Thick Concept, Thin Consensus: Value Judgments in Estimating Inequality of Opportunity

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Abstract:
This paper argues that the prevailing practice of estimating inequality of opportunity (IOp) fails to achieve two objectives of social science indicators: informing the public and guiding policy. As a thick concept, IOp requires a non-epistemic value judgment about the effect of circumstances on effort, yet almost all current estimates follow Roemer's (1998) contested framework. This practice results in distributive epistemic injustice and leaves the underlying value judgment without democratic legitimacy. The paper democratizes this judgment along majoritarian and deliberative lines, drawing on evidence from behavioral economics and a vignette survey with experts in economics, philosophy, and sociology.

Keywords: Inequality of Opportunity, Thick Concepts, Econometric Modeling, Distributive Epistemic Injustice, Democratization of Science

1 Introduction

How can social science indicators contribute to societal progress? According to Thoma (2024), they serve two purposes: to inform the public and to guide policy decisions. This paper argues that the current practice economists employ to estimate inequality of opportunity (IOp) fails to achieve either of these purposes. This failure also undermines two central aims of evidence-based policymaking in this area: to evaluate whether policies succeed in reducing inequalities that are considered unfair, and to allocate public funds to regions where such inequalities are particularly pronounced.

Rooted in philosophical debates about fairness and responsibility, the IOp approach emerged as an effort to combine normative principles with empirical analysis and has gained increasing prominence in economics over the past decades (Roemer and Trannoy, 2016). It rests on a central principle: inequalities due to circumstances beyond an individual's control are unfair, whereas inequalities arising from differences in effort are acceptable. Individuals should thus be held responsible only for their effort, and compensated for inequalities due to circumstances. Distinguishing between effort and circumstances, however, requires normative assumptions before IOp can be estimated. IOp is thus a thick concept, combining a descriptive component with an evaluative one (Djordjevic and Herfeld, 2021). Besides classifying variables as circumstances or effort, a key normative choice concerns the effect of circumstances on effort: should people be held responsible for the influence that circumstances have on the level of effort they exert? While this question was raised in earlier debates on IOp (Roemer, 1998; Barry, 2005; Jusot et al., 2013), the recent literature has shifted its focus to statistical developments, such as the use of machine learning methods to estimate IOp (see e.g., Brunori et al., 2023; Brunori and Neidhöfer, 2021).

This paper revisits this foundational debate and argues that current empirical practice in IOp research overlooks the significance of this normative choice. I show that research almost exclusively follows Roemer's (1998) operationalization, which does not hold individuals responsible for the effects of circumstances on effort, whether for statistical convenience, because of researchers' own normative commitments, or by following the apparent consensus in the discipline. As a result, IOp is estimated within only one normative framework, and the estimates are relevant only to those who share Roemer's perspective. This limits the capacity of IOp estimates to inform the public and results in distributive epistemic injustice: an unfair distri-

bution of epistemic goods, here information about the level of IOp, across members of society (Irzik and Kurtulmuş, 2024; Thoma, 2024).

This information problem could in principle be addressed by estimating multiple IOp indicators under different normative assumptions. Using IOp to guide policy, however, requires that one operationalization be selected and that this selection be legitimized. It is impractical to base policy on multiple divergent IOp indicators, since different operationalizations may lead to different policy recommendations, and people need reasons to trust and accept that guiding policy by one specific operationalization is justified. This challenge is particularly relevant given that international organizations such as the OECD use IOp measures to evaluate the effectiveness of policies aimed at expanding opportunities and reducing inequality(OECD, 2025).

The most influential response to this challenge is the democratization view, according to which non-epistemic value judgments in science should not be left to individual scientists but should be made through democratic procedures that involve the public (Kurtulmuş, 2021; Schroeder, 2021; Pamuk, 2022; Kovaka, 2026). Following Cairns (2025), two broad approaches can be distinguished: majoritarian approaches base such judgments on the values most commonly held in society, whereas deliberative approaches derive them from structured deliberation, often involving both experts and members of the public. While the normative case for democratization has been developed extensively, its empirical side has been comparatively neglected (Kovaka, 2026). The democratization view assumes that social scientific methods can identify the public's values and that the resulting data are adequate for legitimizing scientific conclusions. Yet research that identifies public values relevant to the actual unforced choices scientists make remains scarce(Kovaka, 2026).

Beyond its contribution to the IOp literature, this paper also helps to close this gap by showing, for one normative choice in economics, how evidence on public and expert values can be brought to bear on a scientific value judgment. Drawing on recent experiments in behavioral economics, I argue that, following a majoritarian approach, the current operationalization is not democratically legitimized as a basis for guiding policy. Most people hold others responsible for the effect of circumstances on effort, so current IOp estimates are overestimated from the public's perspective. Following a deliberative approach, which gives experts an active role alongside the pub-

lic, the normative beliefs of experts are also relevant. I therefore conducted a vignette survey eliciting the normative beliefs of 119 academic experts in economics, philosophy, and sociology. The results indicate that experts' fairness judgments differ systematically from those of the public, so that a deliberative approach would require structured deliberation between experts and members of the public. Since neither majoritarian nor deliberative procedures are currently used to legitimize the existing IOp operationalization, current estimates are insufficiently justified to guide policy decisions.

The paper thus contributes to both economics and philosophy. For economists, it shows that a seemingly technical choice in IOp measurement encodes a contested value judgment, and what is required for IOp estimates to inform the public and guide policy. For philosophers, it provides a worked example of how the democratization view can be implemented empirically for a concrete non-epistemic value judgment, and it makes visible the gaps that remain between public values and the value judgments researchers must make. The remainder of the paper is structured as follows. Section 2 introduces IOp as a thick concept and the debate between Roemer (1998) and Barry (2005) on the effect of circumstances on effort. Section 3 discusses how the IOp literature currently handles this debate and how democratic approaches could legitimize the choice of operationalization. Section 4 presents empirical evidence on public and expert beliefs about the circumstance–effort relationship. Section 5 discusses the implications and concludes.

