

# Eliciting Time versus Money: Time Scarcity Underlies Asymmetric Wage Rates

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Marketing strategies are often tied to how consumers spend time (e.g., waiting in lines, searching across stores) in return for money (e.g., receiving a discount). Viewing such time-money tradeoffs in terms of a reservation wage rate for consumers, we identify a wage-rate asymmetry between two elicitation procedures: (a) Money-Elicit (MEL): state the minimum amount of money,  $M$ , that you would accept in return for spending a given number of hours,  $T$ ; and (b) Time-Elicit (TEL): state the maximum number of hours,  $T$ , that you would spend in return for accepting a given amount of money,  $M$ . While these procedures are normatively equivalent, we propose that TEL (vs. MEL) wage rates are higher because time scarcity receives a higher weight in TEL judgments. In eight studies including both hypothetical and real settings, we document the wage-rate asymmetry, the time scarcity process, and a downstream consequence of TEL (vs. MEL) reducing the likelihood of accepting a time-money tradeoff. We discuss the implications for practice, and for research on wage rates, time versus money, procedural invariance, and scarcity.

**Keywords:** time, money, scarcity, time-money tradeoffs, wage rates, procedural invariance

Consumers often spend time in return for money. Examples include waiting in long lines during holiday sales in return for discounts, attending safe-driving lessons to get better rates on car insurance, and agreeing to get “bumped off” a full flight and take a later one in return for compensation. For such time-money tradeoffs, the consumer may initially have information regarding just time or just money. Consider two consumers thinking about going on a post-Thanksgiving Friday to a store selling discounted

coats. Melissa has information on just the waiting time, and Telissa has information on just the discount. Specifically, from past experience, Melissa knows that she would need to line up at the store two hours before the doors open in order to get in and buy what she wants. She does not know how much she will save, and wants to go only if the final savings are \$50 or more. Melissa’s threshold of \$50 is the minimum  $M$  dollars that she would accept in return for spending two hours, a threshold that we refer to as MEL (Money Elicit). Now consider Telissa, who has seen an advertisement for a coat at \$50 off. She does not know how far in advance she should line up at the store in order to get in and buy the coat. Telissa’s threshold is the maximum  $T$  hours that she would spend in return for accepting \$50, a threshold that we refer to as TEL (Time Elicit). Assuming Melissa and Telissa are identical in other respects, the TEL threshold should mirror the MEL threshold of \$50 for two hours—that is, Telissa should be willing to spend up to two hours for \$50. We propose that Telissa would want to spend less time for the same money, making her less likely to visit the store.

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In order to compare MEL to TEL, we draw from a construct central to labor economics known as wage rate—the base wage paid to a worker per unit of time. Specifically, we introduce the notion of a consumer wage rate: the money that a consumer wants in return for spending a unit of time. This construct is ideal, as it provides a summary tradeoff measure that allows us to make TEL-MEL comparisons. A consumer wage rate can be applied across consumption contexts in which money may be received in different forms (lower price, store discount, mail-in rebate, etc.) and time spent in different ways (searching, waiting, filling rebate forms, etc.). Our concern is not with the idiosyncratic features of a situation, because our comparison (i.e., MEL vs. TEL) is within the same situation. As long as time is a cost and money a benefit, we can rely on a consumer wage rate to assess the time-money tradeoff. We show that a consumer's reservation wage rate for a time-money tradeoff is higher for TEL (vs. MEL), which makes acceptance of the tradeoff less likely. We also reveal consideration of time scarcity as the underlying process.

Our results have implications for the literature on labor and wage rates (Borjas 2003; Juhn, Murphy, and Pierce 1993; Lee 1978; Waltman and Pittman 2002). We introduce the notion of a consumer wage rate, for which we demonstrate an effect (i.e., wage-rate asymmetry), as well as the effect's antecedent (i.e., elicitation procedure), consequence (i.e., willingness to accept a time-money tradeoff), and underlying mechanism (i.e., time scarcity).

We also contribute to research on time and money, in which some scholars elicit time for a given amount of money (Marmorstein, Grewal, and Fishe 1992; Okada and Hoch 2004), but others elicit money for a given amount of time (Leclerc, Schmitt, and Dube 1995; Soster, Monga, and Bearden 2010). This variation in procedure would be inconsequential if consumers had time-money tradeoffs in mind, which they simply revealed. But consumers may not carry tradeoffs in their minds for, say, the dollar savings suitable for a given wait time at a store. We show that consumers may construct tradeoffs differently, depending on the elicitation procedure.

Implications also arise for procedural invariance failures—normatively equivalent procedures yielding different preferences between options (Payne, Bettman, and Johnson 1992; Slovic 1995; Tversky, Sattath, and Slovic 1988). We discover a new failure of procedural invariance that applies to time-money tradeoffs, and a new process that relates to time scarcity.

By identifying a role of time scarcity, we add to a recent surge of research on scarcity (DeVoe and Pfeffer 2011; Etkin, Evangelidis, and Aaker 2015; Mani et al. 2013; Mogilner, Chance, and Norton 2012; Mullainathan and Shafir 2013; Shah, Mullainathan, and Shafir 2012; Sharma and Alter 2012). It is known that time scarcity elevates wage rates (Becker 1965; Braverman 1974). The novel effect we show is that changing a wage rate elicitation

procedure changes the weight placed on time scarcity and, consequently, influences the wage rate.

Our results also matter for practice because time-money tradeoffs are at the heart of marketing domains such as salesforce compensation (Basu et al. 1985; John and Weitz 1989; Lal and Staelin 1986), consumer search (Alba et al. 1997; Hoque and Lohse 1999; Lynch and Ariely 2000), and sales promotions (Blattberg and Neslin 1990; Soman 1998). In the General Discussion, we will elaborate further on the implications of our results for theory and practice.

## FAILURE OF PROCEDURAL INVARIANCE

In classical preference theory, the assumption is that individuals have well-defined utility functions and preference ordering in their minds. If this assumption were true, preferences would be invariant to descriptive and procedural invariance. But they are not. Violating descriptive invariance, preferences vary with the surface description of the options, such as when different words are used to frame the same options in different ways (Tversky and Kahneman 1981). More relevant to the current research is the violation of procedural invariance; preferences depend on the method by which they are elicited. Normatively equivalent procedures yield different results because preferences are not simply “revealed,” but “constructed” in the process of elicitation (Payne et al. 1992; Slovic 1995; Tversky et al. 1988).

As Slovic (1995) discusses, failures of procedural invariance challenge the very basis of what a preference is, and in what sense it exists. Consider preference for a state of health, which ought to be based on the true utility derived from the health state. If this preference changes with the assessment process, it raises philosophical questions about what it means for an individual to prefer a certain state of health (Lenert and Treadwell 1999). Analogously, a consumer reservation wage rate ought to be based on the true value of the time spent on an activity. We demonstrate that a reservation wage rate changes with the assessment process, which raises philosophical questions about what it means for an individual to have a reservation wage rate.

One determinant of procedural invariance failures is scale compatibility, which involves the mapping between an available attribute and a response that is sought. Given several attributes, individuals place more weight on those that are more compatible with the response (Slovic, Griffin, and Tversky 1990; Tversky, Slovic, and Kahneman 1990). Consider eliciting preference between two bets using a pricing procedure (i.e., indicate dollar value of bets) versus a choice procedure (i.e., pick one bet). Given two attributes of each bet—dollar payoff from win versus probability of winning—the payoff maps on better to the dollar value elicited in a pricing procedure,

and therefore receives a higher weight in a pricing (vs. choice) response (Lichtenstein and Slovic 1971; Slovic and Lichtenstein 1968). Other research has also documented this over-weighting of an attribute when one attribute-response pair is more compatible relative to another pair (Bleichrodt and Pinto 2002). Such compatibility also applies to the setting that we examine.

To preview our arguments, consumers' time is usually scarce, and ought to be considered in wage-rate judgments. But time scarcity receives a higher weight in the TEL (vs. MEL) procedure, leading to higher wage rates. We argue that this happens because time scarcity has higher scale compatibility with a response of time (i.e., TEL) than of money (i.e., MEL).

## TIME SCARCITY

Research on scarcity is abundant. The feeling of having less than one needs to meet all competing demands has been examined across domains ranging from poverty (i.e., money scarcity) to hunger (i.e., calorie scarcity). Scarcity research has recently surged, with scholars drawing connections to a variety of areas such as self-control, goal conflict, product choice, and happiness (DeVoe and Pfeffer 2011; Etkin et al. 2015; Mani et al. 2013; Mogilner et al. 2012; Mullainathan and Shafir 2013; Shah et al. 2012; Sharma and Alter 2011).

Our focus is on the scarcity of time. For mere mortals, time is limited by one's lifespan. While a lifespan itself is short, time seems even more constrained within the discrete periods into which people divide their time, such as days (Soster et al. 2010); regardless of the competing demands during a day, the supply is constrained at 24 hours. Thus, time seems scarce, particularly in the near future (Zauberman and Lynch 2005). As Leclerc et al. (1995, 110) note, "even the wealthy are limited to 24 hours per day. For many, time is not just a scarce resource; it is *the* scarce resource." Other scholars also lament time scarcity in their opening sentences ("Consumers rarely feel that they have enough time"; Etkin et al. 2015), in the names of their books (*No Time*; Menzies 2005), and in the titles of their articles ("There just aren't enough hours in the day"; Roxburgh 2004). It is clear that the issue of time scarcity is front and center for scholars studying it, and consumers experiencing it.

