Mental Accounts and the Mutability of Altruism:  
An Experiment with Online Workers  

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Abstract

This study uses a framed field experiment to investigate whether the neoclassical model or mental accounting better describes how income from different sources are treated in sharing decisions. Participants play a dictator game after earning income in real-effort task and/or receiving a windfall. I find that dictators treat marginal earned and windfall income as partially infungible, which supports mental accounting. Two-step estimates show that sharers shared 15% of a marginal windfall token and 7% of a marginal earned token. Strikingly, sharers who had income from both sources were sharply less generous with both earned and windfall income than those who had only a single source. This is consistent with other instances of complex decision frames inducing selfish behavior by providing a cover of ambiguity. This aspect of mental accounts has thus far received little attention. A follow-up experiment shows that two accounts must qualitatively different, not just multiple in number, to induce more selfishness.

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1 Introduction

We are all approached on occasion by others asking for money. Solicitations arrive by both post and e-mail, friends seek sponsorship for charity runs and rides, and retail stores ask if we will donate to a food bank or other charity as we check out. The funds at our disposal have an important influence on how we respond to such requests. These funds come to us from a wide variety of sources, such as wages, bonuses, business profits, welfare benefits, tax refunds, rent, investment returns, gifts, gambling winnings, and so forth. While such source categories are widely used by individuals in both describing and managing their income, economists have offered differing theories about whether categorization matters for choice.

The theory of mental accounting holds that individuals view some kinds of spending as more appropriate for some categories of income than others. The source of a marginal dollar will therefore have an effect on choice. In particular, income earned in exchange for labor is thought to be treated differently than income from windfall (Thaler, 1999; Fogel, 2014). Neoclassical economics, by contrast, holds that categories don’t matter. A dollar is a dollar no matter where it comes from, and only the total amount is relevant.\(^1\) Neoclassical economics thus holds income to be perfectly fungible at the margin across sources, while mental accounting holds it to be infungible.

In this paper, I present the results of a framed field experiment that investigates how the categorical distinction between earned income and windfall income affects sharing decisions at the margin.\(^2\) I recruited 1,022 participants from an online labor market to take on the role of dictator or receiver. Dictators earned income via a real-effort task and/or were given windfalls. They then made a decision about how much of their income to share with receivers.

The experiment answers two primary questions: 1) Do dictators treat earned and windfall income as fungible at the margin, as the neoclassical account would predict, or as infungible, as mental accounting would suggest? 2) Does behavior differ when both income sources are present

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\(^1\)Time and liquidity also often figure in a neoclassical model, but I abstract from them here.
\(^2\)See Harrison and List (2004) for a typology of lab and field experiments.
at the same time, increasing the complexity of the decision frame, than when only one source is present?

The experiment measures the causal effects of earned and windfall income on sharing at both the intensive and extensive margins.\textsuperscript{3} Dictators were randomized into treatment cells that induced exogenous variation in both 1) whether and 2) how much income was accrued from earned and windfall sources. The design insures marginal changes in sources are not correlated with total income on average.

The treatment cells are partitioned into two frames that differ in the number of mental accounts in use. In the single-source frame, dictators either earn income or receive windfall, but not both. In the two-source frame, they both earn income and receive a windfall. Average income does not differ between frames. The decision environment is thus more complex in the two-source frame.

I compute the marginal willingness to share from earnings $s_e$ and windfall $s_w$. I distinguish between the neoclassical and mental accounting theories by testing whether dictators treat earned and windfall income as completely fungible ($s_w = s_e$ and $s_{we} = s_{ee}$), completely infungible ($s_w \neq s_e$ and $s_{we} = 0$), or partly infungible ($s_w \neq s_e$ and $s_{we} \neq 0$). My estimations use the expected earnings and windfall in each treatment cell as instruments for the realized values.

Pooling all treatments, I found that dictators shared about 8.5\% of a marginal windfall token and 1.9\% of a marginal earned token on average. They are more generous with marginal windfall than marginal earnings, which is inconsistent with fungibility and supports the mental accounting view. About 27\% of dictators shared no tokens with the receiver. A Heckman two-step estimator allows me to measure the marginal willingness to share specifically for sharers. Sharers shared 15\% of a marginal windfall token and 7\% of a marginal earned token.

An interaction between earned and windfall income is negative and significant when included in the regression. This shows that dictators treat windfall and earned tokens as only partially rather than fully infungible. In other words, the marginal willingness to share from either source falls in

\textsuperscript{3}In this paper I will use the terms “source” and “mental account” interchangeably because it is primarily from the differential treatment of income sources that we infer the use of mental accounting. Note, however, that source differences can only provide indirect evidence about the mental representations of decision makers.
the level of the other source, holding total income constant. To put it another way, preferences over the two sources of income are not separable.

Dictators share substantially less marginal income from both earned and windfall sources in the two-source frame than the single-source frame. With only one source present, the marginal willingness to share from an additional token is 20% for windfall and 11% for earnings for sharers. With both sources present, the margins are 8% for windfall and 5% for earnings. Dictators remain more willing to share windfall than earned income when there are two sources, but the marginal effects are only half as large as when there are two sources.

The partial fungibility observed in the pooled data primarily reflects whether a second source is present or absent, pointing to the discrete effect of a change in decision frame. Mental accounts thus have an effect not only through categorization but also through complexity.

The two-source frame differs in two main ways from the single source frame: 1) Income is accrued in two temporally disjunct episodes in the two-source frame and in one episode in the single-source frame, and 2) Income is of two qualitatively different types, earned and windfall, in the two-source frame. While the theory of mental accounting emphasizes the qualitative difference between earnings and windfall, reduced sharing in the two-source treatment could be driven primarily by simply having two sources rather than one.

I conducted a follow-up experiment to further investigate which characteristics of the two-source frame led to substantially lower sharing. For dictators, I replaced the real-effort task with a randomly assigned windfall of equivalent value in each treatment cell. They then completed the demographic survey. Dictators in the two-source frame were then given a second windfall, while those in the single source frame proceeded directly deciding about sharing.

Sharers in the single-source frame of the follow-up shared about 33% of a marginal token, somewhat more than the single-source windfall in the main experiment as the follow-up excluded some high-income treatment cells. In contrast to the main experiment, however, sharing was not lower in the two-source frame than the one source. For sharers, the marginal willingness to share was 30% from the first windfall and 33% from the second windfall. These estimates show that
introducing a second source on its own does not induce more selfish behavior at the margin. It matters that the sources in the main experiment are qualitatively different.

In summary, mental accounts affect sharing behavior because 1) people treat earned and windfall income differently at the margin, making them infungible, and 2) the presence of two sources in the decision frame rather than a single source leads dictators to share much less of either. Overall, participants treated earned and windfall income as partly fungible, though the effect of one source on the other was mainly a matter of its presence or absence. The abrupt change in marginal sharing with the introduction of the second source gives credence to the notion that a more complex decision frame is what enables increased selfishness. These results provide evidence for the influence of income categories on behavior both through in the standard mental accounting view of greater generosity with windfall and through the novel result that mental accounts increase complexity.

The remainder of the paper is organized as follows. Section 2 explains the experimental design in detail. I explain the statistical methods I use to analyze the data in section 3. Section 4 presents the results of the analysis. Section 5 provides a discussion of the findings including their relationship to the literature on mental accounts, self-signaling and ambiguity, and framing effects in dictator games.