2 Normative Assumptions in Measuring IOp

Many questions social scientists are interested in answering involve so-called thick concepts (Djordjevic and Herfeld, 2021). Thick concepts carry descriptive and evaluative content simultaneously, and this duality is their defining feature (Alexandrova and Fabian, 2022; Djordjevic and Herfeld, 2021). In contrast to thin concepts, which are primarily evaluative (e.g., describing a situation as unjust), and descriptive concepts, which primarily depict a state of affairs (e.g., age), thick concepts combine elements of both (Djordjevic and Herfeld, 2021). An example of a thick concept is the notion of well-being, since empirically measuring well-being requires researchers to take a stance on its definition (Alexandrova, 2017). This is because well-being concerns what is considered good for individuals. While the value-ladenness of thick concepts is often used in philosophy of science to question the ideal of value-free science (Reiss, 2013; Alexandrova, 2017), this recognition re-

mains contested in social science disciplines, notably in economics (see e.g. Gul and Pesendorfer, 2008). IOp, too, combines descriptive and evaluative elements. On the descriptive side, it refers to the extent to which differences in outcomes such as income are associated with circumstances beyond individuals' control. On the evaluative side, it marks these differences as unfair. The remainder of this section shows that these two components cannot be separated, and that IOp must therefore be classified as a thick concept: which differences count as being associated with circumstances, and are thus described as inequality of opportunity, cannot be settled empirically but depends on a prior judgment about what individuals can fairly be held responsible for. IOp researchers have long recognized the normative commitments involved in measuring inequality of opportunity (see e.g. Mitnik et al., 2022). While researchers must make decisions concerning the statistical analysis[1], the most critical normative challenge in measuring IOp lies in how to distinguish and categorize circumstance and effort variables. Importantly, the paper's argument does not depend on choices concerning the statistical analysis.

In the IOp approach, it is essential to identify and categorize variables into two groups: circumstances, for which individuals cannot be held responsible, and effort, for which individuals can be held responsible.[2] Examples of circumstance variables include parental income and parental education, while effort is often defined in terms of working hours. Researchers then estimate the overall effect of circumstance variables on an outcome variable (e.g. income), depending on the variable of interest for which inequality of opportunity is examined.[3] According to Roemer and Trannoy (2016, 1293), the identification of circumstance and effort variables should be approached pragmatically, with the selection of circumstance and effort variables grounded in the "reality of individual responsibility as endorsed by that society".

After classifying variables as either circumstances or effort, inequality of

[1] Inequality of opportunity can be analyzed with parametric or non-parametric statistical methods, from either an ex-ante or an ex-post perspective. For more details on the statistical analysis, see Brunori et al. (2023).

[2] Although this distinction originates in ideas surrounding luck egalitarianism, this paper approaches the IOp framework from the perspective of applied economists, who often regard it as an extension of the social mobility literature (Björklund et al., 2012). Consequently, their primary objective is to provide empirical evidence of inherited inequality rather than to engage in debates about the normative appeal of luck egalitarianism.

[3] Most papers analyze IOp with respect to income.

opportunity can be estimated in its simplest form using a linear regression framework. This leads to the following simple parametric model:

$$Y_i = \alpha C_i + \beta E_i + e_i \tag{1}$$

While C_i describes all circumstance variables, E_i represents effort. From this equation, a counterfactual income for every individual based on circumstances is predicted. Based on these predictions, inequality indices like the Gini index can be computed, resulting in an estimate of inequality attributable to circumstances. Comparing this estimate with the Gini coefficient of actual incomes provides a measure of inequality of opportunity (IOp).

Connected to the challenge of classifying circumstance and effort variables is the question of how to account for the effect of circumstances on effort when estimating IOp. This issue has been previously discussed in the literature under the term "correlation between circumstances and effort" (Jusot et al., 2013, 1471). However, it is more precise to conceptualize effort as a mediating variable between circumstances and the outcome variable. As depicted in Figure 1, circumstances can affect outcomes (e.g. income) not only directly but also indirectly through their impact on effort. For example, parental work attitudes may influence the effort their children exert in life. Researchers must make a decision of how to treat the effect of circumstances on effort. Either, they regard people as responsible for the indirect influence of circumstance variables on outcomes, or they treat this influence similarly to that of other circumstance variables.

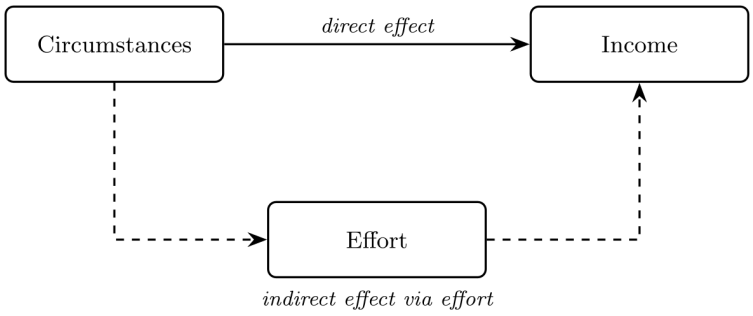


Figure 1: Circumstances influence income directly and indirectly through effort.

The decision is far from straightforward, as both options can be justified

from a normative perspective. The IOp framework implements the idea that individuals should be held responsible for outcomes that reflect their own choices, but not for outcomes that reflect circumstances beyond their control. Effort serves as the empirical counterpart of these choices. Which effort-related inequalities are deemed fair therefore depends on whether individuals are held responsible for their effort preferences, even when those preferences are themselves partly shaped by circumstances. This question lies at the heart of a controversy in moral philosophy between Dworkin (1981) and Cohen (1989). Both agree that individuals should be compensated for disadvantages in their circumstances, such as their talents or social background, but they draw the line of responsibility differently. For Dworkin, individuals are responsible for their preferences and tastes, irrespective of how they came to have them (Dworkin, 1981). On this view, the origin of a preference does not undermine responsibility for it. Cohen, in contrast, argues that individuals should be held responsible only for what reflects their genuine choices (Cohen, 1989). On this view, the origin of a preference matters: if circumstances shape a person's preferences, the choices based on them are not fully free, and the person cannot be held fully responsible for them. The two positions thus diverge when effort preferences are shaped by circumstances, that is, when circumstances influence effort. Applied to IOp, following Dworkin (1981) implies holding individuals responsible for their entire effort, including the part influenced by circumstances. Only the direct effect of circumstances on outcomes then counts as unfair. Following Cohen (1989), by contrast, implies compensating individuals for the indirect effect of circumstances operating through effort as well. Individuals are then held responsible only for the part of their effort that is not influenced by circumstances.