People are reluctant to part with their scarce time, just as they are reluctant to part with other scarce objects (King, Hicks, and Abdelkhalik 2009). This reluctance is evident for varied activities such as reading articles, helping others, and exercising (DeVoe and Pfeffer 2011; Kasser and Sheldon 2009; Rudd, Vohs, and Aaker 2012). In work settings, the scarcity of time makes individuals demand wages for the time that they spend. And the greater the time

scarcity, the greater the wage rate one demands (Becker 1965; Braverman 1974).

The above arguments should extend to consumption settings. Time is a limited resource that consumers have alternate uses for, whether those uses pertain to work or to leisure. Even on a day off, one could spend time on several activities such as gardening, going out with family, or completing household chores. Thus, a consumer would be reluctant to spend hours waiting in a long line at a store unless there is a potential monetary benefit such as a discount (unless waiting in line is by itself a pleasurable activity, which is outside the scope of the current research). For such time-money tradeoffs, the scarcity of one's available time ought to be considered. We argue that the extent to which one's time scarcity is considered depends on the elicitation procedure.

## FAILURE OF PROCEDURAL INVARIANCE FOR CONSUMER WAGE RATES

To appreciate how time scarcity may come into play, it is first important to recognize that both TEL and MEL procedures relate to selling time—parting with time in return for money. This label of sellers is consistent with the literature on the endowment effect, in which sellers are seen as those who part with a good in return for receiving money from buyers (Knetsch 1989). This label is also in line with the labor economics literature, in which workers are seen as selling their time in return for wages (Johnson, Kitamura, and Neal 2000; Pollak and Wachter 1975).

The significance of this perspective is that sellers focus on different features than buyers do (Birnbbaum and Stegner 1979; Birnbbaum et al. 2016). Specifically, sellers do not focus on the money that they receive, but on the features of the good that they forgo. For instance, in basketball game ticket sales, the selling price is determined by the key characteristics of the specific ticket, such as the significance of the game (Carmon and Ariely 2000; Nayakankuppam and Mishra 2005). Because our setting pertains to selling time, the selling price should be determined by the key characteristics of time. The single defining characteristic of time is its scarcity. Time is a limited resource, and spending it on one activity means not being able to spend it on competing activities. Therefore, time scarcity ought to be considered by sellers of time. This is analogous to workers considering their time scarcity when selling their time, although the labor market may also involve other factors, such as workers' skills (Becker 1965; Borjas 2003; Braverman 1974; Juhn et al. 1993).

Let us now consider whether time scarcity will always receive consideration in consumers' wage rates. As we discussed earlier, consumers' time is a limited resource that could be spent on competing work or leisure activities.

Given time scarcity, a consumer may be willing to spend only limited time on, say, waiting in a long line at a store in return for a monetary benefit. However, if she ignores the scarcity of her time, she may be willing to spend her time more liberally for the same money (i.e., accept a lower wage rate). Such neglect of time scarcity is possible. This is because valid attributes are often ignored in decision making, and not given normative consideration. For instance, even though opportunity costs should be considered in decision making, people ignore them unless such costs are made salient (Frederick et al. 2009; Spiller 2011). Similarly, although choosing a smaller-sooner (SS) option over a larger-later (LL) option results in forgoing the larger amount, people do not adequately consider this consequence, unless explicitly told that they will receive \$0 later on (Magen, Dweck, and Gross 2008). Thus, a valid attribute may be available, but not accessible when an individual is making judgments (Lynch and Srull 1982; Tulving and Pearlstone 1966). It may not receive adequate consideration in judgments, unless a cue promotes such consideration (Mitra and Lynch 1995; Nedungadi 1990; Posavac, Sanbonmatsu, and Fazio 1997; Priester, Dholakia, and Fleming 2004). Along similar lines, we believe that time scarcity is a valid piece of information that will not always receive adequate consideration in all wage-rate judgments. Rather, time scarcity will receive more consideration in the TEL procedure and less consideration in the MEL procedure.

Our argument relies on scale compatibility. As discussed earlier, an attribute receives a higher weight if it is more compatible with a response measure. For instance, when an individual evaluates a potential gamble, the dollar payoff receives a higher weight in a pricing (vs. choice) measure, because pricing involves a dollar response, but choice does not (Slovic et al. 1990; Tversky et al. 1990). We argue that scale compatibility may arise for wage-rate judgments, in which time scarcity is a valid attribute to consider. When one thinks about time scarcity (i.e., how limited my time is, given my other commitments), one is thinking on the same time scale as is used for a TEL response (i.e., how much time I can spend), whereas the MEL response involves a different money scale (i.e., how much money I should receive). Thus, the scale compatibility of time scarcity is higher for TEL than for MEL judgments. Therefore, time scarcity should receive a higher weight in TEL (vs. MEL), which should result in a higher wage rate for TEL.

## OVERVIEW OF PREDICTIONS AND STUDIES

Our arguments yield three testable predictions that we test in eight studies that employ a variety of hypothetical and real settings (see table 1). Our core prediction is the wage-rate asymmetry: TEL (vs. MEL) wage rates are

higher. Studies 1 and 2 support this core prediction. The other studies confirm it further, and test the process as well as the downstream effects.

Our second prediction relates to the underlying process. We argue that there is an asymmetry in wage rates (i.e.,  $TEL > MEL$ ) because there is an asymmetry in the extent to which time scarcity is considered (i.e., considered more in TEL than in MEL). To reiterate the logic for this process: time is a limited resource that several alternative activities compete for, making people demand compensation for spending time on activities such as waiting in lines and searching for products. Thus, the default state for individuals (which we also confirm in our studies) is that time seems scarce. Such scarcity receives more weight in TEL (vs. MEL) judgments, leading to a higher TEL wage rate. One way to test this process is via mediation. That is, we verify whether the extent to which time scarcity is considered in making wage-rate judgments is higher in TEL than in MEL, and if this asymmetry statistically mediates the wage-rate asymmetry. Another way to test the process is via moderation. We can verify the weight of an attribute in judgments by examining how sensitive the judgment is to changes in attribute levels. For instance, if reducing a dollar payoff leads to a stronger decline in the pricing of a bet (vs. choice share), then it reveals that the dollar payoff is weighted higher in pricing than in choice (Lichtenstein and Slovic 1971; Slovic and Lichtenstein 1968). Analogously, if lowering the perception of time scarcity leads to a stronger decline in the TEL (vs. MEL) wage rate, then it reveals that time scarcity is weighted higher in TEL than in MEL.

Five studies support the process prediction. Studies 3 and 4 reveal the role of time scarcity via moderation. In study 3, we find that the default state is a perception of high time scarcity, and lowering the perception of time scarcity diminishes the wage-rate asymmetry (by diminishing TEL, but not MEL, wage rates). Along similar lines, study 4 shows that lowering the perception of time scarcity by presenting a distant-future (vs. near-future) activity diminishes the wage-rate asymmetry (because time appears less scarce in the distant than in the near future). Complementing these moderation results, studies 5, 6, and 8 reveal the role of time scarcity via mediation. When we consider only the default state of high time scarcity, the wage-rate asymmetry is mediated by the extent to which time scarcity is considered. We also rule out other processes, showing that there is no asymmetry in the consideration of money scarcity (studies 6 and 8) or base wage rates (study 2).

A final prediction relates to the downstream consequence. When consumers contemplate an activity involving a time-money tradeoff, their decision should be influenced by whether the tradeoff is superior to their reservation wage rate. In other words, they are more likely to accept the tradeoff if their reservation wage rate is low rather than high. Two studies document this consequence.



Studies 7 and 8 show that because the reservation wage rate for the TEL (vs. MEL) procedure is higher, the likelihood of accepting a time-money tradeoff is lower.

Before we discuss these studies in detail, let us elaborate on two operational aspects. One relates to our minimum-maximum phrasing. In our studies, our interest is in assessing a minimum desired wage rate (i.e., money/time) for each participant, which we calculate by dividing the money amount by the time amount (Marmorstein et al. 1992). Therefore, we present MEL participants with an amount of time and elicit the minimum value of money. Conversely, we present TEL participants with an amount of money and elicit the maximum time that they would spend. Hence, the minimum-maximum phrasing is an essential feature of our setting. However, we do show that the wage-rate asymmetry persists even when we create a unique setting that enables us to ask “maximum” questions for both MEL and TEL (study 6).

A second aspect relates to misrepresentation. Could MEL participants strategically state higher amounts of money than they would actually accept, or TEL participants state lower amounts of time than they would be

willing to spend? Such strategizing is unlikely given the structure of our studies, and given that we find similar results for real and hypothetical time-money tradeoffs. But even if strategic misrepresentation were to arise, it should not influence the wage-rate asymmetry. That is, if MEL participants exaggerate the money desired, and TEL participants understate the time they may be willing to spend, the wage rate would increase in both cases. Thus, even if misrepresentation changes wage rates, it cannot yield a wage-rate asymmetry. Rather, as we show via both moderation and mediation, the culprit is time scarcity.

