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## ABSTRACT

We show that individuals narrowly bracket their equity concerns. Across four experiments including 1,600 subjects, individuals equalize components of payoffs rather than overall payoffs. When earnings are comprised of "small tokens" worth 1 cent and "large tokens" worth 2 cents, subjects frequently equalize the distribution of small (or large) tokens rather than equalizing total earnings. When payoffs are comprised of time and money, subjects similarly equalize the distribution of time (or money) rather than total payoffs. In addition, subjects are more likely to equalize time than money. These findings can help explain a variety of behavioral phenomena including the structure of social insurance programs, patterns of public good provision, and why transactions that turn money into time are often deemed repugnant.

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A data appendix is available at http://www.nber.org/data-appendix/w25326

# 1 Introduction

Economists have generated a significant and growing body of theoretical and empirical work on individuals' fairness attitudes and preferences over the outcomes of others. This work has taken a variety of forms. Some has focused on the tradeoff between equality and efficiency.[1] Some has focused on notions of fairness from political philosophy, aiming to disentangle whether individuals are concerned with achieving "equality of opportunity" or "equality of outcomes" and whether individuals aim to achieve "equity" or "equality."[2] Some has focused on inequity aversion, demonstrating that individuals care about eliminating inequities between themselves and others.[3] Exploration of these fairness attitudes have generally simplified the decision environment by considering payoffs comprised of a single component (e.g., cash payoffs).[4]

In this paper, we provide robust evidence that this simplification has masked an important feature of fairness attitudes. Individuals *narrowly bracket* their equity concerns. We report results from 2,360 subjects making decisions about the payoffs of two study participants. In our experiments, payoffs are comprised of two components and subjects can only influence one. Subjects frequently equalize payoffs of the component they can influence at the expense of equalizing total payoffs comprised of both components.

In the *Tokens* version of our study, the two components are small tokens (worth 1 cent) and large tokens (worth 2 cents). In 28% to 48% of decisions, subjects choose to equalize the number of small (or large) tokens participants receive instead of equalizing the total amount of money—including both types of tokens—that participants receive. We call this behavior *narrow bracketing* of equity concerns because subjects are aware of participants' endowments of both types of tokens but act as if they only care about equity on the component they can influence.

In the *Money & Time* version of our study, the two components of payoffs are money and time. We explore payoffs of money and time for a few related reasons. First, money and time are the two major components that comprise overall budgets in practice.[5] Second, we hypothesized

[1] See Andreoni and Vesterlund (2001); Andreoni and Miller (2002); Fisman, Kariv and Markovits (2007); Hong, Ding and Yao (2015); and Fisman, Jakiela and Kariv (2015) for laboratory and field survey evidence.

[2] On equality of opportunity vs. equality of outcomes, see for instance Cappelen et al. (2013), Andreoni et al. (Forthcoming), Alesina, Stantcheva and Teso (2018), and Almås, Cappelen and Tungodden (2019). On equity vs. equality, see for instance Charness and Rabin (2002), Engelmann and Strobel (2004), Fehr, Naef and Schmidt (2006), Reuben and Riedl (2013) and Konow, Saijo and Akai (2016). See also a rich theoretical literature on this topic in political philosophy, which considers "equality in resources" (Rawls, 1971; Dworkin, 1981*a*,*b*) and "equality of outcomes" (Roemer, 1986).

[3] Inequity aversion is a well-documented behavioral phenomenon (Rabin, 1998; Fehr and Schmidt, 1999; Bolton and Ockenfels, 2000) that is relevant in diverse settings such as health (Falk et al., 2014), workplace productivity (Breza, Kaur and Shamdasani, 2016), job choice (Card et al., 2012), and parental investment in their children's education (Berry, Dizon-Ross and Jagnani, 2019). Inequity aversion is observed in childhood (Blake and McAuliffe, 2011) and in other species (Roma et al., 2006); has been shown to correlate with charitable giving (Derin-Güre and Uler, 2010); and has been used to model motives for voting for redistribution (Tyran and Sausgruber, 2006), public good provision (Ahn, Ostrom and Walker, 2003), and inefficient divorce (Smith, 2005).

[4] See Konow (2003) and Gaertner and Schokkaert (2012) for surveys of empirical work on distributive justice.

[5] There is literature that measures inequality incorporating both consumption and leisure, such as the cross-

that subjects might care more about achieving equity in time than equity in money. Third, we believed that individuals narrowly bracketing within money and time domains—and being more motivated to achieve equity in the time domain—could help explain a variety of puzzling phenomena. We find that subjects narrowly bracket their equity concerns within the domains of money and time. Subjects equalize money instead of equalizing overall budgets (including both components) in 19% to 41% of decisions. Subjects equalize time instead of equalizing overall budgets in 41% to 66% of decisions. Subjects are more concerned about achieving equity in time than in money and so we say they are more inequity averse in time than in money.

These patterns are remarkably robust. In an additional *Tokens* version and an additional *Money & Time* version of our study, subjects make decisions affecting themselves and another participant (rather than two other participants) and display the same patterns. While we observe selfish behavior that is consistent with self-serving fairness norms as seen in prior literature (Babcock et al., 1995; Konow, 2000; Engelmann and Strobel, 2004; Konow, 2009; Croson and Konow, 2009; Cappelen et al., 2013; Karadja, Mollerstrom and Seim, 2017), we still see narrow bracketing of equity concerns and more inequity aversion in time than in money. Our results are not an artifact of complexity in the decision environment: in an additional *Tokens* version of our study, we reduce the potential role of cognitive limitations, and our results persist. Finally, our results persist in an additional *Money & Time* version of our study in which there is uncertainty in endowments so that equity can only be achieved in expectation.

What are the consequences of narrow bracketing of equity concerns? Individuals' fairness attitudes are important drivers of government policies surrounding redistribution, optimal taxation, and public good provision (Buffett, 2011; Luttmer and Singhal, 2011; Weinzierl, 2014; Charité, Fisman and Kuziemko, 2015; Kuziemko et al., 2015; Weinzierl, 2016; Saez and Stantcheva, 2016), and so achieving equity within narrow brackets at the expense of achieving overall equity can lead to a less equal society. What are the consequences of greater inequity aversion in time than money? More inequity aversion in time than in money may help explain why requests for private provision of public goods often ask for equal amounts of time but different amounts of money, why unions fight particularly vehemently for regimented hours, and why certain actions that turn inequity in money into inequity in time—such as paying for a place in line or paying for early access to an adoptive child or a living donor kidney—are deemed repugnant and may be outlawed (Roth, 2007). While many of these phenomena have other (often well-documented) explanations, we view the potentially broad relevance of narrow bracketing of equity concerns and differential inequity aversion in time and money as promising directions to help parsimoniously

country comparisons of Rawlsian welfare in Jones and Klenow (2016), and literature that documents the importance of jointly considering these components since they are often negatively correlated (Aguiar and Hurst, 2007; Han, Meyer and Sullivan, 2018). However, to our knowledge, prior literature has not focused on how individuals' decisions are influenced by equity concerns, and in particular the potential for narrow equity concerns, over money and time.

model a wide range of seemingly anomalous attitudes and behaviors. We further discuss these implications in Section 5.

Our results also speak to three related literatures. First and foremost, our results contribute to the literature on fairness attitudes and may help explain some conflicting results that have arisen in it. Narrow bracketing of equity concerns can help explain context effects in laboratory work on social preferences (e.g., why subjects might give in a dictator game but not exhibit similar behavior outside the lab, see Bergh (2008); or the malleability of reference groups over which individuals have fairness concerns, see Fisman, Kuziemko and Vannutell (2018) and Bolton, Dimant and Schmidt (2019)); an individual's adoption of both ex-ante and ex-post perspectives of fairness concerns (Trautmann and Wakker, 2010; Andreoni et al., Forthcoming); the prevalence of the 50-50 norm (see Andreoni and Bernheim (2009) and the review in Engel (2011)); and, more generally, why equity concerns may be influenced by factors such as prior choices or performance but need not be.[6]

Second, our results add to significant existing work in behavioral economics on narrow bracketing, which has found that individuals narrowly bracket choices in a variety of domains. Narrow bracketing has been shown to lead individuals to take dominated options (Barberis, Huang and Thaler, 2006; Rabin and Weizsäcker, 2009) and can help explain the equity premium puzzle (Barberis and Huang, 2006) and insurance purchase decisions (Gottlieb and Mitchell, 2015). We show that narrow bracketing not only extends to equity concerns but is a central driver of equity concerns: it can arise in environments as simple as our experiment involving tokens and can arise at the expense of equalizing total payoffs.[7]