Proponents of the IOp approach have adopted these contrasting standpoints. Roemer (1998), aligning with Cohen (1989), argues that equality of opportunity requires that people are compensated for the effect of circumstances on effort. In contrast, Barry (2005) argues in line with Dworkin (1981), using his example of Asian parents, who pressure their children to perform well in life. According to Barry (2005), the resulting additional effort — even though it originates from circumstance-driven preferences — should not be treated as a circumstance but rather as genuine effort. Thus, differences in effort levels, even those arising from preferences shaped by varying circumstance variables, should not be accounted for. Instead, Barry (2005) contends that only the actual observable effort of people should be con-

sidered. The decision is not only important from a moral standpoint but also has substantial implications for empirical estimates of IOp. Ramos and Van de Gaer (2016) report that the indirect effect of circumstances through effort accounts for a substantial share of the overall effect of circumstances. For example, Bourguignon et al. (2007) find that approximately 40% of the effect of circumstances on earnings in Brazil is mediated through effort, while Björklund et al. (2012) find that, depending on the inequality index, between 21% and 56% of the effect of circumstances on long-run income in Sweden operates through circumstance-specific differences in effort.

Although the statistical difference between both approaches is considerable, empirical research on inequality of opportunity has predominantly followed Roemer's (1998) operational framework. One important reason for defining IOp in accordance with Roemer (1998) lies in its compatibility with the statistical measurement tools employed. Inequality of opportunity researchers are rarely in a position to observe an effort variable. When effort is not observed, it becomes impossible to disentangle the indirect effect of circumstances on the outcome variable (Roemer and Trannoy, 2016). As depicted in Figure 2, accounting for the effect of circumstances on effort would require controlling for the effort variable. According to causal graph theory, as developed by Pearl (2009), controlling for a mediator variable like effort in this context blocks the flow of associations through the mediator variable (Cinelli et al., 2024). This would entail that circumstances only have a direct effect on income, since the flow of association through effort is blocked. However, this is often infeasible because measures of effort are rarely available.

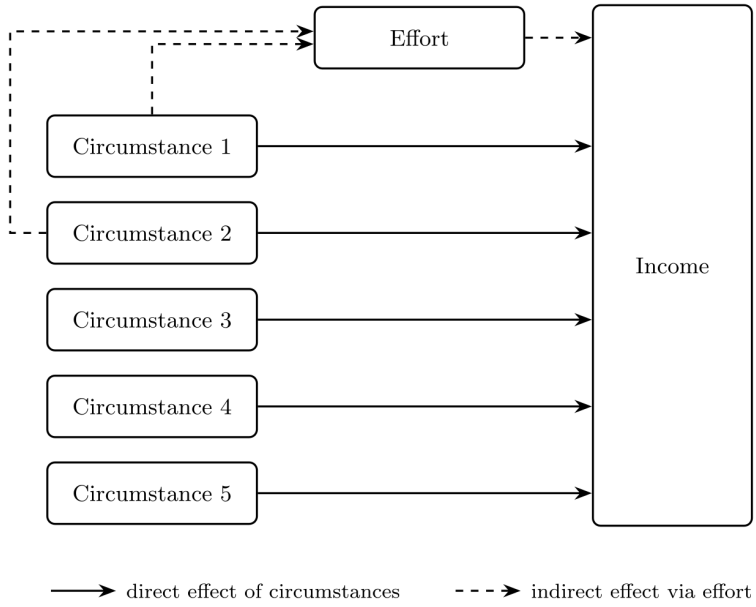


Figure 2: Blocking the indirect effect of circumstances on income through effort requires controlling for the effort variable. This is only possible when effort is observed.

Even when approximations of individual effort are available, researchers often choose to adhere to Roemer's framework—either due to their own normative commitments or to avoid the contentious task of defining effort, which arguably constitutes a thick concept in itself (see e.g., Brunori et al., 2023; Ferreira and Gignoux, 2011). As a result, many studies adopt Roemer's operationalization, which does not hold individuals responsible for the influence of circumstances on their effort. In empirical applications, both approaches ultimately lead researchers to estimate IOp using the following reduced-form equation:

$$Y_i = \alpha C_i + e_i \tag{2}$$

In summary, the descriptive content of IOp cannot be specified independently of its evaluative content: the line between circumstances and effort, and the treatment of the effect of circumstances on effort, depend on contested judgments about responsibility. IOp is therefore a thick concept, and empirically analyzing it entails numerous normative decisions. The most critical of these are how to classify variables as circumstances or effort and how to address the effect of circumstances on effort. The latter decision is not only relevant from a moral perspective but also has substantial implications for the empirical analysis of IOp. Nevertheless, Roemer's (1998)

framework remains widely used in the IOp literature, both because of the empirical difficulties of observing and measuring effort and because of researchers' normative commitment to his approach.

3 Approaching IOp as a Thick Concept

Although thick concepts such as IOp are often cited as examples of the impossibility of value-free science (e.g., Alexandrova, 2017; Kovaka, 2026), the ways in which thick concepts are addressed in the social sciences have received much less systematic attention. One of the few systematic treatments is offered by Alexandrova and Fabian (2022), who identify two main strategies that researchers use to approach thick concepts.

