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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 on 1,600 subjects making a total of 40,000 decisions about payoff distributions between 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 first 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 participants' number of small (or large) tokens instead of equalizing the total amount of money 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.

Having documented narrow bracketing of equity concerns when subjects allocate tokens, we report the results of three additional study versions in which payoffs are comprised of money and time.[5] We explore payoffs of money or time for a few related reasons. First, money and time are

[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. (2016), and Alesina, Stantcheva and Teso (2018). 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), and job choice (Card et al., 2012). 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] As described in Section 2, the money and time versions are very similar to the token version. In Section 2.2.3, we explain how we identify a subject-specific exchange rate between money and time, which allows us to ask each subject to choose between equalizing total payoffs or achieving equity on the component they can influence.

the two major components that comprise overall budgets in practice.[6] Second, we hypothesized that subjects might care more about achieving equity when allocating time than when allocating money. Third, we believed that individuals narrowly bracketing time and money—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 when allocating money and time. In the study version that most closely resembles our tokens version, subjects equalize money—at the expense of equalizing overall payoffs including money and time—in 19% to 41% of decisions. In addition, subjects are more likely to equalize time than money. Subjects equalize time—at the expense of equalizing overall payoffs—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. Subjects believe it is socially appropriate to narrowly bracket equity concerns and that it is socially appropriate to be more inequity averse in time than in money. These behaviors persist in the presence of payoff uncertainty, when equity in money and time can only be achieved in expectation. These behaviors also persist when subjects allocate money and time between themselves and another participant. In this setting, 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). Nevertheless, subjects still narrowly bracket equity concerns, even when doing so requires more personal sacrifice (i.e., requires giving up more money or time) than achieving equity in overall payoffs. In addition, subjects are still more likely to equalize time than money, demonstrating that more inequity aversion in time than in money persists in the presence of self-serving fairness attitudes.

What are the consequences of such 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 narrow bracketing of equity concerns at the expense of achieving overall equity can lead to a less equal society. We further discuss how narrow bracketing of equity concerns might influence social programs aiming to mitigate inequality in Section 4.

What are the consequences of greater inequity aversion in time than money? That individuals are more inequity averse in time than in money may help explain why requests for private

[6]There is literature that measures inequality incorporating both consumption and leisure, such as the cross-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, prior literature exploring the *drivers of equity concerns* has not, to our knowledge, explored settings in which money and time are aggregated into overall budgets.

provision of public goods often ask for equal amounts of time but different amounts of money, why attitudes towards household norms suggest equal contributions of household work when both partners are employed outside the home (but the opposite when only one is), 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 also have other (often well-documented) explanations, we view the potentially broad relevance of differential inequity aversion in time than money as a promising direction to help parsimoniously model a wide range of seemingly anomalous attitudes and behaviors. We further discuss these implications in Section 4.

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)); an individual's adoption of both ex-ante and ex-post perspectives of fairness concerns (Andreoni et al., 2016); 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.[7]

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.[8]

Third, we contribute to a growing literature on decisions involving time and how choices differ

[7]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, there is a large, related literature that 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) as well as papers showing cases 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.

[8]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).

across the domains of money and time (Lilley and Slonim, 2014; Brown, Meer and Williams, 2016; Shaddy and Shah, 2018).[9] Much of the work in this literature shows that individuals display different preferences in time and money domains.[10] Our finding that people are more inequity averse in time than in 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 the experimental design of each of the four versions of our experiment. Section 3 presents results showing that individuals narrowly bracket equity concerns and are more inequity averse in time than in money. Section 4 concludes with a broader discussion on how our results speak to a variety of behavior phenomena and empirical findings.

2 Design

We begin by detailing the design of the first version of our study in Section 2.1 and then highlight how our design differs in the remaining three versions of our study in Section 2.2. We ran all four versions of our study on Amazon Mechanical Turk (MTurk). Our choice of the MTurk platform is particularly valuable for the second, third, and fourth versions of the study, for reasons described in Section 2.2.

2.1 Design of the *Tokens* version

In the *Tokens* version of our study, subjects are in the role of a third-party social planner determining the allocations for two other participants in the study. 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). In each decision, the second

[9] 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.

[10] 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. Saini and Monga (2008) observes a greater use of heuristics in decisions involving time than money. DeVoe and Iyengar (2010) shows how equal distributions of money are less acceptable than equal distributions of vacation days. 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.

participant in a pair is randomly endowed with s small tokens and l large tokens, where $(s, l) \in \{(100, 70), (120, 70), (140, 70), (160, 70), (180, 70), (140, 50), (140, 60), (140, 80), (140, 90), (100, 50), (100, 90), (180, 50), (180, 90)\}$. Thus, there are a total of 13 unique endowment sets where the first participant is always endowed with \$2.80 and the second participant is endowed with some amount of money from \$2.00 to \$3.60, depending on how many small and large tokens are in their randomly determined endowment.

In each small-token allocation decision, subjects must decrease the two participants' payoffs by a total of 80 small tokens (i.e., \$0.80). In each large-token allocation decision, subjects must decrease the two participants' payoffs by a total of 40 large tokens (i.e., \$0.80). Subjects make two allocation decisions for each of the 13 endowment sets: one decision about small tokens and one decision about large tokens and are told that only one decision out of 26 will be randomly selected for payment.

For the 13 small-token allocation decisions, subjects must choose between three possible allocations that require the first and second participants to give up: (1) 20 and 60 small tokens, respectively; (2) 40 small tokens each; or (3) 60 and 20 small tokens, respectively. Similarly, for the 13 large-token allocation decisions, subjects must choose between three possible allocations that are financially equivalent to their small-token counterparts; they require the first and second participant to give up: (1) 10 and 30 large tokens, respectively; (2) 20 large tokens each; or (3) 30 and 10 large tokens, respectively. Examples of the small-token and large-token allocation decision screens are shown in Appendix Figure B.3 and Appendix Figure B.4, respectively.

Certain allocation decisions are indicative of narrow bracketing of equity concerns. While Section 3.1 provides more detail on how we determine evidence of narrow bracketing, the intuition is as follows. Absent narrow bracketing of equity concerns, allocation choices should only be influenced by the distribution of total payoffs: the total monetary value of the sum of small and large tokens (i.e., taking into account the initial endowment and the allocation). If subjects care about equity and do not narrowly bracket equity concerns, they should only aim to equalize these total payoffs. If narrow bracketing of equity concerns is prevalent, however, equity preferences may also be influenced by the specific distribution of small tokens and large tokens across the participants. For example, narrow bracketing of equity concerns could cause subjects to choose an allocation such that both participants end up with the same number of small tokens, even though they have different numbers of large tokens and so total monetary payoffs end up unequal. That is, subjects may narrowly bracket equity concerns over the component they can influence, even though they could achieve equity in terms of total payoffs by choosing a different allocation.

Our design also allows us to observe whether subjects abide by a 50-50 norm with regard to their own allocations, which would lead them to favor the allocations (numbered (2) above) that require both participants to give up an equal number of tokens. Subjects may chose this behavior even when initial endowments are unequal, leading total monetary payoffs to end up

unequal. While this 50-50 norm is well documented in the literature (Andreoni and Bernheim, 2009; Engel, 2011), it is also consistent with narrow bracketing of equity concerns if individuals narrowly bracket over their own influence on allocations, ignoring initial endowments altogether.

2.1.1 Implementation for the *Tokens* version

In February 2018, 400 Mechanical Turk workers completed the *Tokens* version of our study (see Appendix B.1 for screenshots). Subjects in the *Tokens* version receive $4 for completing the study and learn that they will make 26 allocation decisions, one of which will be randomly selected to count and determine the payoffs for two participants in a future version of the study. Each subject is randomized to either make the 13 small-token allocation choices first or the 13 large-token allocation choices first. Within each set of 13 decisions, the order of the endowments for the second participant is also randomized. Prior to making their allocation decisions, subjects must correctly answer several understanding questions, ensuring that they understand how their allocation choices influence the payments for the pair of participants in the decision that is randomly selected to count.[11] We report on results from the *Tokens* version in Section 3.1.

2.2 Design of the three *Money & Time* versions

There are three *Money & Time* versions of our study: (1) the *Money & Time, Baseline* version, (2) the *Money & Time, Uncertain Endowments* version, and (3) the *Money & Time, First Person* version. In these *Money & Time* versions, we investigate similar types of allocation decisions as in the *Tokens* version, except that endowments and allocations are now comprised of money and time, rather than of small and large tokens.

Two experimental design changes are needed to go from the *Tokens* version to the *Money & Time* versions. First, to use time as one of the components of payoffs, we need a way to control participants' endowments of time in our study. In Section 2.2.1, we describe how we control how much time participants have in the *Money & Time* versions of the study. Second, we need to establish an exchange rate between money and time so that subjects are able to aggregate money and time into total payoffs (and so we can be confident that total payoffs aggregated in this way can be set equal to each other).[12] In Section 2.2.3, we detail how we construct a subject-specific exchange rate between money and time so that total payoffs can be aggregated. After highlighting these design features, we discuss the specific details of the three *Money & Time* versions of the study in Sections 2.2.4–2.2.6.

To understand some of our experimental design decisions, it is helpful to know a bit about the MTurk platform, from where we recruit participants into our study. People who work on the MTurk platform choose which, and how many, "Human Intelligence Tasks" (HITs) to complete. The choice of HITs determines how much time they spend working and their income from doing

[11] After the allocation choices, subjects complete a short follow-up survey that gathers demographic information.

[12] In the *Tokens* version 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.

