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DOI

[10.1007/978-3-319-58993-0_6](https://doi.org/10.1007/978-3-319-58993-0_6)

Publication date

2017

Document Version

Final published version

Published in

Interdisciplinary Perspectives on Fairness, Equity, and Justice

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Citation for published version (APA):

Gordon-Hecker, T., Choshen-Hillel, S., Shalvi, S., & Bereby-Meyer, Y. (2017). Resource Allocation Decisions: When Do We Sacrifice Efficiency in the Name of Equity? In M. Li, & D. P. Tracer (Eds.), *Interdisciplinary Perspectives on Fairness, Equity, and Justice* (pp. 93–105). Springer. https://doi.org/10.1007/978-3-319-58993-0_6

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Chapter 6

Resource Allocation Decisions: When Do We Sacrifice Efficiency in the Name of Equity?

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In 1975, Arthur M. Okun introduced the concept of equity–efficiency trade-offs. In his seminal book on the trade-off, he described it as “... our biggest socioeconomic tradeoff, and it plagues us in dozens of dimensions of social policy. We can’t have our cake of market efficiency and share it equally” (Okun, 1975, p. 2). This idea does indeed seem to be a focal point of many economic and pseudo-economic decisions: Employers need to decide how to distribute an increase in the company’s profits in a way that will be fair on one hand, but maximize the benefit for the company on the other hand; parents sometimes need to decide what to do with a single toy or candy if they have more than one child; politicians and policy makers need to decide on a taxation policy that transfers money from the rich to the less fortunate, while maintaining economic growth and the market’s efficiency. Since Okun’s seminal work, equity–efficiency trade-offs have been the subject of numerous studies. Social scientists from the fields of economics, psychology, public policy and management have studied from different perspectives the essential fact that society’s strive for maximizing resources may, at times, increase the differences between people’s payoffs.

Individuals must trade off equity and efficiency in a wide range of contexts as well—from constructing their views on public policy matters (Mitchell, Tetlock, Newman, & Lerner, 2003) to making trade-offs themselves in interpersonal

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contexts (Messick, 1995; Shaw, 2013). Consider, for example, a parent who has twins—and only one ticket to a movie, to which all other tickets have been sold out. The parent can either give the ticket to one of the children, thereby creating inequity, or not give it to any of them—thus wasting the movie ticket but preserving equity. What would people do in such cases? And what factors influence their decision? In this chapter, we review recent research examining people’s decisions in situations where preference for efficiency means deviating from equity, and the factors affecting such decisions. We start by reviewing some literature suggesting that people often reject inequity, regardless of efficiency considerations. We then review the literature for situations in which a conflict exists between equity and efficiency, and differentiate between situations where the allocator is monetarily affected by the allocation and situations where she is allocating the resource as a third party. We end by adding another refinement, differentiating between situations in which the allocation decision is made publicly and situations in which it is made privately.

On Equity

Equity is one of the most fundamental principles for resource allocation (Adams, 1965). According to equity theory, people pursue equitable situations in which the input/output ratio is constant for all members of society. That is, people prefer a state in which equal work results in equal pay (and unequal work results in unequal pay) and the greater the deviation from this state, the more they feel distressed (Walster, Berscheid, & Walster, 1973). Note that equity, equal pay for equal work, differs from mere equality, defined as equal pay regardless of the work invested (Mannix, Neale, & Northcraft, 1995). Although the two concepts often converge, this is not necessarily the case. For example, paying two equally deserving employees the same salary is both equitable and equal. Yet paying a person who puts in more time and effort a higher salary than his colleague who did not work as hard is equitable but not equal. Equity, more so than equality, is considered to be a fair allocation (Bar-Hillel & Yaari, 1993; Shaw & Olson, 2012).

Numerous studies show that people tend to display *inequity aversion*—they are averse to outcomes that deviate from equity, whether that inequity is advantageous or disadvantageous for them (Bolton & Ockenfels, 2000; Fehr & Schmidt, 1999; Loewenstein, Thompson, & Bazerman, 1989).