Firstly, thick concepts are often redefined as technical terms, which causes them to lose their normative element. Following Alexandrova and Fabian (2022), a concept becomes a technical term when its everyday evaluative connotation is set aside and it is judged only by epistemic virtues such as scope, simplicity, and empirical adequacy. In other words, the operationalization of thick concepts often no longer aligns with the meaning the concept has outside of science, where its evaluative component is central to why the public and policymakers care about it. The approach is justified by scientists "because it fits best their measurement tools, or enables the use of new dataset, or because it is theoretically interesting, or because it fits previous definitions, or models" (Alexandrova and Fabian, 2022, 4). In the IOp literature, researchers' reliance on Roemer's (1998) operationalization, largely motivated by the empirical difficulty of observing effort, illustrates this strategy: it treats IOp as a statistical construct and, consequently, as a purely descriptive concept, setting aside its normative dimension.

Secondly, scientists can make the value judgment themselves and adopt a definition of the thick concept on normative grounds. They may either present their own normative arguments for a definition or defer to the prevailing consensus in their discipline. In contrast to redefining thick concepts as technical terms, this strategy acknowledges the normative dimension of the concept, but leaves the value judgment to researchers. In the context of IOp, researchers often defend the use of Roemer's (1998) operationalization by adhering to the apparent consensus in the literature. For example, Ferreira and Gignoux (2011, 654) "formally derive the measure from Roemer's (1998) definition ..." when estimating inequality of opportunity. This ap-

proach is also evident in numerous other studies, including Brunori et al. (2023) and Björklund and Jäntti (2020).

Because researchers mainly follow these two strategies, information about the current level of IOp is available only to those who share the normative values of Roemer's (1998) approach, while those who support Barry's (2005) view are excluded from this knowledge. As discussed in Section 2, the choice of operationalization has direct implications for the statistical analysis. Roemer's approach treats the component of effort influenced by circumstances as an additional circumstance, thereby classifying both the direct effect of circumstances on income and their indirect effect through effort as unfair. By contrast, Barry's approach considers only the direct effect of circumstances on income to be unfair. Because circumstances and effort are often correlated, Roemer's approach thus attributes a greater share of income inequality to circumstances, thereby yielding higher estimates of IOp. From the perspective of Barry's position, current estimates thus overstate IOp. Following Thoma (2024), I argue that such a situation amounts to distributive epistemic injustice, that is, an injustice in the distribution of epistemic goods such as knowledge or information, where some people receive less than their fair share (Irzik and Kurtulmuş, 2024).[4] The concept captures the problem with current IOp estimates: the knowledge science produces serves the needs of some groups and not others. Information about IOp is precisely the kind of knowledge citizens need to reason about the fairness of their society and the policies they support. People who share Barry's (2005) view lack estimates that align with their normative values and therefore cannot evaluate policies in light of recent IOp developments and fully participate in public discussions on this issue. They are left with two unsatisfactory options: either they disregard current estimates because these do not reflect their normative views, or they accept overestimated levels of IOp to inform their judgments. As a result, current IOp estimates fail to satisfy the information criterion for social science indicators set out by Thoma (2024).

The preceding discussion illustrates the potential pitfalls of leaving value judgments implicit in research, particularly when thick concepts are involved. At the same time, it is now widely accepted among philosophers

[4]Distributive epistemic injustice differs from other forms of epistemic injustice, such as testimonial injustice, where a person's testimony is given less credibility because of prejudice against them (Irzik and Kurtulmuş, 2024).

of science that value judgments such as those involved in operationalizing IOp are unavoidable (John, 2025; Alexandrova and Fabian, 2022). What remains contested is who should make them (Cairns, 2025). One prominent and widely endorsed approach to handling such non-epistemic value judgments is to seek legitimacy through democratization, that is, to make these judgments through democratic procedures that involve the public instead of leaving them to individual researchers (Kurtulmuş, 2021; Schroeder, 2021; Pamuk, 2022; Kovaka, 2026).[5] Kurtulmuş (2021) identifies two main arguments for such a democratization of science. First, giving the public a voice in the governance of science can help build trust between the public and scientists. Second, if science provides crucial input for policy and values play an ineliminable role in scientific inquiry, then scientists whose value judgments are not informed by the public's values may undermine the public's right to collective self-government.

Both arguments apply to the case of IOp. The trust argument is closely related to the distributive epistemic injustice discussed above: people who do not share Roemer's normative position have little reason to trust current estimates, as these reflect implicit decisions by researchers rather than democratically determined values. However, for the public information role of indicators, Thoma (2024) argues that a single democratically determined operationalization is not sufficient either. For individuals to engage as equals in policy debates, indicators must reflect a range of normative assumptions, so that each individual can assess policy decisions using an indicator aligned with their own values. The self-government argument, in contrast, applies to what Thoma (2024) describes as the policy guidance role of social science indicators. IOp estimates should be usable, for instance, to allocate public funds or to evaluate policies. In such uses, the choice of operationalization can change the decision, because Roemer's and Barry's operationalizations need not rank regions or policies in the same way. Consider two regions with the same level of income inequality. In region A, circumstances account for 8% of income inequality directly and for 5% indirectly through effort. In region B, the direct effect accounts for 6% and the indirect effect for 9%. Under Barry's operationalization, which counts only the direct effect as unfair, IOp is higher in region A (8% vs. 6%). Under Roemer's operationalization, which counts both effects as unfair, IOp is higher in region B (15% vs. 13%). A fund targeting the region with the highest IOp would thus go to different

[5]For critical perspectives on the democratization of value judgments in science, see John (2025) and Hilligardt (2023).

regions depending on the operationalization. Policy guidance therefore requires a prior decision about which operationalization serves as the guiding metric. Since this is a non-epistemic value judgment with consequences for all members of society, it is precisely the kind of decision that, according to the self-government argument, should be brought under democratic control.

While much of the values-in-science literature has aimed to justify the democratization of value judgments, comparatively little attention has been paid to how it could be implemented in practice (Cairns, 2025; Kovaka, 2026). Following Cairns (2025), two broad approaches to implementation can be distinguished, which differ in their conception of democratic legitimacy: majoritarian and deliberative approaches.