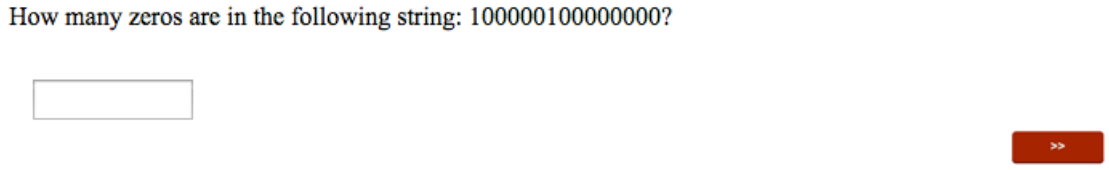
so. In addition, workers face a relatively standard wage on the platform and have the flexibility to earn more money if given more time. These features of the MTurk platform offer particular advantages for the *Money & Time* versions of the study, for reasons we highlight in Sections 2.2.1 and 2.2.3.

2.2.1 How we control time in our study

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 1 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.

Since participants who complete the study more quickly than others are immediately free to complete additional HITs on the MTurk platform to earn more money (or are immediately free to engage in other activities), completing fewer tasks is equivalent to having more time. Moreover, just as we can have participants sacrifice money by taking away cents from their endowed amounts of money, we can have participants sacrifice time by increasing the number of tasks they must do to complete the study.

Figure 1: Screenshot of Example Task



That allocations of time in our study are 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 4, are explicitly about money and work.[13]

[13]Note, also, that alternative approaches to burning participants' time (i.e., without asking them to engage in some other activity) are fraught. On MTurk, it would be hard, if not impossible, to prevent a participant asked to do nothing from engaging in some unobservable activity, possibly even working on other HITs (e.g., in a separate browser). In an experimental laboratory, it would also be hard to prevent subjects asked to do nothing from engaging in other potentially enjoyable activities like thinking or daydreaming. Letting participants leave an experimental laboratory early also introduces issues in our context. Laboratory participants may have limited opportunities to turn time into money and may not value time that they were planning to spend in the laboratory

2.2.2 Allocation decisions in the *Money & Time* versions

As in the *Tokens* version, decisions in the *Money & Time* versions involve decreasing the two participants' endowments. In these versions, the first participant's endowment is again held fixed across decisions—at 200 cents and a requirement to complete 60 time-burning tasks—while the endowment of the second participant varies across decisions such that there are again 13 unique endowment sets.[14]

For each time allocation decision, subjects decide how two participants must split the time burden of completing 60 more time-burning tasks. For the 13 time allocation decisions, subjects choose between allocations that require the first and second participants to do: (1) 10 and 50 more tasks, respectively; (2) 30 more tasks each; or (3) 50 and 10 more tasks, respectively.

To make money allocation decisions equivalent to time allocation decisions, we need to construct monetary sacrifices that are equivalent to the time sacrifices listed above so that each subject thinks of the monetary sacrifices in their money allocation decisions as equivalent to the time sacrifices in their time allocation decisions.[15] For each subject, we define M_{10} and M_{50} as the monetary sacrifices that the subject believes are equivalent to a participant doing 10 and 50 more counting questions, respectively. As described in Section 2.2.3, we establish M_{10} and M_{50} for each subject by asking the subject to complete multiple price lists (on behalf of the first participant) that trade-off sacrificing money and doing more tasks. These price lists imply how much money the subject thinks the first participant should be willing to sacrifice to avoid completing an additional 10 and 50 tasks, and we assume a linear exchange rate in this range, assuming that $\frac{M_{10}+M_{50}}{2}$ is the amount of money the first participant should be willing to sacrifice to avoid completing an additional 30 tasks.[16] For each money allocation decision, subjects must choose between allocations that require the first and second participants to give up: (1) M_{10} and M_{50} cents, respectively; (2) $\frac{M_{10}+M_{50}}{2}$ cents each; or (3) M_{50} and M_{10} cents, respectively.

(e.g., if they made plans assuming the lab session would last an hour but were let out early), so the equivalence of time and money in that setting may not be as tight as it is on MTurk where participants can immediately accept another short-term work task if they have fewer time-burning tasks to complete.

[14] Details of these endowment sets are presented in the Sections 3.2. As described in Sections 2.2.5 and 3.2.3, the *Money & Time, Uncertain Endowments* version only has 11 unique endowment sets.

[15] Since it is the subject who is making the allocation decisions, we care about that subject's beliefs about the money-time tradeoff. Since the subject makes allocation decisions about two anonymous MTurk participants, we assume that the tradeoff is the same for both participants. We address alternative assumptions in Appendix A. In the *Money & Time, First Person* version, we will instead be interested in the subject's own time-money tradeoff, as we will discuss in Section 2.2.6.

[16] We make this assumption to require that all three monetary allocation options require the same total monetary sacrifice (i.e., $M_{10} + M_{50}$ cents). As described in Section 2.2.3 and Appendix A, we show evidence consistent with this linearity assumption and additionally show that our results are not driven by this assumption.

2.2.3 How we establish a subject-specific exchange rate between money and time

As mentioned in Section 2.2.2, we use multiple price lists to calculate a subject-specific exchange rate between money and doing additional tasks.[17] To first give each subject a sense of how much time participants need to complete the tasks, each subject completes 10 time-burning tasks themselves. The subject then completes the M_{10} multiple price list. On each row of the multiple price list, the subject must choose the option on the left, which requires the first participant to do 10 more tasks, or the option on the right, which requires the first participant to instead give up some amount of money.[18] From these choices, we can infer the implied lower bound $\underline{M_{10}}$ and implied upper bound $\overline{M_{10}}$ such that the subject is indifferent between the first participant sacrificing the amount of time needed to complete 10 more tasks and sacrificing M_{10} cents, where $M_{10} \in [\underline{M_{10}}, \overline{M_{10}}]$.[19] The subject then completes corresponding M_{30} and M_{50} multiple price lists. These latter two price lists are constructed just like the M_{10} multiple price list, but with the option on the left requiring the first participant to complete 30 and 50 more time-burning tasks, respectively. Once subjects complete these multiple price lists, we have all the information we need to make the money allocations equivalent to the time allocations.[20]

Using this procedure to establish a subject-specific exchange rate relies on a few important assumptions and requires a few design decisions, which we note here and discuss in further detail in Appendix A. First, we elicit the exchange rate once, by asking the subject to make decisions on behalf of the first participant, and then we apply the same exchange rate to both participants. Since subjects do not know anything about the two participants (except in the *First Person* version, described in further detail below), and since participants on the MTurk platform face similar wages that allow them to turn time into money, it would be surprising if subjects believed that the first and second participant had different time-money tradeoffs. Nevertheless, in Appendix A.5, we present a simple model showing that one cannot generate our narrow bracketing results by assuming different exchange rates for the two participants.

[17] The procedure we use to identify our subject-level calibration is similar in spirit to the procedures we use in our other work (Exley, 2015, Forthcoming; Exley and Kessler, 2018).

[18] As shown in Appendix Figure B.10, the M_{10} multiple price list has 26 rows. The amount of money starts at 100 cents in the first row and decreases in increments of 4 cents down to 0 cents in the last row (i.e., on row r, $R_r = 100 - 4 * (r-1)$). When making these choices, the subjects can always choose the left option, always choose the right option, or choose a row at which they switch from choosing the left option to the right option.

[19] In particular, if a switch occurs from choosing the left option on row r to the right option on row $r+1$, then $\underline{M_{10}} = R_{r+1} = 100 - 4 * r$ and $\overline{M_{10}} = R_r = 100 - 4 * (r-1)$ cents. Since we need an M_{10} for all subjects, if no switch occurs and instead the left option is always chosen, we set $\underline{M_{10}} = \overline{M_{10}} = 0$ cents, if instead the right option is always chosen, we set $\underline{M_{10}} = \overline{M_{10}} = 100$ cents. The interface enforces single switching for those who switch, so we do not observe subjects engaging in multiple switching. In principle, we could have instead fixed the units of money and determined the exchange rates for the units of time. Our approach, however, allows us to know in advance the maximum amount of tasks any participant in the study would need to complete, and thus the maximum amount of time the study would take.

[20] When answering the multiple price lists, subjects do not know about the allocation choices or how their answers will affect these choices. However, they are aware of how many decisions remain in the study and thus are aware of not knowing what those remaining decisions entail.

Second, we assume linearity in each subject's estimated exchange rate between time and money. This leads us to treat the monetary equivalent of completing 30 more time-burning tasks as $\frac{M_{10}+M_{50}}{2}$ (i.e., the average of the monetary cost of completing 10 and 50 more tasks). It also allows us to apply the same exchange rate for a subject across endowments in which the second participant has completed more or less time-burning tasks than the 60 completed by the first participant. As discussed further in Appendix A, we use our estimate of M_{30} from the M_{30} multiple price list to identify if subjects' exchange rates are indeed linear. The plurality of subjects are classified as having linear exchange rates, and we show that our results are robust to considering subjects whose reports on the multiple price list suggest concave, convex, or linear costs to completing additional tasks.

Third, our price lists generate ranges for M_{10} and M_{50}, but we need point predictions of them to generate the allocation options. As discussed further in Appendix A, we handle this by calibrating the point predictions in two ways (i.e., calculating the maximum possible exchange rate, by using the outer extremes of each range in one calibration; and calculating the minimum possible exchange rate, by using the inner extremes of each range in another calibration) and showing our results are robust to both calibrations.

Fourth, 25% of subjects provide responses to the multiple price lists that do not allow for an estimate of a positive exchange rate (i.e., $\underline{M_{50}} \leq \overline{M_{10}}$), which requires us to assign them a random M_{10} and M_{50} (and thus a corresponding random exchange rate). In our main analysis, we drop these subjects. As detailed in Appendix A, however, our results are robust to including the subjects for whom we randomly assign these values.