2 Design

Participants in the experiment are divided into two roles, dictator and receiver. Dictators first accumulate income. There are two sources of income: earned income $e$, which is based on performance on a real-effort task and windfall income $w$. Total income is $y = w + e$. Dictators are presented with the choice to share some of their total income with a receiver. I will call the amount shared $s$ and call the mapping between income and choice $s(w, e)$. The experiment uses variation in $w$ and $e$ to allow for measurement of the marginal effects $s_w$ and $s_e$ at different values of $(e, w)$.

Dictators are divided into treatment cells that create random variation in expected earnings and windfall. I describe how this random variation in created in detail below. I group the treatment
groups into three categories: 1. The earned income only category (EO), in which they only earn income. 2. The windfall only (WO) category, in which they only receive windfall, and 3) the earned income and windfall (EW) category, in which dictators accumulate from both sources. The EO and WO categories comprise the single-source decision frame. The EW category is the two-source decision frame.

2.1 Mental accounts and the sharing function

This section builds up intuition about what the shape of \( s(w,e) \) can tell us about whether participants treat income sources as fungible or infungible. We consider a decision maker with two mental accounts \( w \) and \( e \). The decision maker must choose how much to share \( s \) as a function of the size of the accounts \( s = s(w,e) \).

In the neoclassical model, fungibility of income means that the decision maker must share the same amount \( \bar{s} \) for any combination of \( w \) and \( e \) that sum to \( \bar{y} \).

\[
\forall (w,e) \ (w + e = \bar{y} \implies s(w,e) = \bar{s}) \tag{1}
\]

Fungibility puts several restrictions on the shape of \( s(w,e) \). The first is that a marginal increase in either \( w \) or \( e \) must have the same effect on \( s \).

\[
\frac{\partial s}{\partial w} = \frac{\partial s}{\partial e} \tag{2}
\]

A marginal increase in either windfall income \( w \) or earned income \( e \) must have the same effect on the sharing choice at all values of \( (w,e) \). Equation 2 entails that the equalities

\[
\frac{\partial^2 s}{\partial w^2} = \frac{\partial s}{\partial e \partial w} = \frac{\partial^2 s}{\partial e^2} \tag{3}
\]

will also hold when income sources are fungible. I will use econometric estimates of the shape of \( s(w,e) \) to conduct tests of the restrictions given by equations 2 and 3.
The mental accounting approach proposes that decision makers apply different rules to different income sources. This relaxes the requirement of fungibility. Thaler (1999) and Fogel (2014) suggest the particular rules that decision makers share more of a marginal windfall dollar will be shared than a marginal earned dollar $s_w > s_e$. This is an alternative hypothesis about the shape of $s(w, e)$ to that expressed by equation 2.

We can distinguish between two types of infungibility: complete infungibility and partial infungibility. Complete infungibility requires that the marginal amount shared from one source does not depend at all on the level of the other, which means that $s_{we} = 0$. An example of such a sharing function is $s(w, e) = \omega(w) + \epsilon(e)$. The decision maker completely ignores the level of $e$ when making decisions about $w$ and vice versa. Incomplete fungibility means that the fraction of a marginal dollar shared from one source may depend on the balance in the other source, which implies $s_{we} \neq 0$. We might think of complete infungibility as a “strong” mental accounting and incomplete fungibility as “weak” mental accounting.

### 2.2 Design overview

The experiment used workers in the online labor market Amazon Mechanical Turk as subjects. I played the role of an employer in the market, and the experiment appeared to workers as a task they could contract to perform. Workers who agreed to undertake the task were divided into pairs. I refer to members of the pair as partners. Each participant received a fixed payment of $0.40 for agreeing to take part. Partners were randomly assigned the role of dictator or receiver in a one-shot game. To avoid bias that might come from those labels, I refer to them as role B and role A within the experiment. Dictators accumulate tokens as compensation for completing a task, as a windfall, or both. Tokens were worth $0.03 each. After accumulating tokens, dictators are given an opportunity to share with their partner. Dictators know their partners have not been given a chance to accumulate any tokens. Tokens are paid out after the experiment is over. Participants also completed a short demographic survey.

The token-earning activity is a time-limited number-matching task. Like many AMT tasks,
number matching 1) requires effort and concentration and but no specialized skill and 2) is repetitive. Earned tokens $e$ are awarded based on the how many correct matches are made. More correct matches mean higher earnings. The duration of the matching task is randomly assigned to create exogenous variation in the realized value of $e$. This random variation allows me to use instrumental variables estimation.

The design ensures that there is variation across dictators in both windfall and earned tokens so that the marginal willingness to share from each source, $s_w$ and $s_e$, can be measured independently of total income. The total tokens accumulated depend on a randomly assigned task duration, skill in the task, and a randomly assigned windfall level. Dictators were not made aware that there were multiple task durations to avoid inducing a feeling of being lucky or unlucky in the task. Those dictators who had a single source were not informed that some participants had a different one or both.

2.3 Number matching task

The number-matching task allowed dictators to earn tokens through exerting effort. In the task, dictators are shown a series of grids containing nine numbers between 1 and 99. Figure 1 shows an example grid. Each grid contains at least two numbers that sum to 100. Participants solve the grid by clicking check boxes next to two numbers that sum to 100. Once two check boxes have been clicks, the experiment automatically advances to the next grid. Figure 1 shows an example grid.

The task lasts a fixed duration the length of which depends on the treatments discussed below. Participants were awarded tokens based on whether the scored above or below the median for the duration they were assigned. A pilot test established the median for each task duration. No feedback was provided on performance or on the number of grids attempted during the task. You may try a 240 second version of the task by clicking here.
2.4 Experimental treatments

Dictator/receiver pairs were randomly assigned to one of 25 treatments that are partitioned into two frames depending on which sources are present. The single source frame has the earned income only (EO) and windfall income only (WO) treatments, while the two-source frame has earned and windfall income (EW) treatments.

The treatments are structured to meet two objectives. The first objective is to create exogenous variation in both earnings and windfall. This is a challenge in the case of earnings, as the skill and effort an individual brings to bear on the task means that their reward $e$ is endogenous. The second goal was to produce variation in $w$ and $e$ that spans the positive orthant between total income levels of 30 and 270 tokens.

Randomization takes place in three steps. First, a pair is assigned to the EW, EO, or WO treatment types. EW pairs are then assigned a task duration of 60 to 800 seconds and a windfall level, which is low, medium, or high for most task durations. EO pairs are assigned a task duration of 180 to 1200 seconds. WO pairs are assign a windfall level from low to high. Task durations were chosen based on a pretest of the task to insure expected earnings would scale linearly with the median number of grids completed.

Figure 2 presents a diagram of the experimental design. I have limited the diagram to total token payouts of 50 or less for legibility. The expected windfall and earned tokens from each treatment assignment is shown in orange. Realized token amounts are shown in green. The ovals shown on the diagram illustrate how the expected and realized token combinations are related in EW treatments. The solid oval shows the three expected payouts that correspond to a task duration of 180 seconds. Each of these has expected earnings of 25 tokens. The dashed ovals show the expected and realized payouts for the high, medium, and low windfall levels when the task duration is 180 seconds. Here, the high windfall level has an expected windfall payoff of 25 tokens, the medium 15 tokens, and the low 5 tokens. The realized payouts to the right of the solid oval are reached when an individual performs above the median in the task, while those to the left are reached when performance is below the median. The diagram shows that a person randomized
into the 180s task, medium windfall treatment will realize earnings of 20 tokens and windfall of 20 tokens if they perform below the median and earnings of 30 tokens and windfall of 10 tokens if they perform above the median. Full details of the design including a table listing the features of each treatment are presented in Appendix Table A1.