The first approach, the majoritarian approach, builds on the view that democratic legitimacy belongs to the position most commonly held among citizens (Cairns, 2025). Its most prominent proponent is Schroeder (2021, 2022), according to whom scientists should present information "in light of the considered and informed values and goals held by policy-makers and the public" (Schroeder, 2022, 47). He adds that "[i]f it is not feasible to accommodate all views, preference should be given to the values and goals more commonly held" (Schroeder, 2022, 47). A second proponent is Intemann (2015, 227), who associates "democratic endorsement" with "widely held interest[s]". Construed in this way, the democratization of science requires no particular political decision-making structures, only that scientists can reliably identify the values of the majority, for instance through public opinion surveys. Schroeder considers this feasible, since for many issues "we already have a wealth of data about the public's values" (Schroeder, 2021, 559). Interestingly, the majoritarian approach also aligns with Roemer and Trannoy (2016), who propose identifying circumstance and effort variables in accordance with the predominant beliefs in a society. Roemer, however, did not adopt this proposal in his empirical applications. Instead, he incorporated his own normative view that individuals should not be held responsible for the effects of circumstances on their effort (see, e.g., Björklund et al., 2012).

The second approach, the deliberative approach, builds on deliberative democracy, "a prominent alternative to majoritarianism" that reserves democratic legitimacy for views resulting from structured political debate, "typically requiring consensus or near-consensus amongst participants" (Cairns, 2025, 7). One example is Lusk (2021), who draws on deliberative democratic theory to

assess the legitimacy of value-laden scientific information. Another proponent is Pamuk (2022), who proposes "science courts" as a means of bridging the expertise gap between scientists and the public. In this framework, a representative sample of citizens forms a jury that questions experts advocating different resolutions to a scientific value judgment and then deliberates to reach a preferred outcome. Specifically for thick concepts, Alexandrova and Fabian (2022) propose co-production, in which members of the public, researchers, and policymakers jointly define a concept, each contributing their own form of expertise. Both proposals give experts a more active role than the majoritarian approach. This matters because, as Alexandrova (2017) argues, scientists can gain special normative knowledge through their work. IOp researchers, for instance, are familiar with the statistical implications of classifying variables as circumstances or effort. Applied to IOp, a deliberative approach would involve experts and members of the public jointly deciding how the influence of circumstances on effort should be accounted for when estimating IOp.

In sum, the two strategies that currently dominate IOp research leave the normative choice between Roemer's and Barry's operationalizations to individual researchers. This leads to distributive epistemic injustice and undermines the ability of IOp estimates to guide policy. To meet the information criterion, IOp should be estimated under both operationalizations. Policy guidance, by contrast, requires a choice between them. Democratization offers a way to make this choice legitimate. The majoritarian approach requires evidence on the views of the public, and the deliberative approach additionally requires evidence on the views of experts. The next section provides both: it reviews existing evidence on public beliefs about responsibility for the effects of circumstances on effort and presents novel evidence from a vignette study of academic experts.

4 Democratizing Value Judgments: Empirical Insights into Beliefs about the Circumstance–Effort Relationship

As argued in the previous section, estimating IOp requires a non-epistemic value judgment about the effect of circumstances on effort, which directly affects the estimated level of IOp. Current research leaves this judgment to researchers, whereas a prominent strand in philosophy of science argues for democratizing such value judgments (Kurtulmuş, 2021). This section applies

the two approaches to democratization discussed above to the circumstance–effort relationship. Under both approaches, the debate between Roemer (1998) and Barry (2005) becomes an empirical task: eliciting responsibility beliefs before statistically estimating IOp. This section contributes to this task in two ways. First, it synthesizes recent empirical studies on public beliefs about the relationship between circumstances and effort, which provide the input for the majoritarian approach. Second, it presents novel data from a vignette study eliciting the normative beliefs of academic experts, which, together with the public evidence, provides the input for the deliberative approach.

4.1 Responsibility and Circumstances: What Does the Public Believe?

Even though behavioral economists have only recently become interested in this question, their conclusions are remarkably consistent. The results indicate that people do hold other people responsible for the effect of circumstances on effort, thereby supporting Barry's normative position (Andre, 2025; Fehr et al., 2024; Dong et al., 2025). For example, Andre (2025) finds novel and interesting experimental evidence that individuals' redistributive choices are not influenced by the circumstances that create different incentives. To show this, Andre (2025) conducted a series of representative experiments with varying earnings possibilities for participants.

In the first scenario, two workers faced similar incentives to complete tasks as their chances of reward were equally high ($0.10 and $0.50 per completed task with respectively 50% chance determined by a lottery). In the second scenario, the two workers were aware of the remuneration before completing the tasks. Therefore, one person had more incentive to work hard than the other person. Interestingly, the majority of impartial spectators based their redistributive choices in both scenarios on the actual exerted effort, rather than taking the different circumstances into consideration. Consequently, "[s]pectators' reward decisions do not factor in that circumstances influence choices. They reward others based on their effort, even if effort choices are unequally shaped by external circumstances" (Andre, 2025, 786).

To check the validity of the results, Andre (2025) also conducted a vignette-study examining the effect of circumstances on effort with respect to fairness evaluations in real-world scenarios. The results mirrored those of the experimental setup: "Fairness judgments do not factor in the effect of circum-

stances on choices in important real-world scenarios" (Andre, 2025, 802). The overall findings by Andre (2025) suggest that people indeed hold others responsible for their exerted effort, even when the reasons lie beyond someone's control.

The same effects have been documented in several other studies. For example, Fehr et al. (2024) find that people do not change their stance on inequality aversion or redistributive preferences even when they receive information on the persistence of socio-economic status across families. The authors conclude that "people view parental influence as a sufficiently legitimate reason to justify some inequality" (Fehr et al., 2024, 382). Likewise, Dong et al. (2025) find that spectators do not consider exogenous circumstances when making redistribution decisions. As the body of evidence continues to grow, Fehr and Charness (2025) conclude in their review of the literature that "this growing literature shows that the disregard of unequal opportunities in merit judgements is robust and arises in different settings and cultures" (Fehr and Charness, 2025, 464). In other words, across diverse societies and cultural contexts, there appears to be the prevailing view that individuals deserve to be rewarded based on their actual effort, independent of their external circumstances.

