, individual i's utility diminishes proportionally to the shortfall ($t - x_j$), reflecting i's concerns for basic needs satisfaction. The magnitude of this disutility depends on the weight i assigns to the basic needs of person j relative to i's valuation of i's own income. Once person j's income exceeds the threshold, i experiences no further disutility and derives full utility from their own income.

In the case where the reference group of an individual i consists of multiple persons, we assume that i's utility is given by the sum of their own income utility and the aggregate disutility from the unmet basic needs of all persons j in the reference group whose income falls below the threshold t. Formally:

$$U_i(x) = \alpha_{1i} x_i - \alpha_{2i} \sum_{j=1}^{n} max\big(t - x_j, 0\big). \quad (2)$$

Fig. 1. Utility with concerns for basic needs satisfaction.



Note. Utility of individual *i* as a function of person *j*'s income x_j for a given income of individual *i*, with $x_i \geq t$, where *t* is the threshold of basic needs satisfaction, relative to *t* in the two-person case.

If, for example, two persons with the respective incomes x_1 and x_2 are in need, *i*'s utility is diminished by $\alpha_{1i}[(t - x_1) + (t - x_2)]$.[7] Hence, a situation in which there are enough resources to satisfy the basic needs of every member would result in the lowest (i.e., no) disutility. If, on the other hand, resources are not sufficient to grant every person a sufficiently high income, then minimizing the sum of the differences between the income of each member and *t*, i.e., $\sum_{j=1}^{n} max(t - x_j, 0)$, yields the lowest disutility. This is in line with the notion of minimizing injustice in cases of resource scarcity, as perfect justice cannot be achieved in those cases (Miller 1999).

We now outline key properties of the principle of BNS as defined above. The underlying moral reasoning is that the greater the total unmet basic needs in a society, the less desirable the distribution of resources among its members. This implies that the fairness judgment derived from BNS is independent of how unmet basic needs are distributed across individuals. In formal terms, according to the utility function in equation (2), the disutility an individual *i* derives from the deprivation of others' basic needs depends solely on the aggregate shortfall between the threshold *t* and the incomes of those below it. For example, an individual with BNS would consider it equally problematic if one person were 100 EUR below the threshold or if ten people were each 10 EUR short. This property reflects the moral tenet that all individuals have an equal right to meet their basic human needs (Shue 1996). It also aligns with common intuitions that reject utilitarian cost–benefit analyses that aggregate individual harms and benefits using purely monetary valuations (Sunstein 2005). Accordingly, we interpret BNS not to prioritize some individuals' needs over others regardless of severity. That is, the basic needs principle does not imply that people with greater unmet needs should be given preferential treatment over those with lesser needs. It simply asserts that all unmet needs matter equally in moral evaluations. This conceptually distinguishes the basic needs motive from other principles of fairness that prioritize individuals according to their rank at the lower end of the income distribution, such as the least well-off in a society (maximin) or those who are worse off than oneself (generosity).

A second important property of the BNS principle is its threshold-based nature: once the basic needs of all individuals in a society are fulfilled, the principal provides no further normative guidance for the allocation of additional resources. This is because BNS is defined relative to a minimum

[7] Note that this formulation implies that as the number of persons with unmet basic needs in an individual's reference group increases without bound, the individual's disutility approaches negative infinity. Since a single person's income is unlikely to be sufficiently high to fulfill the needs of an infinitely large group, the individual's utility would approach minus infinity. However, it is reasonable to assume that individuals' reference groups are finite and bounded in size. Moreover, even if the total amount of unfulfilled basic needs in a reference group is sufficiently large to result in negative utility, it is plausible that the presence of widespread need would motivate greater participation by others in fulfilling those needs. This, in turn would reduce the amount of unfulfilled basic needs in a person's reference group and mitigate the individual's experienced disutility.

threshold of well-being. Both this property and the one described earlier are crucial for identifying BNS as a distinct distributional motive.

Besides BNS and selfishness (SLF), we consider four other well-established distributional motives commonly discussed in the literature: maximin (MXM), the desire to maximize the minimum income (Andreoni and Miller 2002; Charness and Rabin 2002; Engelmann and Strobel 2004); efficiency (EFF), the desire to maximize total income (Andreoni and Miller 2002; Charness and Rabin 2002; Fehr and Schmidt 1999); generosity (GEN), the aversion to advantageous inequality; and envy (ENV), the aversion to disadvantageous inequality (Fehr and Schmidt 1999).[8] We assume that an individual's distributional preferences may be shaped by a combination of these six motives. Accordingly, we extend the utility function to incorporate all six motives, allowing us to systematically identify and distinguish the relative importance of each in shaping allocation decisions:

$$U_i(x) = \alpha_{1i}x_i - \alpha_{2i}\sum_{j=1}^{n} max(t - x_j, 0) + \alpha_{3i}\min_{j\in\{1,\dots,n\}}(x_j) + \alpha_{4i}\sum_{j=1}^{n} x_j - \alpha_{5i}\sum_{j=1}^{n} max(x_i - x_j, 0) - \alpha_{6i}\sum_{j=1}^{n} max(x_j - x_i, 0)$$

$$= \alpha_{1i}SLF + \alpha_{2i}BNS + \alpha_{3i}MXM + \alpha_{4i}EFF + \alpha_{5i}GEN + \alpha_{6i}ENV. \quad (3)$$

The weights individual *i* attaches to the different motives are given by α_{1i} for SLF, α_{2i} for BNS, α_{3i} for MXM, α_{4i} for EFF, α_{5i} for GEN, and α_{6i} for ENV. If an individual, for example, deems her own income more important than the total income of the reference group, then $\alpha_{1i} > \alpha_{4i}$. We abstract from the scaling parameter $(1/(1-n))$ for GEN and ENV since we consider only one specific group size.

We acknowledge that (3) represents only one specific formalization of concerns for basic needs satisfaction. We adopt this specification because it offers a clear and tractable way to isolate the BNS motive from other distributional concerns. Alternative formulations, such as a concave function, might imply the prioritization of persons with greater needs and thus conflate BNS with maximin preferences. Conversely, a convex function could suggest triage-like reasoning (Miller 1999). In Section IV.B, we will explore whether choices in line with basic needs satisfaction can also be accounted for by alternative formulations of the motive. In II.A, we describe how we designed our experiment to empirically disentangle BNS as a distinct distributional motive, grounded in the theoretical framework described above.

B. Experimental Implementation

Only a small set of empirical studies consider the role of basic needs fulfillment as a driver of behavior, for example in dictator games (Aguiar, Brañas-Garza, and Miller 2008; Brañas-Garza 2006; Cappelen et al. 2013a; Konow 2010) or in vignette studies (Faravelli 2007; Gaertner, Jungeilges, and Neck 2001; Konow 2001; Weiss, Bauer, and Traub 2017). It remains unclear whether the prosocial behavior observed in these studies is motivated by genuine concerns for BNS or by other distributional motives, such as maximin preferences or generosity. For instance, transferring money to a relatively poorer person, as in Cappelen et al. (2013a), simultaneously reduces inequality between the giver and the receiver and raises the income of the least wealthy person. Such transfers may thus reflect multiple motives, making it difficult to isolate the effect of BNS. Moreover, these studies typically do not incorporate a formal threshold that defines the level of resources required to satisfy basic needs (e.g., Charness and Rabin 2002; Engelmann and Strobel 2004). This omission makes it plausible that what have been interpreted as maximin preferences may, in fact, reflect an unrecognized concern for the satisfaction of basic needs. Given the likely importance of the BNS motive, it is plausible to assume that individuals consider basic needs when making distributional decisions, even if the motive is not

[8] Note that we consider the different components of inequity aversion by Fehr and Schmidt (1999) separately. Results from Dannenberg et al. (2007) indicate that participants' envy and guilt parameters are unrelated. This allows us to treat them as two distinct distributional motives.

explicitly framed in the experiment. Participants may, for example, implicitly associate low allocations with unmet needs, thereby activating BNS-related concerns.

1. Design of Five Basic Choices

To examine BNS systematically as a distinct distributional motive, we designed a series of five experiments that disentangle BNS from other distributional motives, thereby addressing methodological concerns about the designs of previous studies. We ran two experiments in a German laboratory and three experiments (one in the field, two in the laboratory) in the country of Georgia (see Section III for details). Building on Engelmann and Strobel (2004), our experimental design centers on five core distributional choices, which we describe in detail in this section.

In each choice, a decision-maker selects one of three allocation options (A, B, or C) to distribute payoffs between herself (Person 2) and four randomly assigned other experimental participants (Persons 1, 3, 4, and 5). The payoff structures of these allocations are designed such that different motives imply different preferred options. By observing the choices made, we can infer which distributional motive(s) the decision-maker values. Table 1 shows the five basic choices and the three corresponding allocations, using the amounts of the experiments conducted in Germany.[9]

All choices were designed to preclude potential confounding effects. First, in each allocation, Persons 1 to 5 were ranked by income: Person 1 always received the highest payoff (i.e., was the richest), and Person 5 always received the lowest payoff (i.e., was the poorest). The decision-maker (Person 2) always received the second-highest payoff. For example, if a decision-maker in Choice 1 chose allocation C, Person 1 got 2910 monetary units (MU), Person 2 (the decision-maker) got 1620 MU, Person 3 got 1040 MU, Person 4 got 730 MU, and Person 5 got 180 MU. Second, the order of the allocations within each choice and the sequence of the five choices was randomized. Third, in the allocations, we avoided amounts that might make an allocation salient for reasons unrelated to distributional motives. For example, we ensured that within each choice, the income for any given person remained within an interval of the same first digit of a four-digit number. This avoided potentially salient shifts, such as an increase from 2900 to 3100 MU, that may appear more significant than equivalent changes with the same range (e.g., from 2700 to 2900 MU). Fourth, the displayed amounts differed slightly from those stated in the information text about the basic needs threshold (see Section II.B.2 for details) to prevent making the threshold overly salient to the participants. Fifth, we further limited the complexity of the choices and kept calculations and comparisons with the given amounts simple by using numbers rounded to multiples of 10 MU and, where possible, varying incomes across allocations in steps of 100 MU.

[9] In the Georgian experiments, the payoff values were adapted to local conditions but were structurally identical.

Table 1. Design of the five basic choices.

		Person and payoff					
Choice	**Allocation**	**1**	**2 (D)**	**3**	**4**	**5**	**Prediction**
	A	2910	1620	1240	430	280	MXM
1	B	2510	1720	1640	530	180	SLF/EFF/GEN/ENV
	C	2910	1620	1040	730	180	BNS
	A	3210	1720	1080	530	180	SLF
2	B	3010	1620	1480	430	280	MXM/EFF/GEN/ENV
	C	3110	1620	1090	720	180	BNS
	A	2970	1620	1230	530	180	EFF
3	B	2370	1720	1630	430	280	SLF/MXM/GEN/ENV
	C	2870	1620	1040	720	180	BNS
	A	2830	1620	1360	530	180	GEN
4	B	2630	1720	1560	430	280	SLF/EFF/MXM/ENV
	C	2930	1620	1070	720	180	BNS
	A	2750	1620	1310	530	180	ENV
5	B	2950	1720	1690	430	280	SLF/MXM/EFF/GEN
	C	2850	1620	1020	720	180	BNS

Note. The table shows the structure of the five basic selection options using the example of the experiments conducted in Germany (see Section III). Columns 3–7 show the payoffs for Persons 1–5 in allocations A, B, and C. Person 2 is the decision-maker (D). The last column indicates which motive predicts which allocation. Payoffs are given in MU, where 150 MU=1 EUR. The threshold of basic needs satisfaction is 630 MU.

2. Threshold for Basic Needs Satisfaction

We embedded the distribution decisions in a realistic societal context and established a clear evaluative rule for BNS by informing participants about the threshold income necessary to meet basic needs in the country where the experiment was taking place. Before making their decisions, participants read a short text about the distribution of income in their country (see Online Appendix A for the version used in Germany). The text stated that the distribution of income can be influenced by the members of society and can reflect different motives. It also conveyed the monthly amount necessary to fulfill a person's basic needs without explicitly labeling it as such, and introduced other distribution concerns, again without explicitly referring to the indicated motives, by explaining that additional income could be directed to the poorest (MXM), overall income levels could be prioritized (EFF), and income disparities might be considered (GEN, ENV). To avoid drawing disproportionate attention to the basic needs threshold, we included the country's median income for context. From the information provided, it was clear that in each allocation the decision-maker's payoff was close to the median income.

3. Identification Strategy

The literature shows that people are motivated by various distributional principles, which they weigh against one another when making distribution choices in different contexts (e.g., Konow 2001). In naturally occurring environments, selfish incentives typically conflict with people's desire to achieve or maintain a fair distribution of benefits and burdens. The ability to capture field behavior is crucial for the external validity of our study. Therefore, we aimed to disentangle the different distributional motives in a context where selfishness and prosocial principles are in conflict with each other. Moreover, our

design allowed us to determine whether decisions were driven by a concern to fulfill basic needs or by other distributional motives, such as MXM or GEN. Other studies that have considered the role of basic needs fulfillment (e.g., Aguiar, Brañas-Garza, and Miller 2008; Brañas-Garza 2006; Cappelen et al. 2013a; Konow 2010) did not make this important distinction. Finally, it is important to note that, in contrast to other studies on the satisfaction of basic needs (e.g., Faravelli 2007; Gaertner, Jungeilges, and Neck 2001; Konow 2001; Weiss, Bauer, and Traub 2017), we included experiments where the participants' decisions had real monetary consequences for them. This provided additional incentives for the participants to evaluate the experimental choices carefully and truthfully (Falk and Heckman 2009; Smith 1976).