Third, we contribute to a growing literature on decisions involving time and how choices differ across the domains of money and time (Lilley and Slonim, 2014; Brown, Meer and Williams, 2016; Shaddy and Shah, 2018).[8] Much of this work shows that individuals display different preferences in time and money domains.[9] Our finding that people are more inequity averse in time than in

[6]Literature documents that subjects ignore prior choices and performance in some settings but that these factors influence fairness attitudes in other settings (Konow, 2000; Cappelen et al., 2007; Krawczyk, 2010; Cappelen et al., 2013; Mollerstrom, Reme and Sørensen, 2015; Akbaş, Ariely and Yuksel, 2016; Gee, Migueis and Parsa, 2017). In addition, a large, related literature examines how "earning the right" (or the entitlement effect) to be a dictator in the dictator game influences generosity (see Hoffman et al. (1994) for early evidence and Engel (2011) for a review) while another paper shows a case where such an entitlement effect is absent (see the ultimatum game in Demiral and Mollerstrom (2018)). Our results suggest that whether certain resources, including earned resources, are subject to fairness concerns may depend fundamentally on whether the decision maker includes those resources in a narrow bracket constructed for the decision environment. The notion of narrow bracketing of equity concerns may therefore help reconcile potentially conflicting results from the literature on fairness attitudes.

[7]Our results are also related to work showing that individuals might narrowly focus on the "medium of exchange" rather than the outcomes it can achieve (Hsee et al., 2003).

[8]Lilley and Slonim (2014) and Brown, Meer and Williams (2016) show that time contributions generate more "warm glow" than money contributions. Shaddy and Shah (2018) shows that individuals believe spending time is a better signal of preferences than spending money.

[9]Davis et al. (2015) documents more prosocial behavior in decisions involving time than money. Gino and Mogilner (2014) find that priming individuals to think of time instead of money leads to more ethical behavior. Liu and Aaker (2008) finds that people give more when first asked to consider a donation of time rather than

money may help to explain some of the surprising differences in behavior across these domains.

The remainder of the paper proceeds as follows. Section 2 presents our main experimental design and Section 3 presents the corresponding results. Section 4 presents the designs and results of our additional study versions and provides evidence that individuals are more inequity averse in time than in money. Section 5 concludes with a broader discussion on how our results speak to a variety of behavior phenomena and empirical findings.

# 2 Design

In total, we run six different versions of our study. In this section, we describe the design and implementation of the *Tokens* version. In Section 3, we present the results from this *Tokens* version. In Section 4, we describe how the other study versions differ from the *Tokens* version, describe the results from those versions, and highlight what we learn from them.

In the *Tokens* version, subjects make decisions as a social planner, determining the final payoffs for two other study participants. In particular, each subject faces pairs of participants with endowments of "small tokens" and "large tokens" that are known to be exogenously determined. Each small token is worth 1 cent and each large token is worth 2 cents. The first participant in a pair is always endowed with 140 small tokens and 70 large tokens, worth a total of \$2.80 (i.e., \$1.40 in small tokens and \$1.40 in large tokens). The second participant is randomly endowed with one of thirteen combinations of small and large tokens, worth between \$2.00 to \$3.60.[10]

Subjects make two decisions for each of the 13 endowment sets: one in which they must take away small tokens from the participants and one in which they must take away large tokens from the participants. Subjects are told that only one decision out of 26 will be randomly selected for payment. In each small-token decision (see Appendix Figure A.3 for an example screenshot), subjects must take away a total of 80 small tokens (i.e., \$0.80) from the two participants. More specifically, subjects must choose between taking away: (1) 20 small tokens from the first participant and 60 small tokens from the second participant; (2) 40 small tokens from each; or (3)

money. Saini and Monga (2008) observes a greater use of heuristics in decisions involving time than money. DeVoe and Iyengar (2010) shows that, when there are differences in performance across individuals at a company, equal distributions of vacation days are viewed as more fair than equal distributions of money. Other documented differences between time and money include the extent to which time and money investments are considered in bargaining (Ellingsen and Johannesson, 2009), the differential treatment of sunk costs of time and of money (Soman, 2001), differences in loss aversion and risk-seeking behavior when decisions are over time and over money (Leclerc, Schmitt and Dube, 1995; Okada and Hoch, 2004; Abdellaoui and Kemel, 2014; Festjens et al., 2015), differences in discount functions (Olivola and Wang, 2016), differences in how the giving of time versus money is viewed (Reed, Aquino and Levy, 2007; Macdonnell and White, 2015), and even differences in happiness that are associated with time versus money (Mogilner, 2010; Mogilner and Norton, 2016; Whillans, Weidman and Dunn, 2016; Whillans et al., 2017). We note that one important methodological distinction between our work and this literature involves our calibration procedure to ensure units of money are comparable to units of time. We employ this calibration both to examine equity concerns in overall budgets—when aggregating money and time—and to facilitate a comparison of equity concerns in money and time.

[10] In each decision, the second participant is randomly endowed with $s$ small tokens and $l$ large tokens, where $(s, l) \in \{(100, 70), (120, 70), (140, 70), (160, 70), (180, 70), (140, 50), (140, 60), (140, 80), (140, 90), (100, 50), (100, 90), (180, 50), (180, 90)\}$.

60 small tokens from the first participant and 20 small tokens from the second participant. In each large-token decision (see Appendix Figure A.4 for an example screenshot), subjects must take away a total of 40 large tokens (i.e., \$0.80) from the two participants. More specifically, subjects must choose between taking away: (1) 10 large tokens from the first participant and 30 large tokens from the second participant; (2) 20 large tokens from each; or (3) 30 large tokens from the first participant and 10 large tokens from the second participant.

In February 2018, 400 Amazon Mechanical Turk workers completed the *Tokens* version of our study (see Appendix A.1 for screenshots). Prior to making their choices, subjects had to correctly answer several understanding questions on how their choices influenced the payments for the pair of participants. Each subject was then randomized to face the 13 small-token decisions first or the 13 large-token decisions first. Within each set of 13 decisions, the order of the endowments for the second participant was also randomized. After making all 26 decisions, subjects filled out a short demographic survey. Subjects received \$4 for completing the study, and additional payments were distributed from the choice that was randomly selected to count to two future study participants.

# 3 Results

How do we establish narrow bracketing of equity concerns? First, note that in some decisions subjects can equalize the total payoffs received by the two participants (including both small and large tokens). When they do this, we say they have chosen "Overall Equity" (or "O-equity"). Second, note that in some decisions subjects can equalize the number of small tokens that participants end up with (in small-token decisions) or equalize the number of large tokens participants end up with (in large-token decisions). When they do this, we say they have chosen "Narrow Equity" (or "N-equity").

To ensure that subjects in our study care about equity, we look at settings in which there is no conflict between Overall Equity and Narrow Equity to check that subjects indeed choose equal outcomes. To test whether subjects narrowly bracket their equity concerns, we investigate decisions in which subjects face a conflict between Overall Equity and Narrow Equity. We interpret choices to forgo Overall Equity to achieve Narrow Equity as evidence of narrow bracketing of equity concerns.

One caveat to this approach is that, in all decisions, the middle choice always involves taking an equal number of tokens from each participant, which we call a "50/50-split." Subjects may gravitate towards the 50/50-split because it is in the middle, because they are narrowly bracketing their equity concerns around their personal impact on payoffs (i.e., ignoring endowments altogether), or for some other reason. Because of the multiple interpretations, one may or may not want to consider the 50/50-split as evidence of narrow bracketing of equity concerns. We sidestep this debate by reporting the rate at which subjects choose N-equity rather than O-equity both when the 50/50-split coincides with O-equity and when it coincides with N-equity. The

former is thus a lower bound, and the latter an upper bound, of narrow bracketing of equity concerns. The reader's interpretation of the extent of narrow bracketing observed in our data should fall in this range and depend on the extent to which they interpret choosing the 50/50-split as evidence of narrow bracketing of equity concerns.

Following the logic above, our main results focus on 10 decisions (5 small-token decisions and 5 large-token decisions) grouped into three scenarios described below (see Appendix Table B.1 for an example decision from each of these three scenarios).[11]

In Scenario A, the first and second participants have identical endowments of small and large tokens, so taking the same number of tokens away from both participants achieves O-equity, N-equity, and a 50/50-split.

In Scenario B, the first and second participants have equally valued endowments, but the second participant either has more small tokens and fewer large tokens than the first participant or vice versa. In this scenario, the subject can take away a different number of tokens from the two participants so they end up with the same amount of that type of token, achieving N-equity, or can take the same number of tokens away from both participants, achieving O-equity and a 50/50-split.