As revealed by the discussion in this section, establishing an exchange rate between money and time is somewhat complex. However, our results on the narrow bracketing of equity concerns also arise in the simple *Tokens* version of our study where we impose a simple 2-to-1 exchange rate between small and large tokens, demonstrating that our design choices in identifying subjects' money-time exchange rates are not pivotal for our results. In addition, attempting to compare choices in the money domain and the time domain without identifying a subject-specific exchange rate is fraught. Prior literature that compares money decisions to time decisions either does not consider the need for money-time exchange rates or defines 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. Our approach takes seriously the need to elicit such an exchange rate and to allow for it to vary across subjects. The slight complexity of establishing these exchange rates is therefore necessary—and worthwhile—to explore how fairness attitudes differ across these domains.

2.2.4 Implementation for the *Money & Time, Baseline* version

Between April and June 2016, 400 Amazon Mechanical Turk workers completed the *Money & Time, Baseline* version of our study (see Appendix B.2 for screenshots). As described in the

previous section, subjects first complete 10 time-burning tasks and answer the M_{10}, M_{30}, and M_{50} multiple price lists. Subjects are randomly assigned to either make 13 time allocations followed by 13 money allocations or vice versa, and the order of the endowment sets randomly varies within each group of 13 decisions. How the endowments vary across these allocation decisions is detailed in Section 3.2.3 when we present the results of this study version.[21]

In addition to receiving $4 for completing the study, subjects are incentivized in two ways. First, subjects have a chance of being matched with participants from the *Money & Time, First Person* version of our study, and, if matched, there is a 10% chance that their allocation decision will "overrule" a participant's allocation decision from that study to determine the payoffs of the participants.[22] Second, when considering the three allocation options for each decision, subjects are asked to indicate whether each option is "very socially inappropriate," "somewhat socially inappropriate," "somewhat socially appropriate," or "very socially appropriate." One social appropriateness evaluation is randomly selected as the "evaluation-that-counts." If the subject's social appropriateness evaluation is the same as the modal social appropriateness evaluation of others in the evaluation-that-counts, the subject receives a $1 bonus payment. Making the incentives for the social appropriateness evaluation a coordination game among subjects allows us to identify social norms of appropriateness in the manner of Krupka and Weber (2013).

2.2.5 Implementation for the *Money & Time, Uncertain Endowments* version

Between April and June 2016, 400 Amazon Mechanical Turk workers completed the *Money & Time, Uncertain Endowments* version of our study (see Appendix B.3 for screenshots). Relative to the *Money & Time, Baseline* version, there are two differences in this version. First, as detailed when discussing the corresponding results in Section 3.2.3, we introduce uncertainty into endowments such that the equity can often only be achieved in expectation. Second, we only have 11 unique endowment sets (instead of 13 as in the other study versions), so subjects make 11 money allocation decisions and 11 time allocation decisions.

2.2.6 Implementation for the *Money & Time, First Person* version

In August of 2017, 400 Amazon Mechanical Turk participants completed the *Money & Time, First Person* version of our study (see Appendix B.4 for screenshots). In this version, the subjects who make allocation decisions are assigned to the role of the first participant, so each decision involves allocating money or time between oneself and another study participant assigned to the role of the second participant.

Since the first participant is always endowed with 200 cents and a requirement to complete 60 tasks, the study begins by requiring subjects to complete 60 tasks to earn a credited amount

[21] As in the *Tokens* version, the study requires subjects to correctly complete understanding questions about the implications of their decisions and concludes with a short follow-up survey that gathers demographic information.

[22] In practice, the randomly selected question from the *Money & Time, First Person* version was a row on one of the multiple price lists. The process by which subjects were selected for their decision to overrule what the participant chose in the *Money & Time, First Person* version is detailed in footnote 25.

of 200 cents. Then, the subjects complete the M_{10}, M_{30}, and M_{50} multiple price lists trading off completing extra tasks themselves or giving up some of their bonus payment. Finally, subjects make 26 allocation decisions that involve the same sets of endowments and randomization procedure as in the *Money & Time, Baseline* version.[23]

In addition to receiving $6 for completing the study, subjects were informed that exactly one of their decisions would be randomly selected to count.[24] In that decision, subjects knew that their choice would be implemented with a 90% chance and would be replaced by the corresponding decision of a subject from another version of the study with a 10% chance.[25]

3 Results

We organize our results around two questions about how individuals make decisions regarding the payoffs of others. First, do individuals *narrowly bracket* their equity concerns, even at the expense of overall equity? Second, do equity concerns differ in the domains of time and money?

Section 3.1 reports data from the *Tokens* version of our study and establishes that subjects narrowly bracket their equity concerns at the expense of achieving overall equity. Section 3.2 reports data from the *Money & Time* versions of our study, showing additional evidence that subjects narrowly bracket equity concerns at the expense of overall equity and establishing that subjects display more inequity aversion in the domain of time than in the domain of money. Section 3.2 additionally highlights that subjects believe these fairness attitudes are socially appropriate, that they persist when we introduce uncertainty into endowments, and that they persist when narrowly bracketing equity concerns comes at a direct cost to subjects (and when self-serving motives may encourage subjects to choose whichever equity preference is most favorable to them). In total, we analyze data from 40,000 decisions made by 1,600 subjects.

3.1 Results from the *Tokens* version

In each decision in the *Tokens* version of the study, a subject faces two participants with randomly allocated endowments of small and large tokens. The subject must then choose an allocation that takes some number of small (or large) tokens from each participant.

To determine whether subjects narrowly bracket their equity concerns, we classify different types of equity that may be achieved by allocations. We say that an allocation achieves "Overall Equity" (or "O-equity") if it results in both participants ending up with an equal amount of

[23] As in the other versions, the study requires subjects to correctly complete understanding questions about the implications of their decisions and concludes with a short follow-up survey that gathers demographic information.

[24] The completion fee and study length are higher in the *Money & Time, First Person* version than the other *Money & Time* versions, since subjects have to complete at least 60 time-burning tasks in this study version.

[25] The randomly selected decision turned out to be the row on the M_{50} multiple price list where the choice was between: (1) completing an additional 50 tasks or (2) giving up 92 cents. With a 90% chance, the subject had to complete an additional 50 tasks at the end of the study—if they chose (1)—or to forgo 92 cents and thus only receive 108 cents ($200 - 92$) as bonus payment—if they chose (2). With a 10% chance, they had to forgo the 92 cents regardless of what they chose, because this was the option chosen by a subject who was randomly selected from the *Money & Time, Baseline* and *Money & Time, Uncertain Endowments* versions.

money (i.e., combining the value of their small and large tokens). Absent narrow bracketing of equity concerns, all concerns about equity would be about overall equity, and subjects would aim to achieve overall equity whenever possible.

The remaining types of equity are narrowly framed. We say that a small-token allocation achieves a "Small-Token Split" (or an "S-split") if it requires both participants to sacrifice an equal number of small tokens and "Small-Token Equity" (or "S-equity") if it results in both participants ending up with an equal number of small tokens. Similarly, we say that a large-token allocation achieves a "Large-Token Split" (or an "L-split") if it requires both participants to sacrifice an equal number of large tokens and "Large-Token Equity" (or "L-equity") if it results in both participants ending up with an equal number of large tokens.[26]

To easily describe endowments and allocations, we introduce additional terminology. In particular, we adopt the perspective of the first participant, define $\Delta S = 40$ small tokens and $\Delta L = 20$ large tokens, and use ΔS and ΔL to describe the extent to which endowments and allocations favor $(+)$ or disfavor $(-)$ the first participant relative to the second participant. (Note that since each small token is worth one cent and each large token is worth two cents, $\Delta S = \Delta L = 40$ cents.)

Since the first participant always has 140 small tokens and 70 large tokens, whether endowments have $+\Delta S$ or $-\Delta S$ and $+\Delta L$ or $-\Delta L$ is based on the randomly assigned endowment of the second participant. For example, an initial endowments is $+\Delta S$ if the second participant has 100 small tokens and 70 large tokens, since the first participant is favored by ΔS (i.e., $140 - 100 = 40$ small tokens). An initial endowments is $-\Delta L$ if the second participant has 140 small tokens and 90 large tokens, since the first participant is disfavored by ΔL (i.e., $70 - 90 = -20$ large tokens).

We use the same terminology to describe allocations. For example, the allocation that requires the first participant to give up 20 small tokens and the second participant to give up 60 small tokens is $+\Delta S$ (i.e., the first participant has to give up 40 fewer small tokens than the first participant). Alternatively, the allocation that requires the first participant to give up 60 small tokens and the second participant to give up 20 small tokens is $-\Delta S$ (i.e., the first participant has to give up 40 more small tokens than the second participant).[27]

Given these definitions, Table 1 displays the seven endowment sets that we focus on in our main analysis (Appendix Table D.1 describes the six other endowment sets used for robustness tests). We focus on these seven endowments sets—for both small-token and large-token allocation decisions—because they allow O-equity to be achieved by one of the allocations.[28] In addition, all

[26] Thus, only O-equity, an S-split, and S-equity are possible in small-token decisions, while only O-equity, an L-split, and L-equity are possible in large-token decisions. In addition, some allocations achieve multiple types of equity (e.g., a small-token allocation may achieve O-equity, an S-split, and S-equity simultaneously).

[27] The allocation where both participants must give up 40 small tokens is neither $+\Delta S$ nor $-\Delta S$, since it neither favors nor disfavors the first participant.

[28] These endowments introduce a 0-cent or 40-cent difference in total payoffs between the two participants such that an allocation can maintain equity in total payoffs or fully correct an initial inequity in total payoffs. O-equity

but one of these endowment sets introduce a conflict between achieving O-equity and narrowly bracketing equity concerns. In particular, these allocation decisions force subjects to decide whether to achieve O-equity or to forgo O-equity to achieve an S-split, S-equity, or both (or, alternatively an L-split, L-equity, or both).