To separate concerns for BNS from concerns for MXM and GEN, our design contained the following features (see Table 1). Persons 1 and 2 always received an income above the basic needs threshold. In all allocations, three persons (Person 3, 4, and 5) received a lower payoff than the decision-maker. To disentangle BNS from MXM, the income of the worst-off participant (Person 5) was always below the basic needs threshold, while the income of Person 4, the second worst-off participant, was varied across choices to alter the amount of basic needs fulfillment independently of the minimum payoff. To distinguish concerns for GEN from BNS and/or MXM, we also varied the income of the third worst-off person (Person 3) across allocations.

Let x_j be the payoff of person $j \in \{1, \dots, 5\}$ in an allocation, and assume that utility is linear in x. Given that Persons 1 to 5 always retain fixed positions within the income distribution across allocations—with Person 2 being the decision-maker—and that Persons 1 and 2 never have an income below the basic needs threshold, the decision-maker's utility function as specified in equation (3) simplifies to:

$$U_2(x) = \alpha_1 x_2 - \alpha_2 \sum_{j=3}^{5} max(t - x_j, 0) + \alpha_3 x_5 + \alpha_4 \sum_{j=1}^{n} x_j - \alpha_5 \sum_{j=3}^{5} (x_2 - x_j) - \alpha_6 (x_1 - x_2) \,. \quad (5)$$

Using the utility function in equation (5), we can calculate the utility that a decision-maker derives from each allocation, assuming motivation by a specific distributional motive. Consequently, a specific motive predicts an allocation A, B, or C if the utility associated with that motive is higher for this allocation than for the other two allocations.

The last column of Table 1 indicates, for each of the five choices, which allocation is predicted by which motive. If an allocation is predicted by only one motive, a decision-maker will choose this allocation only when they attach a positive weight to that motive, because the allocation provides the highest utility under that motive and lower utility under all others. This forms the core of our identification strategy. Importantly, BNS uniquely predicts allocation C in every choice. Hence, when a decision-maker chooses allocation C, it implies that they value the fulfillment of basic needs, i.e., that their parameter α_2 is positive. For example, in Choice 1, BNS predicts allocation C because the total unmet basic needs, measured as the sum of the positive differences between the threshold and each person's income, is smaller in allocation C than in allocations A or B. Specifically, in allocation C only Person 5 lacks 450 MU, whereas in allocations A and B the total unfulfilled basic needs add up to 550 MU. It is important to note that if a decision-maker chooses an allocation that is not predicted by BNS in a particular choice, this does not necessarily imply that they consider the BNS motive unimportant. Their decision may be shaped by multiple, potentially competing motives. Therefore, our estimates of the prevalence of BNS should be viewed as a conservative lower bound.

Furthermore, in each choice, one of the other five motives uniquely predicts allocation A. For example, in Choice 2, SLF predicts allocation A because the derived decision-maker's utility is higher for this allocation than for allocations B and C. Hence, the selection of allocation A in Choice 2 indicates that the decision-maker values their own payoff and assigns a positive weight to selfishness ($\alpha_1 > 0$). The remaining four motives predict allocation B. In this way, we can assess whether BNS is a crucial

determinant in decision-makers' choices and a distinct distributional motive. Table A1 in Online Appendix A provides an overview of the utilities associated with all five basic choices.

III. The Experiments

In this section, we describe our experiments. We implemented five experiments in total: two laboratory experiments in Germany and three experiments (one field experiment and two laboratory experiments) in the country of Georgia. Each experiment included the five basic choices described in Section II. Participants faced a series of additional choices that varied across experiments. For clarity and coherence, we will explain these additional choices alongside the results in Section IV.B.

A. Experiment BASE (Cologne, Germany, Laboratory, Incentivized)

Our baseline experiment, BASE, deployed the five basic choices in a randomized order as described above (see Section II.B and Table 1). It was conducted with 90 students majoring in different disciplines at the University of Cologne's Laboratory for Economic Research (CLER). Participants were recruited through the online recruiting system ORSEE (Greiner 2015) and participated in one session only. Each session lasted about 90 minutes. Upon arrival at the laboratory, participants drew a random code and were seated in separate, opaque cubicles. Participants were not allowed to communicate. The experiment started once all participants had read the instructions provided on paper and any questions about the procedure had been answered in private (see Online Appendix B for materials). Before making their decisions, participants received a text about the distribution of income in Germany, which included information on the basic needs satisfaction threshold (630 EUR) and the median income (1570 EUR) at the time of the experiment. The threshold was defined as 40% of the median monthly net equivalent income, a widely accepted benchmark for basic needs satisfaction in Germany (Statistisches Bundesamt 2012a, 2012b).[10] The absolute amounts mentioned in the text were of a similar order of magnitude to the experimental currency amounts used in the choices, thereby linking the experimental decisions to a real social context. This connection enabled the participants to evaluate the allocations with respect to the distributional motives under investigation.

The experiments were conducted on computers using the experimental platform z-Tree (Fischbacher 2007). Participants were informed that the experiment consisted of four parts but received no information about the specifics of upcoming parts. In the first part, participants were exposed to the five basic choices.[11] For this purpose, they were randomly assigned to groups of five persons. All participants first decided in the role of Person 2, i.e., the decision-maker. Subsequently, their role for payment within their group (Person 1, 2, 3, 4, or 5) for this part of the experiment was determined at random.[10] Earnings from all parts of the experiment were paid out using an exchange rate of 150 MU to 1 EUR. Participants additionally received a fixed show-up fee of 2.50 EUR and compensation of 2 EUR for completing a questionnaire. On average, participants earned 9 EUR.

[10] It might be argued that experimental participants perceive the threshold of 630 EUR as too high and that students may have less than this amount at their disposal per month. This is, however, not true: German students had, on average, a disposable monthly income of 864 EUR (Greiner 2015) at the time that the experiment was designed and implemented. Moreover, in the case of Cologne (the city where the experiment took place), which has one of the highest rental costs in Germany, students needed on average 893 EUR per month (Zeit Online 2015). Thus, it is reasonable to assume that participants in our study viewed the threshold as sufficiently low as to only cover basic human needs.

[11] In the second and the third parts, we implemented two different decision situations. The fourth part was a post-experimental questionnaire.

[10] A participant's payoff for the first part of the experiment depended on the decision of the participant who had been assigned the role of Person 2 (which could be the same or another participant) in the group. The fact that participants faced role uncertainty at the moment of their decision could have potentially biased them toward making decisions that were less selfish and more prosocial and efficiency-enhancing (Iriberri & Rey-Biel 2011; Walkowitz 2021). Using a similar design, Engelmann and Strobel (2004) did not find such effects. Furthermore, note that a participant's choice only affected their own payoff in the role of Person 2 and only if they was assigned this role. This precludes the possibility that participants' risk preferences could have influenced their choices (Schildberg-Hörisch 2010).

As we will show later, BASE yielded substantial evidence for the prevalence of BNS. Although we embedded the distribution decisions into a naturally occurring environment by implementing an exogenous basic needs satisfaction threshold and framing the payoff structure accordingly, we cannot be sure that Persons 4 and 5 were actually in need in their real lives. This may have influenced the decision-makers' choices, as it introduced a potential disconnect between the laboratory's induced incentive system and the participants' actual perceptions of personal needs. Moreover, the laboratory payments were smaller than the nominal amounts displayed in the experimental choices and those referred to in the accompanying text. As a result, the participants may not have interpreted the income amounts of Persons 4 and 5 as indicators of real needs, even within the societal frame provided. Despite these limitations, we are confident that the societal frame was salient to the decision-makers. This confidence is supported by a qualitative analysis of responses to two open-ended post-experimental questions, which suggests that the decision-makers engaged with the choices in line with the induced societal context.

Another potential and important limitation concerning the validity of our results from BASE relates to the relatively low stakes, which may have allowed for biased decision-making, e.g., due to socially desirable responding (e.g., King and Bruner 2000). Even though the participants' expected earnings in BASE fell in the common range of laboratory experiments, it remains unclear to what extent our results would generalize to situations involving substantially higher monetary stakes, as commonly encountered outside the laboratory setting.

Both limitations may weaken the external validity and generalizability of our findings. External validity seems, therefore, to be an important—but also specifically challenging—issue in the instructive investigation of basic needs satisfaction, as laboratory experiments may approach their limits when it comes to eliciting participants' true motives in a laboratory context where real-world consequences are muted. To address this concern, we made great efforts to test the robustness of our initial findings by conducting additional experiments where we tackled the above-mentioned challenges systematically.

B. Experiment HYPO (Cologne, Germany, Laboratory, Hypothetical)

To address the potential gap between induced laboratory payments and actual needs, we conducted a hypothetical version of BASE, referred to as HYPO. In this experiment, the participants received the same instructions, the same information text describing the threshold for basic needs satisfaction in Germany, and the same numerical figures used in the five basic choices as in BASE (see Table 1). However, unlike in BASE, the decisions in HYPO were hypothetical and had no monetary consequences for any participant (see Online Appendix C for materials). This design allowed us to eliminate the potential disconnect between the numerical figures in the laboratory and people's actual real-life financial situations, as all decisions were made solely within the societal frame presented in the introductory text. This vignette-based method, which is commonly used in the study of distributional motives (e.g., Bauer et al. 2022; Faravelli 2007; Gaertner, Jungeilges, and Neck 2001; Konow 2001; Weiss, Bauer, and Traub 2017), enabled us to test the robustness of our baseline results on the basis of the participants' self-reported preferences.

HYPO, like BASE, was conducted at CLER, but involved 90 students who had not taken part in BASE. The experimental procedures were identical to those in BASE, with two exceptions: First, the experiment consisted only of the first part, which entailed the five basic choices described above; Second, the participants were compensated with a fixed amount of 10 EUR for their participation, irrespective of the decisions they made. Each session lasted about 1 hour.

C. *Experiment HIGH-GEO (Tbilisi, Georgia, Laboratory, High Incentives)*

To examine whether our baseline findings held in decision situations involving substantially higher monetary incentives, we replicated the five basic choices with a student sample in a laboratory located in Tbilisi, Georgia. Georgia presents a particularly suitable context for our study, as a significant share of the population (10.1% in 2015) has an income below the nationally defined subsistence level (Geostat 2016a). Moreover, the country's underdeveloped social security system often fails to reach individuals in need, implying that many are actually deprived of their basic needs. These circumstances allowed us, on the one hand, to induce reasonably high incentives in the laboratory and, on the other hand, to embed the experiment within a social and economic context directly relevant to the participants' lived experiences.

In the HIGH-GEO experiment, the participants received a similar informational text regarding the basic needs satisfaction threshold as in BASE, adjusted to the Georgian context (see Online Appendix D for materials). Specifically, the text stated that the monthly amount required to fulfill a person's basic needs in Georgia is 130 GEL. This amount, published by the National Statistics Office of Georgia, marked the nationally defined subsistence minimum for a single-member household at the time of the experiment. The amount consists of a minimum food basket (70%) and non-monetary items (30%) (Geostat 2015a, 2016b). The numerical figures in the five basic choices were likewise adapted to reflect the Georgian context (see Table D1). Participants were paid at an exchange rate of 20 MU=1 GEL. Expected earnings constituted about 5% of the median monthly income in Georgia (337 GEL in 2023; Geostat 2015b) as compared to 0.75% in Cologne.

We conducted HIGH-GEO with 45 students at the International School of Economics in Tbilisi. The experimental procedures closely mirrored those used in BASE, with a few adjustments. The experiment was conducted using pen and paper, and all materials were provided in English. All the participants were proficient in English, and the instructions had been translated from German into English, applying the back-translation method to ensure accuracy (Brislin 1970). In addition to the five basic choices, the participants made five additional allocation decisions and completed a post-experimental questionnaire. On average, participants earned 14 GEL. Each session lasted about 45 minutes and was conducted by one of the authors, supported by a local research assistant.

D. *Experiment FIELD-GEO (Tbilisi, Georgia, Field, High Incentives)*

To address the crucial and still unresolved question of how BNS-related decisions elicited in the laboratory link to situations where recipients are genuinely unable to satisfy their basic needs in real life, we conducted the FIELD-GEO experiment in Tbilisi, using a sample drawn from the general population sample. As previously discussed, Georgia offers a particularly suitable context for this experiment due to the relatively high proportion of the population living below the nationally defined subsistence level. An additional advantage of using the Georgian participant pool lies in the high level of education among even the less affluent segments of society compared to the education level in other developing countries with underdeveloped social security systems.[11] This allowed for the implementation of a relatively complex experimental design and enhanced comparability with our experiments conducted in Germany.