Empirical evidence suggests that societal normative beliefs regarding the effect of circumstances on effort contradict Roemer's (1998) normative position. Behavioral economists have only recently become interested in this question, so their conclusions should be interpreted with caution. Nonetheless, their findings appear largely consistent in rejecting Roemer's (1998) position. Consequently, under the majoritarian approach, as well as under the proposal of Roemer and Trannoy (2016) to base IOp estimates on the predominant normative beliefs in a society, current IOp estimates overstate the degree of inequality of opportunity. This is because treating the effect of circumstances on effort as an additional circumstance yields higher IOp estimates than the public's normative beliefs would warrant. From the perspective of the majoritarian approach, current IOp estimates therefore lack democratic legitimacy as a guide for policy decisions.

4.2 Expert Beliefs: Findings from a Vignette Study

Proponents of the deliberative approach may arrive at different conclusions. Deliberative proposals such as the science courts of Pamuk (2022) or the

co-production approach of Alexandrova and Fabian (2022) do not simply aggregate public opinion but give experts an active role alongside the public. A deliberative approach therefore also requires evidence on the normative views of experts, who, as discussed in Section 3, possess specialized knowledge about the implications of classifying variables as circumstances or effort. If experts share the public's view, current IOp estimates are overestimated from the perspective of the deliberative approach as well. If experts hold diverging beliefs, however, the choice of operationalization cannot simply be read off either group's views, and structured deliberation between experts and members of the public becomes necessary.

To compare the normative beliefs of experts with those of the general public, I conducted a vignette survey using the same real-world scenarios as in Andre (2025), targeting experts rather than a representative public sample. Experts are defined as academic or applied researchers holding a Ph.D. (or equivalent) who work theoretically or empirically on inequality or distributional issues. Experts from three academic disciplines—economics, philosophy, and sociology—were selected to capture a broad range of perspectives and research practices. The survey was distributed over four months (August 2024 to January 2025) to 250 experts. Of the 250 contacted, 150 started the survey and 119 provided valid responses to the Poverty vignette, yielding an effective response rate of 48%. Of the respondents, 50% held senior positions (37 full professors and 23 associate professors), while 50% held junior positions (47 assistant professors or postdoctoral researchers and 12 applied research scholars). The disciplinary composition was balanced: 40 economists (34%), 37 philosophers (31%), and 40 sociologists (34%). Two respondents indicated affiliation with more than one discipline. These are included in full-sample analyses but excluded from discipline-specific subgroup comparisons. As in Andre (2025), the vignette survey consisted of three hypothetical real world scenarios, each scenario representing a situation in which two individuals face different circumstances that influence their effort choices.

Even though the vignette survey comprises three distinct scenarios, I focus on the most relevant one for estimating IOp. Similar conclusions can be inferred from the other two scenarios. In the so-called Poverty vignette, the "advantaged person grew up in a rich family, went to good schools, and was taught that 'you can go as far as your hard work takes you.' The disadvantaged person grew up in a poor family, went to poor-quality schools,

and was always told that 'the poor stay poor, and the rich get richer.' Whereas the advantaged person always worked hard in his life and, as a consequence, earns $125,000 a year, the disadvantaged person never worked hard and earns only $25,000 a year" (vignette text from Andre, 2025). The complete instructions of the vignette study can be found online at `https://osf.io/xj7vc/`.

After reading the scenario, the experts were asked to redistribute the income between the two individuals. While Andre (2025) also introduced between-subject variation by modifying the counterfactual knowledge of respondents in addition to analyzing the baseline scenario, I focus exclusively on the baseline scenario. In this version, it is unknown how much effort the disadvantaged person would have exerted if they had faced better circumstances. This is important as such knowledge is not available in real-world scenarios when judging whether people should be held responsible for the effect of circumstances on their effort. Consequently, the baseline scenario offers the most realistic representation.

Category	**Andre (2025)**	**Expert study**	**Difference**
Panel A: Reward decisions			
Initial reward share	17%	17%	—
Redistributed reward share	24%	35%	11 pp***
Share redistributing	55%	89%	34 pp***
Observations	887	119	
Panel B: Fairness judgments			
Unequal circumstances unfair	73%	96%	23 pp***
Unequal outcomes unfair	18%	28%	10 pp*
Observations	601	119	

Table 1: Comparison of results from Andre (2025) and the expert study. All differences are statistically significant after Holm–Bonferroni correction for multiple testing. Stars indicate the significance level of the difference between the expert study and the public sample: *** $p < 0.001$, * $p < 0.05$.

While Andre (2025) finds that reward decisions by the general public are largely insensitive to the impact of circumstances on choices and effort, experts' responses reveal substantially different fairness preferences. On average, experts assign 35% of total income to the disadvantaged worker.[6] This

[6]Two respondents indicated that they already knew the original study by Andre (2025). Excluding them does not change the results: the mean share allocated to the disadvantaged person remains at 35% ($N = 117$).

estimate is fairly precise: a bootstrapped 95% confidence interval of [33.0, 37.5] suggests that the true average among the expert population lies comfortably above the public mean of 24% reported by Andre (2025). The 11 percentage-point gap between experts and the public is highly statistically significant ($z = 7.57$, $p < 0.001$), indicating that the difference reflects a substantively meaningful divergence in fairness preferences. In addition, 89% of experts redistribute some amount to the disadvantaged person, compared to only 55% of the general public. Next, I also followed Andre (2025) in asking the experts qualitative questions with respect to their fairness perceptions regarding the unequal circumstances and resulting unequal outcomes. Nearly all experts (96%) evaluated the unequal circumstances as unfair, significantly more than the 73% reported in Andre (2025) ($\chi^2 = 27.6$, $p < 0.001$). A higher proportion of experts also described the unequal outcomes as unfair (28% vs. 18% in Andre's study; $\chi^2 = 5.4$, $p = 0.02$). The p-values of the expert-vs-public comparisons were adjusted for multiple testing using the Holm–Bonferroni correction.