The rows of Table 1 label the relevant initial endowment sets in terms of how much they favor or disfavor the first participant.[29] The first three columns of Table 1 label the three small-token allocations by how much they favor or disfavor the first participant. The last three columns of Table 1 label the three large-token allocations by how much they favor or disfavor the first participant. The interior of Table 1 reports on what type of equity is achieved when the allocation listed in the column is chosen for the endowment set listed in the row.

Figure 2 shows what subjects pick for the endowment sets listed in Table 1. The panels of Figure 2 match the scenario letters in Table 1. The "S-choice" bars show how often subjects choose small-token allocation choices that achieve O-equity, an S-split, and/or S-equity. The "L-choice" bars show how often subjects choose large-token allocation choices that achieve O-equity, an L-split, and/or L-equity.

We start by describing Scenario A, in which initial endowments of the two participants are identical. In these decisions, subjects can choose the allocation that requires both participants to sacrifice the same number of small tokens (or large tokens) in order to achieve O-equity, an S-split (or L-split), and S-equity (or L-equity).[30] Achieving equity is clearly preferred. In 91% of decisions in which initial endowments are equal, subjects choose this allocation and achieve equity, regardless of whether they are allocating small or large tokens.

In Scenario B, participants' endowments differ on the choice dimension but not on the non-choice dimension (i.e., the endowments differ only by $+/-\Delta S$ when subjects make small-token allocation decisions and only by $+/-\Delta L$ when subjects make large-token allocation decisions). In these decisions, subjects face a tradeoff between O-equity (which also achieves S/L-equity) and an S/L-split. A subject can achieve O-equity by choosing the allocation that takes less from the participant who is endowed with less and takes more from the participant who is endowed with more or they can achieve an S/L-split by taking the same number of tokens from each subject. Subjects only choose the O-equity allocation in 60% to 67% of these decisions. That subjects instead choose choose the S/L-split allocation in more than a quarter of these decisions provides evidence that some subjects abide by the 50-50 norm at the expense of achieving overall equity, evidence that is consistent with narrowly bracketing equity concerns.[31]

cannot be achieved in the six other endowment sets that introduce a 20-cent or 80-cent difference in total payoffs.

[29] Note that, since $\Delta S = 40$ cents and $\Delta L = 40$ cents, the initial endowments with $+\Delta S - \Delta L$ and $-\Delta S + \Delta L$ start the first and second participants off with the same amount of money, even though endowments of small and of large tokens differ across the two participants.

[30] In Scenario A of Figure 2, we combine the other two allocations into the category "No equity."

[31] Relatedly, Jakiela (2013) finds that some subjects favor spending the same amount of their budget on themselves as they do on others—even when it results in different total payoffs for themselves than for others. This

Table 1: *Tokens* version: equity arising from allocation choices

	Small-token allocation diff of:			Large-token allocation diff of:		
	0	$+\Delta S$	$-\Delta S$	0	$+\Delta L$	$-\Delta L$
	(1)	(2)	(3)	(4)	(5)	(6)
Scenario A:						
endow diff of 0	O-equity, S-split, S-equity			O-equity, L-split, L-equity		
Scenario B:						
endow diff of $-\Delta S$	S-split	O-equity, S-equity		L-split, L-equity	O-equity	
endow diff of $+\Delta S$	S-split		O-equity, S-equity	L-split, L-equity		O-equity
Scenario C:						
endow diff of $-\Delta S, +\Delta L$	O-equity, S-split	S-equity		O-equity, L-split		L-equity
endow diff of $+\Delta S, -\Delta L$	O-equity, S-split		S-equity	O-equity, L-split	L-equity	
Scenario D:						
endow diff of $-\Delta L$	S-split, S-equity	O-equity		L-split	O-equity, L-equity	
endow diff of $+\Delta L$	S-split, S-equity		O-equity	L-split		O-equity, L-equity

An allocation achieves **O-equity** if it results in both participants ending up with (after accounting for initial endowments and the allocation) an equal amount of money. A small/large-token allocation achieves an **S/L-split** if it requires both participants to sacrifice an equal number of small/large tokens and **S/L-equity** if it results in both participants ending up with (after accounting for initial endowments and the allocation) an equal number of small/large tokens. Differences in endowments/allocations indicate the extent to which endowments/allocations favor the first participant relative to the second participant (i.e., positive differences reflect better endowments/allocations for the first participant than the second participant). See specific definitions of ΔS and ΔL in the main text.

While narrow bracketing of equity concerns can explain this preference for an S/L-split in Scenario B, there are other potential explanations for this behavior. One potential explanation is that subjects gravitate towards the allocation that achieves an S/L-split because it is the "middle" allocation choice. Another potential explanation is that, despite the explicitly stated random nature of the endowments, subjects may somehow interpret the endowments as "earned" or "deserved" and infer that the only equity that matters is the equity associated with their allocation, which drives them towards the equal split. Given these alternative explanations, it is useful to turn to the results from Scenario C where evidence for narrow bracketing of equity concerns does not involve subjects choosing an S/L-split.

finding, like ours, provides evidence for the 50-50 norm in a rather narrow sense—although ours arises in a social planner context that eliminates the role for self-serving motives.

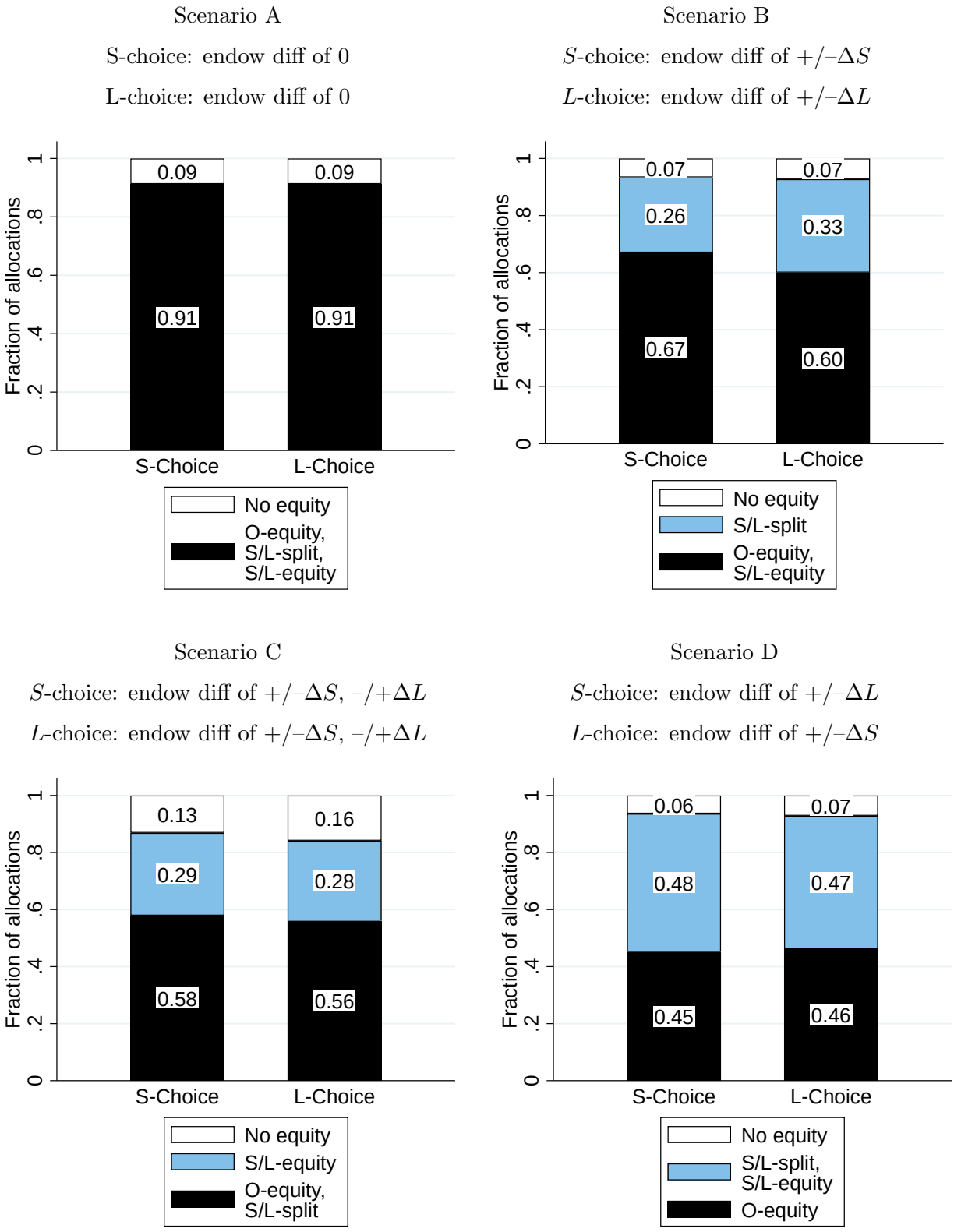
In Scenario C, participants' endowments provide them both with the same amount of money (i.e., \$2.80), but the distribution of tokens generating the \$2.80 is different for the two participants. In particular, one participant is advantaged in small tokens while the other participant is advantaged in large tokens. In these decisions, an S/L-split also achieves O-equity. However, subjects choose the O-equity and S/L-split allocation in only 56% to 58% of decisions and instead choose the S/L-equity allocation 28% to 29% of the time. This result provides evidence for narrow bracketing because subjects often achieve equity in small tokens (when making small-token allocation decisions) or large tokens (when making large-token allocation decisions), even though doing so introduces inequity in overall payoffs.