The dependence of both windfall and earned realization on performance may seem odd, but this design allows me to evenly span the range of the earned share $\theta$ for each level of total earnings while ensuring exogenous variation in both earned and windfall tokens.\(^4\) In this way, marginal changes in either earned or windfall tokens will not be correlated with total income. The exogenous variation enables me to do instrumental variables estimation. While assigning dictators to tasks of different duration creates exogenous variation in expected tokens, realized earnings also depend on participant skill in the task. Below median performers on the task will tend to get a greater share of earnings from windfall while above median performers will get a greater share from earnings. Similarly, above median performers will get lower realized windfalls on average. Estimating the marginal effects of earnings and windfall on giving therefore presents an identification problem.

I use the random assignment of duration, treatment, and windfall level to create instrumental variable for actual earnings and actual windfall. The instruments can be computed as either 1) expected earnings and expected windfall given randomly assigned treatment group or 2) a set of dummy variables for the 25 treatment groups. Under the assumption that task duration has an effect on sharing only through its effect on income, expected earnings and windfall are valid instrumental variable for actual earnings. I compute expected earnings and windfall using weights of 0.5 on each potential realization.

2.5 Dictator’s choice

After they have finished accumulating tokens, dictators are presented with an opportunity to share tokens with their partner. Figure 3 shows how the decision is presented to the dictators in the two-

\(^4\)A simple random assignment of fixed windfall amounts common to all task durations would have made share of total tokens that come from earnings rise with earnings, making it difficult to achieve the coverage of the positive orthant I desire.
source frame. Note that the text reviews the dictator’s earned and windfall tokens and shows the sum. Dictators make a single choice involving the sum. The bars shown in the figure are initially in the zero position and have to be adjusted to the dictator’s choice. A second screen reviewed their choice and asked them to confirm or revise.

### 2.6 Two windfall follow-up experiment

There are three main ways in which accumulating income through earned and windfall sources in the EW treatments differs from the EO and WO. First, there is the primitive difference between having one source or account versus two. Second, there is a qualitative difference in the means by which income is acquired. Earned income is incentivized compensation for performance on the number matching task. Windfall income is a simple transfer. Third, earned income is accrued first and windfall income second.

I investigate whether removing the qualitative difference between earned and windfall income alters the results found in the main experiment. I run a variation of the experiment that 1) eliminates the EO treatments and 2) replaces earned income in the EW treatments with another windfall that pays an equivalent amount of tokens to the task.\(^5\) I place the demographic survey between this new windfall and the second windfall, which is the same as in the main experiment. To economize, total income in the follow-up ranged between 30 and 50 tokens, compare to 30 and 270 in the main experiment.

The follow-up thus generates the same pattern of income in two accounts as the main experiment, with the difference that both accounts now accrue only windfall income. Comparing the results from this follow-up to the main experiment will show the role played by the qualitative difference in how income is acquired.

\(^5\)Dictators are randomly selected to receive either the above-median or below-median amount for the task duration nominally associated with their treatment cell.
2.7 **Subject population**

The experiment used workers in the online labor market Amazon Mechanical Turk as subjects. AMT is the largest internet platform for distributed outsourcing, also known as “crowd-sourcing.” Employers use these markets to hire workers for tasks that require human intelligence, can be broken into discrete chunks, and can be completed using an internet-enabled computer. Tasks available to workers include classifying images by content, performing web searches, data entry and validation, taking market research surveys, transcribing audio, translating text, and commenting on blog posts. AMT allows employers to specify that workers can complete a task only once or multiple times. Workers see a list of tasks they are eligible to work on. The list contains detailed information about the work and the payment offered by the employer. When a worker agrees to perform a task and completes it, employers verify the quality of work, release payment to the worker, and may give a bonus.

A number of studies have compared the behavior of AMT workers to the university undergraduates, who are frequently used as subjects in the literature on social preferences. Horton et al. (2011) compared subjects recruited using AMT to Harvard University undergraduates on identically framed experimental tasks. The two groups performed similarly in the prisoners’ dilemma both with and without a religious prime and in a classic choice dilemma that contrasts gain and loss framing. They then used a transcription task to show that labor supply increased in offered wage. Replication of classic decision phenomena such as loss aversion, the conjunction fallacy, and outcome have shown that AMT workers and university undergraduates behave similarly (Paolacci et al., 2010; Buhrmester et al., 2011).

Nevertheless, AMT workers are difficult to monitor, which may increase the temptation to shirk. To test whether workers were paying close attention, my experiment included a manipulation check. Workers had to read a paragraph and answer a question. The final sentence of the paragraph was designed to mislead workers who might superficially skim for the correct answer (see Appendix A1.3).
3 Methods

This section describes the approach I take to estimating the marginal willingness to share windfall and earned income. Denote the windfall tokens accumulated by a dictator as \( w_i \) and earned tokens by \( e_i \).

I use a regression of the dictator’s choice \( s_i \) on the \( w_i \) and \( e_i \) they obtained in the experiment as my primary tool.

\[
s_i = \alpha + \beta_w w_i + \beta_e e_i + \varepsilon_i
\]  

Recall that earnings are in part determined by performance on the task. If skill at the task has a direct effect on the sharing choice, OLS estimates could be biased. Because the design ensures that there are both above and below median performers at almost every realized \((w, e)\), the bias is likely to be small. Nevertheless, I compute the expected windfall and earned income for each randomly-assigned treatment cell and use them as as instruments for \( w_i \) and \( e_i \). To perform tests for the fungibility of income between sources I estimate variations of equation 4 that introduce higher level terms in \( w_i \) and \( e_i \) as well as the interaction \( w_i \times e_i \).

In most dictator games, a substantial fraction of participants give zero. Both design and practical considerations restrict participants from sharing less than zero (i.e. taking from the recipient), though some might choose to if it were feasible. Since the design imposes a lower bound of zero on sharing, we can think of the amount shared as truncated at zero. There are several methods for taking latent preferences/truncation into account in estimation. The simplest is the tobit estimator, though it is inconsistent under heteroskedasticity and assumes that a single process determines whether and how much the participant would like to share. It could be that the dictator first decides whether to share and then, conditional on deciding yes, chooses how much.