## STUDY 1

Many a traveler has experienced an overbooked flight, with airlines offering monetary compensation to travelers willing to wait for the next available flight. Using this consumer setting, we tested the prediction that a TEL (vs. MEL) procedure elicits higher wage rates.

**TABLE 1**  
SUMMARY OF RESULTS

Study 1	IV: Elicitation procedure (TEL vs. MEL) DV: Wage rate	Establish core effect in hypothetical time-money tradeoff for flight delay. [Wage-rate asymmetry: TEL > MEL wage rate]
Study 2	IV: Elicitation procedure (TEL vs. MEL) × baseline wage rate (absent vs. present) DV: Wage rate	Replicate core effect in hypothetical time-money tradeoff for flight delay. Baseline wage rate affects both TEL and MEL; both shift toward baseline. [No asymmetry in effect of baseline wage rate on TEL vs. MEL wage rate]
Study 3	IV: Elicitation procedure (TEL vs. MEL) × time scarcity (control vs. low vs. high) DV: Wage rate	Replicate core effect in hypothetical time-money tradeoff for store wait. Time scarcity moderates: default is high time scarcity (same as control); lowering scarcity lowers TEL (not MEL), reducing wage-rate asymmetry. [Asymmetric effect of time scarcity on TEL vs. MEL wage rate]
Study 4	IV: Elicitation procedure (TEL vs. MEL) × timing of activity (near vs. distant future) DV: Wage rate	Replicate core effect in real time-money tradeoff for survey. Time scarcity moderates: default is high time scarcity (near future); lowering scarcity (distant future) lowers TEL (not MEL), reducing wage-rate asymmetry. [Asymmetric effect of time scarcity on TEL vs. MEL wage rate]
Study 5	IV: Elicitation procedure (TEL vs. MEL) Mediator: Extent to which time scarcity is considered DV: Wage rate	Replicate core effect in hypothetical time-money tradeoff for store wait. Time scarcity mediates (in default case of high time scarcity): the extent to which time scarcity is considered is higher for TEL than for MEL [TEL→Greater consideration of time scarcity→Higher wage rate]
Study 6	IV: Elicitation procedure (TEL vs. MEL) Mediator: Extent to which time scarcity is considered DV: Wage rate	Replicate core effect in hypothetical time-money tradeoff for insurance. Effect similar to previous studies, but with “maximum” questions for both TEL and MEL. Time scarcity mediates, but money scarcity does not. [TEL→Greater consideration of time scarcity→Higher wage rate]
Study 7	IV: Elicitation procedure (TEL vs. MEL) DV: Wage rate; accept time-money tradeoff	Replicate core effect in real time-money tradeoff for survey. Observe downstream effect on accepting time-money tradeoff. [TEL→Higher wage rate→Less likely to accept a time-money tradeoff]
Study 8	IV: Elicitation procedure (TEL vs. MEL) Mediator: Extent to which time scarcity is considered DV: Wage rate; accept time-money tradeoff	Replicate core effect in real time-money tradeoff for rebate. Time scarcity mediates, but money scarcity does not. Observe downstream effect. [TEL→Greater consideration of time scarcity→Higher wage rate→Less likely to accept a time-money tradeoff]

## Design and Procedure

We used a two-cell design in which the elicitation procedure (TEL vs. MEL) was manipulated between subjects. Seventy-six adult participants from the MTurk online survey panel were asked to imagine a flight delay on the way to Las Vegas. The key sentences in the MEL condition were as follows: "You are at an airport on a Friday, on the way to a weekend trip to Las Vegas. You are due to arrive in Vegas at 4pm. However, the attendant at the gate tells you that your flight has been overbooked. The airline is offering you an opportunity to accept cash compensation in return for waiting for the next available flight. You know that the waiting time is going to be four hours. What is the minimum dollar amount of compensation the airline would have to give you in order for you to be willing to wait?"

The scenario in the TEL condition was similar except that participants were told that they would receive a compensation of \$130, and had to indicate the maximum amount of time, in hours, that they would be willing to wait. (The \$130 amount was based on a MEL pretest with a separate group of 26 participants who provided the monetary value of four hours at an airport.) We also measured demographic characteristics: age, gender, and monthly household income.

## Results and Discussion

We first calculated the wage rate (\$ per hour) that was implied by each participant's response. Specifically, because the MEL participants were provided with four hours and asked to indicate a dollar amount, each participant's wage rate was the dollar amount divided by four. Similarly, because the TEL participants were provided with \$130 and asked to indicate the number of hours, each participant's wage rate was \$130 divided by the number of hours.

Prior to the main analysis, we checked for invalid responses belonging to one of two categories: (a) respondents did not follow directions, or (b) responses were more than three standard deviations below or above the mean. After three invalid responses were dropped, there remained a total of 73 valid responses (73% female,  $M_{\text{age}} = 31$ ).

We conducted an ANOVA in which the dependent variable was wage rate, and the independent variable was the wage-elicitation procedure (MEL vs. TEL). The results were as we predicted: the reservation wage rate (\$ per hour) was higher in the TEL (vs. MEL) condition ( $M_{\text{TEL}} = \$36.99$ ,  $SD = \$17.22$ ;  $M_{\text{MEL}} = \$27.47$ ,  $SD = \$18.25$ ;  $F(1, 71) = 5.26$ ,  $p < .05$ , Cohen's  $d = .54$ ). The wage-rate asymmetry remained significant ( $F(1, 69) = 6.22$ ,  $p < .05$ ) even when we added gender and income as covariates. We will not discuss these covariates in subsequent studies because they did not influence the asymmetry in any of our studies.

## STUDY 2

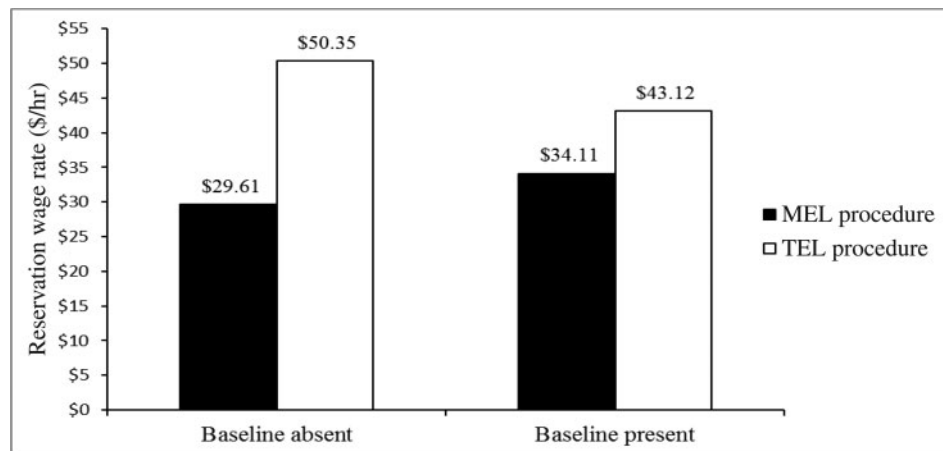
This study examines whether the wage-rate asymmetry that we observed for a flight-delay situation replicates when we consider a longer delay. Also, we introduce an additional manipulation, such that participants either know, or do not know, the baseline wage rate for a flight delay (i.e., \$130 for four hours, or \$32.50 per hour, as we observed in the pretest of study 1). The rationale for introducing this manipulation is as follows. Consumers do not have wage rates in their minds for every consumption situation that they will ever encounter. They do not simply retrieve their wage rate and apply it; instead, they construct it, which leads to a wage-rate asymmetry. The constructed wage rates should shift toward the baseline wage rate when it is made available; after all, the baseline would be both diagnostic and accessible (Feldman and Lynch 1988). However, we expect both TEL and MEL rates to shift similarly because we do not expect the baseline wage rate to influence one elicitation procedure more than the other. That is, our theory is not predicated on an asymmetric influence of baseline wage rates, but on an asymmetric influence of time scarcity (as we explore in later studies). Thus, the current study provides a replication for a longer flight delay, while also showing that our results are not driven by a differential reliance on baseline wage rates for TEL versus MEL.

## Design and Procedure

We used a 2 (elicitation procedure: MEL vs. TEL)  $\times$  2 (baseline wage rate: absent vs. present) between-subjects design in which both factors were manipulated. One hundred eighty-six adult participants from the MTurk online survey panel were asked to imagine an airline employee informing them about an overbooked flight.