In Scenario C, the first and second participants have different endowment values because they have an equal number of tokens of one type and an unequal number of tokens of the other type, and the subject must take away tokens of the type that is initially equal. In this scenario, the subject can take the same number of tokens away from both participants, achieving N-equity and a 50/50-split, or introduce inequity in the type of token they can control to offset the inequity of the other type of token, achieving O-equity.

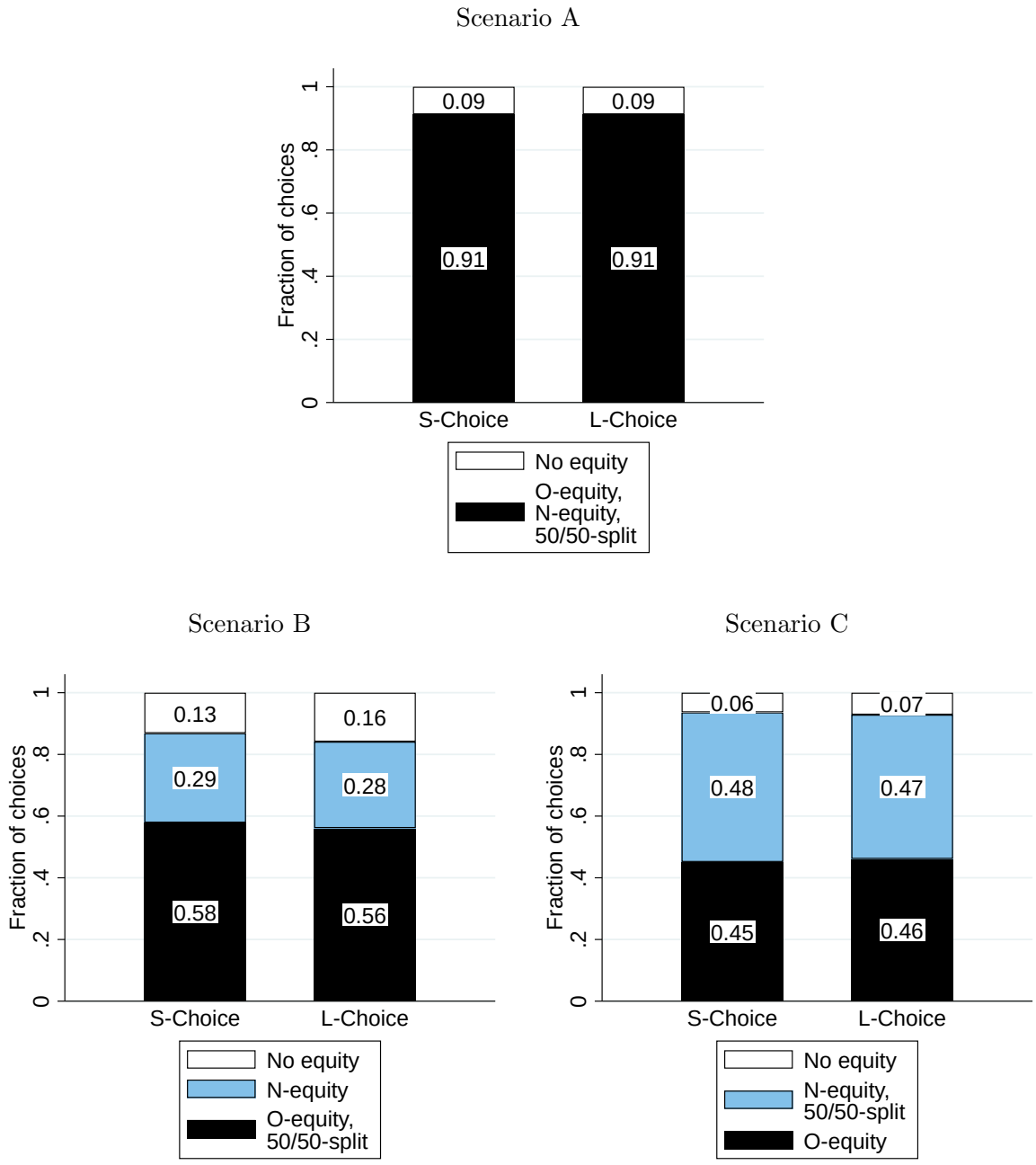
Figure 1 presents the results from these three scenarios. The "S-choice" bars report on small-token decisions and the "L-choice" bars report on large-token decisions. Results from Scenario A (Panel A of Figure 1) show that when the same choice achieves O-equity, N-equity, and a 50/50-split, it is chosen 91% of the time, suggesting strong evidence of equity concerns. Results from Scenarios B and C (Panels B and C of Figure 1) show that subjects often favor N-equity over O-equity. In Scenario B, when N-equity conflicts with O-equity and a 50/50-split, the former is chosen 28–29% of the time and the latter is chosen 56–58% of the time. In Scenario C, when N-equity and a 50/50-split conflict with O-equity, the former is chosen 47–48% of the time and latter is chosen 45–46% of the time. Put differently, subjects narrowly bracket their equity concerns in about one quarter to one half of their decisions.[12]

Table 1 formalizes the results from Figure 1 in a regression framework and confirms that

[11] Appendix Table B.2 shows a more detailed description of these 10 decisions and the additional 16 decisions subjects faced.

[12] These results are also evident on the subject-level: the percentage of subjects who choose N-equity at least once (or at least 50% of the time) is 95% (95%) in Scenario A, 58% (35%) in Scenario B, and 72% (56%) in Scenario C.

Figure 1: *Tokens* version: choices




subjects are more likely to forgo O-equity when it conflicts with N-equity. In particular, Table 1 reports results of a linear probability model of whether a subject forgoes O-equity. Column 1 reports results from small-token decisions and shows that the probability of forgoing O-equity significantly increases by 33 percentage points when N-equity conflicts with O-equity (as in Scenario B) and 46 percentage points when achieving a N-equity and a 50/50-split conflicts with O-equity (as in Scenario C). Column 2 reports results from large-token decisions and shows very similar results. Unsurprisingly, Column 3 confirms that the results hold when we jointly consider

small and large token decisions, and Column 4 shows that the rate at which subjects are willing to forgo O-equity is not substantially different when subjects make small-token or large-token decisions. Finally, Appendix Table B.3 confirms the robustness of the results to the inclusion of subject fixed effects and to focusing on subjects who always choose O-equity in Scenario A.[13] Even in this very simple environment, many subjects narrowly bracket their equity concerns.

Table 1: *Tokens* version: regression results from linear probability models of forgoing O-equity

| | Decisions about | | | |
|---|---|---|---|---|
| | small tokens | large tokens | small & large tokens | |
| | (1) | (2) | (3) | (4) |
| *N-equity* $\not\Rightarrow$ *O-equity* | 0.33*** | 0.35*** | 0.34*** | 0.33*** |
| | (0.02) | (0.02) | (0.02) | (0.02) |
| *N-equity and 50/50-split* $\not\Rightarrow$ *O-equity* | 0.46*** | 0.45*** | 0.46*** | 0.46*** |
| | (0.03) | (0.02) | (0.02) | (0.03) |
| *L-choice* | | | | -0.00 |
| | | | | (0.01) |
| *L-choice**(*N-equity* $\not\Rightarrow$ *O-equity*) | | | | 0.02 |
| | | | | (0.02) |
| *L-choice**(*N-equity and 50/50-split*) $\not\Rightarrow$ O-equ | | | | -0.01 |
| | | | | (0.03) |
| Constant | 0.09*** | 0.09*** | 0.09*** | 0.09*** |
| | (0.01) | (0.01) | (0.01) | (0.01) |
| Observations | 2000 | 2000 | 4000 | 4000 |

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors are clustered at the subject-level and shown in parentheses. The results are from a linear probability model of forgoing O-equity. ***N-equity*** $\not\Rightarrow$ ***O-equity*** is an indicator that the choice that achieves N-equity does not achieve O-equity; and ***N-equity and 50/50-split*** $\not\Rightarrow$ ***O-equity*** is an indicator that the choice that achieves N-equity and a 50/50-split does not achieve O-equity. ***L-choice*** is an indicator for large-token decisions. Data are from the decisions of subjects in Scenarios A–C of the *Tokens* version of our study.