We see similar evidence in Scenario D, in which endowments are unequal on the non-choice dimension (i.e., the endowments differ only by $+/-\Delta L$ when making small-token allocation decisions and only by $+/-\Delta S$ when making large-token allocation decisions). Subjects can achieve O-equity by introducing an inequity in one dimension—forgoing an S/L split and S/L equity—to offset an existing inequity on the other dimension. For example, when the endowments are equal in small tokens and unequal in large tokens, a subject can achieve O-equity by taking more small tokens from the participant who has more large tokens (i.e., introducing inequity in small tokens to achieve overall equity). In these scenarios, subjects only choose the O-equity allocation approximately half of the time and instead choose the S/L-split and S/L-equity allocation approximately half of the time. In other words, subjects are just as likely to equalize the total amount of money as they are to narrowly bracket their equity concerns.

Table 2 formalizes the results from Figure 2 in a regression framework and confirms that subjects are more likely to forgo the O-equity allocation when an S/L-split and/or S/L-equity does not achieve O-equity. In particular, Table 2 reports results of a linear probability model of whether a subject forgoes the O-equity allocation. Column 1 reports results from small-token decisions and shows that the probability of forgoing O-equity significantly increases by 24 percentage points when an S-split does not achieve O-equity (as in Scenario B), 33 percentage points when S-equity does not achieve O-equity (as in Scenario C), and 46 percentage points when achieving an S-split and S-equity does not achieve O-equity (as in Scenario D). 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 allocation decisions. Column 4 shows that the rate at which subjects are willing to forgo O-equity to achieve a more narrow form of equity is not substantially different when subjects make small-token allocation decisions than when they make large-token allocation decisions, although subjects are significantly more likely to forgo the O-equity allocation when a different allocation achieves an L-split rather than an S-split (see also the rates of choosing O-equity in Panel B of Figure 2).[32]

[32] Appendix Table D.4 confirms the robustness of the results to the inclusion of subject fixed effects. By showing the allocation choices in the remaining scenarios where O-equity cannot be achieved (detailed in Appendix Table D.1), Appendix Figure C.1 shows that there are not robust differences across equity preferences in small versus

Figure 2: *Tokens* version: allocation choices



large tokens. While Panel A suggests a greater preference for an L-split than an S-split, the preference for an L-split and L-equity, relative to an S-split and S-equity, seems slightly smaller in Panel B and similar in Panel C.

Table 2: *Tokens* version: regression results from linear probability models of the likelihood to forgo the O-equity allocation

	Allocation decisions about			
	small tokens	large tokens	small & large tokens	
	(1)	(2)	(3)	(4)
S/L-split $\not\Rightarrow$ *O-equity*	0.24***	0.31***	0.28***	0.24***
	(0.02)	(0.02)	(0.02)	(0.02)
S/L-equity $\not\Rightarrow$ *O-equity*	0.33***	0.35***	0.34***	0.33***
	(0.02)	(0.02)	(0.02)	(0.02)
S/L-split and S/L-equity $\not\Rightarrow$ *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(S/L-split* $\not\Rightarrow$ *O-equity)*				0.07***
				(0.02)
L-choice(S/L-equity* $\not\Rightarrow$ *O-equity)*				0.02
				(0.02)
L-choice(S/L-split and S/L-equity* $\not\Rightarrow$ *O-equity)*				-0.01
				(0.03)
Constant	0.09***	0.09***	0.09***	0.09***
	(0.01)	(0.01)	(0.01)	(0.01)
Observations	2800	2800	5600	5600

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors are clustered at the subject-level and shown in parentheses. The results are from a linear probability model of likelihood to forgo the O-equity allocation. The types of equity that do not imply O-equity is achieved are denoted by a series of indicators: ***S/L-split*** $\not\Rightarrow$ ***O-equity*** is an indicator for the allocation that achieves an S/L-split not achieving O-equity; ***S/L-equity*** $\not\Rightarrow$ ***O-equity*** is an indicator for the allocation that achieves S/L-equity not achieving O-equity; and ***S/L-split and S/L-equity*** $\not\Rightarrow$ ***O-equity*** is an indicator for the allocation that achieves an S/L-split and S/L-equity not achieving O-equity. ***L-choice*** is an indicator for large-token allocation choices. Data are from the decisions of subjects among endowment sets where it is possible to achieve O-equity in the *Tokens* version of our study.

Evidence for a narrow bracketing of equity concerns also emerges on the subject level. Scenarios B, C, and D involve a total of 12 small-token or large-token allocation decisions. Across these 12 allocation decisions, 86% of subjects choose at least one allocation that results in an S/L-split and/or S/L-equity over an allocation that would instead achieve O-equity. These subjects choose such an allocation an average of 4.93 out of 12 times.

Taken together, these results show that—even in this very simple environment—many subjects narrowly bracket their equity concerns. Subjects frequently choose allocations that achieve an S/L-split (i.e., choosing to take away an equal number of small tokens or large tokens from each participant) and/or S/L-equity (i.e., choosing to equalize the total number of small tokens or large tokens the two participants have after the allocation), even when these narrow forms of equity come at the expense of achieving overall equity in total payoffs.

3.2 Results from the *Money & Time* versions

Section 3.1 documents evidence for narrow bracketing of equity concerns. This section explores whether narrow bracketing of equity concerns persists when considering allocation choices between money and time, and, if so, whether equity concerns differ across the domains.

We use similar definitions in the *Money & Time* versions as in the *Tokens* version. We say that an allocation achieves "Overall Equity" (or "O-equity") whenever final payoffs (i.e., accounting for initial endowments and allocations) are equal in both money and time or if an inequity in money is offset by an inequity in time.[33] The remaining types of equity are narrowly framed. We say that a money allocation achieves a "Money Split" (or an "M-split") if it requires both participants to sacrifice an equal amount of money and "Money Equity" (or "M-equity") if it results in both participants ending up with the same amount of money. Similarly, we say that a time allocation achieves a "Time Split" (or a "T-split") if it requires both participants to sacrifice an equal amount of time and "Time Equity" (or "T-equity") if it results in both participants ending up with the same amount of time (i.e., having to complete the same number of time-burning tasks).

We again introduce terminology about differences in endowments and allocations. We define $\Delta T = 40$ tasks and define $\Delta M = M_{50} - M_{10}$ cents.[34] We use ΔT and ΔM to describe the extent to which allocations and endowments favor (+) or disfavor (−) the first participant relative to the second participant. In addition, as will become clear below, in the *Money & Time* versions we use a subject's personalized ΔM to construct the endowments shown to that subject.

3.2.1 Allocation choices from *Money & Time, Baseline* version

Given the definitions of equity as well as ΔM and ΔT, Table 3 displays the seven endowment sets that we focus on in our main analysis of the *Money & Time, Baseline* version (Appendix Table D.2 describes the six other endowment sets used for robustness tests).

Figure 3 shows subjects' responses to the allocation decisions listed in Table 3. As before, the panels of Figure 3 match the scenario letters in Table 3. The "M-choice" bars show how often subjects choose money allocation choices that achieve O-equity, an M-split, and/or M-equity. The "T-choice" bars show how often subjects choose time allocation choices that achieve O-equity, a T-split, and/or T-equity.

As before, in Scenario A, the endowments of the two participants are identical. In these decisions, subjects can choose the allocation choice that requires both participants to sacrifice the same amount of money (or time) in order to achieve O-equity, an M-split (or T-split), and M-equity (or T-equity).[35] Equity is clearly preferred. Subjects achieve it 94% of the time when making money allocation decisions and 96% of the time when making time allocation decisions.

[33] The subject-specific exchange rate we identify (described in Section 2.2.3) allows us to construct endowments and allocation decisions in which such inequity in time and money can be set equal to each other.

[34] ΔM is subject-specific, since M_{10} and M_{50} are based on subject-specific responses to the multiple price lists.

[35] In Scenario A of Figure 3, we combine the other two allocations into the category "No equity."

Table 3: *Money & Time, Baseline* version: equity arising from allocation choices

	Money allocation diff of:			Time allocation diff of:		
	0	$+\Delta M$	$-\Delta M$	0	$+\Delta T$	$-\Delta T$
	(1)	(2)	(3)	(4)	(5)	(6)
Scenario A:						
endow diff of 0	O-equity, M-split, M-equity			O-equity, T-split, T-equity		
Scenario B:						
endow diff of $-\Delta M$	M-split	O-equity, M-equity		T-split, T-equity	O-equity	
endow diff of $+\Delta M$	M-split		O-equity, M-equity	T-split, T-equity		O-equity
Scenario C:						
endow diff of $-\Delta M, +\Delta T$	O-equity, M-split	M-equity		O-equity, T-split		T-equity
endow diff of $+\Delta M, -\Delta T$	O-equity, M-split		M-equity	O-equity, T-split	T-equity	
Scenario D:						
endow diff of $-\Delta T$	M-split, M-equity	O-equity		T-split	O-equity, T-equity	
endow diff of $+\Delta T$	M-split, M-equity		O-equity	T-split		O-equity, T-equity

An allocation achieves **O-equity** if it results in both participants ending up with (after accounting for initial endowments and the allocation) an equal amount of money and time, considered jointly. A money/time allocation achieves an **M/T-split** if it requires both participants to sacrifice an equal amount of money/time and **M/T-equity** if it results in both participants ending up with (after accounting for initial endowments and the allocation) an equal amount of money/time. Differences in endowments/allocations indicate the extent to which endowments/allocations favor the first participant relative to the second participant (i.e., positive differences reflect better endowments/allocations for the first participant than the second participant). See specific definitions of ΔM and ΔT in the main text.