This study used a flight delay scenario similar to study 1, but with two differences. First, the numbers from study 1 (\$130 for a four-hour delay) were used only as a baseline wage rate that was either present or absent in the scenario. Second, the focal flight delay mentioned \$195 for TEL and six hours for MEL. Specifically, in the MEL baseline-present condition, the employee says the following: "There is a flight that leaves four hours later than your current flight, and we would give you \$130 for this four-hour wait. Hold on. . . I see that this flight will involve a longer wait, which means that your compensation will be higher. OK. I now see that this flight will involve a six-hour wait, but let me confirm the compensation for you. Please give me a minute as I load up another application." In the MEL baseline-absent condition, the employee does not refer to the baseline (\$130 for four hours), but directly mentions the six-hour wait. Next, all MEL participants saw the following two options: option A, take the current flight (don't wait, get no money); and option B, take the later flight

FIGURE 1:  
STUDY 2: RESERVATION WAGE RATE



(wait six hours for the next flight, get money). They then indicated the minimum amount of money that they would require to choose option B.

Participants in the TEL condition read similar scenarios except that there was no mention of six hours, but of \$195, with the baseline wage rate (\$130 for four hours) being either present or absent. Then, all TEL participants saw the following two options: option A, take the current flight (don't wait, get no money); and option B, take the later flight (wait for the next flight, get \$195). They then indicated the maximum amount of time that they would be willing to wait to choose option B. Finally, all participants answered standard demographic questions.

## Results and Discussion

Following the procedure employed in study 1, we dropped five invalid responses, yielding a total of 181 valid responses (52% female,  $M_{\text{age}} = 34$ ). Next, we conducted an ANOVA in which the dependent variable was wage rate (\$ per hour), and the independent variables were the elicitation procedure (MEL vs. TEL) and the presence of a baseline (absent vs. present). A main effect of procedure emerged, such that the desired wage rate was higher in the TEL (vs. MEL) condition ( $M_{\text{TEL}} = \$46.65$ ,  $SD = \$19.94$ ;  $M_{\text{MEL}} = \$31.78$ ,  $SD = \$19.76$ ;  $F(1, 177) = 25.69$ ,  $p < .01$ , Cohen's  $d = .75$ ). Additionally, there was a significant two-way interaction between procedure and baseline ( $F(1, 177) = 3.99$ ,  $p = .05$ ; see figure 1). The wage-rate asymmetry was present in both conditions but, not surprisingly, it was stronger in the baseline-absent condition ( $M_{\text{TEL-absent}} = \$50.35$ ,  $SD = \$22.95$ ;  $M_{\text{MEL-absent}} = \$29.61$ ,  $SD = \$22.59$ ;  $F(1, 177) = 25.06$ ,  $p < .01$ , Cohen's  $d = .91$ ) than in the baseline-present condition ( $M_{\text{TEL-present}} = \$43.12$ ,  $SD = \$16.05$ ;  $M_{\text{MEL-present}}$

$= \$34.11$ ,  $SD = \$16.15$ ;  $F(1, 177) = 4.70$ ,  $p < .05$ , Cohen's  $d = .56$ ). More important, this diminishing of the wage-rate asymmetry was not driven by a differential reliance on base wage rates, but by an equivalent shift in both MEL and TEL toward the baseline wage rate (increase from \$29.61 to \$34.11 for MEL; decrease from \$50.35 to \$43.12 for TEL). That is, the absolute increase in the case of MEL was statistically equivalent to the absolute decrease in the case of TEL ( $F(1, 177) = .22$ ,  $p > .63$ ). Another interesting perspective comes from a comparison to the wage rate of \$32.50/hour provided in the baseline-present conditions. The MEL wage was statistically similar to \$32.50 ( $t(44) = .67$ ,  $p > .49$ ), but the TEL wage rate was higher ( $t(44) = 4.44$ ,  $p < .001$ ). That is, although providing the baseline wage rate produced equivalent shifts toward the baseline for both MEL and TEL, the deviation from the baseline persisted for TEL, attesting to the robustness of the wage-rate asymmetry.

This replication of the wage-rate asymmetry for a longer delay suggests that the effect is not idiosyncratic to the duration that we used in study 1. Also, as expected, the reported wage rates converged toward the baseline wage rate when it was made available. However, attesting to the robustness of our results, the wage-rate asymmetry remained significant. Moreover, the convergence toward the base rate arises due to an equivalent shift in both procedures. Thus, the wage-rate asymmetry is not due to a differential reliance on baseline wage rates. Rather, it is driven by a differential consideration of time scarcity, as we show in the studies that follow.

## STUDY 3

We employed a waiting time scenario for the current study. Consumers often spend time waiting in long lines at

stores to receive price discounts and gift certificates, such as on Thanksgiving sales. Using this consumer setting, we tested the prediction that a TEL (vs. MEL) procedure elicits higher wage rates. We also delve into the mechanism underlying our results.

Our proposed mechanism involves time scarcity. We argue that time is usually a scarce resource, and that such scarcity receives a higher weight in TEL than in MEL. In the current study, we test this process using moderation, the logic for which we explained earlier. In brief, we can verify the weight of an attribute in judgments by examining how sensitive the judgment is to a change in attribute levels. Thus, lowering the perception of time scarcity should lead to a stronger decline in the wage rate for TEL (vs. MEL). We employ three conditions for time scarcity in this study: low scarcity, high scarcity, and control (i.e., no scarcity manipulation). Because the default for time is a perception of high scarcity, we expect both the control and high-scarcity conditions to reveal a wage-rate asymmetry. However, the low-scarcity condition should yield a lower wage rate for TEL (vs. MEL), leading to a diminished TEL-MEL asymmetry.

To create a manipulation for perception of time scarcity, we relied on a technique of using different measurement scales. For instance, Fishbach and Dhar (2005) used narrow (i.e., –5 pounds to +5 pounds) versus wide (i.e., –25 pounds to +25 pounds) scales to manipulate perceptions regarding weight loss goals. To change scarcity perceptions, we created different scales that we verified in a pretest with a separate group of 90 participants. They were asked to think of everything that they would be doing on the coming Saturday after 4pm, and were asked what percentage of that day after 4pm they would consider free time. Those in the low time-scarcity condition responded to a measure that encouraged responses at the higher end (Free time: 0–1%, 2–5%, 6–10%, Greater than 10%). For instance, if a participant has 20% free time, the highest option, “Greater than 10%,” would be marked, providing a sense of low time scarcity. Those in the high time-scarcity condition responded to another measure that encouraged responses at the lower end (Free time: 0–50%, 51–70%, 71–90%, Greater than 90%). For a participant having 20% free time, the lowest bracket, “0–50%,” would be marked, making him feel that he does not have much free time, providing a sense of high time scarcity. No manipulation was employed in the control condition. Finally, we measured perceived time scarcity by asking two questions that were later averaged ( $\alpha = .80$ ): (a) “Consider all your likely activities on Saturday after 4pm. How much free time do you have on that day after 4pm? (1 = Very little, 7 = A lot”; reverse-coded), and (b) “Consider all your likely activities on Saturday after 4pm. How much of your time on that day after 4pm is taken up by activities? (1 = Very little, 7 = A lot).”

An ANOVA revealed that the manipulation worked as intended ( $F(2, 87) = 4.08, p < .05$ ). Specifically, those in

the low-scarcity condition perceived less time scarcity relative to those in the high-scarcity condition ( $M_{\text{low-scarcity}} = 3.85, SD = 1.79$ ;  $M_{\text{high-scarcity}} = 4.88, SD = 1.41$ ;  $F(1, 87) = 6.22, p < .05$ ) and relative to control participants ( $M_{\text{control}} = 4.87, SD = 1.59$ ;  $F(1, 87) = 6.03, p < .05$ ). However, those in the high-scarcity condition did not differ from control participants ( $F(1, 87) = .002, p > .10$ ), suggesting that the default for individuals is to perceive their time as being scarce. Having verified our manipulation, we proceeded to the main study.

## Design and Procedure

We used a 2 (elicitation procedure: MEL vs. TEL)  $\times$  3 (time scarcity: control vs. low vs. high) between-subjects design in which both factors were manipulated. Two hundred thirty-four adult participants from the MTurk online survey panel were asked to imagine a promotional event. Specifically, all participants read the following: “This Saturday, at 4pm, one of the local electronics stores is going to have a huge promotional event. This is a very popular event, and you will have to wait in line in order to receive a free gift certificate at the door, which can be used to purchase anything inside the store. The store is organizing this event so that they can attract customers. That is why they are offering a specific amount of money as a gift certificate. However, to get that certificate, you will need to spend a specific amount of time waiting in line. Please imagine that you are considering going to the event this Saturday at 4pm.”

Next, the elicitation procedure was manipulated. Those in the MEL condition were told that they would need to wait four hours in line and asked to indicate the minimum dollar amount of gift certificate that they would require. Those in the TEL condition were told that the gift certificate was valued at \$65 and asked to indicate the maximum amount of time that they would be willing to wait. (The \$65 amount was based on a MEL pretest with a separate group of 34 participants who provided the monetary value of waiting four hours in line.) This wage elicitation was common to the control, low-scarcity, and high-scarcity conditions. However, for the two scarcity conditions, scarcity was manipulated (as described in the pretest) just prior to wage elicitation.