# 4 Additional Designs and Results

In this section, we present the design and results of the five additional study versions. In Section 4.1, we describe the *Tokens, First Person* version that we ran to investigate whether narrow bracketing of equity concerns persist when such narrow bracketing comes at a financial cost to the subject. In Section 4.2, we describe the *Tokens, Final Allocation* version that we ran to investigate whether narrow bracketing of equity concerns persists when the decision environment is even simpler—mitigating a potential explanation based on cognitive limitations. In Section 4.3,

[13] Appendix Figure B.1 reports on data from the other scenarios. Results from Scenario D show that in one-quarter to one-third of choices subjects favor a 50/50-split over the choice that instead achieves O-equity and N-equity. As described above, evidence for a 50/50-split may or may not be interpreted as evidence of narrow bracketing of equity concerns. Regardless, these results contribute to the literature on 50/50-splits as discussed in Andreoni and Bernheim (2009) and Jakiela (2013) and as reviewed in Engel (2011).

we describe results from the *Money & Time* version and two additional versions built off of that version. We ran these versions to investigate whether narrow bracketing of equity concerns arises when considering components of budgets that are particularly relevant outside of the laboratory (i.e., money and time) and to explore whether equity concerns differ across money and time.

## 4.1 Will subjects pay a cost to narrowly bracket equity concerns?

### Design of the *Tokens, First Person* version

The *Tokens, First Person* version of our study is nearly identical to the *Tokens* version except that the subject is assigned the role of the first participant (rather than a third-party social planner). This design gives the subject a financial incentive to choose certain options. The first option is always the least costly (i.e., most self-serving) for the subject as it requires the first participant to give up the smaller share of tokens; the middle (i.e., 50/50-split) option is always slightly more costly for the subject; and the third option is always the most costly for the subject as it requires giving up the larger share of tokens. Implementation details and screenshots are shown in Appendix A.2. We recruited 400 Amazon Mechanical Turk participants to complete the *Tokens, First Person* version in April 2019.

### Results of the *Tokens, First Person* version

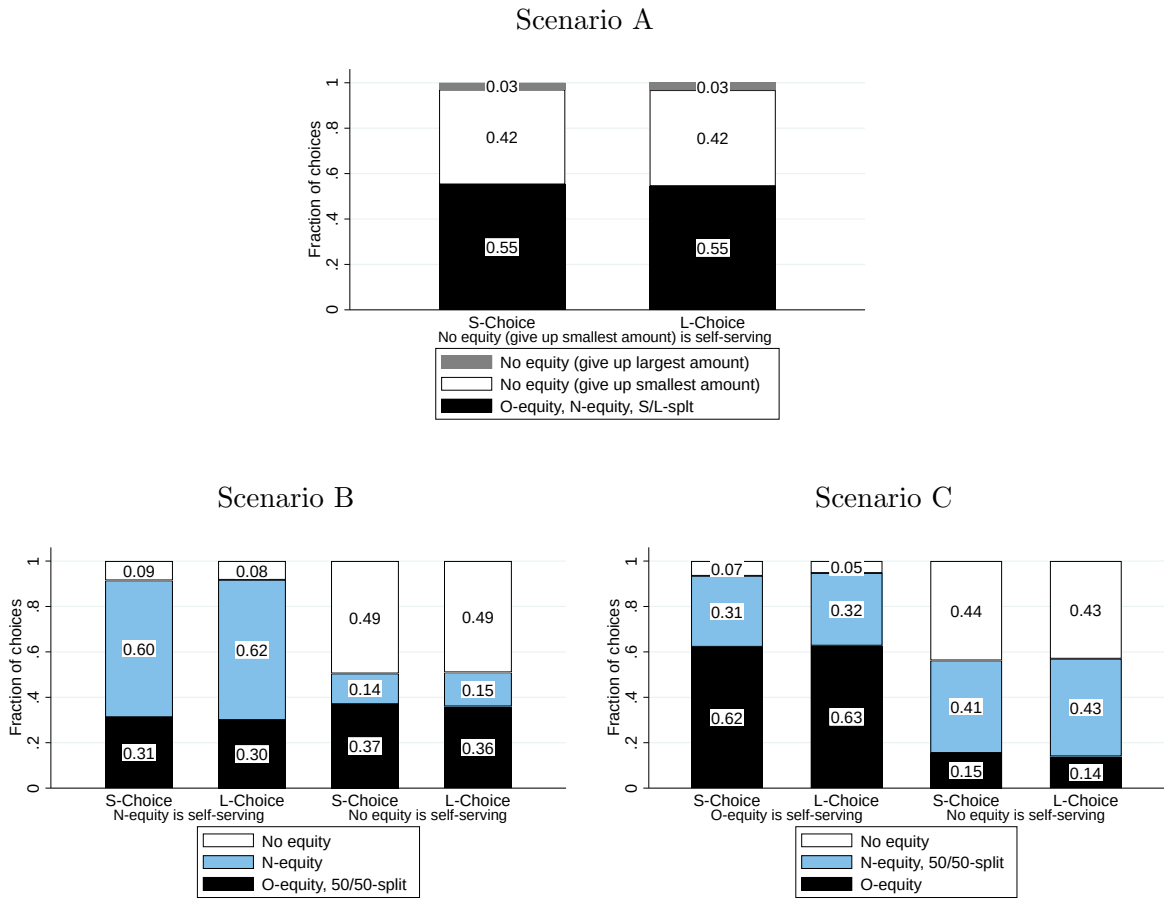
Figure 2 replicates the structure of Figure 1 but splits the data to take into account the role of self-serving motives by noting which choice is the most self-serving.[14] Results suggest that when subjects make choices in the presence of financial incentives, they care equally about achieving N-equity as achieving O-equity. Four comparisons make this equivalence clear.

First, comparing the left two bars of Panel B to the left two bars of Panel C, subjects take the most self-serving action 60–62% of the time when it achieves N-equity and 62–63% of the time when it achieves O-equity. Second, in the left two bars of Panel C, subjects pay a cost to achieve N-equity and a 50/50-split 31–32% of the time; similarly, in the left two bars of Panel B, subjects pay the same cost to achieve O-equity and a 50/50-split 30–31% of the time. Third, comparing the right two bars of Panel B to the right two bars of Panel C, subjects choose the most costly option 14–15% of the time when it achieves either N-equity (Panel B) or O-equity (Panel C). Fourth, in the right two bars of Panel C, subjects pay a cost to achieve N-equity and a 50/50-split 41–43% of the time; in the right two bars of Panel B, subjects pay the same cost to achieve O-equity and a 50/50-split 36–37% of the time (i.e., slightly less often). These results are robust to other approaches to analyzing the data.[15]

[14] Appendix Table B.4 runs the same regression specifications as Table 1, ignoring the role of self-serving motives, and shows that subjects are still significantly more likely to forgo O-equity if it conflicts with N-equity or conflicts with N-equity and a 50/50-split. The results from the additional scenarios from the *Tokens, First Person* version are shown in Appendix Figure B.2.

[15] Appendix Figure B.3 (and Column 3 of Appendix Table B.5) provides an alternative way to take into account the role of self-serving motives by restricting analysis to "equity-concerned" subjects who are willing to pay a cost to achieve equity. These subjects are identified as those who always forgo the self-serving choice in Scenario

Figure 2: *Tokens, First Person* version: choices




## 4.2 Is narrow bracketing of equity concerns an artifact of cognitive limitations?

One potential explanation from the first two study versions is that subjects narrowly bracket equity concerns because of cognitive limitations. If aggregating payoffs across multiple dimensions is too cognitively demanding for subjects, they may instead focus on equalizing one dimension of payoffs only. Our prior study versions provide some evidence against subjects being cognitively constrained in this way. First, as shown in Appendix Figure A.2, prior to making their decisions, all subjects must answer understanding questions that require knowing how much each small token and each large token is worth and require correctly reporting the number of tokens a subject will end up with given an endowment and a choice that reduces payoffs. Second, results from the *Tokens, First Person* version show that narrow bracketing of equity concerns persists even when cognitively constrained subjects could simply choose the self-serving option (which is

A in favor of the choice that maintains the existing equity (i.e., they always choose to achieve O-equity, N-equity and a 50/50-split, even though it comes at a cost to themselves). Focusing on these subjects ensures that we are exploring the equity concerns of people who particularly value equity. Among these equity-concerned subjects, evidence in favor of narrow equity concerns is even stronger.

cognitively simple to identify and is more financially beneficial) in every decision. Nevertheless, to further examine whether narrow bracketing of equity concerns is an artifact of cognitive limitations, we designed and ran the *Tokens, Final Allocation* version of our study.

**Design of the *Tokens, Final Allocations* version**

The *Tokens, Final Allocation* version of our study is built on the *Tokens* version but with three differences that seek to limit the potential role of cognitive limitations (see Appendix A.3 for implementation details and screenshots).