Define the additional variables \( p_i^* \) to represent the latent desire to share something rather than
nothing and $p_i$ to represent the decision to share a positive amount. We then have

$$p_i = \begin{cases} 
1 & \text{if } p^*_i \geq 0, \\
0 & \text{if } p^*_i < 0. 
\end{cases} \quad \text{and} \quad s_i = \begin{cases} 
s^*_i & \text{if } p_i = 1, \\
0 & \text{if } p_i = 0. 
\end{cases}$$

(5)

With this two-step model of dictator behavior, we can recover the marginal effects of windfall and earned income on the latent willingness to share using the Heckman two-step procedure (Cameron and Trivedi, 2005). This procedure uses an augmented version of equation 4 for $s_i$ and a second equation for $p_i$.

$$s_i = \alpha + \beta_w w_i + \beta_e e_i + \gamma \lambda(x'_i \hat{\Theta}) + \varepsilon_i \quad \text{if } p_i = 1, \text{ and}$$

$$p_i = \delta + x'_i \hat{\Theta} + \nu_i \text{ for all } i.$$  

(6) (7)

where $\lambda(\cdot)$ is the inverse Mills ratio and $x_i$ contains exogenous variables that affect whether the dictator shares anything. In this application, $x_i$ contains indicators for whether the dictator has a low, medium, or high windfall and indicators for task duration. The estimated coefficients $\hat{\Theta}$ are obtained by probit estimation of equation 7 on the full data. Estimates $\hat{\beta}_w$ and $\hat{\beta}_e$ are then obtained by estimating equation 6 using 2SLS on the subset of participants who shared a positive amount. These estimates can be interpreted as the marginal willingness to share for those who decide to share.

4 Results

A total of 2,155 AMT workers completed in the experiment during the summer and fall of 2012. All participants resided in India. The experiment included a manipulation check to insure that participants were fully engaged (see Appendix A1.3). The check was passed by 1,636 participants, or about 76%. The analysis below will focus on this group, though including those who failed the check does not qualitatively change the results. There were 1,022 participants in the main
experiment and 614 participants in the two-lottery follow-up experiment.

4.1 Participant characteristics and task performance

Table 1 shows some characteristics of the participants. They averaged 20.4 years old. Most had completed college and 28% had a postgraduate degree. The postgraduate completion rate in India for this cohort is about 6%, so the participants are much better educated than average. Females made up 39% of the total. Most participants work full time and spend the majority of their work hours on distributed outsourcing tasks, either using AMT or another online labor market. At the end of the experiment, 91% of participants judged the English used easy or very easy to understand.

On average, the 507 dictators in the main experiment accumulated $2.09 (about 70 tokens), and spent 13m47s completing the entire experiment. This works out to an hourly rate of $10.67 when we include the $0.40 participation fee. While this is a typical rate for workers on AMT, it is quite high compared to average wages in India. A full-time job paying $10 per hour is well into the top decile of earnings in India (Dubey and Vanneman, 2011).

Figure 4 shows the distribution of matrices solved per minute relative to the median rate for the task duration. Recall that above-median performance paid more. The distribution is smooth around the median, suggesting that workers did not decrease effort if they passed it. There was substantial variation in the number of matrices solved. The 75th percentile worker was twice as fast as the 25th percentile worker. The timer ran only while the matrices were displayed, so the dispersion does not reflect network latency. Solving an extra grid per minute translated to approximately 10 additional tokens.

4.2 Overall marginal willingness to share

In this section, I present the main regression results for dictators’ marginal willingness to share and discuss the fungibility of earned and windfall income. These estimates pool single source and two source frames. We will analyze the effects by frame in a later section.

All independent variables are rescaled by dividing by 10 to make the tables easier to read.
Coefficients thus show the marginal effects of 10 additional tokens. The effect of one additional token can be obtained by dividing the coefficient by 10. In discussing the results, I perform this conversion to express estimates in terms of the percentage of a marginal token that would be shared. Observations are weighted to give an equal weight to each level of expected income and expected earned share.

I begin with the average marginal willingness to share additional windfall and earned tokens for all dictators (Table 2, Panel A). The first column shows OLS estimation of equation 4. The average dictator is willing to share 9% of a marginal windfall token and 1% of a marginal earned token. The difference of 8 percentage points is statistically significant at p=0.09. These estimates could both be biased as task performance has an effect on earned and windfall income. I use expected earnings and windfall as an instrument in column 2. The average willingness to share is 9% for a marginal windfall token and 2% for a marginal earned token. The difference of 7 points is marginally significant (p=0.12). The constant is positive, which suggests the overall marginal willingness to share falls with income. The similarity of the OLS and 2SLS estimates suggest that endogeneity bias is small. I add controls for gender, age, education level, and work hours in column 3. The windfall effect increases slightly.

Twenty-seven percent of dictators decided to give zero tokens to the receiver. I use the Heckman two-step approach outlined in section 3 to allow for the possibility that whether and how much to share are separate decisions. The two-step estimates are presented in Table 2, Panel B. These estimates can be interpreted as the marginal willingness to share from an additional token for the subpopulation of sharers. As we would expect, the effects are much larger than those for all dictators. Sharers part with about 18% of a marginal windfall token and 9% of a marginal earned token using OLS estimation (column 1). The difference of 9 percentage points is statistically significant (p=0.04). The 2SLS estimates for sharers are 15% and 7%, respectively. Adding controls in column 3 yields estimates of 16% and 6%, and the 10 point difference between them is marginally significant (p=0.12).
Marginal source changes and total income

The estimates in Table 2 show that dictators do not treat marginal earned and windfall income the same. In order for us to conclude that the income sources are infungible, it is important to know that total income is unaffected by marginal changes in the sources. If an increase in earned income relative to windfall were to be correlated with increasing total income, for example, the marginal willingness to share from each source would be confounded with the marginal willingness to share overall.

The experimental design randomizes participants to levels of expected earnings and windfall so that total income should not vary with the fraction that is earned or from windfall. I use a local-linear regression to show how total income varies with the share earned (Cameron and Trivedi, 2005). The expected earned share serves as an instrument for the actual earned share and the bandwidth used is 0.2. Figure 5 plots the estimated conditional mean of total income against the share of income that is earned. The figure also shows the 24 different realized combinations of total income and the share earned. The two are clearly uncorrelated on average, and only weakly correlated local to any particular level of the earned share.

Fungibility

The estimates in Table 2 already show that dictators do not treat earned and windfall income as fungible at the margin. They are more willing to share marginal windfall tokens than marginal earned tokens. Recall that we can distinguish between partial and complete infungibility by examining the cross-partial derivative $s_{we}$ and that fungibility implies the equality of second-order derivatives $s_{ww}, s_{ee},$ and $s_{we}$.

Table 3 adds an interaction between windfall and earned tokens to the basic specification. The uncorrected 2SLS estimate of the cross-partial effect $s_{we}$ is negative, large in magnitude at -0.11, and statistically significant (column 1). While the difference between earned and windfall margins remains about 7 percentage points, the marginal effects are larger than in the non-interacted regression (Table 2, panel A, column 2). A similar pattern appears when we use the two-step estimator
The negative interaction coefficient implies that dictators treat the two income sources as only partially infungible (see Section 2.1). An additional earned token will have a negative effect on the marginal willingness to give windfall, and vice versa. The estimates in columns 1 and 3 could mislead us about the sign of $s_{we}$ if the marginal willingness to share each source falls at a different rate. If that were true and only linear terms in windfall and earned income were included in the regression, a negative coefficient could appear on the interaction even if income were completely infungible. I add quadratic terms in earned and windfall income in columns 2 and 4. The size of the interaction term is unchanged and remains significant. A further test for fungibility, the equality of second-order derivatives $s_{ww} = s_{we} = s_{ww}$, rejects the null ($p < 0.01$) both regressions.