When allocating resources, people try a great deal to avoid allocations that deviate from equity, even when their own self-interest is pitted against equity. In the well-known dictator game, a participant receives a certain monetary endowment and needs to decide how to allocate this endowment between herself and another participant (Forsythe, Horowitz, Savin, & Sefton, 1994). The allocator receives no information regarding the relative contribution compared to his own, thus there is no reason for him to assume he deserves a greater payoff than the other participant does. Importantly, the decision is completely up to the allocator, and the other participant cannot reject it or retaliate in any way. Studies show that although there

is no rational reason for the allocator to transfer any money to the other participant, allocators tend to transfer some money, thereby creating allocations that are more equitable than keeping all the money to themselves. A recent meta-analysis shows that on average, across many treatments and manipulations, people transfer 28.3% of the endowment to the other participant (Engel, 2011). Such decisions seem to be driven by concern with fairness, as they minimize the gap between the allocator and the recipient's final payoffs (at the allocator's own expense). Furthermore, it is difficult to explain this fair behavior by reputation considerations, since some of these findings were found in a double-blind design, where the experimenter cannot learn the allocator's decision, which did not reduce participants' transfers (Engel, 2011).

The willingness to forfeit some monetary payoff to maintain equity develops with age (Bereby-Meyer & Fiks, 2013; Fehr, Bernhard, & Rockenbach, 2008). Around the age of 6, children become more likely to throw away resources to maintain equity—even if these resources are their own (Shaw & Olson, 2012). Interestingly, older children (over the age of 6) are less likely to create inequity that is advantageous for them (i.e., they are willing to forfeit some of their own resources to maintain equity) and other unfair forms of inequity compared to their younger counterparts. However, they are actually more likely to create disadvantageous inequity, in which they receive less than their counterpart does, in order to promote other goals, such as maximizing efficiency (Shaw, Choshen-Hillel, & Caruso, 2016). Additionally, 8-year-old children tend to reject allocations that create inequity between themselves and another child, even if this means they will both get nothing (Blake & McAuliffe, 2011), and by the age of 9 they also feel good about equitable decisions (Kogut, 2012). When equitable allocation is not costly, children as young as 4 years old prefer equitable allocations over inequitable ones, even when the other recipient is a complete stranger (Moore, 2009).

The preference for equity seems to stem from basic, automatic mechanisms—people's attention is automatically drawn towards equal allocations (Halevy & Chou, 2014), and when put under cognitive load, participants are more willing to forfeit some of their own payoff in order to reduce inequity between themselves and another person (Schulz, Fischbacher, Thöni, & Utikal, 2014). As such a basic tendency, it comes as no surprise that the preference for equity is not rare. A meta-analysis suggests that approximately half of the population show prosocial preferences (Balliet, Parks, & Joireman, 2009), i.e., preferences for an allocation that maintains equity between the self and another person over allocations that are advantageous to the self but harm the other (Van Lange, 1999; Van Lange, De Bruin, Otten, & Joireman, 1997).

People exhibit inequity aversion even in situations where they themselves are not affected by the allocation. Sixteen-month-old toddlers seem to favor an agent that allocates resources equally among other actors over an agent who allocates them unequally (Geraci & Surian, 2011). The willingness to forgo resources in order to maintain equity develops around the age of 6–8 (Blake & McAuliffe, 2011; Shaw & Olson, 2012). Adults too tend to prefer equitable allocations among others (Engelmann & Strobel, 2004). People want to live in an equitable society (Norton & Ariely, 2011), and prefer that those who put the same amount of effort receive the

same payoff (Cook & Hegtvædt, 1983). When they are responsible to allocating resources, people are also sensitive to the effort invested, and tend to reward more those who put more efforts, finding equity to be fairer than equality (Leventhal & Michaels, 1971). In health policy, for example, equity plays a major role in resource allocation of central budget to healthcare providers (Sheldon & Smith, 2000).

To summarize this section, we refer to the work of David Messick (1993), who describes the preference for equality as a “decision heuristic,” making it the dominant option in many allocation dilemmas. Since the difference between equity and equality is based on recipients’ contributions, when the contributions are the same, equality coincides with equity. Hence, one can conclude that when no recipient is more deserving than the other, people pursue equity automatically, and use it as a simple guideline in resource allocation dilemmas. This is true both when the allocator is affected by her decision and when she is simply asked to be the allocator of resources among other individuals.