First, rather than making adjustments to endowments, subjects in the *Tokens, Final Allocation* version make decisions over "final allocations," which requires fewer mathematical computations. In particular, instead of taking away tokens from existing endowments, subjects simply choose the final number of tokens each participant ends up with.[16]

Second, to be able to examine whether subjects make different decisions as third-party social planners after getting experience making the same decisions under financial incentives, we have each subject in the *Tokens, Final Allocations* version make 10 decisions (i.e., 5 small-token decisions and 5 large-token decisions) once in the role of a third-party social planner (as in the *Tokens* version) and once in the role of first participant (as in the *Tokens, First Person* version). For each subject, we randomize: whether the subject makes social-planner or first-person decisions first, whether the subject makes the small-token or large-token decisions first, and the order of decisions within each set of five.

Third, prior to making choices in this study, subjects are asked three screening questions that require them to correctly report the monetary value of: (1) 50 small tokens, (2) 100 large tokens, and (3) the sum of 140 small tokens and 40 large tokens. Subjects who answer any of these questions incorrectly are screened out of our study and do not participate.[17] We recruited 400 Amazon Mechanical Turk to complete the *Tokens, Final Allocation* version of our study in March 2019. A total of 340 subjects correctly answered the screening questions and completed this version of the study.

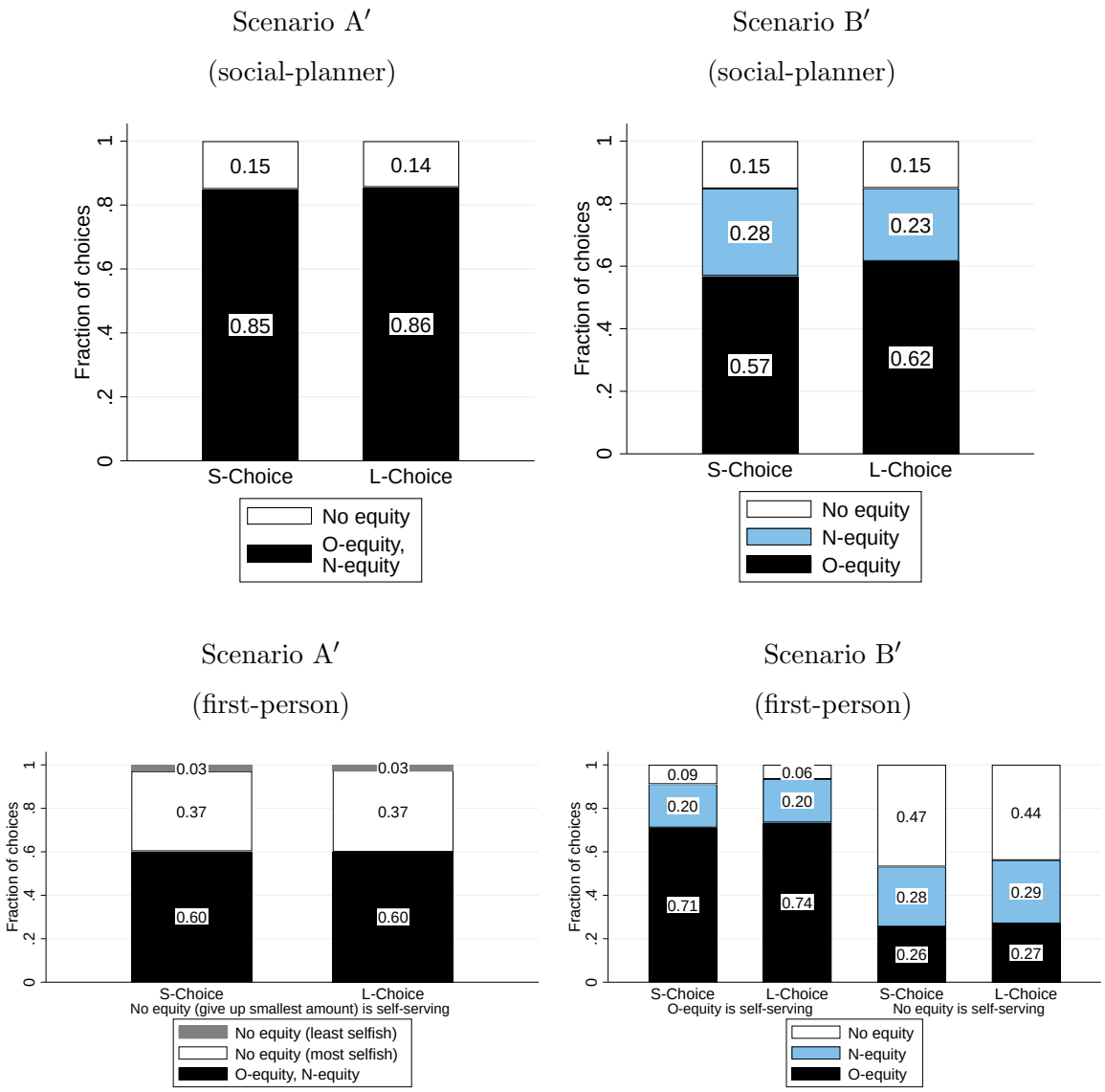
[16]In each small-token decision, the first participant is always endowed with 70 large tokens while the second participant is randomly endowed with either 50, 60, 70, 80, or 90 large tokens. Subjects must choose to give: (1) 120 small tokens to the first participant and 80 small tokens to the second participant; (2) 100 small tokens to each; or (3) 80 small tokens to the first participant and 120 small tokens to the second participant. In each large-token decision, the first participant is always endowed with 140 large tokens while the second participant is randomly endowed with either 100, 120, 140, 160, or 180 small tokens. Subjects must choose to give: (1) 60 large tokens to the first participant and 40 large tokens to the second participant; (2) 50 large tokens to each; or (3) 40 large tokens to the first participant and 60 large tokens to the second participant. Appendix Table B.6 shows additional details.

[17]Subjects who are screened out only receive a $1.50 completion payment whereas subjects who answer all of these questions correctly make 20 choices and receive a $3.00 completion payment. The difference in completion payments—$1.50 versus $3.00—is known to subjects when they are answering the screening questions. Subjects who are screened into our study may also receive a bonus if the randomly selected decision is one of the decisions when the subject is in the role of the first participant.

**Results of the *Tokens, Final Allocations* version**

Figure 3 shows results from the social-planner decisions in the top two panels and the first-person decisions in the bottom two panels for the scenarios in which O-equity can be achieved.[18] For the first-person scenarios, decisions within each scenario are further split based on which choice is self-serving. Since subjects are directly choosing final allocations of tokens rather than subtracting tokens, achieving a 50/50-split and N-equity are synonymous. Thus, we no longer separately consider the role of a 50/50-split and only show results from two scenarios.

Figure 3: *Tokens, Final Allocation* version: choices




Beginning with the social-planner decisions, the results in Scenario A′ show that the vast majority (85%) of choices involve achieving both N-equity and O-equity when the same choice

[18] Appendix Figure B.4 presents results from the scenarios in which O-equity cannot be achieved.

achieves both. The results in Scenario B′ show that even in this dramatically simpler decision environment, subjects favor N-equity over O-equity about one-quarter of the time. As can be seen by comparing decisions in Scenarios A′ and B′ or in the regression results in Appendix Table B.7, the rate at which subjects choose O-equity decreases by 26 percentage points when it conflicts with N-equity. Finally, as shown in Column 4 of Appendix Table B.8, this effect size does not substantially decrease (it is still 24 percentage points) when subjects make social-planner decisions after they make first-person decisions (i.e., after they have experience in the decision environment with their own money at stake). In sum, even when the potential role of cognitive limitations is dramatically reduced—due the existence of screening questions, a simplification of the decision environment, and experience from making the same decisions with one's own money is at stake—subjects still narrowly bracket equity concerns.[19]

We additionally see narrow bracketing of equity concerns in first-person decisions in this simpler environment. As can be seen in Scenario B′, even when achieving O-equity is self-serving, subjects will pay a financial cost to achieve narrow equity approximately 20% of the time, and this rate increases further when O-equity is not self-serving.[20]

## 4.3 Does narrow bracketing of equity concerns arise over money and time?

To investigate whether evidence for narrow bracketing of equity concerns arises over money and time—components of budgets that are particularly relevant outside of the laboratory—and to explore whether individuals have different equity concerns within these two domains, we ran three *Money & Time* versions of our study. In this subsection, we first describe the *Money & Time* version and how it differs from the *Tokens* version. After describing the design and results of this version, we provide additional results on robustness and describe the design and results of the remaining two versions: the *Money & Time, First Person* version and the *Money & Time, Uncertain Endowments* version.