Interestingly, the results varied across academic disciplines (see Table 3 in Appendix B), although the differences in the mean share allocated to the disadvantaged person are not statistically significant (Kruskal–Wallis test: $H = 5.38$, $p = 0.068$), which may reflect the limited size of the disciplinary subgroups ($n = 37$ to 40). Philosophers and sociologists on average assigned more than one-third of the overall income to the disadvantaged individual (37% and 37%, respectively), while economists compensated the person growing up in poverty with 32%. The proportion of respondents who redistributed in favour of the disadvantaged individual ranged from 87% among philosophers to 93% among sociologists, with economists in between (88%). Similarly, nearly all experts considered the unequal circumstances to be unfair, with agreement levels ranging from 95% among philosophers and economists to 98% among sociologists. In contrast, views on the fairness of unequal outcomes differed more substantially: 43% of philosophers judged the unequal outcomes to be unfair, compared to only 13% of economists and 30% of sociologists.

Despite these descriptive differences across disciplines, experts consistently hold different fairness preferences than members of the general public. They take the effect of circumstances on effort into account to a larger extent. One possible explanation is that experts, given their training and expertise, are more aware of the counterfactual, that is, of how much effort the dis-

advantaged person would have exerted under better circumstances. Such counterfactual thinking would then be a consequence of their education and training. This interpretation is consistent with Andre (2025), who finds that providing respondents with knowledge of the counterfactual (that both individuals would exert equal effort under similar circumstances) increases redistribution, although only by 4 percentage points in the Poverty vignette. Experts, by contrast, redistribute more than twice as much as the public (18 vs. 7 percentage points relative to the initial share of 17%) without being given explicit counterfactual information. The specific mechanism behind the divergence between experts and the public, however, cannot be investigated with the present data and is not important for the conclusions drawn from the survey.

While these results do not provide conclusive evidence that experts do not hold individuals responsible for the effect of circumstances on effort, they suggest that experts are more willing to redistribute when circumstances may have influenced individuals' effort decisions. Moreover, experts' fairness judgments in such situations appear to differ systematically from those of the public. These findings align with the observation that many authors in the IOp literature define the concept in a way that reflects their own values, specifically by not holding individuals responsible for the effects of circumstances on effort. Consequently, proponents of the deliberative approach face a potential disagreement between experts and the public. Given the diverging views of the public and experts, operationalizing IOp under the deliberative approach therefore requires further exploration in deliberative settings such as science courts or other forms of co-production. Such an exercise would not only help determine how IOp should be operationalized but also show whether experts and the public can converge on a shared position. Studies on deliberation show that people can change their fairness preferences through structured discussion and exposure to factual knowledge (Zimmermann et al., 2018). While experts are likely to possess such knowledge already, it remains an open question whether their views might also change through dialogue with members of the public.

5 Discussion and Conclusion

This paper has argued that the current practice of estimating IOp almost exclusively in line with Roemer's (1998) operationalization fails to fulfill both objectives of social science indicators identified by Thoma (2024): informing

the public and guiding policy decisions. Because the treatment of the effect of circumstances on effort is a non-epistemic value judgment, estimating IOp under only one normative framework results in distributive epistemic injustice and violates the information criterion: for those who share Barry's (2005) view, current estimates overstate IOp. At the same time, the absence of any legitimization procedure for the chosen operationalization undermines the use of IOp estimates to guide policy. The most prominent response to this kind of legitimacy problem is the democratization view, according to which non-epistemic value judgments in science should be based on the values of the public rather than on those of individual researchers (Cairns, 2025). Applying the two main approaches to democratizing this value judgment yields two findings. Under the majoritarian approach, recent evidence from behavioral economics indicates that most people hold others responsible for the effect of circumstances on effort, implying that current IOp estimates are overestimated. Under the deliberative approach, the expert vignette study shows that experts' fairness judgments differ systematically from those of the public, so that structured deliberation between the two groups would be required before an operationalization could claim democratic legitimacy.

These findings imply a dual responsibility for researchers working on IOp. First, to meet the information criterion, they should report IOp estimates under different normative assumptions, in particular under both Roemer's (1998) and Barry's (2005) operationalizations. This requires greater attention to the measurement of effort, since only then can IOp be estimated under Barry's operationalization. As effort itself constitutes a thick concept, the democratization approaches discussed in this paper apply to its operationalization as well. Second, if IOp estimates are to guide policy decisions, researchers and policymakers must identify one operationalization as democratically legitimate, since different operationalizations may lead to different policy recommendations, for instance by ranking regions differently. Depending on the legitimization procedure, current estimates are either overestimated (under the majoritarian approach) or require further deliberation between experts and the public (under the deliberative approach). If such deliberation leads to the same conclusion as the majoritarian approach, policy guidance should rely on estimates consistent with Barry's (2005) position. If deliberation instead endorses Roemer's (1998) position, it must first be decided which legitimization procedure is most appropriate for IOp research, a question that cannot itself be settled empirically.

Taking these steps would make IOp estimates both more informative for the public and more suitable for policy guidance. Due to its foundations in moral philosophy, the IOp approach makes its normative assumptions more explicit than other social science indicators. Recognizing this, some researchers have recently tried to avoid these inherent normative elements. Most prominently, Ferreira and Brunori (2024) introduced the concept of inherited inequality, aiming to reduce the philosophical controversies surrounding IOp by focusing exclusively on circumstances inherited at birth. According to the authors, this approach helps to overcome the problem of normative assumptions in IOp research: "The point is merely that the meaning of the measures thus obtained no longer requires taking normative positions on either the precise boundaries between responsibility and non-responsibility factors ..., or on the extent to which personal responsibility is deserving of reward, in order to construct a meaningful measure of the extent to which inequality is inherited" (Ferreira and Brunori, 2024, 14). While this reframing is innovative, Ferreira and Brunori (2024, 14) themselves acknowledge that their conceptual shift does not alter empirical estimates, as inherited circumstances are already the default input for estimating IOp. In addition, the same methodology underlying IOp is proposed to estimate inherited inequality. The reframing can thus be read as an instance of the first strategy discussed in Section 3: it redefines a thick concept as a technical term by setting aside its evaluative component. Yet this does not eliminate the underlying value judgment. As soon as inherited inequality is interpreted as unfair and used to inform public debate or guide policy, the question of how to treat the effect of circumstances on effort arises again. This challenge is therefore equally relevant to their approach. It cannot be resolved by reframing IOp as inherited inequality, but only by engaging explicitly with the underlying non-epistemic value judgment.