### 4.3 Single-source and two-source frames

The analysis presented so far has combined data for all dictators. Recall that dictators were presented with two different frames. Some dictators accrued income from one source only, either earned income only (EO) or windfall income only (WO), while others income from both earnings and windfall (EW). When making their decision, dictators are presented with information about income accrued in the sources they had access to and, if they had both sources, the total. It is thus only in the two-source frame that dictators are presented with information about multiple accounts. I estimate the marginal willingness to share for single and multiple source treatments separately in Table 4 panels A and B. Weighting insures that average income is almost identical across the estimations so that we can compare the coefficients.

The marginal willingness to share for single source treatments is shown in Table 4, Panel A. The willingness to share a marginal windfall token is about double that of a marginal earned token. Comparing the margins for single sources to the overall estimates in Table 2, 2SLS estimates in column 1 show the magnitude is slightly larger in the case of windfall (13% vs 9%) and substantially larger in the case of earned income (6% vs 2%). The differences are smaller in relative terms for the two-step estimates (20% vs 15% and 11% vs 7%) in column 2. Dictators are overall more
generous than average when they are exposed to a single source, which in part explains the negative interaction term in the fungibility analysis. I add a dummy for the WO treatments in columns 3 and 4 to allow for different intercepts across sources. There is no meaningful change in the estimates.

The marginal willingness to share for dictators who had both earned and windfall income is shown in Table 4, panel B. Comparing the two panels, we see that the marginal willingness to share either windfall or earned income is much lower when both sources are present than when only one is. The uncorrected 2SLS estimates show less than one-fifth the level of marginal generosity when both sources are present (windfall: 3% versus 13%; earned income: 0.4% versus 6%). For sharers, the two-step estimates show less than one-half the level of marginal generosity for both windfall (8% versus 20%) and earnings (5% versus 11%).

To a substantial degree, then, the partial fungibility ($s_{we} < 0$) we saw when pooling treatments (see Table 3) is driven by the difference between seeing one income source or two. I add an interaction to the two-source regressions in Table 4, Panel B to see if partial fungibility also holds within those who saw two sources (columns 3 and 4). The magnitude of the 2SLS interaction is similar to what we saw with the pooled data but the two-step interaction is smaller. The linear terms are of similar magnitude. While the point estimates are statistically insignificant, these regressions suggest that sharers see windfall and earned income as more completely infungible when both are present.

To summarize, Table 4 presents a comparison of sharing behavior with earned and windfall income when they are accrued in isolation or together. Overall dictators are more generous with marginal windfall tokens than marginal earned tokens. Most strikingly, they are much less generous at the margin when both sources occur than when they appear in isolation. The presence of two sources as opposed to one makes the dictators much less sensitive to changes in income in their sharing behavior. This difference largely accounts for the partial fungibility ($s_{we} < 0$) observed in the overall data.
4.4 Two windfall sources

The main results so far are that 1) dictators share less of a marginal earned than a marginal windfall token, 2) earned and windfall income are partially infungible, and 3) partial infungibility primarily reflects lower marginal sharing from either source when both sources are present than when they are encountered in isolation.

Windfall and earned income differ in three main ways in the experiment. First, there is a qualitative difference. Earned income is received as compensation for work. Second, in the two source frame, earned and windfall income are presented as distinct accounts. Third, earned income is accrued first and windfall income second. I investigate the roles played by these differences in a two-windfall follow-up experiment that eliminates the qualitative difference between earned and windfall income.

A total of 198 dictators participated in the two-windfall experiment. Their characteristics are comparable to participants in the main experiment. I present results on their marginal willingness to share in Table 5. Estimates for dictators in the single-source WO treatments are shown in columns 1 and 2. The estimates show a willingness to give 18% of a marginal token in the 2SLS estimation and 34% in the two-step estimate. Recall that average income for these dictators is lower than in the main experiment, which explain the higher average marginal willingness to share.

When there are two sources, the marginal willingness of share from each is roughly the same as when there is only one. The 2SLS estimates show dictators share around 24% of a marginal token from the first windfall and 25% from the second windfall (column 3). The two-step margins are 30% and 33%, respectively (column 4). I add the interaction to check for fungibility in the two-source frame. The interactions are positive and large in magnitude though insignificantly different from zero (columns 5 and 6).

The follow-up experiment shows that when there is no qualitative difference between sources, dictators treat them as more nearly fungible. Their behavior is more similar to what the neoclassical framework would lead us to expect.
5 Discussion

The experimental evidence presented above has shown that participants were much less generous at the margin 1) with income earned as compensation from a task than with income received as windfall and 2) when two qualitatively different sources of income were part of the decision frame rather than two sources of the same type or a single source.

The evidence on greater marginal generosity with windfall income builds on a longstanding literature on income sources in dictator games (Hoffman et al., 1994; Cherry, 2001; Cherry et al., 2002; Cherry and Shogren, 2008; Oxoby and Spraggon, 2008). This literature examines how sharing changes when the source of income is earnings versus windfall. It finds that dictators are more generous with windfall. My experiment advances this literature by measuring marginal effects of income sources, which allows for explicit tests of fungibility.

My findings also contribute to the small empirical literature on mental accounts in a field setting. This literature has shown that consumers treat income from different sources as infungible when one source is labeled with a particular purpose, such as government child benefits (Kooreman, 2000) or a discount coupon/voucher (Milkman and Beshears, 2009; Abeler and Marklein, 2010). They also incompletely adjust expenditures on goods when prices change (Hastings and Shapiro, 2012). By showing that qualitatively different income sources are infungible in sharing decisions, I provide evidence in favor of mental accounting.

My results further show that mental accounts affect choice not only through labeling sources but also through the increased complexity an additional source brings to the decision context. Dictators were much less generous at the margin when there were two qualitatively different income sources than when either source appeared singly. The qualitative difference between earned and windfall income mattered, as this pattern was not observed in the follow-up experiment. A range of studies have demonstrated a tendency by individuals to interpret complex information in a way that supports their own interests (Darley and Gross, 1983; Dunning et al., 1989; Sanitioso et al., 1990; Babcock et al., 1995, 1996; Babcock and Loewenstein, 1997).

One way to interpret the effect of complexity on sharing is through Benabou and Tirole’s (2011)
model of self-signaling. The model considers agents who value both their own payoffs and their self-image as prosocial. Agents rely on their own actions as signals to update their beliefs about themselves. More complex decision frames introduce uncertainty into the signal conveyed by the agent’s action. This makes the signal less informative. Consequently, a highly selfish action in a complex environment may have the same effect on self image as a modestly selfish action in a simple environment. Benabou and Tirole (2011) refer to the elements of a frame that creates a psychological decoupling of action and effect as *ambiguity*. Ambiguous situations then allow agents to reap the benefits of being selfish without damaging self image. The ambiguous context thus provides plausible deniability for one’s actions, where the entity that finds the denial plausible is oneself.⁶

Support for this interpretation of the complexity of mental accounts comes from the other work on how sharing choices are affected by framing changes that leave both the endowment and set of possible choices unaltered. These changes include allowing subjects to explicitly opt out of the choice, allowing them to delegate the choice to an agent whose past performance is known, allowing taking as well as giving, and making the subject’s action obscure to the receiver via a lottery (Dana et al., 2006, 2007; List, 2007; Hamman et al., 2010; Haisley and Weber, 2010; Lazear et al., 2012; Kessler and Meier, 2014). A common element in these sharing-reducing frames is the psychological decoupling of the relationship between the dictator’s action and outcome for the receiver through the introduction of uncertainty, indirection, or ambiguity about social norms.