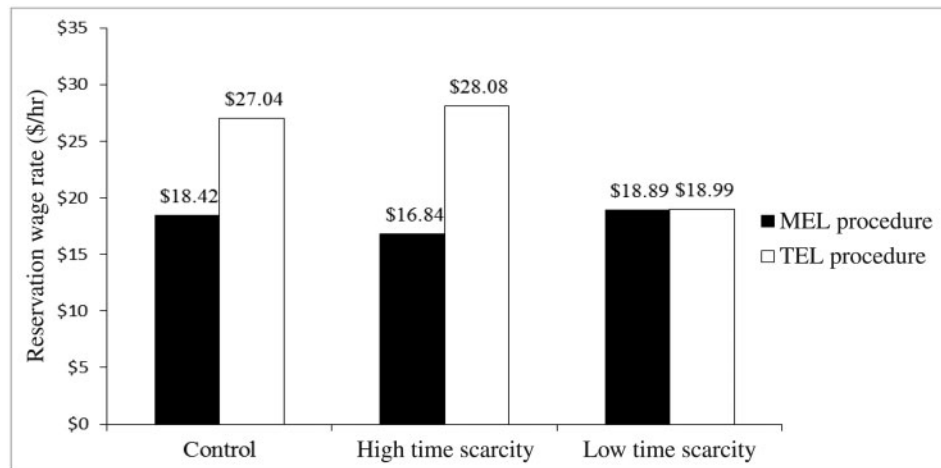
## Results and Discussion

Following the procedure employed in our earlier studies, we dropped 10 invalid responses, yielding a total of 224 valid responses (41% female,  $M_{\text{age}} = 31$ ). Next, we conducted an ANOVA in which the dependent variable was wage rate (\$ per hour), and the independent variables were the wage-elicitation procedure (MEL vs. TEL) and the perceived time scarcity (control vs. low vs. high). A main effect of procedure emerged, such that the desired wage rate



FIGURE 2:

STUDY 3: PERCEPTION OF TIME SCARCITY MODERATES THE EFFECT OF ELICITATION PROCEDURE ON RESERVATION WAGE RATE



was higher in the TEL (vs. MEL) condition ( $M_{\text{TEL}} = \$24.77$ ,  $SD = \$16.34$ ;  $M_{\text{MEL}} = \$18.04$ ,  $SD = \$11.27$ ;  $F(1, 218) = 12.72$ ,  $p < .01$ , Cohen's  $d = .47$ ). Moreover, as predicted, there was a significant two-way interaction between procedure and time scarcity ( $F(2, 218) = 3.32$ ,  $p < .05$ ; see figure 2). Specifically, the wage-rate asymmetry was evident in the control condition ( $M_{\text{TEL-control}} = \$27.04$ ,  $SD = \$17.57$ ;  $M_{\text{MEL-control}} = \$18.42$ ,  $SD = \$12.27$ ;  $F(1, 218) = 6.70$ ,  $p = .01$ , Cohen's  $d = .57$ ) and in the high-scarcity condition ( $M_{\text{TEL-high scarcity}} = \$28.08$ ,  $SD = \$19.37$ ;  $M_{\text{MEL-high scarcity}} = \$16.84$ ,  $SD = \$10.47$ ;  $F(1, 218) = 12.81$ ,  $p < .01$ , Cohen's  $d = .72$ ), but diminished in the low-scarcity condition ( $M_{\text{TEL-low scarcity}} = \$18.99$ ,  $SD = \$8.40$ ;  $M_{\text{MEL-low scarcity}} = \$18.89$ ,  $SD = \$11.30$ ;  $F(1, 218) = .001$ ,  $p > .10$ , Cohen's  $d = .01$ ).

The interaction was driven, as we predicted, by TEL (vs. MEL) participants being more sensitive to the change in time scarcity. That is, in the TEL condition, the wage rate was higher in the high-scarcity than in the low-scarcity condition ( $F(1, 218) = 8.49$ ,  $p < .01$ , Cohen's  $d = .61$ ), higher in the control than in the low-scarcity condition ( $F(1, 218) = 6.17$ ,  $p < .05$ , Cohen's  $d = .58$ ), but statistically similar across the control and high-scarcity conditions ( $F(1, 218) = .11$ ,  $p > .10$ , Cohen's  $d = .05$ ). For those in the MEL condition, the wage rate was statistically similar across the high-scarcity and low-scarcity conditions ( $F(1, 218) = .40$ ,  $p > .10$ , Cohen's  $d = .18$ ), across the control and low-scarcity conditions ( $F(1, 218) = .20$ ,  $p > .10$ , Cohen's  $d = .04$ ), and across the control and high-scarcity conditions ( $F(1, 218) = .23$ ,  $p > .10$ , Cohen's  $d = .14$ ).

These results provide evidence for the wage-rate asymmetry and the underlying process. TEL (vs. MEL) wage rates

were higher in the control condition and the high-scarcity condition, suggesting that high time scarcity is the default. That is, consistent with the pretest of time scarcity (i.e., control = high scarcity), the main study revealed wage rates to be similar for the control and high-scarcity conditions. However, the low-scarcity condition depressed the wage rate for TEL (but not for MEL), diminishing the wage-rate asymmetry. Thus, while the default is a perception of high time scarcity that is weighted higher in TEL (vs. MEL), lowering this scarcity perception leads to a stronger decline in TEL (vs. MEL), diminishing the TEL-MEL asymmetry. Hence, via moderation, we were able to show that time scarcity underlies the wage-rate asymmetry. The next study adds to this evidence by using a temporal manipulation.

## STUDY 4

One feature of this study is that we verify our effects in a situation in which participants face an ostensibly real time-money tradeoff. Specifically, we elicited wage rates from MTurk participants for spending time on an upcoming online survey in return for money.

Another feature of this study is that we verify the time-scarcity process by employing a different manipulation from the one used in the previous study. This manipulation involves the timing of the activity. Timing has parallels in the real world because consumers often expect activities (e.g., waiting in line at a store) that may be in the near future or the distant future. Such timing has implications for scarcity. While individuals usually perceive time to be scarce in the near future, they believe that time scarcity

will decline in the distant future (Zauberman and Lynch 2005). As discussed earlier, the TEL procedure should be more sensitive to a change in time scarcity, because time scarcity receives a higher weight in TEL (vs. MEL). Analogously, the TEL procedure should be more sensitive to a change in the timing of the activity. That is, distant activities should yield lower wage rates, particularly in the TEL (vs. MEL) procedure, which should diminish the wage rate asymmetry. To verify this prediction, we solicited wage rates from MTurk participants about an ostensibly real job—spending time on a survey in return for money—in the near versus the distant future. The survey was presented as taking four hours (MEL) or as offering \$24 (TEL), consistent with the usual \$6/hour wage rate on MTurk (Berinsky, Huber, and Lenz 2012). Because such substantial jobs are infrequent on MTurk, this study would also help examine whether our results hold in situations that are seen as particularly lucrative.

Prior to the main study, we conducted a pretest to verify that time is perceived to be less scarce in the distant (vs. near) future. We told 56 MTurk participants that we wanted to assess their interest in participating in a future online survey (i.e., HIT: Human Intelligence Task). The survey was to be held on the upcoming Saturday (near-future condition) or on a Saturday three weeks later (distant-future condition). Next, we measured perceived time scarcity by asking two questions that were later averaged ( $\alpha = .79$ ): (a) “Consider all your likely activities on the day of the planned HIT. How much free time do you have on that day? (1 = Very little, 7 = A lot”; reverse-coded), and (b) “Consider all your likely activities on the day of the planned HIT. How much of your time on that day is taken up by activities? (1 = Very little, 7 = A lot).” Consistent with prior research (Zauberman and Lynch 2005), perceived time scarcity was lower in the distant than in the near future ( $M_{\text{distant-future}} = 2.38$ ,  $SD = 1.29$ ;  $M_{\text{near-future}} = 3.11$ ,  $SD = 1.38$ ;  $F(1, 54) = 4.14$ ,  $p < .05$ ). Having verified this manipulation of timing, we incorporated it into the main study.

## Design and Procedure

We used a 2 (elicitation procedure: MEL vs. TEL)  $\times$  2 (timing of activity: near vs. distant future) between-subjects design in which both factors were manipulated. One hundred eighty-nine adult participants from the MTurk online survey panel were asked to consider participating in an upcoming online survey in return for monetary compensation. All participants were informed that they would be required to start the survey at 8:00am on a Saturday in either the near future (“3 days from today”), or the distant future (“24 days from today”). Those in the MEL condition were told that the survey would take four hours and were asked to indicate the minimum amount of money that they would require for this job. Those in the

TEL condition were told that they would be paid \$24 and asked to indicate the maximum amount of time that they would be willing to work on the survey.