Equity–Efficiency Conflict

Whereas most people generally prefer to promote equity in resource allocation, they may have to reconsider it, at times, when equity comes at the expense of efficiency. Here we use the term efficiency as surplus maximization (Engelmann & Strobel, 2004). A person who is motivated by efficiency considerations values the total monetary payoff for the group positively in his or her utility function. Take, for instance, taxation policy. Whereas a progressive taxation system might be a good way to reduce income inequality, it is often described as inefficient (Ballard, 1988; Browning & Johnson, 1984; Greenwald & Stiglitz, 1986). According to Okun (1975), a transfer of money from the rich to the poor through progressive taxation is done in a metaphorical “leaking bucket”—during the transfer, some money is inevitably lost. The question policy makers must face, then, is how much waste (if any) they are willing to accept in order to maintain equity. The answer to this question, according to Okun, “...cannot be right or wrong- any more than your favorite ice-cream flavor is right or wrong” (p. 92). How do individual decision makers approach equivalent dilemmas? Do they lean towards equity or efficiency? And what factors might affect their preference?

We start by differentiating between two types of situations in which such dilemmas might arise—one is a situation in which the allocator is monetarily affected by his decision, and the other in which he is not, i.e., he is a third party. Those two situations might differ vastly in the psychological mechanisms involved. Whereas in situations where the allocator is monetarily affected, considerations of self-interest, social comparison, and envy might come into play, those considerations are irrelevant when the allocator is not monetarily affected by his or her decision. Studies that examined such situations tried to tap into purer aspects of the decision regarding the equity–efficiency trade-off, by removing considerations of social comparison and own payoff maximization. Despite the fact that both lines of research often report

similar results, we follow this distinction throughout the chapter, since they involve potentially different psychological mechanisms. When a person is a third party thinking about equity, she is mainly concerned about pure fairness. Yet when a person is involved in the allocation herself, she might be driven by other motivations, such as self-interest and social comparison.

Consider first people's equity–efficiency trade-offs, where the allocator is a part of the allocation (i.e., he or she is monetarily affected by the allocation). A common finding is that in such situations people tend to prefer income distributions that preserve equity, at the expense of efficiency. In other words, people prefer that each individual will receive the same outcome, even if this means shrinking the pie, and even if that shrinkage comes out of their own pocket. For example, participants were willing to pay out of their own pocket in order to restore equity by destroying resources that were unjustifiably held by others, and thus deviated from equity (Dawes, Fowler, Johnson, McElreath, & Smirnov, 2007). The same willingness to destroy one's own resources, in order to maintain equity, is observable in children as young as 6–8. When asked to react to a suggested allocation of goods between themselves and another child, 8-year-old children were willing to reject unfair allocations and not allocate any candies, even when the inequity was advantageous for them (i.e., they received more candies than the other child; Blake & McAuliffe, 2011; Shaw et al., 2016; Shaw & Olson, 2012).

Nevertheless, it has been shown that allocators, who are monetarily affected by their own decisions, are sometimes willing to deviate from equity in a bid for greater efficiency (Charness & Rabin, 2002; Engelmann & Strobel, 2004). Bar-Hillel and Yaari (1993) showed that when maintaining equity results in a vast waste of resources, people opt for inequity.

Furthermore, it seems that the preference for equity over efficiency and vice versa is sensitive to situational factors. Choshen-Hillel and Yaniv (2011, 2012) have suggested that the preference for equity over efficiency is affected by the allocator's degree of agency—the allocator's feeling of control over the resource allocation process. Participants in these studies were more likely to prefer an allocation that maximized total welfare, yet was inequitable, when they were agentic (could determine the payoff) compared to when they were not (could merely judge the payoff and could not affect it). Framing can also play an important role in constructing people's preferences, as people tend to have stronger reactions to inequity when they allocate burdens rather than gains (Griffith & Sell, 1988; Northcraft, Neale, Tenbrunsel, & Thomas, 1996).