The FIELD-GEO experiment addressed both potential concerns raised regarding BASE. First, the monetary stakes were substantial, as participants were making decisions involving actual monthly income levels. Second, the artificial divide between "laboratory" and "real world" was effectively eliminated, given that participants were confronted with exactly the income amounts in the experiment as in their everyday lives (i.e., some of the participants were actually in need in their daily lives). Another

[11] For example, the adult literacy rate in Georgia is 99.75% as compared to 83.44% in all middle-income countries and 57.50% in low-income countries (Worldbank 2016).

methodological distinction from BASE and HIGH-GEO was the absence of role uncertainty among decision-makers in FIELD-GEO (see footnote 12).

In FIELD-GEO, decision-makers made allocation decisions involving actual monthly incomes, both their own and those of four other selected and matched participants from the same sample. As in HIGH-GEO, participants received information about the monthly income level required to fulfill basic needs in Georgia, which at the time of FIELD-GEO was defined as 140 GEL. We used the same five basic allocation choices (see Online Appendix E for materials), with monetary figures tailored to reflect this updated threshold. The difference in thresholds between HIGH-GEO and FIELD-GEO stemmed from the different points in time at which the experiments were conducted.

To incentivize BNS appropriately, we gathered pre-experimental data on the participants' current monthly income (personal income) through a survey. The participants reported their household income and size, allowing us to compute their personal income using the modified OECD equivalence scale to account for household composition (assigning a value of 1 to the household head, 0.5 to each additional adult, and 0.3 to each child; see OECD 2013). Based on this information, the participants were assigned either the role of decision-maker (Person 2) or the role of Person 1, 3, 4, or 5. The participants who were assigned the role of Person 1 or Person 2 were further classified according to five different income categories (see Table E1), resulting in five different versions of the experiment. This categorization was implemented to ensure that the income ranges of Persons 1 and 2 remained manageable and comparable within each version. Accordingly, we developed tailored instructions, control questions, and decision booklets for each version, adjusting income figures in the allocation choices to reflect the respective income categories.

Before making their choices, and depending on their assigned income category, the decision-makers received information about the personal incomes of the four matched participants (Persons 1, 3, 4, and 5). For example, a decision-maker from income category I was informed that she was matched with participants whose personal income ranged between 590 and 617 GEL (Person 1), 171 and 197 GEL (Person 3), 69 and 95 GEL (Person 4), and 32 and 68 GEL (Person 5).

The five choices of the decision-maker are depicted in Table E2. These resemble the five basic choices of BASE, with income amounts adjusted to the Georgian context. Importantly, the payoffs were implemented in a way that supplemented a participant's actual current monthly personal income so that their total income reached the amount specified in the chosen allocation. In other words, the experimental payoff for a participant in the role of Person 1, 2, 3, 4, or 5 was the difference between the income amount assigned in the selected allocation (A, B, or C) and the participant's actual reported personal income. This design ensured that the decisions were about final distributions of actual income amounts among five genuine participants for the month of the experiment. For instance, think of a participant with a personal income of 600 GEL (income category I), who was assigned the role of Person 1. If the decision-maker in Choice 2 chose allocation C, in which Person 1 receives 641 GEL, the participant's experimental payoff would be 641–600 = 41 GEL.

Critically, among the four participants matched to each decision-maker, two participants had personal incomes below the Georgian threshold of basic needs satisfaction. Thus, choosing an allocation with a higher income amount for these participants could effectively satisfy their basic needs. This design feature allowed us to observe directly whether the decision-makers were motivated by BNS considerations in real-world income contexts.

The FIELD-GEO experiment was conducted at the University of Georgia and at the International School of Economics, both located in Tbilisi, between November 2015 and May 2016, and involved a total of 113 participants recruited from two different samples of the general population living in Tbilisi. The first sample consisted of respondents from a 2013 survey recruited via the random walk

method. The second sample comprised participants recruited by a Georgian helper team who were not informed about the specific purpose of the study.

The study included five steps (see Table E3). In the first step, participants were approached during home visits by trained helpers who conducted a pre-survey in which they asked respondents, among other things, about their monthly disposable household income and the number of (adult) family members. At the end of the pre-survey, respondents were invited to participate in the experiment and a more extended general survey. Those who agreed to participate were informed that they would be contacted again to schedule their experimental session. In the second step, families were selected by the research team on the basis of their calculated disposable monthly equalized income per family member. Selected families were contacted via telephone and invited to the experiment. Where possible, all family members were invited to the same time slot. However, if multiple members of the same family showed up, only one person, selected at random, was allowed to take part in the experiment.[12] All participants selected for the experiments decided in the role of the decision-maker (Person 2). Since Persons 1, 3, 4, and 5 did not make decisions, they were not present when the decision-makers made their choices.[13]

The sessions were conducted by a team of comprehensively trained local Georgian helpers, who had also completed trial runs of the experiment as part of their training. The helper team was led by an experienced Georgian supervisor, who was responsible for coordinating all aspects of the implementation of the experiment. The authors of the study stayed in the background during FIELD-GEO to minimize potential experimenter demand effects. Such effects could have been elevated had one of the German authors, who would have been perceived as an outsider due to cultural differences, been present during the experiment. By having locals run the sessions, both language barriers and cultural priming were avoided (see Herrmann, Thöni, and Gächter 2008).

The experiment consisted of three parts. In the first part, participants completed the five basic choices from BASE.[14] The second and third parts involved tasks unrelated to the present study. To guarantee anonymity during the decision-making process, the participants were separated by cardboard partitions that had been fixed at each desk (see Online Appendix E). Instructions had been translated from German into Georgian, applying the back-translation method to ensure accuracy (Brislin 1970). To make sure that the participants understood the instructions, they answered a set of control questions after reading the instructions. Their responses were reviewed individually by the experiment assistants. If a participant made a mistake, the assistant explained the relevant part of the instructions again and made sure the participant understood everything. After the control questions, the participants received the information text. After everyone had read the text, each participant received a printed decision booklet containing the five basic choices. Each decision was presented on a separate, single-sided page. The participants were instructed to proceed sequentially through the booklet without revisiting previous decisions.

The participants were paid for one of their decisions in the first part or the third part of the experiment; the second part was not incentivized. After completing all three parts of the experiment, the decision that determined the individual payoff was randomly determined. Each participant drew a card from a bag to select either the first part with probability 0.2 or the third part with probability 0.8.[15] Each

[12] Family members who did not participate in the experiment took part in another experiment or in the general survey questionnaire. The general survey questionnaire was administered either at another home visit or within the centralized sessions. For nine participants, the experiment and the survey questionnaire were conducted individually in their homes.
[13] Participants with these roles answered the general survey questionnaire or additionally participated in another experiment.
[14] In total, the participants made decisions in 24 choices. Due to the fact that the experiment was paper-and-pencil based and that the administration of the five different sets of decision booklets was already organizationally demanding, the order of the 24 choices, as well as the presentation of choice alternatives, was the same for all the participants. The order of choices was determined randomly before the experiment. The presentation of choice alternatives was balanced for each motive across the choices. In this way, we controlled for possible confounding effects if the participants for some reason systematically preferred, for example, the middle option (Option B). For a detailed description of the other choices, see Section IV.B.
[15] The different payment probabilities were assigned to balance the different stake sizes in the first and third parts of the experiment.

participant then determined the decision in the respective part that was to be paid out, again by physically drawing a card from a bag (see Online Appendix E). The decision-makers who received payment for a decision from the first part of the experiment were matched with four other participants (Persons 1, 3, 4, and 5) corresponding to their respective income categories. These participants received their payment at the end of their session after they had filled out the general survey questionnaire. In cases where this session took place before or on the same day of the session of the respective decision-maker's experiment, they could collect their payment later. As a result of this payment procedure, 25% of participants were paid for the first part.

On average, the participants earned about 67 GEL in this part of the experiment, where the exchange rate in November 2015 was 1 EUR=2.6 GEL.[16] Taking the median income in Tbilisi of 337 GEL as a reference, this amount constituted about 6.1 daily median incomes (Geostat 2015b). Each experimental session lasted about two hours.

E. Experiment HYPO-GEO (Tbilisi, Georgia, Field, Hypothetical)

In Tbilisi, we also conducted a hypothetical experiment (analogous to HYPO in Cologne) with participants from a general population sample. This experiment served as an additional robustness check for our German data as well as for the Georgian lab and field data collected in HIGH-GEO and FIELD-GEO. The experiment took place at both the University of Georgia and the International School of Economics in Tbilisi. A total of 108 participants from the same recruitment pool as in FIELD-GEO were exposed to the same set of choices as in FIELD-GEO, but in a hypothetical setting (see Online Appendix F for materials). The parameters of the five choices were identical to those used for income category I in FIELD-GEO. These parameters were also comparable to those used in HYPO in Cologne, in as far as the decision-maker received income amounts that were similar in relative distance to those of the three poorer persons in each choice. Independent of their decisions, each participant received a fixed compensation of 10 GEL for their participation. Apart from the hypothetical nature of choices with fixed compensation, all other experimental procedures were identical to those in FIELD-GEO. Eighteen participants were dismissed from the analysis because they had answered more than one of the five control questions wrongly. Each experimental session lasted about 45 minutes.

IV. Results

In the following, we present our empirical analysis structured in four subsections. In Section IV.A, we provide descriptive evidence about the prevalence of the BNS motive in the five basic choices across the five experiments. In Section IV.B, we report a series of robustness checks to evaluate both the consistency and the formalization of the BNS motive, on the basis of the participants' additional choices. Section IV.C introduces a series of mixed logit regression models to assess the extent to which distinct motives affected the probability of a given allocation being chosen. Finally, Section IV.D reports on the prevalence of BNS in repeated dictator games where dictators have a strategic incentive to satisfy receivers' basic survival needs.

A. Basic Choices

1. Prevalence of Motives

Fig. 2 depicts the average percentage of participants choosing in line with BNS across the five experiments. For a substantial number of the participants, BNS turned out to be an important motive. Across all experiments, 19.36% of the participants made BNS-consistent choices when contrasted with

[16] In addition to the payments in the experiment, participants received compensation of 20 GEL for filling out the survey questionnaire. Passive participants received on average 53 GEL in their role of a receiver (Person A, B, C, or D) in the first part of the experiment.

MXM. This proportion increased to 27.76% when contrasted with SLF. In line with previous literature (e.g., Engelmann and Strobel 2004), our summary statistics also underscore the relevance of MXM and SLF: 38.59% of the decision-makers behaved consistently with MXM preferences, while 30.55% followed SLF. Motives of efficiency, generosity, and envy were less prevalent, with only about 14% of the participants choosing in line with EFF and 13% doing so for GEN and ENV.

When analyzing the five choices separately for each of the five experiments, we found that a substantial number of the participants made their decisions according to BNS in each choice and each experimental setting (see Table 2); the prevalence of BNS-consistent choices ranged from 10% in HYPO (Choice 4) to 46.67% in BASE-GEO (Choice 2). The importance of MXM and SLF was also evident within each single experiment. EFF, GEN, and ENV were more prevalent in the Georgian context, with EFF reaching its highest proportion of 21.11% in HYPO-GEO, while GEN and ENV did so in FIELD-GEO, at 29.9% and 21.24%, respectively.

2. Individual Choice Patterns

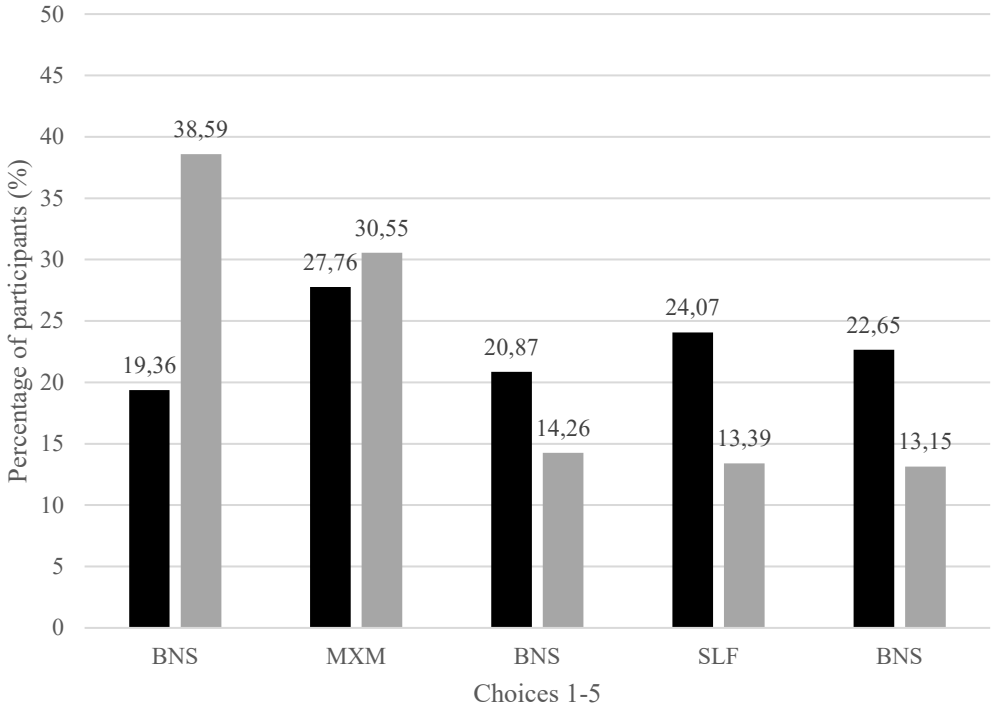
We now turn to the analysis of individual choice patterns. Fig. 3 depicts the reverse cumulative distribution of the frequency with which the participants chose in line with a given motive, conditional on choosing in line with this motive when it alone predicted an allocation across all experiments.[17] The reverse cumulative distribution indicates the proportion of participants choosing more than x times in line with a motive. Across all experiments, 48.6% of the participants chose in line with BNS at least once. For these participants, we can infer that they attached a positive weight to BNS, i.e., that the motive entered their utility function. We can further observe that, on average, 38.1% of the participants chose at least once in line with MXM, and 31.8% chose at least once in line with SLF.