More broadly, my results show that we should think of mental accounts not only as categories that have particular preferences attached to them. There is also a dynamic aspect to the way the categories are invoked in a decision context that matters for choice. In the case of sharing behavior, multiple explicit categories reduced sharing in a way consistent with the effect of complexity.

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⁶The term “plausible deniability” more typically refers to a covert espionage or military operation conducted so that the sponsoring government will appear to have no connection to the operation if it is exposed.
References


### Table 1: Participant Characteristics, N=1,418

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<th>Standard Deviation</th>
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</tr>
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Notes: Includes participants in the main (N=1,022) and two-lottery (N=396) experiments. Average characteristics do not differ substantively across experiments.
Table 2: Marginal Willingness to Share: All Treatments

Panel A. Uncorrected Estimates

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<th>(3)</th>
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<td>0.947**</td>
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<tr>
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<td>(0.397)</td>
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<td>(0.198)</td>
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Panel B. Heckman Two-Step Estimates

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<td>(0.374)</td>
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<td>10 Earned Tokens</td>
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<td>0.694***</td>
<td>0.564***</td>
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<td>6.636***</td>
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<td>(1.161)</td>
<td>(6.756)</td>
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<td>2SLS</td>
</tr>
<tr>
<td>Controls</td>
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<td>N</td>
<td>Y</td>
</tr>
</tbody>
</table>

Notes: Tokens rescaled by $\frac{1}{10}$ to better show higher-order coefficients. IV regressions use expected earned/windfall tokens by treatment cell as instruments. The first step equation in the Heckman estimation in panel B uses task time and windfall level dummies to predict giving. Standard errors computed by bootstrapping both steps and are clustered by treatment cell. Controls are gender, age, age squared, education level dummies, and average hours worked both overall and in distributed outsourcing.
Table 3: Marginal Willingness to Share: Fungibility

<table>
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<th>(4)</th>
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<td>1.487</td>
<td>1.908**</td>
<td>1.541*</td>
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<tr>
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<td>(0.267)</td>
<td>(0.871)</td>
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<td>(0.920)</td>
</tr>
<tr>
<td>10 Earned Tokens</td>
<td>0.570***</td>
<td>1.510*</td>
<td>1.102***</td>
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</tr>
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<td></td>
<td>(0.102)</td>
<td>(0.787)</td>
<td>(0.201)</td>
<td>(1.040)</td>
</tr>
<tr>
<td>10 Windfall Tokens²</td>
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<td>0.020</td>
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<tr>
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<td>(0.034)</td>
<td>(0.049)</td>
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<td></td>
</tr>
<tr>
<td>10 Earned Tokens²</td>
<td>-0.037</td>
<td>-0.031</td>
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<tr>
<td></td>
<td>(0.028)</td>
<td>(0.037)</td>
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</tr>
<tr>
<td>10 Earned × 10 Won</td>
<td>-0.109***</td>
<td>-0.147**</td>
<td>-0.128*</td>
<td>-0.137**</td>
</tr>
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<td>(0.027)</td>
<td>(0.055)</td>
<td>(0.068)</td>
<td>(0.068)</td>
</tr>
<tr>
<td>Constant</td>
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<td>5.050***</td>
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<td>(0.811)</td>
<td>(2.538)</td>
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<td>(2.952)</td>
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<td>500</td>
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Notes: Tokens rescaled by $\frac{1}{10}$ to better show higher-order coefficients. IV regressions use expected earned/windfall tokens by treatment cell as instruments. Standard errors in Heckman estimation corrected for use of predicted values in second step.
Table 4: Marginal Willingness to Share by Number of Sources

A. Single Income Source Treatments (EO and WO)

<table>
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<th>(4)</th>
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</thead>
<tbody>
<tr>
<td>10 Windfall Tokens</td>
<td>1.299***</td>
<td>1.997**</td>
<td>1.431***</td>
<td>2.172**</td>
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<tr>
<td></td>
<td>(0.261)</td>
<td>(0.826)</td>
<td>(0.254)</td>
<td>(0.940)</td>
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<tr>
<td>10 Earned Tokens</td>
<td>0.571***</td>
<td>1.124***</td>
<td>0.455***</td>
<td>0.931***</td>
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<td>(0.069)</td>
<td>(0.168)</td>
<td>(0.054)</td>
<td>(0.112)</td>
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<tr>
<td>Windfall Only</td>
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<td>-3.816**</td>
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<td>(1.553)</td>
<td>(3.969)</td>
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<td>Constant</td>
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<td>4.420**</td>
<td>5.909***</td>
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<td>(0.999)</td>
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<td>2-Step</td>
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B. Two Income Source Treatments (EW)

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<td>10 Windfall Tokens</td>
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<td>1.123</td>
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<td>(0.109)</td>
<td>(0.173)</td>
<td>(1.007)</td>
<td>(0.989)</td>
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<tr>
<td>10 Earned Tokens</td>
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<td>0.763</td>
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<td>(0.170)</td>
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<td>10 Earned × 10 Won</td>
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<td>-0.047</td>
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Notes: Tokens rescaled by $\frac{1}{10}$ to better show higher-order coefficients. Observations weighted to give equal importance to each level of expected income. Standard errors clustered by treatment cell. Standard errors in Heckman estimation corrected for use of predicted values in second step.
Table 5: Marginal Willingness to Share Tokens from Two Windfalls

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<td>(3)</td>
<td>(4)</td>
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<td>(6)</td>
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<tr>
<td>10 1st Windfall Tokens</td>
<td>1.829***</td>
<td>3.348***</td>
<td>2.396**</td>
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<td>1.924*</td>
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<td></td>
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<td>(0.980)</td>
<td>(0.963)</td>
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<td>10 2nd Windfall Tokens</td>
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<td>2.544***</td>
<td>3.318***</td>
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<tr>
<td></td>
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<td>(0.649)</td>
<td>(0.752)</td>
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<td>10 1st × 10 2nd Windfall</td>
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Notes: Tokens rescaled by $\frac{1}{10}$ to better show higher-order coefficients. Observations weighted to give equal importance to each level of expected income. Standard errors clustered by treatment cell. Standard errors in Heckman estimation corrected for use of predicted values in second step.
Figure 1: Number-Matching Task

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<td>27</td>
<td>7</td>
<td>74</td>
</tr>
</tbody>
</table>
Notes: The orange dots represent the expected payouts for different treatments. Green dots represent the realized payouts. The solid oval shows the three expected payouts that correspond to a task duration of 180 seconds. Each of these three has expected earnings of 25 tokens. The dashed ovals show the expected and realized payouts for the high, medium, and low windfall levels when the task duration is 180 seconds. The realized payouts to the right are reached when an individual performs above the median in the task, while those to the left are reached when performance is below the median. The diagram shows that a person randomized into the 180s task, medium windfall treatment will realize earnings of 20 tokens and windfall of 20 tokens if they perform below the median and earnings of 30 tokens and windfall of 10 tokens if they perform above the median.
Figure 3: Dictator’s Choice

You earned 20 tokens from the number-matching task. 10 additional tokens were then added to your account.
Your Total: 30

Please decide how many of your 30 tokens you wish to give to your partner and how many you wish to keep for yourself.