## Results and Discussion

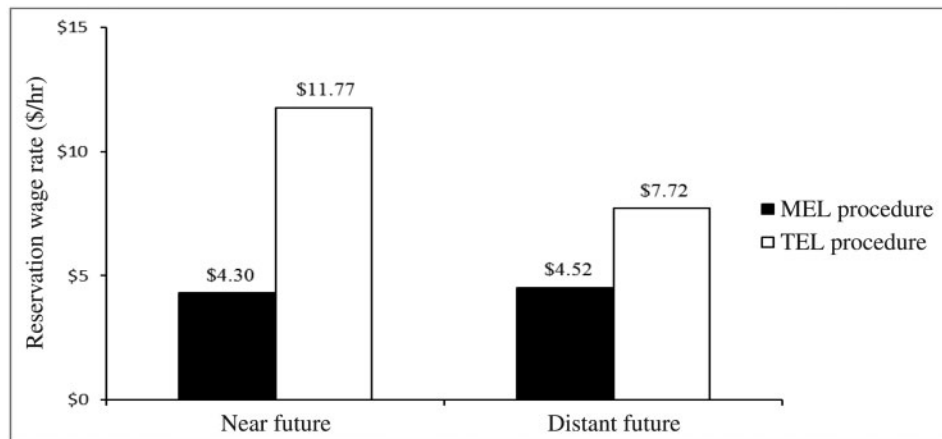
Following the procedure employed in our earlier studies, we dropped 10 invalid responses, yielding a total of 179 valid responses (51% female,  $M_{\text{age}} = 34$ ). Next, we conducted an ANOVA in which the dependent variable was wage rate (\$ per hour), and the independent variables were the wage-elicitation procedure (MEL vs. TEL) and the timing of the activity (near vs. distant). Figure 3 depicts the pattern of results.

A main effect of procedure emerged, such that the desired wage rate was higher in the TEL (vs. MEL) condition ( $M_{\text{TEL}} = \$9.81$ ,  $SD = \$6.39$ ;  $M_{\text{MEL}} = \$4.41$ ,  $SD = \$2.84$ ;  $F(1, 175) = 53.72$ ,  $p < .01$ , Cohen's  $d = 1.08$ ). Additionally, a main effect of timing emerged, such that the wage rate was lower in the distant (vs. near) future ( $M_{\text{near future}} = \$8.50$ ,  $SD = \$7.08$ ;  $M_{\text{distant future}} = \$6.12$ ,  $SD = \$3.68$ ;  $F(1, 175) = 6.92$ ,  $p < .01$ , Cohen's  $d = .34$ ). More importantly, as predicted, there was a significant two-way interaction between procedure and timing ( $F(1, 175) = 8.60$ ,  $p < .01$ ), such that the wage-rate asymmetry was stronger in the near future ( $M_{\text{TEL-near future}} = \$11.77$ ,  $SD = \$7.75$ ;  $M_{\text{MEL-near future}} = \$4.30$ ,  $SD = \$2.54$ ;  $F(1, 175) = 50.83$ ,  $p < .01$ , Cohen's  $d = 1.29$ ) than in the distant future, though the TEL-MEL difference remained significant ( $M_{\text{TEL-distant future}} = \$7.72$ ,  $SD = \$3.55$ ;  $M_{\text{MEL-distant future}} = \$4.52$ ,  $SD = \$3.10$ ;  $F(1, 175) = 10.03$ ,  $p < .01$ , Cohen's  $d = .96$ ). The interaction was driven, as predicted, by TEL participants for whom the wage rate was lower in the distant (vs. near) future ( $F(1, 175) = 16.56$ ,  $p < .01$ , Cohen's  $d = .67$ ). For MEL participants, the effect of timing was not significant ( $F(1, 175) = .04$ ,  $p > .10$ , Cohen's  $d = .07$ ).

This study further attests to the robustness of the wage-rate asymmetry. Even though the effect weakened for the distant future, it remained significant. Moreover, this effect emerged in a setting that participants did not see as hypothetical; they faced the prospect of a real time-money tradeoff. Furthermore, the scarcity process was supported in that the asymmetry was relatively weaker in the distant (vs. near) future condition. This is because, as indicated by our pretest as well as prior research (Zauberman and Lynch 2005), while time is usually scarce, people expect scarcity to be lower in the distant (vs. near) future. The TEL procedure is more sensitive to such changes in time scarcity. Consequently, the distant (vs. near) future activity had a significantly lower TEL wage rate, whereas the MEL rate did not change, thus diminishing the TEL-MEL asymmetry. Taking studies 3 and 4 together, we have now established the time scarcity process via moderation. When we modified the default state of high time scarcity by inducing a low-scarcity manipulation based on scale format

FIGURE 3:

STUDY 4: TIMING OF ACTIVITY MODERATES THE EFFECT OF ELICITATION PROCEDURE ON RESERVATION WAGE RATE



(Fishbach and Dhar 2005) or based on the timing of an activity (Zauberman and Lynch 2005), the wage-rate asymmetry diminished because of a greater decline in the TEL (vs. MEL) wage rate. A change in time scarcity perception yields a greater change for TEL than for MEL, suggesting that time scarcity is weighted higher in TEL.

## STUDY 5

Having established our process via moderation, we now test it via mediation. In our theoretical development, we discussed how time is usually seen as a scarce resource that is limited, and subject to competing demands. We also observed empirical support for this default of high time scarcity in the pretest of study 3, which showed that inducing high scarcity does not increase perceptions of scarcity (vs. control) because the control condition represents high scarcity (while inducing low scarcity does lower scarcity perceptions). The main study was also in line with this, such that the wage-rate asymmetry in the high-scarcity condition was similar to that of the control condition. In study 4, although the wage-rate asymmetry did diminish in the distant (vs. near) future condition, in line with our time scarcity process, it remained significant. Thus, time scarcity continued to play a role in not only the default condition of the here and now, but also when the activity was relegated to the distant future. We now focus on the default “control” condition, which represents a natural state of high time scarcity. Giving greater consideration to such scarcity should elevate the wage rate that one demands. Such greater consideration should happen for TEL (vs. MEL), leading to a higher wage rate for TEL. Therefore, we now measure the consideration given to time scarcity in

wage judgments, and expect such consideration to mediate the wage-rate asymmetry.

## Design and Procedure

We used a two-cell design in which the elicitation procedure (TEL vs. MEL) was manipulated between subjects, and the consideration of time scarcity was measured. The scenario that we employed was similar to that of study 3, in which a consumer needs to wait in line in order to receive a gift certificate at an electronics store. The key difference from study 3 was that we did not manipulate time scarcity, but considered only the control condition.

One hundred undergraduate students from a large public university were asked to imagine the promotional event, and respond to either the TEL or MEL measure as described in study 3. Next, participants were presented with two questions, responses to which were averaged ( $\alpha = .75$ ) to yield a measure of the extent to which time scarcity was considered: (a) “When deciding on the amount you mentioned, how much did you consider how much free time you would have after 4pm on Saturday? (1 = Not much at all, 7 = A lot),” and (b) “When deciding on the amount you mentioned, how much did you consider the other time commitments you might have on the day of the promotion? (1 = Not much at all, 7 = A lot).” Note that these two questions do not measure how scarce one’s time is, but rather the extent to which one’s judgments are based on the consideration given to time scarcity.

## Results and Discussion

Following the procedure employed in our earlier studies, we dropped seven invalid responses, yielding a total of 93

valid responses (38% female,  $M_{\text{age}} = 21$ ). Next, we conducted an ANOVA in which the dependent variable was wage rate (\$ per hour), and the independent variable was the wage-elicitation procedure (MEL vs. TEL). The results were as we predicted. The desired wage rate was higher in the TEL (vs. MEL) condition ( $M_{\text{TEL}} = \$39.59$ ,  $SD = \$18.39$ ;  $M_{\text{MEL}} = \$22.95$ ,  $SD = \$14.43$ ;  $F(1, 91) = 22.79$ ,  $p < .01$ , Cohen's  $d = 1.00$ ).

We next conducted a similar ANOVA in which the independent variable was the same as above (MEL vs. TEL), but the dependent variable was the proposed mediator, the extent to which time scarcity was considered. The predicted results emerged: the consideration of time scarcity was higher in the TEL (vs. MEL) condition ( $M_{\text{TEL}} = 3.60$ ,  $SD = 1.86$ ;  $M_{\text{MEL}} = 2.63$ ,  $SD = 1.50$ ;  $F(1, 91) = 7.41$ ,  $p < .01$ , Cohen's  $d = .57$ ).

We next conducted a mediation analysis using the PROCESS SPSS macro (model 4; Hayes 2013; Preacher and Hayes 2004). The regression model used wage rate as the dependent variable. The independent variables were the elicitation procedure and the mediator, which was the consideration of time scarcity. The effect of the mediator was significant ( $\beta = 2.47$ ,  $t = 2.47$ ,  $p < .05$ ), while the effect of wage-elicitation procedure remained significant ( $\beta = 14.24$ ,  $t = 4.04$ ,  $p < .01$ ). A bootstrap analysis confirmed an indirect effect at 95% bias-corrected CI [.50, 6.31]. Thus, the consideration of time scarcity mediated the effect on wage rates.

The wage-rate asymmetry emerged yet again, such that TEL (vs. MEL) wage rates were higher. In addition, we complemented the process evidence from moderation (studies 3 and 4) with process evidence from mediation in the current study. Given that time scarcity is the default, we showed that a greater consideration of time scarcity led to a higher wage rate for TEL than for MEL. That is, the consideration of time scarcity mediated the asymmetry, in line with our proposed process about time scarcity being weighted higher in TEL (vs. MEL) judgments.