A second line of research on the equity–efficiency conflict deals with situations in which the allocator is a third party, i.e., he or she is not one of the recipients. Such allocations are common in the context of policymaking, such as vaccination policies, budget allocation, and taxation policy. By and large, third-party allocators tend to prefer equity to efficiency just like those who are affected by the allocation do. When constructing an ideal hypothetical society, participants chose governmental plans that create a society where no one falls below the poverty line, even if it meant reducing the mean income of the entire population (Mitchell, Tetlock, Mellers, & Ordóñez, 1993). Just like allocators who are a part of the allocation, third-party

allocators are also susceptible to the effects of framing. For example, when vaccination policies are presented in terms of lives lost, people prefer vaccination policies that benefit younger people over older people, even when their expected years remained to live is held constant. Such preference reflects a “fair” allocation, as it reflects a desire to allow a younger person to live and experience life to the same extent his older counterpart had lived. However, when vaccination policies are presented in terms of lives saved, they prefer policies that prioritize people with more expected years to live (Li, Vietri, Galvani, & Chapman, 2010). This may be seen as a preference for efficiency. On that note, it is interesting to state that the American organ donations system has shifted from equity-driven considerations (i.e., giving priority to those who waited longer for a transplant) to efficiency-driven considerations (i.e., giving priority to those who have a higher probability for a successful transplant) (Elster, 1993).

Interestingly, the reference point plays a major role in the willingness to accept inequity. People were more tolerant towards inequity when it was the initial state, compared to when resources were distributed by the allocator inequitably between formerly equal recipients (Mitchell et al., 2003). Indeed, when asked to allocate a resource between two equally deserving recipients, children (Shaw & Olson, 2012), as well as adults (Choshen-Hillel, Shaw, & Caruso, 2015; Gordon-Hecker, Rosensaft-Eshel, Pittarello, Shalvi, & Bereby-Meyer, 2017; Shaw & Knobe, 2013), were willing to throw a resource (be it a chocolate bar, a monetary reward, or a rock concert ticket) in the trash rather than allocate it unequally. However, they did not wish to throw it away, when its allocation restored equity (Shaw & Olson, 2012).

A neuroimaging study has suggested that the tendency to prefer equity over efficiency in situations where they are at conflict is driven by the emotional system that encodes equity, overriding the rational system that encodes efficiency (Hsu, Anen, & Quartz, 2008). In this study, participants read a hypothetical scenario in which they were asked to reduce the amount of meals donated to children in an orphanage. They were asked to decide whether to take more meals, but from more children, so the children are treated more equally but more meals are taken away in total, or to take away less meals, but they will all be taken from one kid. Results showed that the putamen, an area associated with cognition, was correlated with efficiency, whereas the insula, which is associated with emotions, was correlated with equity, thus supporting the hypothesis that preference for equity stems from the emotional system. This is consistent with other brain studies, associating preference for equity with emotional areas such as the anterior insula (Sanfey, Rilling, Aronson, Nystrom, & Cohen, 2003; Zaki & Mitchell, 2013) and the amygdala (Gospic et al., 2011).

Although destroying resources to maintain equity may seem weird or even illogical, we have reviewed repeated evidence that people do indeed engage in such behavior. Why do people prefer to destroy resources rather than create inequity? Several lines of research propose theoretical accounts to explain this phenomenon. In the following section, we review the literature on the mechanisms underlying people’s preference for equity over efficiency. We begin by examining situations in which the allocator’s identity is known, and therefore considerations of self-image are expected to be taken into account. Next, we consider situations in which the

allocator is anonymous, and therefore his or her decision should be affected mainly by internal psychological mechanisms.

Consider first the concept of self-image. In August 2008, Armin Heinrich released an iPhone application called “I am rich.” The application does nothing but displaying a glowing red diamond on the screen, and comes with a price tag of \$999.99. Why would anyone ever purchase such an application? The app’s official description reads “The red icon on your iPhone or iPod Touch always reminds you (and others when you show it to them) that you were able to afford this.” Clearly, people care about their public image and wish to maintain it to present themselves as good, compatible, or in other ways that can serve their interests (Baumeister, 1998; Goffman, 1959). Indeed, many people do so by signaling their wealth through purchasing luxurious products (Bagwell & Bernheim, 1996). However, people can maintain and improve their public image also by behaving in certain ways. It has been argued that people conform to social norms because behaving in a way that contradicts the social norm reflects an unusual, unappreciated disposition (Bernheim, 1994), and behaving according to social norms helps to maintain and form social relationships (Cialdini & Trost, 1998). One norm people conform to is the equal sharing—“50–50 norm.” In one experiment, when participants played a dictator game, most of the participants split the endowment equally when it was certain that their decision would be implemented as is. However, if there was a chance that a different, unequal split will be enforced instead of their own split, participants tended to split the resources unequally (and in the same form of inequity as the forced split), arguably because the unfairness cannot be traced back to their decision. Hence, the researchers conclude that people tend to split resources equally not necessarily because they prefer equity, but because they want to *appear* fair (Andreoni & Bernheim, 2009).