### Design of the *Money & Time* version

The *Money & Time* version is very similar to the *Tokens* version of the study, with subjects in the role of social planner making decisions that affect two study participants with exogenously determined endowments of money and time. The first participant always has a fixed endowment and the second participant's endowment takes one of 13 possible combinations of money and

[19] Considering the restriction to equity-concerned subjects (i.e., subjects who always choose O-equity in Scenario A′) results in an even larger effect size of 34 percentage points, as shown in Column 5 of Appendix Table B.8. This effect can be seen more broadly in Appendix Figure B.5.

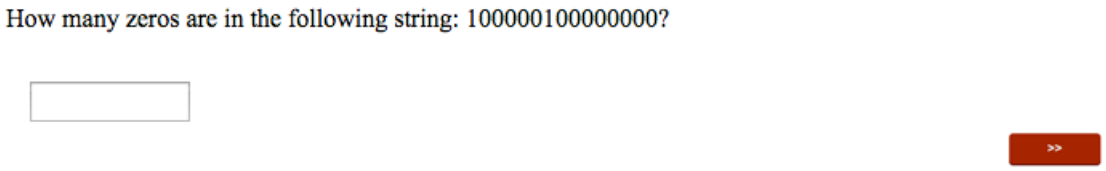
[20] The regression results in Appendix Table B.7, ignoring the role of self-serving motives, show that the overall frequency with which O-equity is chosen significantly decreases by 11 percentage points when N-equity conflicts with it. Moreover, focusing on the equity-concerned subjects who are willing to pay a cost to achieve equity results in a substantially larger effect size of 47 percentage points, as shown in Column 5 of Appendix Table B.8. This effect can be seen more broadly in Appendix Figure B.5.

time. Subjects make two decisions for each endowment set, once when they decide about taking away money from the participants and once when they decide about taking away time from the participants. We randomly determined whether each subject made time or money decisions first and the order of the decisions within each set of 13.

Of course, going from the *Tokens* version to the *Money & Time* version requires two fundamental experimental design changes. First, to use time as one of the components of payoffs, we need a way to control participants' time in our study. Second, we need to establish an exchange rate between money and time so that subjects are able to aggregate them into total payoffs, and so we can be confident that total payoffs aggregated in this way can be set equal to each other to achieve O-equity.[21]

First, to manipulate the amount of time participants have in our study, we require participants to complete a particular number of "time-burning" tasks to receive any payment from participating in the study. Completing one time-burning task requires correctly counting how many times "0" appears in a string of 15 numbers that are each either a "0" or a "1" (see Figure 4 for an example task). We see this task as an ideal way of imposing a time cost as these tasks: (1) take time, (2) must be done to complete the study, and (3) do not allow participants to engage in other activities while they are being completed. Moreover, just as we can take away money from endowments, we can take away time by increasing the number of tasks they must do to complete the study.[22]

Figure 4: Screenshot of example time-burning task




Second, to establish an exchange rate between money and time, we ask each subject—using incentivized multiple price lists—the amount of money that they view as equivalent to doing a certain number of time-burning tasks. We make a number of decisions and assumptions in designing these multiple prices lists, and we highlight the most important ones in the following paragraph. For more detail, see Appendix C, which provides a thorough discussion on how we

[21]Note that in the *Tokens* versions of the study, we explicitly set the exchange rate between small and large tokens to be 2-to-1, which allows subjects to easily aggregate up to total payoffs.

[22]That taking away time in our study is achieved by having participants do tasks means that one could interpret time in our study as "time spent working" or, alternatively, just "work." We are quite happy with these alternative interpretations, since work is a major use of time and an important one in contributing to overall budgets. Many of the phenomena that we believe narrow bracketing can help explain, discussed in depth in the Section 5, are explicitly about money and work.

establish these exchange rates in a manner similar to our prior work (Exley, 2015, Forthcoming; Exley and Kessler, 2018).[23]

Since subjects are in the role of social planner deciding about the payoffs of other participants, they perform the multiple price lists on behalf of the first participant rather than themselves (i.e., we ask them to choose how much money the first participant should give up to avoid doing additional time-burning tasks). We have each subject make their own evaluations and then use these personalized exchange rates for all of their decisions in the study, and we apply the same exchange rate for the first and second participant.[24] We ask subjects to report how much money the first participant should be willing to give up to avoid doing 10 additional tasks, 30 additional tasks, and 50 additional tasks. We use the first and third values (i.e., for 10 and 50 tasks) to determine the exchange rate in one of two ways (and show our results are robust to both ways). We impose a linearity assumption when considering how subjects should value doing 30 additional tasks (and confirm that our results are robust to participants with linear, concave or convex cost of additional tasks based on their answer to the multiple price list for the 30 additional tasks). Finally, 25% of subjects do not report a strictly positive value for the first participant's time and are excluded from our main analysis (but we show that our results are robust to including them).

We recruited 400 Amazon Mechanical Turk participants to take the *Money & Time* version of the study between April and June of 2016. Appendix A.4 shows further implementation details and screenshots.

**Results of the *Money & Time* version**

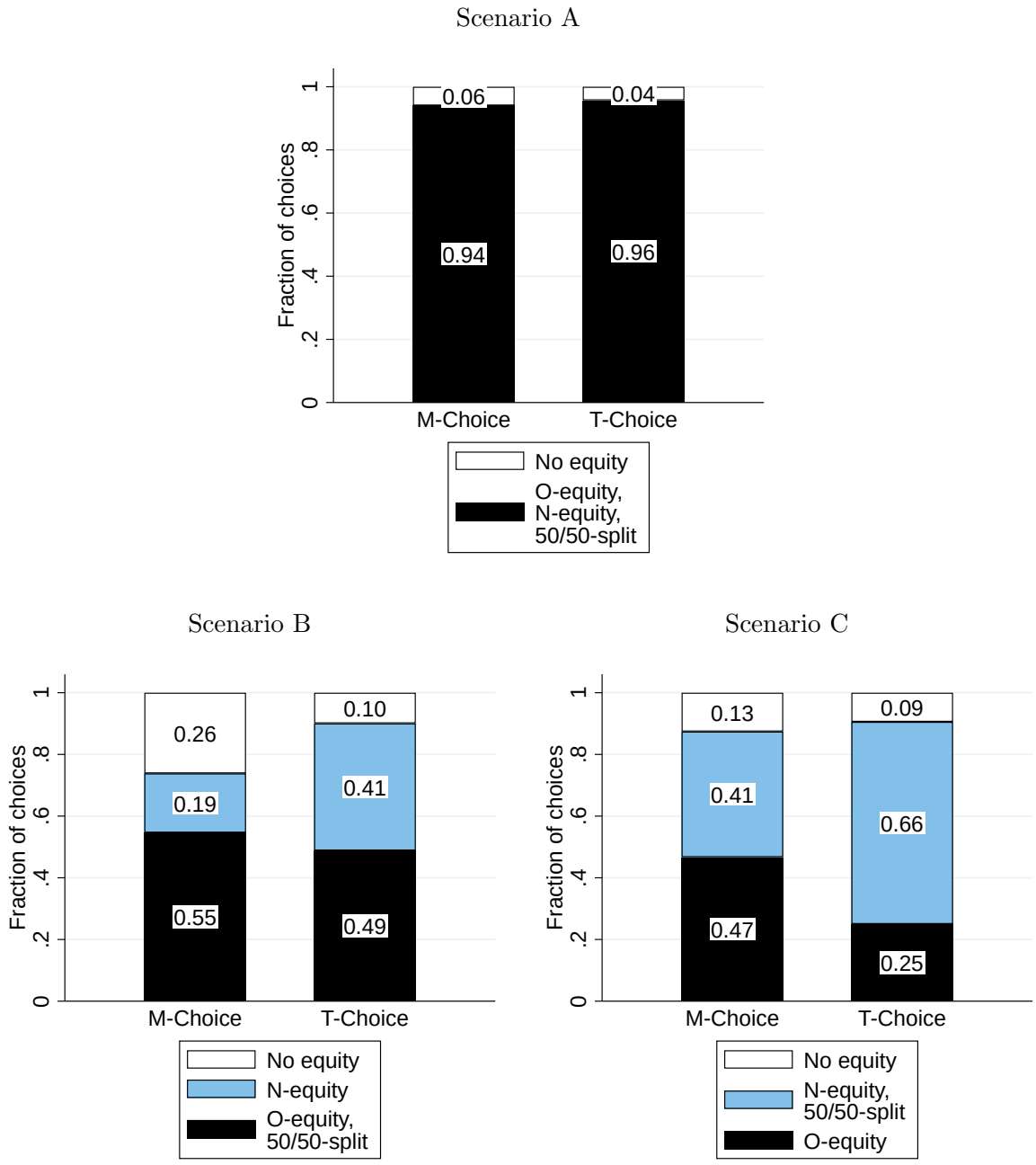
Figure 5 presents the results from the same three scenarios as we analyzed in the *Tokens* version (see Appendix Table B.9 for details on these scenarios and the other scenarios in this version). The bars highlight how often the subjects choose O-equity (i.e., so that total budgets, accounting for both money and time, end up equal) and how often they choose N-equity (i.e., so that participants end up with the same number of cents in money decisions or the same number of tasks to complete in time decisions). The "M-choice" bars report on money decisions and the "T-choice" bars report on time decisions.