## STUDY 6

In this study, we employ a new consumption setting—a car insurance context in which a company advertises a lower insurance rate in return for consumers spending time on a defensive driving course. As in study 5, we examine whether time scarcity mediates the wage-rate asymmetry. We also examine whether our results are unique to time scarcity, or whether a broader sense of scarcity is evoked in the TEL procedure. Thus, we measure scarcity not only of time, but also money. However, we should note that there is no a priori reason to suspect that money scarcity may play a role. As discussed in detail earlier, sellers of time should focus more on the characteristics of what they

forgo (Carmon and Ariely 2000), which is time and not money.

We also made another change from previous studies in which we used a “maximum” time phrasing for TEL, and “minimum” money phrasing for MEL. As discussed earlier, these terms are integral to the two procedures. However, it is worthwhile to examine if our results replicate if we are able to employ a “maximum” phrasing for both procedures. The car insurance context allows us to do that. Specifically, in TEL, participants indicate the maximum time they would be willing to spend on a defensive driving course in order to pay a lower amount to the new insurance company. In MEL, participants indicate the maximum money they would be willing to pay to the new insurance company if they spend time on the defensive driving course.

## Design and Procedure

We used a two-cell design in which the elicitation procedure (TEL vs. MEL) was manipulated between subjects, and the consideration of time scarcity was measured. Seventy-three adult participants from the MTurk online survey panel were asked to imagine encountering an advertisement for car insurance. All participants read the following: “Imagine that you are currently paying \$800 per year for your car insurance, and are in the market for a lower price. While researching different insurance companies, one company offers you a lower rate for a full year if you complete their defensive driving course.”

Next, the participants read a line from the advertisement, which differed according to condition. In the MEL condition, the line read “Spend 5 hours in class and save some money...” whereas in the TEL condition, the line read “Spend some time in class and save \$200...” (The \$200 amount was based on a MEL pretest with a separate group of 35 participants who indicated how much savings they would require to spend five hours in class.) Next, the participants read that there would be a class on the coming Saturday at 1pm and indicated either the maximum amount of money that they would be willing to pay to the new insurance company (MEL) or the maximum amount of time they would be willing to spend in the defensive driving class (TEL).

Afterward, participants responded to two items that measured the extent to which time scarcity was considered. These items were similar to those used in study 5, and the responses were averaged ( $\alpha = .84$ ): (a) “When deciding on the amount you mentioned, you may have considered the free time you have after 1:00pm this Saturday. To what extent did you consider the free time you have after 1:00pm this Saturday? (1 = Not much at all, 7 = A lot),” and (b) “When deciding on the amount you mentioned, you may have considered the other time commitments you have after 1:00pm this Saturday. To what extent did you consider



the other time commitments you have after 1:00pm this Saturday? (1 = Not much at all, 7 = A lot).” The two questions for money scarcity ( $\alpha = .91$ ) were similar except that participants were asked to indicate the extent (1 = Not much at all, 7 = A lot) to which they considered money and their other financial commitments.

## Results and Discussion

Following the procedure employed in our earlier studies, we dropped five invalid responses, yielding a total of 68 valid responses (37% female,  $M_{\text{age}} = 34$ ). Next, we conducted an ANOVA in which the dependent variable was wage rate (\$ per hour), and the independent variable was the wage-elicitation procedure (MEL vs. TEL). The results were as we predicted. The desired wage rate was higher in the TEL (vs. MEL) condition ( $M_{\text{TEL}} = \$53.73$ ,  $SD = \$28.50$ ;  $M_{\text{MEL}} = \$40.03$ ,  $SD = \$24.81$ ;  $F(1, 66) = 4.49$ ,  $p < .05$ , Cohen’s  $d = .51$ ).

We next conducted two more ANOVAs in which the independent variable was the same as above (MEL vs. TEL), but the dependent variables were different. In one ANOVA, the dependent variable was the proposed mediator, consideration of time scarcity. The predicted results emerged: consideration of time scarcity was higher in the TEL (vs. MEL) condition ( $M_{\text{TEL}} = 4.53$ ,  $SD = 1.38$ ;  $M_{\text{MEL}} = 3.82$ ,  $SD = 1.53$ ;  $F(1, 66) = 4.02$ ,  $p < .05$ , Cohen’s  $d = .49$ ). In the other ANOVA, the dependent variable was consideration of money scarcity. As expected, a null effect emerged: the consideration of money scarcity was similar in the TEL (vs. MEL) condition ( $M_{\text{TEL}} = 3.83$ ,  $SD = 1.61$ ;  $M_{\text{MEL}} = 4.28$ ,  $SD = 1.77$ ;  $F(1, 66) = 1.18$ ,  $p > .28$ , Cohen’s  $d = .27$ ).

We next conducted a parallel mediation analysis using the PROCESS SPSS macro (model 4; Hayes 2013; Preacher and Hayes 2004). The regression model used wage rate as the dependent variable. The independent variables included the elicitation procedure, the consideration of time scarcity, and the consideration of money scarcity. The effect of the time mediator was marginally significant ( $\beta = 4.07$ ,  $t = 1.81$ ,  $p = .07$ ), the effect of the money mediator was not significant ( $\beta = -2.22$ ,  $t = -1.15$ ,  $p > .24$ ), and the effect of wage-elicitation procedure was also not significant ( $\beta = 4.91$ ,  $t = 1.47$ ,  $p > .14$ ). A bootstrap analysis confirmed an indirect effect at 95% bias-corrected CI for the time mediator [.02, 5.18], and a nonsignificant indirect effect at 95% bias-corrected CI for the money mediator [−.23, 2.93]. Thus, the weight of time scarcity mediated the effect on wage rates, but the weight of money scarcity did not.

In the current study, we employed a consumption context of buying car insurance and observed the same wage-rate asymmetry that we did earlier: TEL (vs. MEL) wage rates were higher. We also provided support for the time scarcity process, bolstering the evidence that we have now

laid out in multiple studies via both moderation and mediation. We also rule out any role for money scarcity. Finally, we reveal these results in a context that allowed us to frame both TEL and MEL questions using a “maximum” frame. Having established the asymmetry yet again, we now explore the downstream consequence of this asymmetry in the next two studies.

## STUDY 7

It is often critical for marketing managers to gauge consumers’ reservation wage rates. After all, if the reservation wage rate is too high, salespeople may decline jobs, consumers may limit their search for low prices, and shoppers may forgo discounts. We examine whether the high reservation rate induced by a TEL (vs. MEL) procedure makes one more reluctant to accept a time-money tradeoff. To test this downstream consequence, we use a modified version of our study 4 setting, with MTurk participants facing an ostensibly real time-money tradeoff.

## Design and Procedure

We used a two-cell design in which the elicitation procedure (TEL vs. MEL) was manipulated between subjects. Eighty-eight adult participants from the MTurk online survey panel were asked to consider participating in an upcoming online survey that was being planned for 8:00pm later that evening. Those in the MEL condition were told that the survey would take 25 minutes and were asked to indicate the minimum amount of money that they would require for this job. Those in the TEL condition were told that they would be paid \$2.50 and asked to indicate the maximum amount of time that they would be willing to work on the survey. These values of \$2.50 and 25 minutes were consistent with the wage rate of \$6/hour used for MTurk participants in study 4. After eliciting wage rates, we presented participants with both money and time values (i.e., \$2.50 and 25 minutes) and asked if they would be willing to participate (Yes/No) in the 8:00pm study. We predicted that the TEL (vs. MEL) procedure would elevate the reservation wage rate, and lower the willingness to participate in the study.

## Results and Discussion

Following the procedure employed in our earlier studies, we dropped four invalid responses, yielding a total of 84 valid responses (43% female,  $M_{\text{age}} = 35$ ). Next, we conducted an ANOVA in which the dependent variable was wage rate (\$ per minute), and the independent variable was the wage-elicitation procedure (MEL vs. TEL). The wage-rate asymmetry emerged just as we predicted and just as we observed in our previous studies: the reservation wage rate (\$ per minute) was higher in the TEL (vs. MEL)

condition ( $M_{\text{TEL}} = \$0.12$ ,  $SD = \$0.12$ ;  $M_{\text{MEL}} = \$0.08$ ,  $SD = \$0.04$ ;  $F(1, 82) = 4.35$ ,  $p < .05$ , Cohen's  $d = .45$ ).