Observing that participants repeatedly chose in line with a given motive raises confidence that this motive was genuinely important to them. As illustrated in Fig. 3, 8.6% of the participants chose in line with BNS at least four out of five times, and 4% did so in all five decisions. In comparison, the motives MXM and SLF appear more dominant: 25.9% of the participants chose in line with MXM at least four times, and 15.7% did so five times, while 21.3% chose at least four times in line with SLF, with 14% doing so consistently across all five choices.

Figs. G1a–e in Online Appendix G display the reverse cumulative distribution of the frequency with which the participants chose in line with each motive, separately for each experiment. The results support the findings from our aggregated analysis. Specifically, the prevalence of BNS was evident across all the experimental settings: between 31.1% (HYPO) and 68.9% (BASE-GEO) of the participants made at least one decision consistent with BNS. Moreover, between 2.7% (FIELD-GEO) and 24.4% (BASE-GEO) of the participants chose in line with BNS in at least four out of the five decisions.

[17] This means that for the motives MXM, SLF, EFF, GEN, and ENV, a participant was counted as choosing x times in line with a given motive only if the participant selected the respective option in cases where that motive uniquely predicted the choice (e.g., Option A in Choice 1 for MXM). Choosing such an option when it was exclusively predicted by one motive indicated that the motive held some independent significance for the participant. It is, therefore, a stronger and more reliable indicator of the participant's preferences compared to situations where the chosen option was consistent with multiple motives simultaneously. Notably, owing to the construction of the five basic choices, selecting an option in line with any of the motives—MXM, SLF, EFF, GEN, or ENV—automatically implies choosing in line with all other motives (except BNS) in $x-1$ of the cases. Consequently, if a participant chose x times in line with a given motive (e.g., MXM), they would, by design, also be aligned with the other overlapping motives in at least $x-1$ instances. This interdependence does not apply to BNS, as its predictions are distinct from each other.

Fig. 2. Distribution of motives.



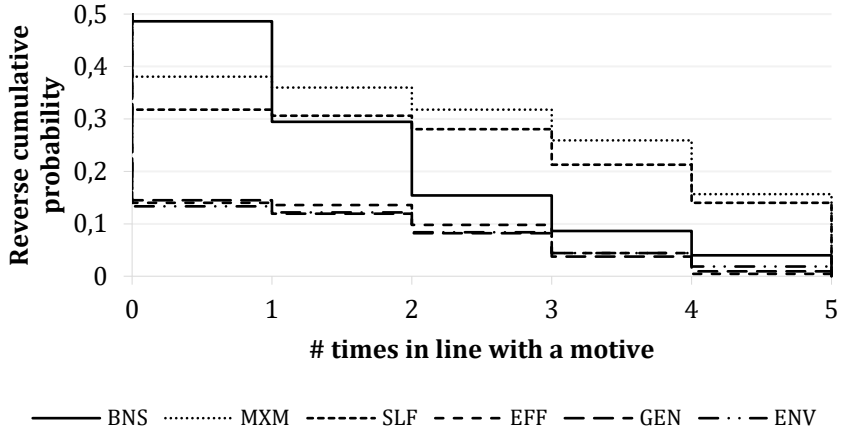
Note. The proportion of participants across all five experiments choosing Option C and thus attaching a positive weight to BNS (black bars) and the proportion of participants choosing Option A and thus attaching a positive weight to the respective motive predicting this option (grey bars) in the five basic choices across all five experiments (1–5, from left to right). The remaining participants choose Option B (the option predicted by the four remaining motives), which is not depicted here.

Table 2. Proportion of participants choosing in line with BNS.

Experiment	Choice 1		Choice 2		Choice 3		Choice 4		Choice 5	
	BNS	MXM	BNS	SLF	BNS	EFF	BNS	GEN	BNS	ENV
BASE	11.11	36.67	20	36.67	16.67	7.78	17.78	5.56	21.11	8.89
HYPO	12.22	43.33	16.67	21.11	12.22	7.78	10	4.44	13.33	11.11
BASE-GEO	33.33	40	46.67	22.22	37.78	17.8	35.56	11.1	40	15.6
FIELD-GEO	21.24	31.86	26.55	37.17	17.70	16.81	24.78	29.20	17.70	21.24
HYPO-GEO	18.89	41.11	28.89	35.56	20.00	21.11	32.22	16.67	21.11	8.89

Note. The table displays the proportions of BNS choices across the five experiments. BNS=basic needs satisfaction, MXM=maximin, SLF=selfishness, EFF=efficiency, GEN=generosity, ENV=envy.

Fig. 3. Reverse cumulative distribution of choice of motive.



Note. Reverse cumulative distribution across all experiments indicating the proportion of participants choosing more than *x* times (0–5) in line with a motive conditional on choosing in line with this motive when it alone predicts an allocation. BNS=basic needs satisfaction, MXM=maximin, SLF=selfishness, EFF=efficiency, GEN=generosity, ENV=envy.

These observed frequencies cannot be explained by random choice behavior. Given that the participants chose from three possible alternatives in five choices, the total number of possible choice patterns was 243 (i.e., 2^5). Under the assumption of purely random choice behavior, each option in a given decision would be equally likely to be chosen. Importantly, only one of the 243 choice patterns aligned perfectly with a given motive across all five choices. In the case of BNS, this pattern was always choosing Option C. Thus, the resulting probability of choosing five times in line with a given motive under random choice was 1 in 243. Furthermore, there are exactly 10 choice patterns that imply being in line with BNS exactly four times. The expected probability of a participant choosing at least four times in line with BNS under random choice is therefore $\frac{10}{243} + \frac{1}{243} = \frac{11}{243}$.

Two-sided binomial probability tests rejected the null hypothesis that the proportion of decision-makers choosing at least four times in line with BNS would be equal to the share that we would expect if participants were choosing completely randomly in all experiments, except for FIELD-GEO. Specifically, the null hypothesis was rejected at the 5% significance level for BASE, HYPO, and BASE-GEO, and at the 10% level for HYPO-GEO (see Table H1 in Online Appendix H). We found similar results for those decision-makers who chose five times in line with BNS ($p<.05$ for BASE, BASE-GEO, and HYPO-GEO, $p<.1$ for HYPO). Applying the same logic to MXM and SLF, we also found statistically significant deviations from randomness. Two-sided binomial probability tests rejected the null hypothesis that the proportion of decision-makers choosing five (at least four) times in line with MXM (SLF) could be attributed to random behavior ($p<.05$ for all tests).[18]

These results collectively reinforce the conclusion that BNS, MXM, and SLF systematically influenced distributional choices. Moreover, the fact that a majority of our participants chose repeatedly in line with one of the motives under consideration lends support to the internal validity of our experiments: 37% of the participants consistently chose in line with a single motive in the five basic choices. This proportion rises to 68% if we also consider the participants who chose four times in line with one motive. Hence, a large number of our participants put positive weight on one of the motives under consideration. Among these participants, the majority were consistently guided by a non-selfish

[18] For MXM and SLF, there is also exactly one choice pattern that implies being in line with a given motive five times resulting in a probability of 1 in 243 of choosing five times in line with a given motive under random choice. In the case of MXM, for example, this choice pattern is choosing Option A in Choice 1 and Option B in the remaining choices. Furthermore, the expected probability of a participant choosing at least four times in line with either MXM or SLF (conditional on choosing in line with this motive when it alone predicts an allocation) under random choice behavior is 5 in 243.

motive. This suggests that our design effectively captured motivations that were relevant to our participants, rather than reflecting arbitrary or situational responses. At the same time, it is important to keep in mind that the participants who did not consistently choose in line with a single motive were not necessarily deciding without a coherent preference structure. Instead, their decisions may have been shaped by multiple, potentially competing motives that varied in salience and importance depending on the specific context of a particular choice task (an idea discussed in Section II). The individual choice data also revealed substantial heterogeneity in the importance the participants attached to different distributional motives, a topic we explore further in Section IV.C.

3. Interpreting the Prevalence of BNS Concerns and Measurement Issues

Regarding the conclusion about the prevalence of the BNS motive, our findings provide strong evidence that BNS was a distinct and important distributional concern. When interpreting differences in the proportion of the participants who repeatedly chose in line with a particular motive, two further considerations are important. First, choosing in line with BNS was especially demanding: each such choice required selecting an allocation that was *not* predicted by any of the other motives. For instance, a decision-maker who chose in line with BNS four times was, by definition, selecting four times an allocation that was neither optimal in terms of her own payoff, nor optimal in terms of MXM, EFF, GEN, or ENV. In contrast, all the other motives, including SLF and MXM, were the sole predictors of an allocation in only one of the five basic choices; in the other four choices, the allocations favored by these motives were also supported by three other motives. For example, a decision-maker who chose in line with MXM five times had to choose only one allocation that was predicted by MXM alone (in Choice 1, where MXM predicted Option A; see Table 1). In the other cases (i.e., Choices 2–5; see Table 1), MXM predicted Option B, which was also predicted by three of the other motives. This asymmetry means that the consistency criterion was more conservative for BNS, which may explain why BNS exhibited a steeper decline in the reverse cumulative distribution (Fig. 3). Although many participants chose in line with BNS at least once, consistency in BNS-guided choices declined faster than for the other motives. In light of this, it is particularly noteworthy that a sizable proportion of the participants nevertheless chose in line with BNS throughout all five choices.

Second, it might have been cognitively more demanding for the participants to evaluate allocations based on BNS compared to MXM or SLF. Choosing the highest possible outcome for oneself (SLF) or for the least well-off person (MXM) was relatively straightforward. The participants simply had to compare three income amounts, specifically, the income of Person 2 for SLF or Person 5 for MXM. In contrast, evaluating BNS, the participants had to assess if and how far the income of Person 4 and Person 5 fell short of the specified need threshold (which also had to be remembered). This required a calculation of the differences between the depicted incomes and the given need threshold, as well as a comparison of the overall sum of needs across allocations. This added complexity increased the likelihood of mistakes and may have made BNS choices more taxing, thereby rendering our findings on the prevalence of BNS more conservative.

To evaluate whether BNS was indeed more cognitively demanding, we compared the response times of the participants who chose five (or at least four) times in line with the most prevalent motives, MXM, SLF, and BNS, in the five basic choices. For this analysis, we used pooled data from our computerized laboratory experiments BASE and HYPO, which allowed us to track individual response times. We found that both choices in line with SLF and choices in line with MXM were made significantly faster than choices in line with BNS (see the descriptive statistics in Table I1 in Online Appendix I). In particular, participants who chose five (at least four) times in line with SLF took, on average, 54 (58) seconds, while their BNS counterparts took 100 (100) seconds (Wilcoxon signed-rank test, two-sided: p=.002 [p<.001]). Similarly, participants choosing in line with MXM five (at least four)

times took on average 74 (84) seconds (Wilcoxon signed-rank test, two-sided: p=.039 [p=.034]). This lends support to the conjecture that applying the principle of BNS was more demanding and involved greater cognitive effort than applying SLF or MXM.

Finally, any assessment of the relative importance of the different motives depends on the specified utility function (equation [3]), as well as on the operationalization of motive-consistent choices in the experiment. Furthermore, as noted earlier, our classification of participants as attaching a positive weight to BNS is rather conservative, since choosing an allocation that was also predicted by a different motive does not imply that the participant did not care about BNS. Therefore, any direct comparison of the prevalence of concerns for BNS, MXM, or SLF must be made with caution and careful attention to the specific features of the experimental design. Most importantly, the results presented in this paper are not intended to provide precise estimates of the relative strength of concerns for BNS. Instead, they provide robust evidence for the existence of BNS as a distinct and important distributional motive.

B. Evidence from Additional Distribution Choices

In the following, we describe the design and the results of additional choice scenarios that we implemented to assess the robustness and prevalence of the BNS motive. Tables J1–6 (see Online Appendix J) provide an overview of these additional decisions across the different experiments. Importantly, in each experiment, the participants first completed the five basic choices before proceeding to any supplementary task. Moreover, to underpin the robustness of our findings, we present insights drawn from qualitative data collected in connection with the participants' decisions.