Traditional research on inequity aversion implies that the reason people prefer equity over efficiency is that they find inequity inherently unfair. Since they care deeply about fairness, they try to preserve equity even if this means they must waste resources (Adams, 1965; Fehr & Schmidt, 1999). Choshen-Hillel et al. (2015), however, argued that the reason people waste in the name of equity is not that they worry about inequity per se, but that they worry about the partiality that inequitable allocations entail. According to the *partiality aversion* explanation, people waste resources to maintain equity mainly because they worry about the social signals associated with inequitable allocations, signals of unfair favoritism to one party or another. Indeed, people are unwilling to appear as if they favor one person over another, if both parties are equally deserving (Shaw, 2013). Consistent with this explanation, it has been shown that when inequitable allocations do not signal favoritism (such as when one places someone else in a better position than oneself), people actually favor efficiency over equity (Choshen-Hillel et al., 2015; Shaw et al., 2016). The partiality aversion account emphasizes the importance of public appearances. As mentioned by Shaw (2013), reputation considerations are the main factor that drives fair behavior, as “fairness functions as a way to signal impartiality to others, in order to avoid third-party condemnation” (p. 415). This, however, does not exclude the possibility that people also internalized the desire to act impartially.

Indeed, it has been found that participants display partiality aversion also in private, anonymous settings (Choshen-Hillel et al., 2015).

Although partiality aversion deals mainly with a desire to appear partial, Choshen-Hillel et al. (2015) also provided some evidence that people might prefer equity to efficiency under anonymous setting. Consider, for example, a contest in which contestants do not know each other, and do not know their ranks and relative performance either (because they are evaluated by an external referee). Further imagine that two contestants end up at the first place and are equally deserving of winning. Since only a single award was purchased, the contest organizer must decide whether to announce one of them as the winner, or announce no winner. Clearly, considerations of reputation should not play a role, since the contestants are not aware of the fact they ended up with similar rankings and no one would feel as if she was treated impartially if one person is crowned winner. Will, in such situations, people find no difficulty in violating equity and allocating the reward to one of the contestants? Empirical evidence to date is scarce to address these questions.

Work in related fields revealed that people wish to maintain a moral, honest and fair self-concept (Mazar, Amir, & Ariely, 2008), and therefore avoid major moral transgressions. Indeed, many studies have found that people do indeed lie, but they tend not to lie to the full extent, but to some extent that will allow them to secure a higher profit but still perceive themselves as moral beings (Fischbacher & Föllmi-Heusi, 2013; Shalvi, Dana, Handgraaf, & De Dreu, 2011). Accordingly, just as people internalize the desire to be somewhat honest, they also internalize the desire to be fair (Rustichini & Villeval, 2014) and avoid inequitable allocations even in private settings.

Indeed, when people are called upon to violate equity among others, they prefer to avoid making a decision altogether and prefer that someone else would make the decision, even if the recipients of the inequitable allocation will not know who made the decision. Beattie, Baron, Hershey, and Spranca (1994) have asked participants to imagine they were the trustee of their sister's estate and that her only valuable possession is an antique piano that can be given to one of her two children. The researchers show that participants wish to avoid choosing one of the two children, whether the recipients are aware of the identity of the decision maker or not. That is, people wish to refrain from deciding on how to implement inequity, even if it is not their own reputation at stakes.

People are also less worried about inequity when the allocator's sense of responsibility is reduced. For example, people are more likely to accept unfair offers in the Ultimatum Bargaining Game that are generated by a random device compared to a person (Blount, 1995). This is because the allocator has no intention to be unfair and is not responsible for the inequitable outcome (Lagnado & Channon, 2008). Similarly, when forced to allocate resources between themselves and an equally deserving other, people tend to prefer a random device to determine the allocation than deciding on the allocation themselves (Kimbrough, Sheremeta, & Shields, 2014; Shaw & Olson, 2014). Presumably, allocation of a reward to one of two equally deserving recipients, the allocator knows nothing about, is just as random as using a random device (preferring participant number 1734 over participant number 5672 is just as random as deciding that participant 1734 corresponds with "heads" in a coin flip). However, not using a random device also bears a sensation of per-

sonal responsibility—the allocator must personally decide if she prefers participant number 1734 or participant number 5672.