As before, Scenarios B to D show that subjects regularly choose allocations that achieve an M/T-split and/or M/T-equity and will forgo O-equity to do so. This evidence is again consistent with narrow bracketing of equity concerns. When subjects make money allocation decisions, they forgo the O-equity allocation to choose a different allocation that achieves an M-split, M-equity, or both an M-split and M-equity 19% to 42% of the time. When subjects make time allocation decisions, they forgo the O-equity allocation to choose a different allocation that achieves a T-split, T-equity, or both a T-split and T-equity 31% to 66% of the time.

A closer examination of Figure 3 further reveals that subjects are more likely to choose the allocation associated with T-equity rather than with M-equity. In Scenario B, this involves choosing the O-equity allocation 63% of the time when it achieves T-equity but only 50% of the time when it achieves M-equity. In Scenario C, this involves forgoing the O-equity allocation to

choose the T-equity allocation 41% of the time versus the M-equity allocation 19% of the time. In Scenario D, this involves forgoing the O-equity allocation to choose the T-split and T-equity allocation 66% of the time versus the M-split and M-equity allocation 41% of the time.[36] We interpret this pattern of results as subjects being more inequity averse in time than in money.

Evidence for narrow bracketing of equity concerns and more inequity aversion in time than money also emerges on the subject-level. Across the money allocation decisions in Scenarios B to D, 80% of subjects choose at least one money allocation that results in an M-split and/or M-equity over a money allocation that would instead achieve O-equity. By contrast, across the time allocation decisions in Scenarios B to D, 92% of subjects choose at least one time allocation that results in a T-split and/or T-equity over a time allocation that would instead achieve O-equity (this 12 percentage point difference is statistically significant, $p < 0.01$). Among subjects who choose to forgo O-equity at least once, they choose to forgo O-equity more often when making time allocations than money allocations (2.99 out of 6 versus 2.74 out of 6, $p < 0.01$).

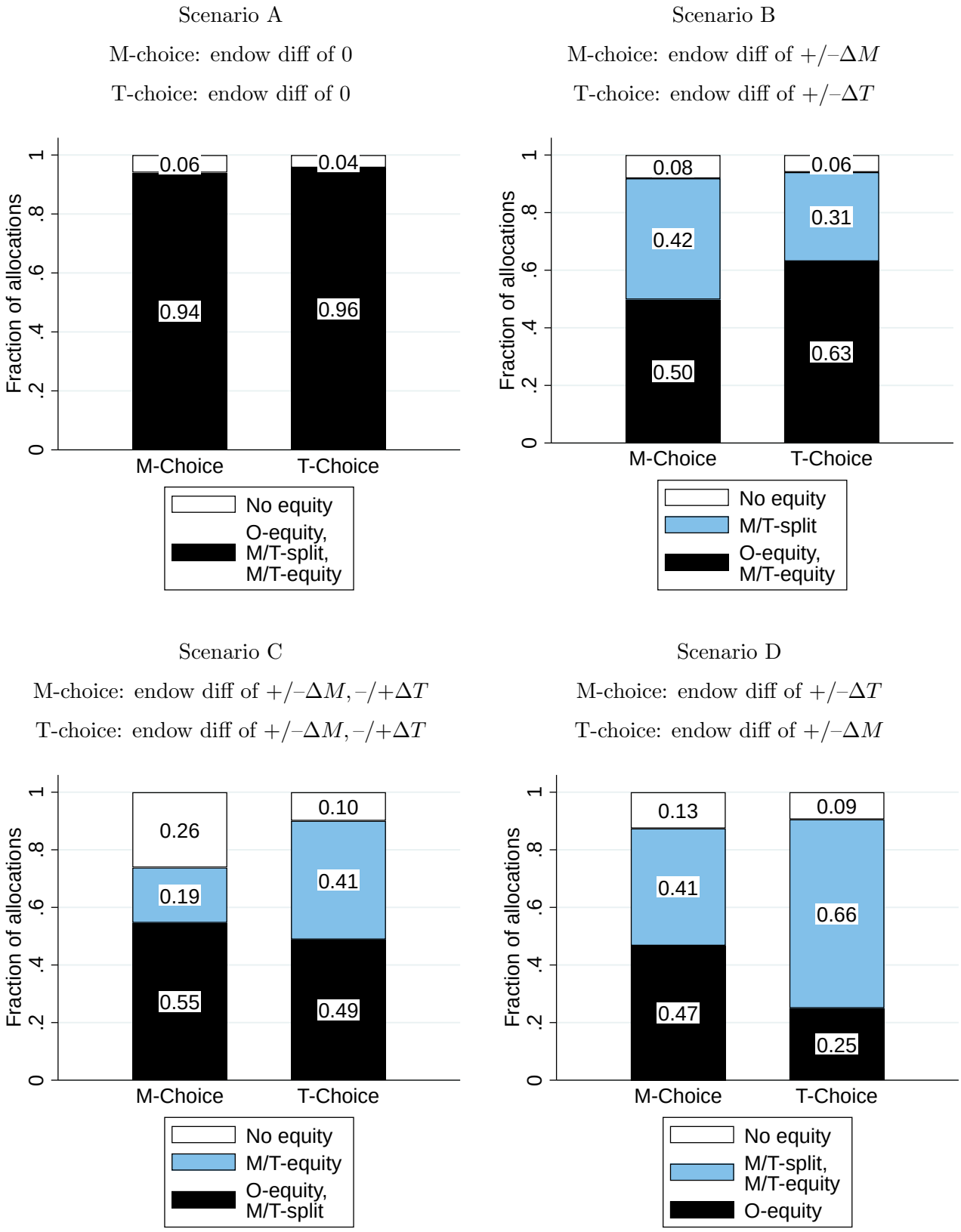
Table 4 formalizes the results from Figure 3 in a regression framework. Table 4 shows that the likelihood that a subject forgoes O-equity significantly increases when a different allocation achieves a M/T-split and/or M/T-equity. Column 1 shows results from money decisions, Column 2 shows results from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

Appendix Table D.5 confirms the robustness of these results. Column 1 replicates Column 3 of Table 4. Column 2 includes subject fixed effects. Columns 3 to 5 separately examine subjects whose reports on the multiple price list suggest concave, convex, or linear costs of the first participant completing additional tasks. This robustness check examines whether our result of more inequity aversion in time than 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 both participants for efficiency reasons. That our evidence of more inequity aversion in time than money persists among subjects whose preferences over the first participant doing additional tasks are convex, linear, and concave demonstrates that this is not a key motivation for why subjects equalize time across participants.[37] Columns 6 and 7 separately examine subjects who randomly were assigned each of the calibrations for M_{10} and M_{50}, as described in Appendix

[36] That subjects are more likely to choose the T-split and T-equity allocation than the M-split and M-equity allocation rules out an alternative explanation that subjects simply prefer the M-split to the T-split. In addition, Appendix Figure C.2, which shows results from the scenarios listed in Appendix Table D.1, confirms subjects' preference for T-equity relative to M-equity by examining scenarios in which O-equity cannot be achieved.

[37] When *M/T-split* $\not\Longrightarrow$ *O-equity*, achieving *O-equity* achieves *M/T-equity*. Consequently, negative coefficients on *T-choice**(*M/T-split* $\not\Longrightarrow$ *O-equity*) also provide evidence of more inequity aversion in time than money.

Figure 3: *Money & Time, Baseline* version: allocation choices



A. Column 8 includes subjects who were randomly assigned exchange rates.

The following subsections further document the robustness of our results by examining an alternative measure of equity concerns in Section 3.2.2 and additional versions of our study in Sections 3.2.3 and 3.2.4.

Table 4: *Money & Time, Baseline* version: regression results from linear probability models of the likelihood to choose to forgo the O-equity allocation

	Allocation decisions about			
	money	time	money & time	
	(1)	(2)	(3)	(4)
M/T-split $\not\Rightarrow$ *O-equity*	0.44***	0.33***	0.38***	0.44***
	(0.03)	(0.03)	(0.02)	(0.03)
M/T-equity $\not\Rightarrow$ *O-equity*	0.39***	0.47***	0.43***	0.39***
	(0.03)	(0.02)	(0.02)	(0.03)
M/T-split and M/T-equity $\not\Rightarrow$ *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(M/T-split* $\not\Rightarrow$ *O-equity)*				-0.12***
				(0.03)
T-choice(M/T-equity* $\not\Rightarrow$ *O-equity)*				0.07***
				(0.03)
T-choice(M/T-split and M/T-equity* $\not\Rightarrow$ *O-equity)*				0.23***
				(0.03)
Constant	0.06***	0.04***	0.05***	0.06***
	(0.01)	(0.01)	(0.01)	(0.01)
Observations	2114	2114	4228	4228

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors are clustered at the subject-level and shown in parentheses. The results are from a linear probability model of likelihood to forgo the O-equity allocation. The types of equity that do not imply O-equity is achieved are denoted by a series of indicators: ***M/T-split*** $\not\Rightarrow$ ***O-equity*** is an indicator for the allocation that achieves an M/T-split not achieving O-equity; ***M/T-equity*** $\not\Rightarrow$ ***O-equity*** is an indicator for the allocation that achieves M/T-equity not achieving O-equity; and ***M/T-split and M/T-equity*** $\not\Rightarrow$ ***O-equity*** is an indicator for the allocation that achieves an M/T-split and M/T-equity not achieving O-equity. ***T-choice*** is an indicator for time allocation choices. Data are from the decisions of subjects—with accurately estimated calibration values—among endowment sets where it is possible to achieve O-equity in the *Money & Time, Baseline* version of our study.

3.2.2 Normative allocation choices from *Money & Time, Baseline* version

As described in Section 2.2.4, for each decision, subjects reported the social appropriateness of choosing each of the three allocations on a 4-point scale from "very socially inappropriate" to "very socially appropriate." For each allocation, subjects were incentivized to report the modal response of others, allowing us to measure social norms as in Krupka and Weber (2013). Subjects were told that one allocation from one decision would randomly be selected for payment, and they would receive a $1.00 bonus for correctly reporting the modal social appropriateness response.