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>5</th>
<th>10</th>
<th>15</th>
<th>20</th>
<th>25</th>
<th>30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Give to my partner</td>
<td></td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>Keep for myself</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>24</td>
<td></td>
</tr>
<tr>
<td><strong>Total:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>30</td>
</tr>
</tbody>
</table>
Figure 4: Matrices Solved Per Minute Relative to Median

Notes: The figure shows a kernel density estimate of the number of matrices solved per minute. The estimation used an Epanechnikov kernel with a bandwidth of 0.7.
Figure 5: Total Income and Share Earned

Notes: The blue line shows how the conditional mean of total income varies with the share earned based on a non-parametric regression. Confidence intervals computed using bootstrap. Blue dots show the realized combinations of total income and share earned. Bandwidth is 0.2.
Appendix

A1 Experimental Design

A1.1 Treatments

Table A1 presents a diagram of the experimental design. Each dictator is assigned to one of the 25 treatments described in the first three columns of the table. There are two sources of random variation in treatments. The first is the duration of the task, which ranges from zero to 1200 seconds (20 minutes) in nine steps. Those in the zero-duration task are in the windfall only (WO) treatment. Dictators in the other task durations may take part in the task only and get earned income (EO) or get both do the task and earn income and get a windfall (EW). Durations were chosen so that expected earnings would scale linearly with the median number of grids completed in the task. The second source of variation is a random assignment to a windfall category. For durations between 60 and 300 seconds, different windfall levels are associated with each windfall category depending on score. This means that conditional on task duration, the windfall category determines the total payout. For the TW treatment, the mixture between earnings and windfall varies across task duration for each level of total payout.

The windfall levels for each task duration and above/below median performance were chosen to variation between 0 and 1 in the share of total tokens coming from earnings/windfall that is orthogonal to the level of total tokens. This allows me to uncover how the marginal willingness to share an earned or windfall token varies as the composition of income in terms of earnings and windfall varies.

A1.2 Recruitment

I recruited workers on Amazon Mechanical Turk (AMT) who were residents of India to take part in the experiment. The experiment appeared as a task, a Human Intelligence Task or HIT in Amazon parlance, that they could choose to complete. I limited the experiment to workers who
Table A1: Random Assignment and Payoffs

<table>
<thead>
<tr>
<th>Task Duration</th>
<th>Treatment</th>
<th>Windfall Category</th>
<th>E(Payoff)</th>
<th>Task Result</th>
<th>Actual Payoff</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Earnings</td>
<td>Windfall</td>
<td>Above/Below</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Duration</td>
<td></td>
<td>Median</td>
</tr>
<tr>
<td>No Task</td>
<td>WO</td>
<td></td>
<td>L</td>
<td>- 30</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>ML</td>
<td>- 40</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>M</td>
<td>- 50</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>MH</td>
<td>- 135</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>H</td>
<td>- 270</td>
<td>-</td>
</tr>
<tr>
<td>60s EW</td>
<td>L</td>
<td>5 25</td>
<td>B</td>
<td>0 30</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>5 35</td>
<td>B</td>
<td>0 40</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>H</td>
<td>5 45</td>
<td>B</td>
<td>0 50</td>
<td>50</td>
</tr>
<tr>
<td>120s EW</td>
<td>L</td>
<td>15 15</td>
<td>B</td>
<td>10 30</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>15 25</td>
<td>B</td>
<td>10 30</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>H</td>
<td>15 35</td>
<td>B</td>
<td>10 40</td>
<td>40</td>
</tr>
<tr>
<td>180s EW</td>
<td>L</td>
<td>25 5</td>
<td>B</td>
<td>20 10</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>25 15</td>
<td>B</td>
<td>20 20</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>H</td>
<td>25 25</td>
<td>B</td>
<td>20 30</td>
<td>50</td>
</tr>
<tr>
<td>EO</td>
<td>L</td>
<td>35 0</td>
<td>B</td>
<td>30 0</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>35 5</td>
<td>B</td>
<td>30 10</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>H</td>
<td>35 15</td>
<td>B</td>
<td>30 20</td>
<td>50</td>
</tr>
<tr>
<td>240s EW</td>
<td>L</td>
<td>45 0</td>
<td>B</td>
<td>40 0</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>45 5</td>
<td>B</td>
<td>40 10</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>H</td>
<td>45 5</td>
<td>B</td>
<td>40</td>
<td>40</td>
</tr>
<tr>
<td>EO</td>
<td>L</td>
<td>45 0</td>
<td>B</td>
<td>40</td>
<td>40</td>
</tr>
<tr>
<td>300s EW</td>
<td>M</td>
<td>45 5</td>
<td>B</td>
<td>40</td>
<td>40</td>
</tr>
<tr>
<td>400s EW</td>
<td>MH</td>
<td>67.5 135</td>
<td>B</td>
<td>45 90</td>
<td>135</td>
</tr>
<tr>
<td>800s EW</td>
<td>MMH</td>
<td>135 67.5</td>
<td>B</td>
<td>90 45</td>
<td>135</td>
</tr>
<tr>
<td>1200s EO</td>
<td>-</td>
<td>202.5</td>
<td>B</td>
<td>135 0</td>
<td>135</td>
</tr>
</tbody>
</table>

Treatment abbreviations: WO: Windfall Only; EW: Earnings and Windfall; EO: Earnings Only
Notes: Participants are randomly assigned to a task duration, treatment, and windfall level as described in left three columns. The expected payoff from that assignment is shown in the next two columns. Depending on task performance in the fourth column, details of the realized payoff from the different activities are shown in the last four columns.
had completed at least 500 HITs with a 95% or higher approval rating to filter out cheaters. Workers saw the experiment advertised as with fixed compensation of $0.40 and the headline

Survey with number puzzles and extra compensation. Bonus up to $1.80, with average bonus $0.60. 4-20 minutes. Average completion time 8 minutes.

Those workers who selected the HIT learned more about it. They could then choose whether to accept the HIT or not. The information they saw stated:

This HIT is part of a research project on decision making. In the HIT you will answer a number of questions and make some decisions. The HIT takes between 4 and 25 minutes. You will be paid $0.40 to complete this HIT.

You can get additional money, between $0 and $8.10, depending on decisions made by workers doing the HIT. The average additional amount is $2.10. You will receive any additional amounts as a bonus.

If you accept this HIT, a link to our website will appear here.

If you completed one of our HITs since June 2012, you are NOT ELIGIBLE to participate in this one and cannot get paid. This helps us maintain the validity of our results. If you are unsure, accept the HIT and our website will check your ID. You can return the HIT if you are not eligible.

When you have completed the task, you will be provided a completion code. Please paste the code in the box below before submitting the HIT.

We welcome your comments and feedback! Please enter them in the box below.

When a worker accepted the HIT, they linked to the experiment, which was conducted using Qualtrics survey software.
A1.3 Manipulation Check

I wanted to insure that participants in the experiment made their choices carefully and fully understood the instructions. While nearly all tasks on AMT are in English, it is possible that the English ability of some workers is low. I embedded the following question near the end of the experiment.

Research in the economics of decision making shows that people, when making decisions and answering questions, prefer not to pay attention and minimize their effort as much as possible. Some studies show that over 50% of people don’t carefully read questions. If you are reading this question and have read all the other questions, please select the box marked “other” and type “decision making” in the space provided. Do not select “your choices about dividing money.” Thank you for participating and taking the time to read through the questions carefully!