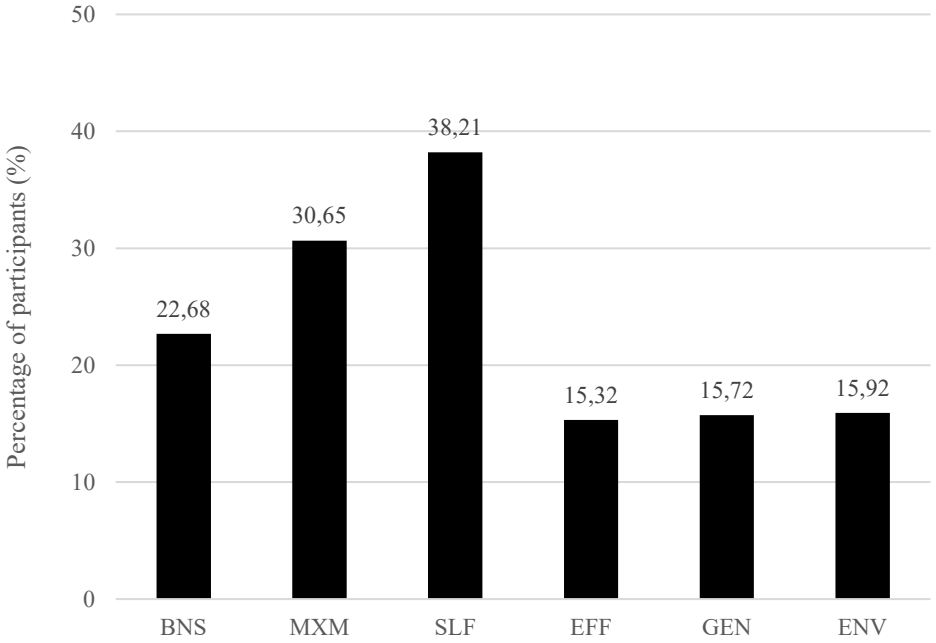
1. Isolation Choices

First, in FIELD-GEO and HYPO-GEO, the participants completed 11 additional *isolation* choices, which were designed to assess the importance of the other distributional motives disentangled from BNS concerns. These choices involved high-stakes decisions embedded in a real-world context. Unlike the basic choices, where each motive (except BNS) uniquely predicted an option only once, each of the other motives now uniquely predicted one option in five of the 16 choices (five basic choices plus the 11 additional choices).[19] Specifically, in each of these five choices, one motive alone predicted Option 1 or Option 3, while the remaining four motives predicted Option 2 (see Table J5). This approach resulted in a balanced design that allowed us to analyze the frequency with which each motive was chosen, and was well-suited for the estimation of the choice model described in Section IV.C. To the best of our knowledge, the importance of distributional motives has not yet been assessed in high-stakes decisions with a real-world context in which the fulfillment of basic human needs is at stake.

Fig. 4 shows the average percentage of participants who chose in line with each motive in the choices where that motive alone predicted an option. The overall pattern closely resembles the results from the five basic choices. Once again, SLF emerged as the most prevalent motive, chosen by about 38% of the participants, followed by MXM (31%), and BNS (23%). The other motives—EFF, GEN, and ENV—were chosen by around 15% to 16% of the participants. When examining each experiment separately, a similar pattern held across all the experiments, with one notable exception: in HYPO-GEO, MXM was chosen more frequently than SLF when it alone predicted an option (see Figs. K1–K4 in Online Appendix K).

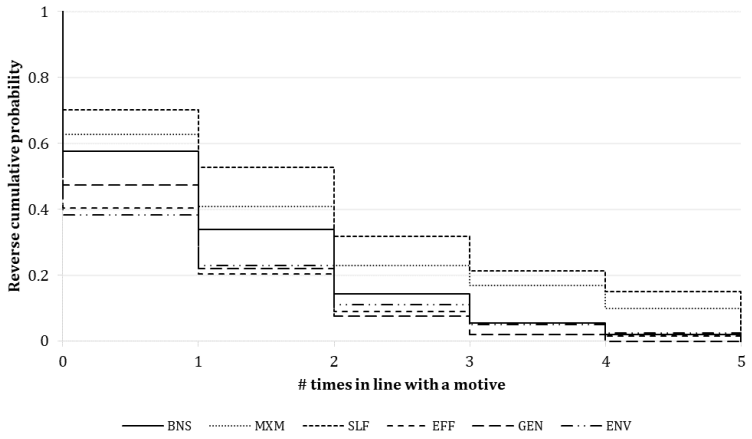
[19] It was not possible to have the motives SLF and GEN alone predict a different option at the same time. Thus, we employed one choice in which SLF alone predicted an option and GEN, as well as EFF, predicted a different option (Choice 11), and a second choice in which GEN alone predicted an option and SLF, as well as EFF, predicted a different option (Choice 12).

Fig. 4. Average percentages of basic and isolation choices.



Note. Average percentage of participants choosing in line with each motive when it alone predicted an option in the basic and isolation choices (1–16) in experiments FIELD-GEO and HYPO-GEO. The rest of the participants chose the option predicted by the four remaining motives, which is not depicted here (*N*=201). BNS=basic needs satisfaction, MXM=maximin, SLF=selfishness, EFF=efficiency, GEN=generosity, ENV=envy.

Fig. 5. Reverse cumulative distribution of basic and isolation choices.



Note. The reverse cumulative distribution indicates the proportion of participants choosing more than *x* times in line with a motive when it alone predicts an option in isolation choices (1–16) in experiments FIELD-GEO and HYPO-GEO. BNS=basic needs satisfaction, MXM=maximin, SLF=selfishness, EFF=efficiency, GEN=generosity, ENV=envy.

Furthermore, Fig. 5 reveals that the percentage of the participants choosing at least once in line with BNS (MXM, SLF, EFF, GEN, ENV) was roughly 58% (63%, 70%, 40%, 47%, 38%). Regarding more consistent choice patterns, the figure shows that 32% of the participants chose SLF, 23% MXM, and 14% BNS at least three out of five times, even when it was the only motive predicting an option. For ENV, EFF, and GEN, these shares were 11%, 9%, and 7%, respectively.

2. Maximin and Basic Needs Satisfaction Choices

Both in natural settings and in empirical studies, MXM preferences and concerns for BNS often predict the same choice option. Some people appear to favor those who are worst-off—consistent with maximin preferences—but are actually guided by a desire to ensure that everyone reaches a minimally acceptable standard of well-being. In other words, what looks like a concern for maximizing the minimum may in fact reflect a concern for satisfying basic needs. Real-world examples exist in many contexts. When allocating health resources (e.g., Radinmanesh et al. 2021) or education resources (e.g., Baker, Sciarra, and Farrie 2024), for example, authorities may prioritize regions with the worst indicators, not strictly to maximize the minimum but to ensure that all regions have access to essential services like clinics or schools. Similarly, policies targeting homelessness may prioritize individuals sleeping on the street, not to raise their utility above other people's but to guarantee access to shelter and food that meets basic standards (e.g., Fowler et al. 2019).

In experimental studies that elicited MXM preferences, concerns for BNS might also have influenced decisions and provided confounding results. For instance, a possible explanation of why we found a lower prevalence of MXM concerns than Engelmann and Strobel (2004, 2007) is that, in their setting, some of the participants who chose in line with MXM preferences actually did so because this option had the highest prospect of fulfilling basic needs.[20]

To distinguish between BNS and MXM motivations, we included four additional MXM and BNS choices in each experiment where both motives predicted the same option (see Tables J2, J3, and J4). Comparing decision patterns in the five basic choices with decisions in the additional MXM and BNS choices allowed us to examine the importance of MXM and BNS in situations in which they made similar predictions. For our analysis, we used Choices A1 and A2 of the 225 participants in BASE, HYPO, and BASE-GEO (Tables J2 and J3)[21] and Choices A6 and A7 collected from 202 participants in FIELD-GEO and HYPO-GEO (Table J4).

We compared the participants' decision patterns in the five basic choices with those in the additional choices (A1, A2, A6, and A7). Choice A1 was similar to Choice 1 but differed in that BNS predicted the same option as MXM. In this option, the basic needs of Person 4 and 5 were satisfied. The remaining four motives predicted a different option. Likewise, in Choice A2, which was similar to the basic Choice 2, MXM and BNS predicted the same option together with all other motives but SLF. Again, in this option, all persons had an income at least at the threshold, while the option predicted by SLF left three persons with an income below the threshold and had the highest overall amount of unfulfilled basic needs. In choices A6 and A7, SLF alone predicted one option, and MXM together with BNS (MXM & BNS) predicted a second option, while the other motives predicted the remaining option. In the MXM & BNS option of both choices, there were no remaining unfulfilled basic needs. In the selfish option of Choice A7, the overall amount of unfulfilled basic needs and the number of persons in need were greater than in Choice A6.

[20] Engelmann and Strobel (2004, 2007) elicited participants' distributional motives in three- and five-person dictator games, similar to our choice design. They found that on average 48%–73% of participants choose in line with MXM when it alone predicted an allocation. One possible explanation for the higher prevalence of MXM is that, in their setting, without information on a threshold for basic needs fulfillment, the absolute smallest monetary amount was most likely to be perceived as being below such a threshold. As a result, some participants may have chosen in line with MXM not because of maximin concerns but because the option also best addressed basic needs. In contrast, our experimental design explicitly provided information about the basic needs threshold, enabling the participants to distinguish more clearly between MXM and BNS. Hence, participants for whom BNS was sufficiently important will have chosen the option predicted by BNS. Notably, in Choice 1—where BNS and MXM predict different allocations—48% of our participants chose in line with either BNS or MXM. This percentage is much closer to the levels found by Engelmann and Strobel (2004, 2007) than the 37% who chose in line with MXM alone in Choice 1. This suggests that BNS concerns may have influenced behavior in earlier studies, even if those studies were interpreted as capturing pure MXM preferences.

[21] In the experiments BASE, HYPO, and BASE-GEO, the participants were exposed to a total of five additional choices (A1–A5; see Tables J2 and J3 in Online Appendix J). The order of the five additional choices, as well as the display of the allocation options within each game, was completely randomized. A3–A5 were used in the choice model (see Section IV.C).

Table 3. Proportion of MXM & BNS option by preference type.

		Type						
			BNS		MXM		SLF	
Choice	Total	225	26	11.56%	73	32.44%	47	20.89%
A1	MXM & BNS	111 49.33%	25 96.15%	22.52%	47 64.38%	42.34%	10 21.28%	9.10%
A2	MXM & BNS	145 64.44%	22 84.62%	15.17%	59 80.82%	40.69%	17 36.17%	11.72%
	Total	202	11	5.45%	38	18.81%	42	20.79%
A6	MXM & BNS	82 40.59%	7 63.64%	8.54%	25 65.79%	30.49%	8 19.05%	9.76%
A7	MXM & BNS	96 47.52%	8 72.73%	8.33%	25 65.79%	26.04%	7 16.67%	7.29%

Note. Choice percentages of the MXM & BNS option in Choices A1 and A2 in experiments BASE, HYPO, and BASE-GEO, as well as in Choices A6 and A7 in experiments FIELD-GEO and HYPO-GEO by type (participants choosing at least four times in line with BNS, MXM, or SLF in the five basic choices) and corresponding percentages (N=225, $n_{\text{BASE}} + n_{\text{HYPO}} + n_{\text{BASE-GEO}}$; N=202, $n_{\text{FIELD-GEO}} + n_{\text{HYPO-GEO}}$, with one observation missing for Choice A6 in experiment FIELD-GEO and one for Choice A7 in experiment HYPO-GEO, respectively). BNS=basic needs satisfaction, MXM=maximin, SLF=selfishness, EFF=efficiency, GEN=generosity, ENV=envy.

Table 3 shows that 40.59% to 64.44% of the participants chose the option that was predicted by MXM & BNS (column 3).[22] When focusing on the participants who consistently chose in line with one motive at least four times, we find that 22.52% (15.17%) of those who selected the option predicted by MXN & BNS in Choice A1 (A2) were BNS types, although BNS types constituted only 12% of the participants in BASE, HYPO, and BASE-GEO. For MXM, these percentages were 42.34% and 40.69%, with those types making up 32% of the participants.

The proportion of BSN types selecting the MXM & BNS option in Choice A6 (A7) was 8.54 (8.33)%, although only 5% of all the participants in FIELD-GEO and HYPO-GEO were SLF types. For MXM, these percentages were 30.49% and 26.04%, with these types making up 19% of the participants. This suggests that both MXM and BNS were indeed important in explaining why participants chose the option in which there were no unfulfilled basic needs in these two choices.

Even though the overall prevalence of MXM types was almost three times higher than that of BNS types in the basic choices (11.56% vs. 32.44%), MXM types were less than twice as prevalent as BNS types when looking at those participants who chose the MXM & BNS option in Choice A1 (22.52 vs. 42.34%). This is because almost all the BNS types chose this option, whereas only 64% of the MXM types did so. Choices A2 and A7 presented a similar although less pronounced picture. Here, 84.62% and 72.73% of previously classified BNS types and 80.82% and 65.79% of MXM types chose the MXM & BNS option. Thus, having a strong preference for BNS seems to have been (slightly) more predictive for choosing the option aligned with both motives than putting a relatively large weight on MXM. This suggests that in situations in which both motives made similar predictions—especially when it was a decision to fulfill all basic needs—the motive of BNS was likely to play an important role next to MXM. If basic needs satisfaction was ignored as a motive, there was a tendency to overestimate the prevalence of MXM.