We observe 10,400 cases of a subject rating the social appropriateness of the three allocations.[38] In 82% of cases, a subject reports that one allocation is more socially appropriate than the other two. When this happens, we call this allocation a "normative allocation." Appendix Figure C.3 and Appendix Table D.6 report on which allocation is considered a normative allocation.[39] These results reveal that subjects believe that narrowly bracketing equity concerns and being more inequity averse in time than in money are both normatively appropriate.[40]

3.2.3 Allocation choices from *Money & Time, Uncertain Endowments* version

To examine whether our results persist when equity cannot be achieved with certainty—and instead can only be achieved in expectation—we analyze results from the *Money & Time, Uncertain Endowments* version.

The endowment sets in this version build off of the endowment sets in the *Money & Time, Baseline* version where endowments are equal on one or more dimension (i.e., Scenarios A, B, and D). These endowments are altered to introduce uncertainty on a dimension that is equal such that, in this version, it is only equal in expectation. In particular, a money endowment difference that is zero in expectation is denoted as $E[M] = 0$ and has a difference of either: $-\Delta M, -\frac{1}{2}\Delta M, 0, +\frac{1}{2}\Delta M$, or $+\Delta M$, each with a 20% chance. Similarly, a time endowment difference that is zero in expectation is denoted as $E[T] = 0$ and has a difference of either: $-\Delta T, -\frac{1}{2}\Delta T, 0, +\frac{1}{2}\Delta T$, or $+\Delta T$, each with a 20% chance. See Appendix Table D.3 for the full set of allocation decisions.[41]

Appendix Figure C.4 and Appendix Table D.7 show that our main results are robust to the setting with uncertainty. Subjects still narrowly bracket their equity concerns and are still more inequity averse in time than in money.[42]

Comparing the *Money & Time, Uncertain Endowments* results to the *Money & Time, Baseline* results allows us to make one additional observation. In the presence of uncertainty, subjects gravitate towards an M/T-split. Comparing results from Scenario B in Figure 3 to Appendix Figure C.4, we see that the M/T-split allocation is only chosen 31% to 42% of the time when endowment differences are certain but 53% to 63% of the time when endowment differences involve uncertainty. One interpretation of this finding is that subjects prefer to implement types of equity that they can achieve for sure (i.e., an M/T-split) rather than equity that they can only achieve in expectation, echoing earlier laboratory findings from Roth and Murnighan (1982).

[38] Each of our 400 subjects makes three social appropriateness ratings for each of the 26 decisions they face.

[39] In particular, they follow the structure of Figure 3 and Table 4, which report on which allocation is chosen.

[40] These results on social appropriateness are robust to the same specifications as we adopt in Appendix Table D.5 and robust to other definitions of a "normative allocation," such as relaxing our classification to allow multiple allocations to be normative (e.g., when a subject rates two allocations as equally socially appropriate and more socially appropriate than the third).

[41] We achieve this uncertainty by keeping the first participant's endowment the same and certain (i.e., 200 cents and 60 counting questions) for all decisions and introduce uncertainty in the endowment of the second participant.

[42] These results are robust to the same specifications as those in Appendix Table D.5 and to the remaining scenarios where O-equity cannot be achieved.

3.2.4 Allocation choices from *Money & Time, First Person* version

To examine whether our results persist when subjects have a selfish reason to choose certain allocations, we now consider results from the *Money & Time, First Person* version. Allocation choices are the same as in the *Money & Time, Baseline* version of our study, but now the subject is also the first participant, so allocation choices also affect his or her payoffs. Figure 4 shows results from this study version. It follows the structure of Figures 2 and 3 but facilitates the comparison of outcomes according to which allocation is the most selfish (i.e., takes the least amount of money or time from the first participant).[43] Figure 4 highlights that our main results are robust to this setting and additionally presents some new results.

First, it is clear that subjects are willing to sacrifice personal payoff to achieve equity. Results from Scenario A show that over half of subjects are willing to sacrifice money or time (i.e., to forgo choosing the no equity allocation that requires them to give up the least amount of money or time) to achieve equity in payoffs across themselves and the other participant. Second, subjects favor O-equity more when it is the most selfish allocation (see the first two set of results from Scenarios B and D), demonstrating that subjects do respond to their private incentives.

Third, subjects still narrowly bracket their equity concerns and are still more inequity averse in time than in money. As can be seen in the first two sets of results from Scenario C, when the most selfish allocation achieves M/T-equity, 59% to 75% of the time subjects forgo O-equity (and an M/T-split) to choose M/T-equity. Subjects are also willing, however, to make private monetary sacrifices to narrowly bracket their equity concerns. As can be seen in the first two set of results from Scenario B and Scenario D, when the most selfish allocation achieves O-equity, 16% to 41% of the time subjects forgo O-equity to choose an M/T-split (Scenario B) or both an M/T-split and M/T-equity (Scenario D).

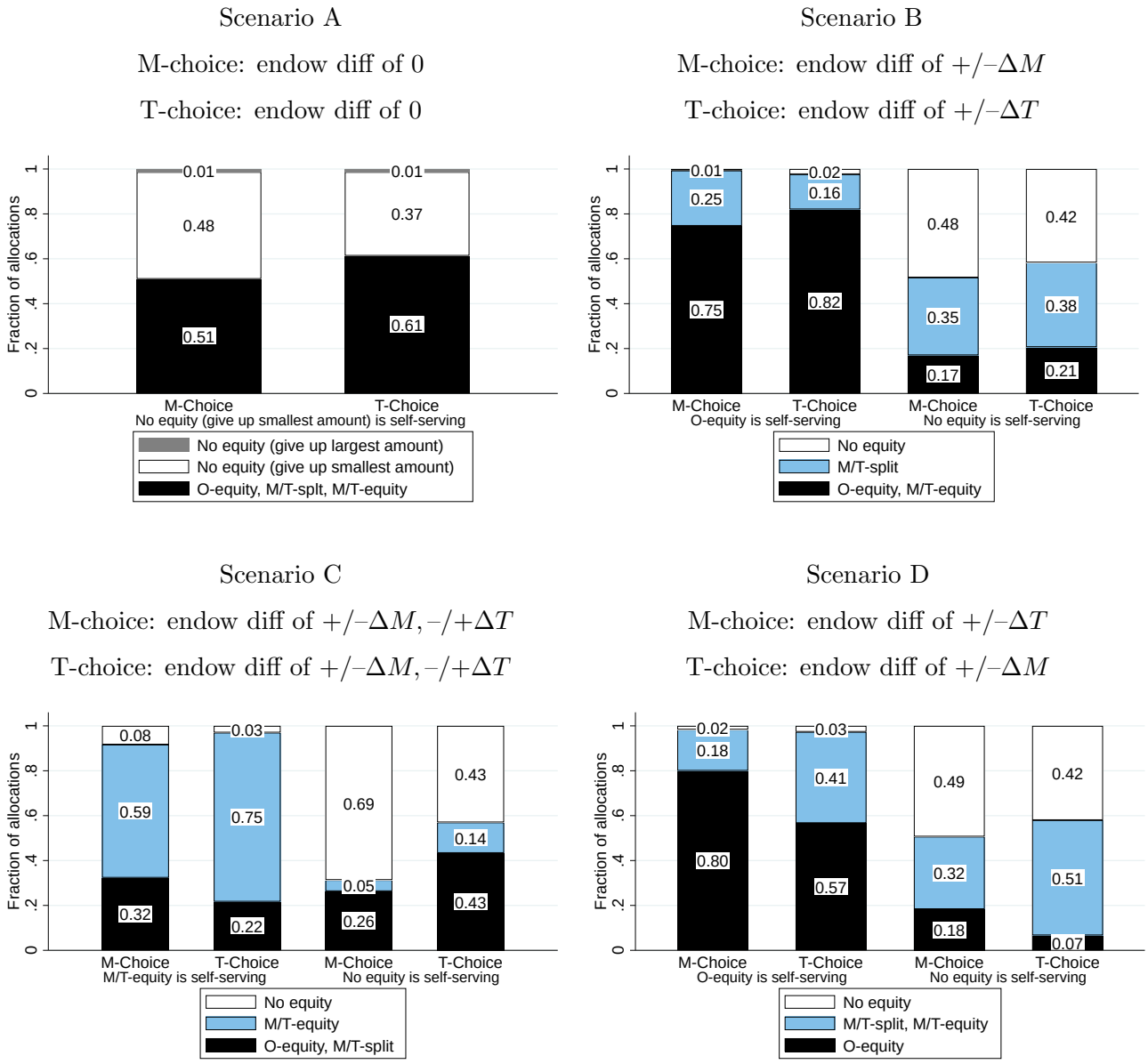
Fourth, we see that subjects are again more inequity averse in time than in money. They are robustly more likely to choose an allocation that achieves T-equity than an allocation that achieves M-equity, regardless of the associated private cost.

Table 5 shows these results in a regression framework, adopting the same specifications as Table 4 but including a control for whether the O-equity allocation is the most selfish allocation, which dramatically increases the likelihood that subjects choose the O-equity allocation, and thus decreases the likelihood that subjects forgo O-equity (the coefficient on *O-equity is self-serving* is large and negative).[44]

[43] By definition, the M/T-split allocation is neither the most selfish nor most generous allocation, so whatever allocation is neither labeled "Selfish" nor "M/T-split" is the most generous allocation.