Recently, Gordon-Hecker and colleagues (2017) have shown that people are indeed inequity *responsibility* averse. That is, the reason why people are willing to destroy a resource is to avoid the personal responsibility of determining which of two equally deserving recipients should receive it, and not necessarily to avoid inequity in itself. The researchers have presented participants, in a strictly anonymous setting, with three decision alternatives. They could either allocate a resource to one of two equally deserving recipients, allocate it to the other recipient, or discard the resource altogether. The researchers found that many participants preferred to discard the resource rather than implement inequity. However, when allocators received the option of allocating the resource using a random device, discarding rates dropped drastically.

In one experiment, the researchers had participants serve as referees in a Trivia contest between two other participants. They graded the Trivia contest and were given a coupon for coffee and pastry and asked to give it to a recipient of their choice, or to discard it. Equity was manipulated, such that allocation of the reward could either result in inequity (i.e., the recipients did similarly well on the Trivia but only one of them got the reward) or in equity (i.e., participants performed differently on the contest and accordingly got the reward). The researchers found that participants were indeed inequity responsibility averse—when allocation resulted in equity, all participants allocated the reward to the more deserving recipient (the winner). However, when both recipients performed equally well, more than half of the participants preferred to discard the reward rather than choose which of the two recipients should receive it. Nonetheless, introducing a random envelope, that could have been used to allocate the reward randomly to one of the two, reduced discarding rates to zero. Since no information was given regarding the recipients other than their participant numbers, one can conclude that a decision between one of the two is just as random as a coin flip. Therefore, objectively, in both conditions the allocation was random, and none of them violated the principles of distributive justice (both recipients have an equal probability of getting the reward both when the allocation is decided upon randomly and when an anonymous allocator chooses one of the two without any information regarding their identity). However, personally implementing inequity bears a sensation of responsibility, and this, the authors claim, is what drives people to discard the reward altogether (Gordon-Hecker et al., 2017).

Conclusion

The world we live in is vastly inequitable, and most people believe equity is a value worth pursuing (Norton & Ariely, 2011). To complicate things further, equity at times comes at the expense of efficiency. In the current chapter, we reviewed studies that investigate people's approach to this conflict.

Throughout this chapter, we reviewed research that shows that people display inequity aversion and tend to resist allocations where one gets more than one's fair share. People refute inequity both when they are affected by their decisions and thus might be susceptible to effects of self-interest or envy, and when they are merely allocating between others, where only fairness considerations should be relevant for the decision. Next, we showed that when equity is pitted against efficiency, many people would still prefer wasteful, yet equitable allocation (even though, they might also sometimes opt for efficiency). We discussed important factors influencing the trade-off people make, mainly anonymity and framing. Lastly, we reviewed recent literature that elaborates on the concept of inequity and suggests that the role the allocator plays in implementing the inequity serves as a moderator for the preference for equity over efficiency. We suggest that what people see when deliberating between equity and efficiency is not the mere concept of equity, but rather other refinements of this concept, namely partiality and responsibility. We suggest that what people are averse to is not an inequity of outcomes, but rather the social signals associated with inequity. Furthermore, this aversion is internalized, and people try a great deal to avoid it even if the signals would never be observed by anyone other than themselves. Thus, when an allocation favors one person over another, people would be willing to go as far as destroying a resource in order to avoid the decision, be it a private or public decision. However, if that inequity can be created without favoring one person over the other, using procedures such as a random allocation or disadvantaging the self, then people are much more willing to accept such inequity.

The concepts of partiality and responsibility complement each other to provide a comprehensive framework that enables researchers to make clear predictions in different environmental settings (i.e., shared knowledge, anonymity). For example, whereas people wish to avoid both responsibility for implementing inequity and appearing partial, it seems as if what they are most concerned about is being responsible for partial allocations. Yet this prediction deserves further investigation.

Further experiments should test such predictions that will corroborate and extend the discussed concepts, in order to shed more light on the determinants underlying allocators' decisions. We believe that such experiments will help design environments that allow an optimal allocation of resources, with the goal of increasing both equity and efficiency in the world.

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