Table 3 also reveals that 16.67% to 36.17% of selfish types chose the option predicted by MXM and BNS in Choices A1, A2, A6, and A7. This is surprising, given that these participants displayed a strong preference for SLF in the basic choices. In fact, the majority of these selfish types (77% and 57%) always chose the selfish option in the basic choices. There are a number of reasons why the switch from

[22] In choice A2, the MXM and BNS option seems to have been very appealing to the participants, since 64% opted for it. This might be because choosing the selfish option entailed letting three persons fall below the threshold and thereby had the highest overall amount of unfulfilled basic needs. Indeed, 36% of selfish types chose this option in Choice A2, whereas this was the case for only 21% in Choice A1 (in which choosing the selfish option entailed leaving two other people with unfulfilled needs and thereby also a lower amount of overall unfilled basic needs).

SLF to MXM & BNS might have occurred. One potential explanation is that the overall amount of unfulfilled basic needs (as well as the number of persons in need) was higher in the selfish option of Choices A1, A2, A6, and A7 than in the five basic choices. These altered trade-offs between SLF and MXM/BNS might have induced some participants to prefer the non-selfish option MXM & BNS. These findings confirm the idea that the prevalence of selfish behavior depends on the context and the specificities of the trade-off (e.g., Frohlich, Oppenheimer, and Kurki 2004).

3. Income Gap Choices

In FIELD-GEO and HYPO-GEO, participants made decisions in five additional income gap choices (IG1–IG5) (see Table J6), which allowed us to test an important assumption of our model of BNS (Section II), namely whether participants were primarily concerned with the *sum* of unfulfilled needs (i.e., the income gap) or with the *number* of individuals falling below the basic needs threshold (i.e., headcount considerations).[23] In the basic choices, the option predicted by BNS was constructed to minimize both the total amount of unfulfilled needs and the number of individuals below the threshold. As a result, it remains unclear which of the two need-based criteria—income gap or headcount—primarily drove the participants' decisions.

To address this ambiguity, the income gap choices were designed such that the number of persons below the need threshold was held constant across options (Table J6 in the Online Appendix J).[24] This enabled us to isolate the participants' sensitivity to the size of unfilled needs while holding headcount constant. If the participants were motivated by minimizing the income gap, we should have observed that at least as many chose the BNS-predicted option in the income gap choices as in the corresponding basic choices. Conversely, if the proportion choosing in line with BNS was smaller in the income gap choices, this would suggest that the participants were primarily concerned with reducing the number of individuals below the threshold.

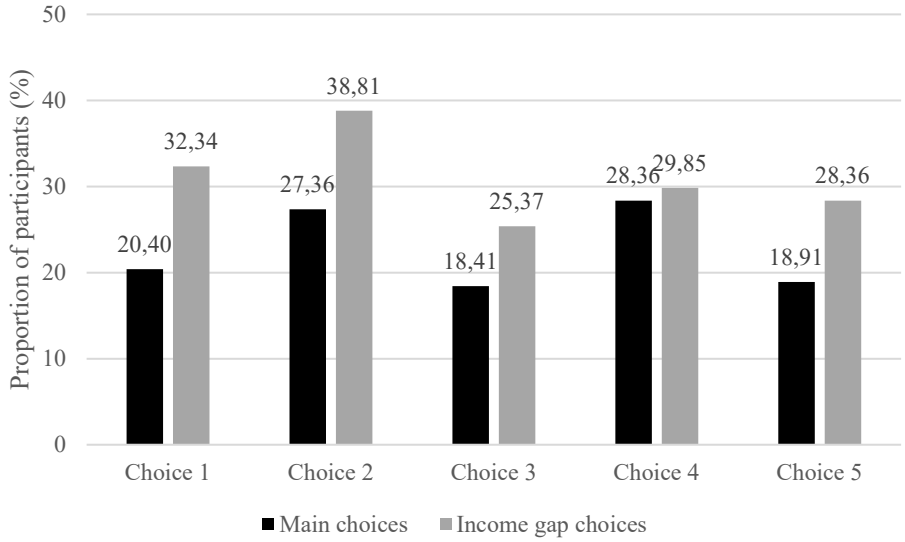
Fig. 6 compares the proportion of participants who chose in line with BNS in the income gap choices versus the basic choices. Across all five pairwise comparisons, more participants selected the BNS-predicted option in the income gap choices than in the corresponding basic choices. A series of McNemar's change tests confirms that these differences were statistically significant in four of the five comparisons.[25] At the experiment level, we also found that the choice proportions in the income gap choices were at least as large as in the basic choices (see Figs. L1 and L2 in Online Appendix L). These findings suggest that the participants who chose the BNS-predicted options in the basic choices were indeed motivated by a desire to minimize total unfulfilled basic needs. This does not necessarily imply that they did not also care about the number of people below the threshold. Rather, it indicates that minimizing the amount of unfulfilled basic needs was sufficient to drive their choice for this option.

[23] The terms "income gap" and "headcount" are taken from the poverty measurement literature, where both are measures of the extent of poverty. The income gap is defined as the difference between the poverty threshold and the mean income of the poor (Chakravarty 2009). Our definition of concerns for BNS considers the sum of the differences between the poverty threshold and the income of the poor.

[24] In order not to confuse MXM and BNS considerations, in these choices we kept the income of the poorest person (Person 2) the same (72 GEL). Thus, MXM did not make any prediction in these choices. Apart from that, the choices were similar to the basic choices (Choices 1–5).

[25] McNemar's change tests evaluated the null hypothesis that the proportion of participants choosing the option that only BNS predicts is the same; Choice 1 and IG1: McNemar's $\chi^2(1)=7.58$, $p=.008$; Choice 2 and IG2: McNemar's $\chi^2(1)=8.490$, $p=.005$; Choice 3 and IG3: McNemar's $\chi^2(1)=3.16$, $p=.098$; Choice 4 and IG4: McNemar's $\chi^2(1)=0.11$, $p=.828$; Choice 5 and IG5: McNemar's $\chi^2(1)=5.92$, $p=.020$ (all exact p-values).

Fig. 6. Choice percentages of BNS, main and income gap choices.



Note. Proportion of the participants choosing in line with BNS in the basic choices (black bars) and income gap choices (grey bars) in FIELD-GEO and HYPO-GEO. The remaining participants chose the option that a different motive predicted alone or the option predicted by the four remaining motives, neither of which is depicted here (*N*=201).

C. Estimation Results: Choice Models

In the last step of our analysis, we assessed the importance of the distributional motives under scrutiny in the participants' decisions. The observed choice patterns suggest substantial heterogeneity in how much weight the participants placed on different motives. For example, 15.7% of the decision-makers always chose in line with MXM, and 14% consistently chose in line with SLF (see Fig. 3). These consistent choice behaviors indicate distinct preference structures, with different groups of decision-makers placing positive weight on different motives.

To account for this heterogeneity in preferences, we estimated a set of mixed logit models for each experiment, following Train (2009). These models allowed for random taste variation across participants and thus captured individual differences in the importance attached to each motive. The utility of each allocation was modeled as a function of its characteristics, specifically the monetary values of the utility terms identified in our framework. We included these in the model as independent variables, which allowed us to estimate the (marginal) impact of each term of the utility function on the probability of an given option being chosen.

Let:

$$U_{imk} = \alpha_i^{SLF} x_{ikm} - \alpha_i^{BNS} \sum_{j=1}^{n} max(t - x_{jkm}, 0) + \alpha_i^{MXM} \min(x) + \alpha_i^{EFF} \sum_{j=1}^{n} x_{jkm}, \\ -\alpha_i^{GEN} \sum_{j=1}^{n} max(x_{ikm} - x_{jkm}, 0) - \alpha_i^{ENV} \sum_{j=1}^{n} max(x_{jkm} - x_{ikm}, 0) + \varepsilon_{ikm} \\ = \alpha_i^t c_{ikm}^t + \varepsilon_{ikm} \quad (6)$$

denote the utility that participant i derives from choosing an alternative $k \in \{A, B, C\}$ in choice $m = [1,10]$, where the coefficients α_i^w vary over decision-makers, c_{ikm}^w is a vector of distributional concerns, $w \in \{SLF, BNS, MXM, EFF, GEN, ENV\}$, and ε_{ikm} is an i.i.d. extreme value distributed error term. The vector of preference coefficients α_i^w has density $g(\alpha|\theta)$ with distribution parameters θ. The mixed logit

choice probability (i.e., the probability of the decision-maker's choice sequence conditional on the parameters of the population distribution) is given by:

$$P_i(\theta) = \int S_i(\alpha) g(\alpha|\theta)\, d\alpha,$$

where $S_i(\alpha_i) = \prod_{m=1}^{M} L_{ik(i,m)m}(\alpha_i)$ is the probability of the observed choice sequence conditional on knowing α_i^w, with $k(i,m)$ denoting the alternative k chosen by decision-maker i in choice m, and with $L_{ik(i,m)m}(\alpha_i) = \frac{exp\left(\alpha_i^w c_{ik(i,m)m}^w\right)}{\sum_{m=1}^{M} exp(\alpha_i^w c_{ikm}^w)}$. The mixed logit model estimates the population parameters θ based on the simulated log likelihood $SLL(\theta) = ln\left\{\frac{1}{R}\sum_{r=1}^{R} S_i(\alpha^r)\right\}$ for each observation, where *r* is the *r*th draw from the distribution $g(\alpha|\theta)$, and R is the number of simulated draws (see Hole 2007; Train 2009).

For the estimation of the models, we used the choice data from the five basic choices and the elicited five additional choices in the BASE, HYPO, and BASE-GEO experiments. For the FIELD-GEO and HYPO-GEO experiments, we were able to use a larger data set by including the 16 isolation choices (see Section IV.B). To account for the correlation of individual decisions across choices, we allowed for individual specific standard errors. Due to multicollinearity between SLF, EFF, GEN, and ENV, we estimated four different models for each experiment, each omitting one of these variables. We focused on assessing the impact of BNS and MXM.[26] The models were estimated using simulated maximum likelihood with *R*=5000 Halton draws. We assumed that the coefficients were normally distributed in our sample.[27] A comparison of the estimated means with the sample means of the conditional distributions revealed that this was indeed a reasonable assumption and that the model was correctly specified (Train 2009).

Table 4 displays the means and the standard deviations of the mixed logit estimates of the models excluding ENV for each experiment. Tables M1–M5 in Online Appendix M show the mixed logit estimates for all four models for each experiment.

In line with our previous findings, the estimated coefficients of BNS, MXM, SLF, and ENV were significant and positive in nearly all the models. This indicates that, on average, the participants attached a positive weight to these motives. Regarding BNS, we found that in the HYPO experiment only, the coefficients were not consistently significant. Moreover, the estimated standard deviations of the random coefficients were substantial, reflecting significant heterogeneity in the participants' preferences. This validates the use of the mixed logit model, which allowed for individual-level differences in distributional concerns. The ratio between a coefficient's mean and its standard deviation provides information about the proportion of the participants who placed a positive weight on the motive (Hole 2007).

For SLF, between 71% (experiment FIELD-GEO, model GEN excluded) and 95% (HYPO, model ENV excluded) of the participants placed a positive weight on the motive. For MXM, this percentage was between 66% (BASE-GEO, model ENV excluded) and 88% (HYPO, model EFF excluded). For BNS, the percentage lay between 58% (HYPO, model GEN excluded) and 77% (FIELD-GEO, model SLF excluded). For EFF, it was between 19% (BASE, model ENV excluded) and 84% (FIELD-GEO, model SLF excluded). For GEN, it was between 22% (BASE-GEO, model SLF excluded) and 94% (HYPO, model ENV excluded). For ENV, it was between 44% (HYPO-GEO, model EFF excluded) and almost 100% (HYPO, model SLF excluded), depending on the model. Note, however, that these numbers do not consider how far away the different coefficients are from zero.

[26] The multicollinearity is due to the construction of the utility terms ($SLF = (EFF + ENV - GEN)/5$).
[27] There was one exception in BASE and BASE-GEO, where we applied 6000 draws. We chose these numbers because from this number onwards the coefficients remained stable (i.e., when estimating models (1), (2), and (3) with, e.g., 6000, 7000, 9000, or 10,000 draws and model (4) with 7000, 9000, or 10,000 draws, the coefficients remained approximately the same).

Table 4. Mixed logit models.