[44] The coefficient on *O-equity is self-serving* is identified off of the difference between the left and right pairs of bars in Panels B and D of Figure 4. Whenever O-equity is *somewhat* self-serving (i.e., neither self-serving nor generous) it is associated with an M/T-split, so a control for O-equity being somewhat self-serving would be co-linear with our other controls. Appendix Table D.8 instead controls for the *Benefit of choosing O-equity*, which is 1 when O-equity is self-serving, 0.5 when O-equity is somewhat self-serving, and 0 when O-equity is generous. These specifications assume that part of the reason subjects forgo O-equity when it is not associated with an M/T-split is because choosing O-equity in those cases requires being generous. Consequently, the coefficients

Figure 4: *Money & Time, First Person* version: allocation choices



As expected, Table 5 shows that the results are very similar to those from the other versions of the study. The likelihood that a subject forgoes the O-equity allocation significantly increases when a different allocation achieves an M/T-split or M/T-equity. This arises for money allocation decisions (see Column 1) and for time allocation decisions (see Column 2), and so it is also observed when pooling all decisions (see Column 3). Subjects are also more inequity averse in time than in money (see Column 4).[45] For example, the coefficient on *T-choice**(*M/T-split and*

on *M/T-split* $\not\Rightarrow$ *O-equity* and *M/T-split and M/T-equity* $\not\Rightarrow$ *O-equity* decrease. Nevertheless, we still see narrow bracketing of equity concerns and more inequity aversion in time than money.

[45]Column 4 shows that subjects are slightly less self-serving when making time choices than money choices (see the coefficient on *O-equity is self-serving***T-choice*). This is consistent with literature that documents more

Table 5: *Money & Time, First Person* version: regression results from linear probability models of the likelihood to forgo the O-equity allocation

	Allocation decisions about			
	money	time	money & time	
	(1)	(2)	(3)	(4)
M/T-equity $\not\Rightarrow$ *O-equity*	0.22***	0.29***	0.25***	0.22***
	(0.02)	(0.02)	(0.02)	(0.02)
M/T-split $\not\Rightarrow$ *O-equity*	0.35***	0.38***	0.36***	0.35***
	(0.03)	(0.03)	(0.02)	(0.03)
M/T-split and M/T-equity $\not\Rightarrow$ *O-equity*	0.32***	0.57***	0.45***	0.32***
	(0.03)	(0.03)	(0.03)	(0.03)
O-equity is self-serving	-0.60***	-0.56***	-0.58***	-0.60***
	(0.03)	(0.03)	(0.03)	(0.03)
T-choice				-0.10***
				(0.02)
T-choice(M/T-equity* $\not\Rightarrow$ *O-equity)*				0.07***
				(0.02)
T-choice(M/T-split* $\not\Rightarrow$ *O-equity)*				0.03
				(0.03)
T-choice(M/T-split and M/T-equity)* $\not\Rightarrow$ *O-equity*				0.26***
				(0.03)
O-equity is self-serving T-choice*				0.04*
				(0.02)
Constant	0.49***	0.39***	0.44***	0.49***
	(0.03)	(0.03)	(0.03)	(0.03)
Observations	2100	2100	4200	4200

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors are clustered at the subject-level and shown in parentheses. The results are from a linear probability model of likelihood to forgo the O-equity allocation. The types of equity that do not imply O-equity is achieved are denoted by a series of indicators: ***M/T-split*** $\not\Rightarrow$ ***O-equity*** is an indicator for the allocation that achieves an M/T-split not achieving O-equity; ***M/T-equity*** $\not\Rightarrow$ ***O-equity*** is an indicator for the allocation that achieves M/T-equity not achieving O-equity; and ***M/T-split and M/T-equity*** $\not\Rightarrow$ ***O-equity*** is an indicator for the allocation that achieves an M/T-split and M/T-equity not achieving O-equity. ***O-equity is self-serving*** is an indicator for when the O-equity allocation requires the first participant to give up the least amount of money or time. ***T-choice*** is an indicator for time allocation choices. Data are from the decisions of first participants—with accurately estimated calibration values—among endowment sets where it is possible to achieve O-equity in the *Money & Time, First Person* version of our study.

M/T-equity $\not\Rightarrow$ *O-equity*) shows that subjects are 26 percentage points more likely to forgo the O-equity allocation if a different allocation achieves a T-split and T-equity rather than an M-split and M-equity.[46] Appendix Table D.9 shows that these results are robust to the same robustness tests considered in the *Money & Time, Baseline* version.

prosocial behavior in time domains than monetary domains (Ellingsen and Johannesson, 2009; Davis et al., 2015).

[46] Appendix Figure C.5 again shows that this result is likely driven by a greater preference for achieving T-equity than M-equity (as opposed to a greater preference for achieving a T-split than an M-split).

4 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). Subjects engage in narrow bracketing of equity concerns even at the expense of achieving overall equity and even when they must incur private costs to do so. Results from the *Money & Time* versions of our study additionally document that individuals are more inequity averse in time than in money. Subjects believe these patterns of behavior are socially appropriate (see Section 3.2.2) and the patterns are robust to both uncertainty in endowments (see Section 3.2.3) and self-serving motives (see Section 3.2.4).

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. 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.

Our finding that equity concerns are narrowly framed helps explain the context effects that have been observed across settings testing inequity aversion (Fehr and Schmidt, 1999; Bolton and Ockenfels, 2000). For example, that individuals narrowly bracket equity concerns may help explain why individuals behave differently when 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.[47] 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 (see also Exley and Kessler (2018)).

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

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

dimensions.[48] Similarly, other social programs that provide income or in-kind support also often have associated time costs (Sunstein, Forthcoming).[49]

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.[50] Vacation time is often equal across workers or solely based on a worker's tenure at a firm. When snow days cause school cancellations, effort is taken to ensure equal "make-up" work across teaching and non-teaching staff.[51] 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.[52]

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.[53] This pattern may contribute to the "volunteering puzzle," which refers to 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

[48]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).

[49]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.

[50]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 and other organizations use work-sharing rules (e.g., by cutting hours equally) so that all workers would suffer the same consequences in hours, even if their hourly wages differed.

[51]For example, see the policies discussed by the Gateway Regional School District in Massachusetts https://perma.cc/PP6B-KWJ2.

[52]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." Also, 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."

[53]In 2008, the Church of Jesus Christ of Latter Day Saints began asking congregants to clean the church buildings, sometimes assigning individuals to volunteer alphabetically by last name. The Church does not provide an alternative option of making an extra donation, even though it previously used congregant donations to pay janitorial staff to do the same job (Evans, Curtis and Cnaan, 2013).

market and subsequently donate (Handy and Katz, 2008; Lilley and Slonim, 2014).[54]

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.[55] 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.[56] 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. For example, while some adoption agencies implement fees that vary by household income, they do not let families pay to adopt a child faster.[57] Immigrants cannot pay to expedite certain parts of their immigrant probationary period, and the age at which one can vote or drink cannot be reduced by a monetary payment (Cohen, 2016). There is currently a push in cities across the U.S. to eliminate cash bail, in part because it gives the rich a way to avoid time in jail that is not available to the poor (Covert, 2017). An organ transplant that could add years to a recipient's life cannot be legally purchased.[58]

As noted above, no single theory can explain all of these phenomena on its own, each of these examples has received attention and has been the subject of other proposed explanations, from both inside and outside of economics.[59] Nevertheless, that our two findings are consistent with

[54]Of course, as noted above, there are other well-documented reasons why volunteering may differ from donation. For example, time contributions often occur in more observable situations than money contributions, and the resulting image motives are likely instrumental. For examples of image motivations in the context of prosocial behavior, see Gneezy and Rustichini (2000); Andreoni and Bernheim (2009); Ariely, Bracha and Meier (2009); Meer (2011); Castillo, Petrie and Wardell (2015); Exley (2017).

[55]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).

[56]In response to lobbyists paying people to stand in line for seats for the U.S. Supreme Court's oral arguments, the Court has discouraged the practice of individuals holding a place in line for others (Totenberg, 2015). There is also anger over scalpers who resell appointment times for doctors in Beijing's Hospitals (Reuters, 2016); users of fast-track lanes at amusement parks (McArdle, 2013; Wallop, 2010); theatergoers paying people to stand in line for tickets to see free Shakespeare in the Park performances in New York City (Sandel, 2012); and airline travelers paying for preferential service at airport security, during aircraft boarding, and at passport control (Lind, 2012). Similarly, Oberholzer-Gee (2006) examines outrage over raising prices in the presence of excess demand.

[57]The Independent Adoption Center, an open adoption agency formed in 1982, charges more to high income prospective parents, but prospective parents cannot pay to adopt a child faster.

[58]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. Attempting to subvert these organ donation rules is also a crime. The restrictions, which are codified by the National Organ Transplant Act of 1984, persist despite substantial excess demand for organs and years-long waiting lists. Substantial research is devoted to attempting to increase the supply of organs, see, e.g., Kessler and Roth (2014). Of course, concerns about paying for access to organs may also reflect concerns about the the sanctity of the human body as in Elias, Lacetera and Macis (2015*b*).

[59]In Psychology, Fiske and Tetlock (1997) discusses "taboo tradeoffs" that prevent transactions across domains.

all these phenomena is encouraging in the potential usefulness of our results in modeling such attitudes and behaviors.

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.[60] Inequity in money is more obvious and observable than inequity in time. 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.[61]

In Philosophy, Sandel (2012) discusses how outrage over paying to cut a line may reflect discomfort about the "ethic of the queue" being replaced by the "ethic of the market."

[60] For instance, individuals may believe that time is more equally distributed than money, which may contribute to why time individuals deem contributions of time as a better signal of individuals' preferences than contributions of money (Shaddy and Shah, 2018).

[61] That is, while the opportunity cost of time, available leisure time, and life expectancy may vary widely across individuals, these differences may be harder to observe.

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