The results from Scenario A (Panel A of Figure 5) show that when initial endowments are

[23]While there is complexity built into calculating these exchange rates, we view doing so as an important step towards understanding how fairness attitudes differ between money and time. Absent this calibration exercise, a natural explanation for differences between money and time could be that participants value the available amounts of money and time differently. Thus, while this calibration exercise may have limitations, we view it is as notable improvement upon prior literature that compares money decisions to time decisions and instead has either: (1) not considered the need for money-time exchange rates or (2) defined the money-time exchange rate to be some fixed value (and thus does not account for the possibility that individual subjects' valuations of the involved units of money differ from their valuations of the involved units of time).

[24]That is, we allow each subject to have a different belief about how participants should trade off time-burning tasks and money—since subjects may differ in their views of how time intensive or difficult the time-burning tasks are in general—but we do not allow a subject's belief to differ across anonymous study participants.

Figure 5: *Money & Time* version: choices




identical, subjects choose to achieve O-equity, N-equity, and a 50/50-split in 94% of the money decisions and in 96% of the time decisions. As can be seen from Scenarios B and C (Panels B and C of Figure 5), evidence for narrow bracketing of equity concerns clearly extends to the domains of money and time. When considering money decisions, subjects forgo O-equity to achieve N-equity between 19% (from Panel B, a lower bound) and 41% (from Panel C, an upper bound) of the time. Meanwhile, when considering time decisions, we see even more evidence of subjects narrowly bracketing equity concerns. Subjects forgo O-equity to achieve N-equity between 41%

(from Panel B, a lower bound) and 66% (from Panel C, an upper bound) of the time. This stark difference between money and time decisions suggests that subjects are more concerned about achieving equity in the narrow bracket of time than in the narrow bracket of money: they are more inequity averse in time than in money.[25]

Table 2 formalizes the results from Figure 5 in a regression framework. Table 2 shows that the likelihood that a subject forgoes O-equity significantly increases when a different choice achieves N-equity or both N-equity and a 50/50-split. Column 1 shows results from money decisions, Column 2 shows results from time decisions, and Column 3 shows results from both money and time decisions. Column 4 confirms the significant differences across money and time decisions and that subjects are more inequity averse in time than in money. For instance, the coefficient on *T-choice*(N-equity and 50/50-split* $\not\Rightarrow$ *O-equity)* in Column 4 shows that, subjects in time choices are 23 percentage points more likely than subjects in money choices to forgo O-equity when a different choice achieves N-equity and a 50/50-split.

Table 2: *Money & Time* version: regression results from linear probability models of forgoing O-equity

| | Decisions about | | | |
|---|---|---|---|---|
| | money | time | money & time | |
| | (1) | (2) | (3) | (4) |
| *N-equity* $\not\Rightarrow$ *O-equity* | 0.39*** | 0.47*** | 0.43*** | 0.39*** |
| | (0.03) | (0.02) | (0.02) | (0.03) |
| *N-equity and 50/50-split* $\not\Rightarrow$ *O-equity* | 0.47*** | 0.71*** | 0.59*** | 0.47*** |
| | (0.03) | (0.02) | (0.02) | (0.03) |
| *T-choice* | | | | -0.02 |
| | | | | (0.01) |
| *T-choice*(N-equity* $\not\Rightarrow$ *O-equity)* | | | | 0.07*** |
| | | | | (0.03) |
| *T-choice*(N-equity and 50/50-split)* $\not\Rightarrow$ O-equ | | | | 0.23*** |
| | | | | (0.03) |
| Constant | 0.06*** | 0.04*** | 0.05*** | 0.06*** |
| | (0.01) | (0.01) | (0.01) | (0.01) |
| Observations | 1510 | 1510 | 3020 | 3020 |

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors are clustered at the subject-level and shown in parentheses. The results are from a linear probability model of forgoing O-equity. ***N-equity*** $\not\Rightarrow$ ***O-equity*** is an indicator that the choice that achieves N-equity does not achieve O-equity; and ***N-equity and 50/50-split*** $\not\Rightarrow$ ***O-equity*** is an indicator that the choice that achieves N-equity and a 50/50-split does not achieve O-equity. ***T-choice*** is an indicator for time decisions. Data are from the decisions of subjects—with accurately estimated exchange rates—in Scenarios A–C of the *Money & Time* version of our study.

Appendix Table B.10 confirms the robustness of these results. Column 1 replicates Column 3

[25] Appendix Figure B.6 shows results from the other scenarios and highlights that the differential preference for achieving equity in time is driven by concerns about N-equity rather than the 50/50-split. Preference for the 50/50-split seems identical across the money and time domains as shown in Scenarios E and G.

of Table 2. Column 2 includes subject fixed effects. Columns 3 to 5 separately examine subjects whose reports on the multiple price lists suggest linear, concave, or convex costs of the first participant completing additional tasks. This robustness check examines whether our result of more inequity aversion in time than in money is driven by subjects believing that participants face convex costs of time (or of completing tasks) and therefore want to equalize the number of tasks assigned to each participant for efficiency reasons. That our evidence of more inequity aversion in time than in money persists among subjects whose preferences over the first participant doing additional tasks are linear, concave, and convex demonstrates that this is not a key motivation for why subjects equalize time across participants. Columns 6 and 7 split out subjects based on the two ways we turned multiple price list responses into money-time exchange rates, as described in Appendix C. Column 8 includes subjects who were randomly assigned exchange rates.

**Robustness of our *Money & Time* results**

Three additional sets of results—one from the *Money & Time* version and two from other study versions—demonstrate the robustness of narrow bracketing of equity concerns over money and time and of more inequity aversion in time than in money.

Our first set of additional results come from an additional design feature of our *Money & Time* version. In addition to choosing how much money or time to take from each participant, subjects were asked to indicate the social appropriateness of making each choice on a 4-point scale from "very socially inappropriate" to "very socially appropriate"' (see Appendix Figure A.23 for an example of this decision screen). Following the procedure in Krupka and Weber (2013), subjects were told that one potential choice from one decision would randomly be selected for payment and that they would receive a $1.00 bonus for correctly reporting the modal social appropriateness response for that choice. Appendix Figure B.7 and Appendix Table B.11 confirm the robustness of our results to this alternative measure that provides monetary incentives to carefully consider the social appropriateness of each choice.[26]

Our second set of additional results come from our *Money & Time, First Person* version. Decisions in the *Money & Time, First Person* version are the same as in the *Money & Time* version of our study, but the subject making the decisions is also the first participant and thus has self-serving reasons to choose certain options (see Appendix A.5 for implementation details and screenshots). We recruited 400 Amazon Mechanical Turk participants to take the *Money & Time, First Person* version of the study in August of 2017. Appendix Figure B.9 follows the structure of Figure 2 from the *Tokens, First Person* version and shows that even in the presence of self-serving motives, subjects still narrowly bracket their equity concerns over money and time and are still more inequity averse in time than in money.[27]

[26] Appendix Table B.10 shows additional robustness tests using the social appropriateness responses and Appendix Figure B.8 shows appropriateness results from the other scenarios.