		BASE	HYPO	BASE-GEO	FIELD-GEO	HYPO-GEO
α^{SLF}	Mean	.0231***	.0188***	.0347**	.0556***	.0491***
		(.0036)	(.0024)	(.0138)	(.0085)	(.0109)
	SD	.0209***	.0117***	.0371**	.0679***	.0754***
		(.0033)	(.0028)	(.0183)	(.0088)	(.0111)
α^{BNS}	Mean	.0042**	.0030*	.0490***	.0176***	.0323***
		(.0019)	(.0018)	(.0141)	(.0040)	(.0070)
	SD	.0143***	.0143***	.0770***	.0260***	.0552***
		(.0030)	(.0023)	(.0161)	(.0058)	(.0082)
α^{MXM}	Mean	.0146***	.0183***	.0303**	.0198***	.0604***
		(.0023)	(.0023)	(.0139)	(.0056)	(.0125)
	SD	.0146***	.0163***	.0747***	.0485***	.1009***
		(.0022)	(.0021)	(.0152)	(.0073)	(.0145)
α^{EFF}	Mean	–.0015*	–.0006	–.0012	.0006	.0049**
		(.0007)	(.0010)	(.0035)	(.0012)	(.0024)
	SD	.0017	.0029***	.0079	.0073***	.0155***
		(.0012)	(.0011)	(.0060)	(.0015)	(.0029)
α^{GEN}	Mean	.0020***	.0022***	.0010	.0030***	–.0008
		(.0004)	(.0005)	(.0030)	(.0011)	(.0018)
	SD	.0015**	.0014**	.0081**	.0042***	.0102***
		(.0007)	(.0006)	(.0035)	(.0014)	(.0030)
SLL at convergence		–620.9230	–603.5275	–374.0168	–1555.4201	–1034.1277
Wald χ^2 (5)		82.15	116.08	26.13	73.13	70.33
Prob $> \chi^2$		<.0001	<.0001	.0001	<.0001	<.0001
N		2700	2700	1350	5376	4272

Note. Mixed logit estimates based on the five basic choices (Choices 1–5) and five additional choices (Choices A1–A5) in experiments BASE, HYPO, and BASE-GEO, and based on the 16 isolation choices (Choices 1–16) in experiments FIELD-GEO and HYPO-GEO. Individual specific standard errors in parenthesis. To control for multicollinearity, we estimated the models omitting the variable ENV. *p<.10, **p<.05, *** p<.01. *SD*=Standard deviation, SLL=Simulated log likelihood. Halton draws: 5000. BNS=basic needs satisfaction, MXM=maximin, SLF=selfishness, EFF=efficiency, GEN=generosity, ENV=envy.

To summarize, the estimation results of the mixed logit models reinforce the conclusions we drew from the earlier analyses. The participants appeared to place value on their own income, the income of the least well-off person, and the fulfillment of basic needs. Additionally, the results indicate that the participants exhibited aversion to disadvantageous inequality, i.e., that they tended to dislike situations in which another person had more than themselves.

D. Studying the Prevalence of Basic Needs Satisfaction in Repeated Survival Games

An important question regarding the prevalence and manifestation of basic needs concerns is whether behavior in line with basic needs satisfaction can be reinforced when strategic motives exist to satisfy these needs. From an evolutionary perspective, this motive may have developed as a mechanism to enhance the survival potential of social groups. Ensuring that the basic needs of the members of one's reference group are satisfied fosters cooperation, reduces internal conflict, and ultimately increases the group's chances of survival, as the well-being of its members is essential to the resilience and functionality of the group as a whole. Moreover, individuals are often more inclined to support those with whom they share genetic ties. By supporting kin in meeting their basic needs, individuals indirectly promote the survival of shared genes. Therefore, behavior in line with basic needs satisfaction in situations where group survival is at stake might be hardwired (e.g., Bowles and Gintis 2005; Kaplan et al. 1985; Trivers 1971). This also implies that selfish individuals may be compelled to contribute to help other group members in order for the group to survive and benefit from the group's survival in later time periods

So far, we had deliberately used one-shot experimental settings to exclude strategic considerations so that we could identify the existence of BNS as a distinct motive in an unconfounded manner. To explore our conjecture, we implemented an additional experiment: the "need game," a multi-round variant of the dictator game (Forsythe et al. 1994). In the need game, receivers were at risk of being eliminated from subsequent experimental rounds if their final payoff in a given round fell below a given threshold. The game was designed to mimic the real-word consequences that persons suffer when their needs are not met—in this case, exiting the experiment and hence being deprived of possible future gains (for a similar approach, see Kittel, Neuhofer, and Schwaninger 2020). We varied the initial endowments of the players systematically to manipulate whether the receiver was in need across three variants of the need game (see Table N1 of Online Appendix N). Importantly, the dictators had a strategic motive for satisfying the receivers' needs, i.e., to transfer at least as much as the receiver needed to reach the threshold that ensured the receiver survived to the next round. If only one receiver remained in the game, the game ended and the dictators did not receive any future income. Since the dictators' earnings depended on the continuation of the game, their earnings were tied indirectly to the survival of the receivers. Hence, transfers by the dictators may have been driven both by an intrinsic concern to satisfy the receivers' needs and by the desire to secure continued opportunities for personal gain.

The need game was played by the same experimental participants who took part in our BASE experiment (N=90). This design allowed us not only to examine basic needs satisfaction in repeated social interactions but also to relate the participants' revealed preferences in the need game to their decision patterns in the BASE experiment (see Online Appendix N for full documentation).

Our additional findings from the need game revealed several key behavioral patterns (see Table N3 and Figs. N1 and N2 of Online Appendix N): i) The dictators regularly fulfilled the survival needs of the receivers; ii) Most of the dictators who ensured the receivers' survival *gave exactly* the amount necessary for the receiver to reach the survival threshold; iii) The dictators who decided according to BNS in the basic choices also satisfied the receivers' needs in the need game; iv) The dictators who did not decide according to BNS in the five basic choices and, more specifically, the dictators who repeatedly choose the selfish option in the five basic choices (even those who choose five times according to SLF) also satisfied the receivers' needs by giving up half of the amount that they could distribute; v) As a result, when there was a strategic incentive to satisfy needs to ensure the survival of the receivers in the game, the prevalence of behavior in line with concerns for basic needs satisfaction increased substantially; vi) These results cannot be explained by the players' risk attitude or beliefs about other dictators' giving behavior—rather, the results suggest that the salience of group survival triggered the dictators' desire to fulfill the receivers' needs.

V. Concluding Discussion

In this paper, we have provided clear and robust evidence for the existence of concerns about basic needs satisfaction as a distinct and fundamental distributional motive. Drawing on data from five distinct experiments—two laboratory experiments conducted in Germany, and two field experiments and one laboratory experiment conducted in Georgia—we found that 34% of the participants chose in line with basic needs satisfaction in at least one of the five implemented basic choices, while 9% consistently selected allocations that reflected a positive weight on basic needs satisfaction. Importantly, our results show that the participants were willing to forgo their own income, efficiency, and utility in terms of envy reduction in order to satisfy additional basic needs. Consistent with previous studies (e.g., Andreoni and Miller 2002; Blanco, Engelmann, and Normann 2011; Charness and Rabin 2002; Engelmann and Strobel 2004, 2007; Fehr and Schmidt 1999; Fisman, Jakiela, and Kariv 2017, we also found that selfishness and the maximin principle were prevalent motives, whereas efficiency, generosity, and envy concerns were less prevalent.

Crucially, our design enabled us to disentangle BNS from other motives, especially in cases where maximin would predict the same allocation. Our analysis also reveals that the motive for basic needs satisfaction was relatively insensitive to variations in relative prices and monetary incentives ranging from standard laboratory stakes in Germany to real monthly incomes in the Georgian field settings. Moreover, the participants tended to fulfill the overall amount of unfulfilled basic needs, rather than merely minimizing the number of people below the basic needs threshold. Finally, in settings where strategic incentives existed to satisfy needs to ensure survival, the prevalence of basic needs fulfillment increased significantly. Notably, even participants previously identified as selfish or non-BNS types exhibited need-fulfilling behavior when group survival was at stake. This finding suggests that basic needs satisfaction is a latent motive in a wider share of the population and can be activated in contexts where group welfare becomes salient.

A. Basic Needs Satisfaction in Relation to Other Distributional Motives

In our experiments, the motive of basic needs satisfaction accounted for a range of choices that cannot be explained by other established distributional motives, such as caring about the incomes of relatively poorer people in a society (i.e., maximin and generosity). By disentangling basic needs concerns from these motives, we demonstrated that overlooking basic needs satisfaction as a separate motive would lead to behavior driven by this motive being misattributed to maximin or generosity, resulting in an overestimation of the prevalence and explanatory power of those motives.

It is important to emphasize that the prevalence of concerns for basic needs satisfaction we detected is likely to be a conservative estimate. First, if maximin is taken seriously, it would call for income redistribution until income equality is achieved. It is questionable whether the participants who chose (repeatedly) in line with maximin in our experiment would go as far as to promote total equality or at least a large amount of unconditional redistribution. It is therefore plausible to assume that some choices in line with maximin were driven by a desire to fulfill the needs of the poorest person. In other words, the participants choosing the maximin option may simply have been giving priority to the "needier" person at the expense of the sum of unfulfilled basic needs. This implies that some behavior categorized as maximin-consistent in our experiment may, in fact, have been motivated by BNS under a different utility representation (Weiss, Bauer, and Traub 2017). Second, we found the highest prevalence of basic needs concerns in our high-stakes experiments GEO-HIGH and GEO-FIELD. This suggests that in situations outside the research laboratory, where fundamental needs in people's lives are at stake, basic needs fulfillment is likely to become more pronounced. Third, when decisions affected the "survival" of a fellow participant—and ultimately also of the group—basic needs satisfaction became significantly stronger. In addition, our results from the need games show that most of the dictators who ensured receivers' survival gave exactly the amount necessary for the receiver to reach the survival threshold. This precise targeting of transfers suggests that the main other-regarding motivation behind this increased dictator giving was actually the desire to fulfill the receiver's need as opposed to maximin or generosity concerns.[28] Moreover, from the control treatment 1 of the need game, we learned that the participants' generosity in a situation without receivers' survival needs was significantly lower.

An important question is whether the documented BNS patterns reflect stable preferences rather than systematic measurement error or random choice behavior. The results of our experiments make this explanation highly unlikely for several reasons. First, we consistently identify BNS preferences across different study contexts (laboratory vs. field), incentive schemes (incentivized vs. hypothetical), and participant pools (Germany vs. Georgia). Second, in every study, many participants choose BNS-

[28] Maximin concerns would predict equalizing payoffs and thus giving a higher amount (i.e., 150 MU) to the receiver.

consistent allocations multiple times in the basic choices. As discussed earlier (see p. 16, Individual Choice Patterns), the probability that a participant repeatedly chooses in accordance with BNS by chance is very small. Third, a qualitative analysis conducted after the HYPO experiment provides further insight into the motivations underlying the observed choices. After completing the experiment, participants were asked two open-ended questions: "*What did you consider when making your decision?*" and "*What criteria did you apply to make your decision?*" The hypothetical nature of HYPO makes it particularly suitable for analyzing self-reflection data, which facilitates self-reflection and reduces concerns that explanations merely justify payoff-relevant choices. Two independent coders assigned motive codes when responses clearly matched a specific motive. If participants indeed choose allocations because of the motive that predicts them, those who repeatedly choose in line with a given motive should mention that motive more frequently than other participants. We find that 81% of participants were assigned at least one motive code in at least one of the two questions, while 28% referred to two or three different motives. Two-sided Fisher's exact tests show that participants who choose in line with BNS, MXM, and SLF motives five times (or at least four times) are significantly more likely to mention the corresponding motive in their explanations. Importantly, this correspondence between choices and stated motives is specific to BNS, MXM, and SLF, and does not appear for ENV, GEN, or EFF types.[29] Moreover, BNS, MXM, and SLF types do not mention any of the other motives more frequently than other participants. These findings suggest that participants who attach high importance to BNS, MXM, and SLF motives in their choices also emphasize these motives in their explanations. Fourth, the need-game results provide cross-task predictive validity: participants who choose BNS-consistent allocation more frequently in the basic choices are more likely to secure survival in the need game. With increasing alignment with BNS, the share of generous giving rises markedly and remains largely stable across rounds. In contrast, SLF-consistent decision-making in the basic choices is negatively related to generous giving in the need game. Taken together, these results provide converging evidence that the observed BNS behavioral patterns reflect stable and meaningful preferences rather than measurement error or random choice behavior.

Regarding the relationship between needs fulfillment and efficiency an important question is whether an institutionalized guarantee of basic needs fulfillment necessarily entails efficiency losses. Okun (1975) postulated a trade-off between redistribution and efficiency, since the former undermines individuals' motivation to exert effort.[30] This is particularly marked if the rule on which redistribution is based is perceived as unjust. This raises the broader question of whether the efficiency implications of redistribution depend on the underlying normative goal, i.e., whether the relationship is different if the primary goal of redistribution is the satisfaction of basic needs rather than a reduction of general inequality. Frohlich and Oppenheimer (1992) provided experimental evidence on this issue by implementing a tax system in which the participants' earnings above a certain floor level were redistributed to those who fell short of this minimum.[31] Strikingly, they found that the participants' overall productivity increased when they experienced redistribution through such a tax system.[32] This suggests that when redistribution is explicitly targeted at ensuring a minimum standard of well-being, rather than at promoting equality per se, it may be perceived as more legitimate and less demotivating.