What was this study about?

a. Your choices about dividing money
b. Matching numbers
c. Political beliefs
d. Other __________

Participants who both checked the ‘other’ box and entered ‘decision making’ passed the test. One quarter of the participants failed the test.

A1.4 Screen Shots

I provide a set of 19 screen shots that show the progress through the experiment for a dictator, beginning with the landing screen that appears when they have accepted the HIT through the final screen.

The task duration for this run was 180 seconds and the windfall category was M (see Table A1).
Task performance was below median, which resulted in earned income of 20 tokens and windfall income of 20 tokens.

Screens 1 through 5 introduce the experiment, reveal that the participant will play Role B (the dictator), and describe the number matching task.

The number matching task and its results are shown in screens 6 and 7.

The windfall is revealed in screens 8 through 10. While the screen design makes it appear that the participant’s choice of boxes determines the amount of the windfall in tokens, in fact the windfall level M determines a windfall of 20 tokens given the below-median task performance.

Screens 11 through 14 present the sharing choice. Screen 13 is shown after an amount has been selected—when this screen initially appears both bars are at the zero position. The total of the amount shared and the amount kept must equal the dictator’s total earnings before they can continue.

Screens 15 through 19 present the manipulation check, demographic questions, and payment screen.
Screen 1

This HIT is part of a research project on decision making. It takes 4-25 minutes to complete.

All workers who complete this HIT will get base pay of $0.40.

Workers may get additional pay by accumulating "tokens." Each token is worth $0.03 and will be paid to you as a bonus. You can get as few as zero and as many as 270 tokens total during the HIT.

READ INSTRUCTIONS CAREFULLY TO GET THE MOST TOKENS.

All descriptions and instructions about how the HIT is conducted are truthful. No deception is employed in this project.

Screen 2

This section presents seven statements that inquire about your beliefs and actions in a variety of circumstances.

For each statement, indicate how well it describes you by clicking the appropriate button. Answer as honestly as you can. The statements begin on the next page.

PLEASE READ AND REFLECT BRIEFLY ON EACH STATEMENT CAREFULLY BEFORE RESPONDING.
Screen 3

You have been randomly chosen to play Role B in the experiment. Your partner will play Role A.

Role B workers complete some or all of the following tasks:

1. A number matching task to earn tokens based on performance.
2. A lottery where you may win or lose additional tokens.
3. Some decisions about their tokens.
4. Questions about beliefs and actions.
5. Demographic questions.

Screen 4

In the number matching task, you will be shown a series of boxes containing nine numbers.

Your task is find two numbers that add up to 100 and click the checkboxes next to them. Here is an example:

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>21</td>
<td>24</td>
<td>10</td>
</tr>
<tr>
<td>55</td>
<td>76</td>
<td>17</td>
</tr>
<tr>
<td>27</td>
<td>7</td>
<td>74</td>
</tr>
</tbody>
</table>

Select two numbers that sum to 100.

In this box, 24 and 76 add up to 100. You solve this box by clicking the checkboxes next to 24 and 76.

When you select two numbers in the box, you will automatically be advanced to the next one.
Screen 5

The number matching task lasts for 180 seconds. You will earn tokens based on how many boxes you solve correctly:

<table>
<thead>
<tr>
<th>Number of Boxes Solved Correctly</th>
<th>Tokens Earned</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 12</td>
<td>20</td>
</tr>
<tr>
<td>12 or more</td>
<td>30</td>
</tr>
</tbody>
</table>

A timer will show you the number of seconds remaining. When you are ready to begin the test, click the NEXT button below.

Screen 6

Seconds remaining: 87

Select two numbers that sum to 100.

- [ ] 63
- [ ] 74
- [ ] 36
- [ ] 86
- [ ] 47
- [ ] 5
- [ ] 21
- [ ] 3
- [ ] 53

Survey Powered By Qualtrics
Screen 7

Remember that earning for the task depend on how many boxes you solved correctly as follows:

<table>
<thead>
<tr>
<th>Number of Boxes Solved Correctly</th>
<th>Tokens Earned</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 12</td>
<td>20</td>
</tr>
<tr>
<td>12 or more</td>
<td>30</td>
</tr>
</tbody>
</table>

You correctly solved 9 boxes and got 1 incorrect.
You earned 20 tokens from the task.

Screen 8

You will now take part in a lottery for tokens.

The lottery has three prizes:
- 10 tokens
- 20 tokens
- 30 tokens

On the next page, you will see boxes labelled A, B, and C. Each prize has been placed at random behind one of the boxes.

You will click on a box to play the lottery and reveal the prize.
Screen 9
Please click on one of the boxes to play the lottery.

A  B  C

Screen 10
Please click on one of the boxes to play the lottery.

30  20  10

Your prize is 20 tokens.
Screen 11

Remember that you are playing Role B and your partner is playing Role A.

Role A workers do not have opportunities to win or earn tokens. This means your partner did not have any opportunities to earn or win tokens in this HIT.
Your partner can only get tokens if you share some of yours with them.

Screen 12

You will now have the opportunity to give some of your tokens to your partner. You may choose to give as many or as few as you prefer.

Tokens that you give to your partner will be deducted from your total. Each person will be paid $0.03 for each token they have at the end of the HIT through a bonus.
Screen 13

Tokens you won in the lottery: 20
Tokens you earned from test: 20
Your Total: 40

Please decide how many of your 40 tokens you wish to give to your partner and how many you wish to keep for yourself.

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>8</th>
<th>16</th>
<th>24</th>
<th>32</th>
<th>40</th>
</tr>
</thead>
<tbody>
<tr>
<td>Give to my partner</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Keep for myself</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>32</td>
<td></td>
</tr>
<tr>
<td>Total:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>40</td>
</tr>
</tbody>
</table>

Screen 14

You chose to give 8 tokens to your partner and keep 32 tokens for yourself.

If you are satisfied with your choice, please click NEXT to continue.
If you wish to change your choice, you may select BACK.
Screen 15

Research in the economics of decision making shows that people, when making decisions and answering questions, prefer not to pay attention and minimize their effort as much as possible. Some studies show that over 50% of people don't carefully read questions. If you are reading this question and have read all the other questions, please select the box marked ‘other’ and type ‘Decision Making’ in the box below. Do not select “your choices about dividing money.” Thank you for participating and taking the time to read through the questions carefully!

What was this study about?

- [ ] Your choices about dividing money
- [ ] Matching numbers
- [ ] Earning and winning tokens
- [x] Other

[Decision Making]

Screen 16

Please answer the following demographic questions.

What is your age in years?

[44]

What is your sex?

Male

What is your education level?

Graduate school

Survey Powered By Qualtrics
Screen 17

How many hours per week do you work online using Mechanical Turk or similar Internet-based services?

How many hours per week do you work at other types of paid employment?

What is your approximate monthly income from all sources? Please enter an amount in either US dollars or Indian Rupees. This information is strictly confidential.

US Dollars

Indian Rupees

☐ Click here if you would prefer not to answer

Screen 18

How easy or hard do you find it to understand the English used in this HIT? (Your answer will not affect your payment.)

Very Easy ☐ Easy ☐ Somewhat Easy ☐ Neutral ☐ Somewhat Hard ☐ Hard ☐ Very Hard ☐

Screen 19

Please enter this completion code in the Mechanical Turk window: 1680408917. We welcome any comments you have, which you can enter in the field provided in Mechanical Turk.

When you have done so, return to this window and click the NEXT button.