[27] Appendix Table B.13 shows results following the analysis in Appendix Table B.4. Appendix Figure B.10 shows results from the other scenarios. Moreover, Column 9 of Appendix Table B.14 shows that focusing on the

Our third set of additional results come from the *Money & Time, Uncertain Endowments* version, in which O-equity and N-equity cannot be achieved with certainty and instead can only be achieved in expectation. More specifically, the endowments in this version build off of the set of endowments in the *Money & Time* version in which endowments are equal on one or more dimension (i.e., Scenarios A and C). The uncertain version alters these endowments to introduce uncertainty on a dimension that is initially equal, so that it is now only equal in expectation (see Appendix Table B.15 for details of the resulting scenarios and see Appendix A.6 for implementation details and screenshots). We recruited 400 Amazon Mechanical Turk participants to take the *Money & Time, Uncertain Endowments* version of the study between April and June of 2016. Appendix Figure B.12 and Appendix Table B.16 show that our main results are robust to the setting with uncertainty.[28] Subjects still narrowly bracket their equity concerns and are still more inequity averse in time than in money even when N-equity and O-equity can only be achieved in expectation.

# 5 Conclusion

The results in this paper demonstrate that individuals narrowly bracket their equity concerns both when making decisions over arbitrary components of payoffs (i.e., small and large tokens) and when making decisions over important and common components of payoffs (i.e., money and time). Results from the latter setting additionally document that individuals are more inequity averse in time than in money.

To conclude, we elaborate on how our findings relate to the broader literature and highlight that narrow bracketing of equity concerns and more inequity aversion in time than in money can explain myriad phenomena observed in practice. In doing so, we do not suggest that our results are the only explanation for these phenomena. Many of the phenomena we discuss have other explanations that are already well documented from both inside and outside of economics.[29] Instead, we emphasize that narrow bracketing of equity concerns and more inequity aversion in time than in money are parsimonious explanations for these rather diverse patterns, which are otherwise difficult to rationalize, suggesting that our explanation may have widespread predictive power and prove useful for modeling such patterns of behavior.

Our finding that equity concerns are narrowly framed helps explain the context effects that have been observed across settings exploring fairness attitudes. For example, that individuals narrowly bracket equity concerns may help explain why individuals behave differently when

equity-concerned subjects who are willing to pay a cost to achieve equity produces results of similar magnitude to those observed in the *Money & Time* version of our study in which the decision-makers are social planners without any self-serving motives.

[28] Appendix Figure B.13 shows results from the additional scenarios and Appendix Table B.17 shows additional robustness checks.

[29] For instance, relevant discussions may include the discussion of "taboo tradeoffs" in Psychology (Fiske and Tetlock, 1997), the discussion of the"ethic of the queue" versus the "ethic of the market" in Philosophy (Sandel, 2012), and the discussion of "sacred values" in economics Elias, Lacetera and Macis (2015*b*).

faced with a dictator game in the lab—in which the dictator and recipient are narrowly framed together—than when considering distributional concerns with individuals outside the lab.[30] This phenomenon may also help explain why a charitable giving appeal that creates an "identifiable victim" (Jenni and Loewenstein, 1997; Small and Loewenstein, 2003) can generate additional giving, since it may effectively frame an individual with that victim. In this light, one can consider charitable giving appeals more broadly as an attempt to manipulate the frame around which individuals' equity concerns are active.

That individuals narrowly bracket equity concerns may also help to explain why work requirements are part of social insurance programs, such as the Temporary Assistance for Needy Families (TANF) program and the earned income tax credit (EITC). Comparing TANF and the EITC to social insurance programs that do not require recipients to work, TANF and EITC decrease the leisure time and increase the income of beneficiaries. Consequently, these policies eliminate inequity between program recipients and the average voter on both the time and money dimensions.[31] Similarly, other social programs that provide income or in-kind support also often have associated time costs (Sunstein, Forthcoming).[32]

That individuals are more inequity averse in time than in money is potentially relevant to understanding labor market outcomes, the structure of public good provision, and why some transactions that turn money into time may be deemed repugnant. Beginning with labor market outcomes, we note that a 40-hour work week is a well-established norm across workers and across industries.[33] Inside the ivory tower, teaching loads are likely very similar, if not identical, across faculty whose salaries differ. Even committee responsibilities are viewed more favorably when equally distributed. These norms further extend to the household, where—despite any differences in contributions towards the household's financial budgets—equal contributions of household chores are believed to be appropriate if both partners spend equal amounts of time working outside the home.[34]

[30] See Bergh (2008) for a discussion of this phenomenon and a broader critique of inequity aversion.

[31] Negative marginal tax rates that incent work, like those induced by the EITC, are hard to justify for redistributive reasons (Jacquet, Lehmann and Van der Linden, 2013). There are, of course, other potential benefits to incentivizing work such as screening and deterrence (Besley and Coate, 1992) as well as overcoming a behavioral bias (Lockwood, 2016).

[32] Sadoff and Samek (2017) finds that voter support for a social program can increase by requiring recipients to contribute a large amount of time but not by requiring participants to contribute a large amount of money.

[33] Historically, unions fought for fixed, equal hours for their members, or effectively discouraged firms from variation by demanding high rates for overtime pay (Earle and Pencavel, 1990). In tough economic times, unions use work-sharing rules (e.g., cutting hours equally) so that all workers would suffer the same consequences in hours, even if their hourly wages differed.

[34] We ran a Google Consumer Survey (March 2017, n = 211) that asked: "Imagine a married couple where both individuals work the same number of hours outside of the household. Should the spouse who earns less money have to do more housework?" 83% responded "no" and 17% responded "yes." However, unequal contribution of household work is reported as appropriate if one partner does not work outside the home and thus has more time to work inside the house. We ran a Google Consumer Survey (March 2017, n = 201) that asked "Imagine a married couple where only one individual works outside of the household. Should the spouse who does not work outside of the household have to do more housework?" 64% responded "yes" and 36% responded "no."

Turning next to the provision of public goods, we note that solicitations often call for equal contributions of time but unequal contributions of money. Citizens are equally likely to be called for jury duty and must spend equal amounts of time going to the polls, but taxes differ dramatically. Schools and churches might ask richer parents or congregants for larger monetary donations but still ask for equal volunteering hours.[35] This pattern may contribute to the "volunteering puzzle," or the phenomenon that many high-income individuals spend time volunteering for tasks that generate less value than the money they could earn in the labor market and subsequently donate (Handy and Katz, 2008; Lilley and Slonim, 2014).

Finally, more inequity aversion in time than in money may naturally lead individuals to deem repugnant—and to protest against—transactions that allow others to turn inequity in money into inequity in time.[36] A prime example of turning inequity in money into inequity in time, paying for a place in line—common at amusement parks, public events, hospitals, the airport, and even U.S. Supreme Court hearings—is often met with outrage. Similarly, it is the "thought that counts" in gift giving, and social mores frequently deem cash gifts inappropriate (Tuttle, 2011). Some transactions that would allow individuals to turn inequity in money into inequity in time are even prohibited, such as an organ transplant that could add years to a recipient's life but cannot be legally purchased.[37]

One related question, which we leave for future work, is why equity concerns differ across the domains of time and money. On this point, we speculate that part of the effect might be driven by differential beliefs in the existing levels of inequity of money and time. Inequity in money is more obvious and observable than inequity in time.[38] It is very clear that some people are born rich and others are born poor, and the persistence of socio-economic status from birth to adulthood is a well-established empirical fact (Chetty et al., Forthcoming). Meanwhile, inequity in time is less obvious (e.g., everyone has 24 hours in a day), less observable (e.g., life length is unknowable), and, perhaps correspondingly, less acceptable.

[35] In 2008, the Church of Jesus Christ of Latter Day Saints began asking congregants to clean the church buildings, sometimes assigning individuals to volunteer in alphabetical order, even though it previously used congregant donations to pay janitorial staff to do the same job (Evans, Curtis and Cnaan, 2013).

[36] Negative attitudes towards such transactions are relatively widespread (Leider and Roth, 2010) even though they have been shown to be correlated with happiness (Whillans, Weidman and Dunn, 2016; Whillans et al., 2017). Repugnance arises when a third party prefers that a transaction between others not occur and may thus place a constraint on markets (Roth, 2007). See Roth (2015) for a popular discussion and see a growing literature on what causes transactions to be repugnant (Leider and Roth, 2010; Falk and Szech, 2013; Slonim, Wang and Garbarino, 2014; Ambuehl, Niederle and Roth, 2015; Elias, Lacetera and Macis, 2015*a*,*b*; Ambuehl, 2016).

[37] Living donors cannot be compensated for kidneys and the allocation of deceased donor organs is heavily regulated through waiting lists that do not include a price mechanism.Substantial research is devoted to attempting to increase the supply of organs, see, e.g., Kessler and Roth (2014).

[38] While the opportunity cost of time, available leisure time, and life expectancy may vary widely across individuals, these differences may be harder to observe. Individuals may believe that time is more equally distributed than money, which may contribute to why individuals deem contributions of time as a better signal of preferences than contributions of money (Shaddy and Shah, 2018).

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