[29] BNS: p=.043, .001; MXM: p=.009, .002; SLF: p=.002, .002; ENV: p<.999, .191; GEN: p>.999, .999; EFF: p=N/A, >.999.
[30] See, for example, Andersen and Maibom (2020) for an analysis of this trade-off using data on 34 OECD countries.
[31] In the experiment, the participants were paid according to their performance in a real effort task. Participants who earned more than a certain floor level were taxed. This money was assigned to participants who earned less than this minimum. Thus, the effective size of the tax depended on the task performance of the least productive members of the group. The experiment was played for three rounds. Before engaging in the task, the participants ranked four principles of distributive justice after those principles were briefly introduced. This ranking did not have any consequences for their payoffs. The principles were maximizing either the floor or the average income, the average with a floor, or the average with a range constraint. The floor was defined as the income of the least well-off individual. The principle of maximizing the average with a floor constraint "ensure(d) that individuals 'at the bottom' receive(d) a specific minimum" (Frohlich and Oppenheimer 1992, 36). Roughly 57% of the participants ranked this principle first.
[32] Note that they found this effect only in treatments in which the principle was adopted in a democratic process.

Given the findings of our repeated need game, it becomes even more relevant to investigate whether similar positive effects on productivity emerge when falling below the basic needs threshold entails real consequences. As we have shown in Section IV.D, participants described as "selfish types" in the basic choice experiment, or as types who did not decide according to BNS in the basic choice experiment, nonetheless choose to satisfy receivers' needs in the repeated game, voluntarily giving up half of the amount that they could distribute. These findings are consistent with the notion that human beings are predisposed to act in accordance with the BNS motive in situations in which it is of evolutionary importance (Bowles and Gintis 2005). They also support the idea that people act in a context-specific manner and that their decisions can be guided by several seemingly contradictory motives, if the context under consideration, such as survival, is disregarded (e.g., Konow 2001). Again, this does not necessarily imply that the motives or preferences themselves change, but that other motives or preferences come into play depending on the situation.

B. Implications for (Re-)Distribution and Poverty Policy

Knowledge about people's distributional motives can be informative for the design and acceptance of social security systems. As Frohlich and Oppenheimer (1992) pointed out, people's notions of fairness can influence how redistributive mechanisms, such as tax systems, are judged. These perceptions, in turn, affect the legitimacy and acceptance of redistributive policies, and potentially, the broader political regime. In support of this view, Barth, Cappelen, and Ognedal (2013) showed that people's fairness concerns are linked to the probability of justifying and actually engaging in tax evasion.

In debates on the optimal design of redistributive policies, individuals driven by different distributional motives may not only support different redistributive policies but also frame redistribution in fundamentally different terms. For example, advocates of a maximin principle prioritize equality and focus on reducing disparities in income, wealth, and access to education. They may support taxing the wealthy more heavily while exempting lower-income individuals to achieve greater equality. In contrast, those motivated by concerns for basic needs fulfillment focus on securing the minimum conditions for a dignified life. Their redistribution goals are not centered on full equality but on ensuring that all individuals meet a baseline threshold. Accordingly, they may support taxing everyone above the basic needs threshold and advocate for stronger social safety nets—including adequate social benefits and public investment in essential services such as education, healthcare, and infrastructure—while opposing redistribution that exceeds what is necessary to meet basic needs.

Recognizing the diversity of people's distributional motivations is thus essential. Understanding the motives of the electorate has important implications for the design of feasible policies, as it affects the optimal extent of redistribution, its costs, and acceptance of redistributive policies. It also helps in structuring the political debate. Our findings are a first step toward such an understanding of the importance of different redistributive motives and of basic needs satisfaction as distinct concerns when it comes to shaping the distribution of incomes in a society.

Our findings also contribute to the literature on poverty measurement and reduction (e.g., Chakravarty 2009), as we explicitly tested whether people cared about the sum of unfulfilled needs (the income gap) or about the number of persons below the basic needs threshold (headcount considerations). Our experimental evidence suggests that the participants were motivated primarily by a desire to minimize overall unfulfilled basic needs rather than simply to decrease the number of individuals in need. In other words, they appeared to care more about how severely other people were deprived than about how many people were suffering. This insight strengthens long-standing critiques of headcount-based poverty measures (e.g., Foster, Greer, and Thorebecke 1984; Han, Meyer, and Sullivan 2022; Sen 1976) and supports a shift toward more sophisticated, justice-sensitive approaches to poverty measurement and intervention. In practical terms, this suggests that policymakers may want to de-

emphasize simple headcount ratios and focus instead on metrics that capture the total deprivation or poverty gap. Such an approach would justify targeting resources toward those who are worst-off, rather than distributing resources evenly or across broader groups. Because (strategic) selfish motives also influence allocation behavior prominently, such policies could be made more effective and acceptable by aligning them with incentives that appeal to self-regarding motives—for instance, through tax benefits for donations to the worst-off, or by highlighting the societal returns of reducing extreme deprivation, such as lower crime rates or reduced pressure on social services and migration systems.

Our additional data from the need game indicate, first, that if fiscal policies and national or regional welfare systems are presented not as burdens but as targeted mechanisms for group welfare in areas such as health care, environmental resilience, and infrastructure maintenance, even individuals with low prosocial tendencies may be more willing to support them. In addition, messages that specifically address existential risks to the social group, such as pandemic preparedness or social unrest due to inequality, could increase the acceptance of progressive tax measures. In this sense, more transparency and feedback should also be provided on how government tax revenues actually support the social well-being or resilience of a society. Second, our results suggest that poverty should be discussed not only as a question of moral obligation or fairness, but also as an intrinsic threat to the functioning and cohesion of society. The consequences of poverty, such as increased crime, health crises, political instability, and reduced productivity, all threaten the well-being of the entire group. Social safety nets, targeted support for disadvantaged groups, and funding for education could receive more support if they were communicated as tools for collective resilience. In this sense, societal poverty metrics could be adapted to include indicators of systemic risk and go beyond simply mapping income thresholds. For example, indicators such as community health vulnerability, educational deficits with long-term effects on the labor force, and food and housing instability linked to political unrest could be mapped and actions to improve them justified.

C. Directions for Future Research

Given, on the one hand, the relevance of basic needs satisfaction as a driver of economic behavior with important implications for theoretical considerations and social policy, and, on the other hand, the relatively modest attention it has received in the economics literature to date, it seems pivotal to investigate this distinct motive and the contexts of its manifestation further.

Future work could explore the role of a person's responsibility for being in need. There are two interesting cases: a person can be responsible for being in need because they made a risky choice or because they exerted too little effort to avoid a dire situation. In the first case, since the receiver made a risky choice and was unlucky, they can be held responsible for the fact of being in need (see Cappelen, Konow, Sørensen, and Tungodden 2013b). The second case gets at the trade-off between equity or merit and need and can be incorporated into the need game by varying the source of the endowment in the style of Frohlich et al. (2004). In one treatment, the endowment is provided by the experimenter as manna from heaven. In a second treatment, the endowment is allocated to subjects based on performance in a real effort task. In this treatment, it is thus again a receiver's responsibility if her initial endowment is lower than the threshold.

It appears important to investigate the influence of these two types of responsibility for being in need on another individual's willingness to fulfill these needs, since they relate to redistribution policies in the field. In a society with high needs-based redistribution, people's willingness to bear the cost of redistribution is crucial for social cohesion. This willingness is, in turn, likely to depend on people's propensity to consider individual responsibility for being in need. Research (e.g., Bullock 1999) has shown that people who are not in need often attribute poverty to individual failings, such as hazardous behavior (e.g., drinking or extreme sports); they might reduce their willingness to support those in need

according to this belief. People's willingness to incur costs in cases in which the affected individuals are (at least partly) responsible for the emergence of these costs therefore deserves empirical attention.

The relative importance of merit and need claims is also relevant for assessing people's support for the redistribution of incomes in the field. In a market economy, a person's pre-tax work income is typically based on their productive contribution, i.e., on meritocratic grounds. It is a stable finding in the experimental economics literature that people generally like to give people the fruits of their productivity (e.g., Almås, Cappelen, and Tungodden 2020; Cappelen et al. 2007; Frohlich, Oppenheimer, and Kurki 2004). Depending on the size of the (welfare) state, these incomes are taxed and a part of the tax revenue is spent on redistributive purposes. Redistribution, in turn, is based to a large extent on ensuring people's basic necessities. In other words, in these types of welfare states, people are currently paying to cover the basic necessities for those whose income is not high enough to do so by themselves. It is therefore an important question how people trade off the fulfillment of needs against meritocratic claims. In a vignette study, Bauer et al. (2022) found that participants choose allocations which reflect an inner trade-off between equity and need while also taking into account a person's accountability. Cappelen et al. (2013a) showed that when participants have to trade off entitlements against need considerations, both motives are important. In their study, however, the possibility of need considerations was introduced by letting participants from rich countries play with participants from poor countries. This relied on the assumption that the participants from the poor countries were indeed viewed as needy. This assumption is not unproblematic, since the participants were all students, i.e., individuals who are often not deprived of their basic needs, even in poor countries.

Another fruitful direction for the future is to investigate whether, under what circumstances, and to what extent individuals are concerned with the overall amount of unfulfilled basic needs and/or the number of persons falling below the threshold. Answers to these questions would inform the theoretical formulation of the motive (see Section II, and Siebel 2017; Springhorn 2022). In a first attempt, we have shown that people care not only about the number of persons to be lifted above the threshold but also about the overall amount of unfulfilled needs. In future studies, a systematic variation of the number of persons in need and the amount of unfulfilled needs would allow exploration of the relative importance of these two factors. Another related question is whether individuals care more generally for the distribution of unfulfilled needs, which is especially relevant in situations of resource scarcity. Do people prefer equal relative needs fulfillment, as suggested by Siebel (2017), or do they give priority to a needy person who lacks fewer resources in order to reach the threshold over another needy person who lacks more resources, as could be derived from Weiss, Bauer, and Traub (2017)? Or do they give priority to a poorer needy person? These issues relate to the above-mentioned possibility that behavior in line with the maximin motive in our choice experiments might actually have been motivated in part by a desire to help the person with the highest needs.

Our study also shows that hypothetical instruments can provide valid results in the context of studies measuring the prevalence of basic needs. This is particularly interesting in view of the fact that in BASE and BASE-GEO, the induced basic needs threshold was hypothetical in relation to the actual population of the countries under consideration (Germany and Georgia), i.e., the described population incurred no consequences from the experimental choices. However, this applied above all to our HYPO and HYPO-GEO experiments. It is typically argued that monetary incentives ensure that participants perceive their behavior as relevant and experience real and genuine emotions (e.g., Falk and Heckman 2009). Eliciting participants' actual preferences can therefore be complicated in hypothetical settings. Feldman Hall et al. (2012) argued that the absence of monetary incentives can dramatically distort people's judgments and behavior, especially in the moral domain. According to this literature, we would expect the prosocial motives of basic needs satisfaction, maximin, and generosity to be particularly strong in our hypothetical HYPO and HYPO-GEO experiments. However, this is not what we found

(see Table 2), which confirms other studies that found no systematic differences between hypothetical and incentive-based experiments (e.g., Ben-Ner, Kramer, and Levy 2008; Engel 2011). Future studies can investigate how robust our research instruments are when applied to other contexts, such as different countries.

D. Limitations

Although we have presented extensive evidence from the laboratory and the field, from incentivized and hypothetical settings, and from two different countries, our study is naturally not without limitations. One obvious limitation is that we collected data for our experiments in only two countries. Running an empirical study on distributional preferences in two countries limits the generalizability of our findings. Notions of fairness, inequality, and poverty are deeply shaped by cultural values, institutional frameworks, welfare regimes, and social norms, all of which vary significantly across countries and also within countries (e.g., Falk et al. 2018). Furthermore, public attitudes toward the poor—such as whether poverty is seen as a personal failure or a societal problem (e.g., Bullock 1999)—can influence how individuals make trade-offs between equity and efficiency. Thus, findings from two single national contexts may not capture the full range of human preferences and may reflect context-specific norms rather than universal principles. Future studies could incorporate cross-country comparisons or replications in diverse settings, which would reveal whether observed patterns are robust across different socioeconomic and political environments.

Another limitation of our work is that we have gained little insight into how the manifestation of the basic needs satisfaction motive differs between individuals. We found some evidence that female participants were more likely than men to make decisions in line with this motive and that the age of the participants had no significant influence on their decisions. Due to the complexity of the study designs used, the challenges in the organizational implementation of our experiment, and the abundance of tasks that the participants had to complete, we refrained from collecting further individual difference measures, such as personality traits, political attitudes, human values, or socioeconomic background, with which to predict individual choices (Becker et al. 2012; Grünhage and Reuter 2022; Lönnqvist, Leikas, and Walkowitz 2025; Lönnqvist et al., 2013). Future studies could investigate the extent to which there is heterogeneity in the use of the basic needs motive. This is particularly interesting in the case of individuals who, in the presence of a strategic incentive, switch from a selfish choice to a decision that is in line with the fulfillment of basic needs.

Finally, we cannot say anything about how the observed behavior depends on the magnitude of the implemented threshold for meeting basic needs. There may also be differences in calculation and acceptance between different countries and institutions, which in turn may influence willingness to meet the defined basic needs. However, it can be assumed that the official value is more conservative than the calculations of social institutions such as trade unions. Whether this leads to a greater willingness to fulfill the stated basic needs—because the threshold is lower—or to a lower level of willingness—because potentially fewer people are below the more enviable threshold or fewer needs are unfulfilled—remains an open question.

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