The paper thus contributes to both economics and philosophy. For economists, it shows what is required for empirical estimates of IOp to fulfill both objectives of social science indicators: reporting estimates under different normative assumptions to inform the public, and legitimizing one operationalization to guide policy. For philosophers, it provides a worked example of how the democratization view can be implemented empirically for a concrete non-epistemic value judgment, and it shows that existing social science data can sometimes already supply the required evidence, as in the case of the public's responsibility beliefs. At the same time, the analysis makes visible the gaps that remain between public values and the value judgments researchers

must make. In particular, empirical evidence alone cannot determine which democratization approach should be adopted, nor how a disagreement between experts and the public should be resolved. These remain normative questions that require further philosophical reflection and, ultimately, democratic deliberation.

Data Availability Statement

The data and code used in this study are stored in a GitHub repository, which has been made available to the editor and will be made publicly available upon publication. The survey instrument and instructions are publicly available at `https://osf.io/xj7vc/`.

Statement on the Use of AI Tools

During the preparation of this work, the author used ChatGPT-4o and Claude Opus 5.5 (Anthropic) for language editing and coding support. After using these tools, the author reviewed and edited the content as needed and takes full responsibility for its content.

Appendix A. Expert Survey

A.1. Target Population and Eligibility

The target population consists of academic and applied researchers who work theoretically or empirically on inequality or distributional issues. Specifically, I define eligible respondents as researchers holding a Ph.D. (or equivalent) whose primary research engages with topics such as inequality, social mobility, distributive justice, or fairness. Experts were drawn from three academic disciplines: (i) economics, (ii) philosophy, and (iii) sociology. Eligible participants included applied research scholars, postdoctoral researchers, assistant professors, associate professors, and full professors. The sample is international, comprising experts affiliated with universities and research institutes across multiple countries and continents. Nevertheless, it is not a probability-based sample and likely skewed toward research-active institutions in high-income countries (due to e.g., unavailable contact information or missing details on research specialization for some institutions and scholars). Contact details were gathered from institutional or personal academic webpages. While I contacted experts based in diverse regions (including Asia, South America, North America, Europe, Africa, and Australia), I did not collect respondents' nationality. As such, I cannot analyze the geographic composition of the sample in greater detail.

A.2. Sampling Frame and Recruitment

Between August 2024 and January 2025, I compiled a sample of 250 experts based on departmental and institute websites. Invitations to participate in the survey were sent via personalised emails containing a direct link to the survey. No financial incentives were offered. Of the 250 experts contacted, 150 started the survey (60% initial response rate). After removing 31 incomplete responses—defined as cases where both allocation fields were missing or the respondent's discipline was not recorded—the analytical sample comprises 119 valid responses to the Poverty vignette, yielding an effective response rate of 48%. Four of these respondents did not complete the full survey but answered all questions on the Poverty vignette. Two additional responses contained allocation entries in absolute amounts rather than percentage shares. These were rescaled to percentages (see replication code for details).

Table 2 summarizes the composition of the sample. Of the 119 respondents, 40 identified as economists (33.6%), 37 as philosophers (31.1%), and

40 as sociologists (33.6%). Two respondents indicated affiliation with more than one discipline (one economics and philosophy, one economics and sociology). These are included in full-sample analyses but excluded from discipline-specific subgroup comparisons. Regarding seniority, 50.4% of respondents held senior positions (37 full professors and 23 associate professors), while 49.6% held junior positions (47 assistant professors or postdoctoral researchers and 12 applied research scholars).

Category	n	%
Response flow		
Experts contacted	250	—
Started survey	150	60.0
Incomplete responses dropped[a]	31	—
Analytical sample	119	47.6
Discipline		
Economics	40	33.6
Philosophy	37	31.1
Sociology	40	33.6
Multiple disciplines[b]	2	1.7
Academic position		
Full professor	37	31.1
Associate professor	23	19.3
Assistant professor / post-doc	47	39.5
Applied research scholar	12	10.1

Table 2: Sample composition and response flow. Percentages for the response flow are relative to the 250 experts contacted. Percentages for discipline and position are relative to the analytical sample ($N = 119$). [a] Responses were dropped if both allocation fields were missing or the discipline was not recorded. [b] One respondent selected economics and philosophy. One selected economics and sociology. Both are included in full-sample analyses but excluded from discipline-specific subgroup comparisons.

A.3. Survey Design

The vignette survey replicates real-world scenarios originally developed by Andre (2025) to elicit normative judgments about the effect of circumstances on effort. Each vignette presents two individuals who differ in background characteristics that plausibly influence their effort choices. Respondents, acting as impartial spectators, are asked to redistribute income between the two individuals. The key outcome measures are: (i) the share of income allocated to the disadvantaged individual, and (ii) binary fairness judgments regarding (a) unequal circumstances and (b) unequal outcomes. To mitigate ordering effects, the vignette presentation was randomized. Comprehension

checks preceded the allocation tasks to ensure participants understood the scenarios. Full instructions and materials are available online at: `https://osf.io/xj7vc/`.

Appendix B. Expert Survey: Redistribution Decisions Across Disciplines

Category	**Economics** ($n = 40$)	**Philosophy** ($n = 37$)	**Sociology** ($n = 40$)
Initial reward share (%)	17.0	17.0	17.0
Redistributed reward share (%)	32.1	37.4	36.6
Share redistributing (%)	87.5	86.5	92.5
Unequal circumstances judged unfair (%)	95.0	94.6	97.5
Unequal outcomes judged unfair (%)	12.5	43.2	30.0

Table 3: Redistribution decisions by discipline. Percentages are reported with one decimal place. Two respondents who indicated multiple disciplinary affiliations are excluded from this table.

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