To examine the downstream effect, we conducted a binary logistic regression. The dependent variable was whether or not one agreed to participate in the future study (0 = No, 1 = Yes) and the independent variable was the wage-elicitation procedure ( $\text{MEL} = -1$  vs.  $\text{TEL} = 1$ ). Those in the TEL (vs. MEL) condition were less likely to agree to participate ( $\beta = -.57$ ,  $\text{Wald} = 3.80$ ,  $p = .05$ ; percent saying yes in each condition: TEL: 70%, MEL: 88%), presumably because the TEL reservation wage rates were higher. We confirmed this mediation using the PROCESS SPSS macro (model 4; Hayes 2013; Preacher and Hayes 2004). The regression model used study participation as the dependent variable, with the independent variables being the elicitation procedure as well as the mediator, which was the reservation wage rate. The effect of the mediator was significant ( $\beta = -15.23$ ,  $z = -2.29$ ,  $p < .05$ ), while the effect of wage-elicitation procedure was insignificant ( $\beta = -.38$ ,  $z = -1.25$ ,  $p > .21$ ). A bootstrap analysis confirmed an indirect effect at 95% bias-corrected CI for the mediator  $[-1.09, -.05]$ , suggesting that the wage rate mediated the effect of elicitation procedure on acceptance of the future survey. Thus, we observed the process yielding a downstream consequence: a TEL (vs. MEL) procedure elevated the reservation wage rate in a time-money tradeoff, which lowered participation in the tradeoff.

## STUDY 8

We have already established a robust-wage rate asymmetry using both hypothetical settings (studies 1, 2, 3, 5, and 6) and settings that participants saw as real time-money tradeoffs (studies 4 and 7). We now explore another real time-money tradeoff. Consumers often spend time in order to receive money back after making a purchase (e.g., mail-in rebates; Soman 1998). In a rebate setting, we examine whether a high reservation wage rate is induced by a TEL (vs. MEL) procedure, and if that makes individuals more reluctant to accept the rebate's time-money tradeoff. Additionally, while we earlier tested the mediational chain leading up to the wage rate asymmetry (i.e., studies 5 and 6), we now examine the chain extending up to rebate choice.

### Design and Procedure

We used a two-cell design in which the elicitation procedure (TEL vs. MEL) was manipulated between subjects, and the consideration of time scarcity was measured. At a university bookstore, research assistants approached individuals who had made a purchase and asked them to complete a brief survey in return for a granola bar. One hundred fifteen undergraduate students agreed to participate. They were told that if they were willing to participate

in a second survey being held at the university library, they would earn a cash rebate on their purchase. Thus, students could get a monetary rebate by walking to the library and completing a survey. Those in the MEL condition were told that the total amount of time they would spend (i.e., walking to the library and filling out the survey) would be 11 minutes and indicated the minimum amount of money that they would require. Those in the TEL condition were told that they would receive \$5, and indicated the maximum amount of time that they would spend walking and completing the survey. (The \$5 amount was based on a MEL pretest with a separate group of 25 participants who were told that they would spend 11 minutes.)

Next, participants responded to two items that measured the extent to which time scarcity was considered, just as we measured in studies 5 and 6, but using slightly different language. These two items were as follows ( $\alpha = .89$ ): (a) "When deciding on the amount you indicated earlier, to what extent did you consider how scarce your time is right now?" and (b) "When deciding on the amount you indicated earlier, to what extent did you consider how limited your time is right now? (1 = Not at all, 7 = Very much)." Afterward, participants responded to two items that measured the consideration of money scarcity ( $\alpha = .90$ ): (a) "When deciding on the amount you indicated earlier, to what extent did you consider how scarce your money is right now?" and (b) "When deciding on the amount you indicated earlier, to what extent did you consider how limited your money is right now? (1 = Not at all, 7 = Very much)." Finally, participants answered standard demographic questions. After completing this survey, participants were presented with both money and time values (i.e., \$5 and 11 minutes). They then chose to either (a) not go to the library, or (b) go to the library where they met a research assistant, completed an unrelated survey, and received the rebate.

### Results and Discussion

**Wage Rate.** Following the procedure employed in our earlier studies, we dropped six invalid responses, yielding a total of 109 valid responses (50% female;  $M_{\text{age}} = 21$ ). Next, we conducted an ANOVA in which the dependent variable was the wage rate (\$ per minute), and the independent variable was the wage-elicitation procedure (MEL vs. TEL). The wage-rate asymmetry emerged just as we predicted and also observed in our previous studies: the reservation wage rate (\$ per minute) was higher in the TEL (vs. MEL) condition ( $M_{\text{TEL}} = \$0.93$ ,  $SD = \$0.68$ ;  $M_{\text{MEL}} = \$0.42$ ,  $SD = \$0.41$ ;  $F(1, 107) = 21.64$ ,  $p < .01$ , Cohen's  $d = .91$ ).

**Second Survey Choice.** We conducted a binary logistic regression in which the dependent variable was whether or not people agreed to walk to the library to complete the

second survey (0 = No, 1 = Yes) and the independent variable was the wage-elicitation procedure ( $MEL = -1$  vs.  $TEL = 1$ ). Those in the TEL (vs. MEL) condition were less likely to agree to go to the library ( $\beta = -.43$ ,  $Wald = 4.09$ ,  $p < .05$ ; percent saying yes in each condition: TEL: 23%, MEL: 42%).

*Consideration of Time and Money Scarcity.* We next conducted an ANOVA in which the independent variable was the same as above (MEL vs. TEL), and the dependent variable was the proposed mediator, consideration of time scarcity. The predicted results emerged: the consideration of time scarcity was higher in the TEL (vs. MEL) condition ( $M_{TEL} = 5.38$ ,  $SD = 1.23$ ;  $M_{MEL} = 4.42$ ,  $SD = 1.71$ ;  $F(1, 107) = 11.62$ ,  $p < .01$ , Cohen's  $d = .64$ ). In another ANOVA, the dependent variable was the consideration of money scarcity. As expected, a null effect emerged: the consideration of money scarcity was equal in the TEL (vs. MEL) condition ( $M_{TEL} = 3.82$ ,  $SD = 1.78$ ;  $M_{MEL} = 4.05$ ,  $SD = 1.95$ ;  $F(1, 107) = .42$ ,  $p > .51$ , Cohen's  $d = .12$ ).

*Second Survey Choice Mediation.* We conducted a mediation analysis using the PROCESS SPSS macro (model 4; Hayes 2013; Preacher and Hayes 2004). The regression model used agreement to complete the second survey as the dependent variable, with the independent variables being the elicitation procedure as well as the mediator, which was the desired wage rate. The effect of the mediator was significant ( $\beta = -2.08$ ,  $z = -3.06$ ,  $p < .01$ ), while the effect of wage-elicitation procedure was insignificant ( $\beta = -.07$ ,  $z = -.28$ ,  $p > .76$ ). A bootstrap analysis confirmed an indirect effect at 95% bias-corrected CI for the mediator  $[-.96, -.21]$ , suggesting that the reservation wage rate fully mediated the effect on acceptance of the future survey.

*Wage Rate Mediation.* We next conducted a parallel mediation analysis using the PROCESS SPSS macro (model 4; Hayes 2013; Preacher and Hayes 2004). The regression model used wage rate as the dependent variable. The independent variables included the elicitation procedure, the consideration of time scarcity, and the consideration of money scarcity. The effect of the time mediator was significant ( $\beta = .08$ ,  $t = 2.19$ ,  $p < .03$ ), the effect of the money mediator was not significant ( $\beta = -.01$ ,  $t = -.52$ ,  $p > .59$ ), and the effect of wage-elicitation procedure was significant ( $\beta = .21$ ,  $t = 3.79$ ,  $p < .01$ ). Most importantly, a bootstrap analysis confirmed an indirect effect at 95% bias-corrected CI for the time mediator  $[.009, .09]$ , and a nonsignificant indirect effect at 95% bias-corrected CI for the money mediator  $[-.03, .005]$ . Thus, the weight of time scarcity mediated the effect on wage rates, but the weight of money scarcity did not.

*Sequential Mediation.* We also conducted a sequential mediation analysis to confirm the indirect path of elicitation procedure  $\rightarrow$  time scarcity consideration  $\rightarrow$  wage rate  $\rightarrow$  second survey choice (model 6; Hayes 2013;

Preacher and Hayes 2004). Confirming our theorizing, a bootstrap analysis confirmed an indirect effect at 95% bias-corrected CI for this path  $[-.23, -.01]$ .

Complementing the earlier studies, including the ones in which participants perceived the time-money tradeoff to be real (studies 4 and 7), the current study demonstrated the wage-rate asymmetry in another real time-money tradeoff. This situation was akin to marketing contexts in which consumers invest time after a purchase is made, such as by completing a mail-in form in order to receive a rebate. In the current study, participants had to invest that time in going to the library and completing a survey. The wage rate that participants indicated in anticipation of this activity revealed the same wage-rate asymmetry that we observed in the seven previous studies. Moreover, this wage rate influenced whether or not participants actually engaged in that activity. Finally, this study provided a comprehensive assessment of the entire mediational chain intervening between elicitation procedure and choice.

## GENERAL DISCUSSION

Time-money tradeoffs are at the heart of consumer search, sales promotions, and other contexts. We introduce a new construct, consumer wage rate, to capture such contexts in which consumers incur the cost of time in return for a monetary benefit. We argue that because consumers may not have wage rates readily available in their minds, they construct them. When faced with money, they construct a threshold for time (TEL); and when faced with time, they construct a threshold for money (MEL). In eight studies (see the summary of results given earlier), we show that TEL yields a higher wage rate than MEL. Five of these studies reveal, via moderation and mediation, the underlying process. Specifically, there is an asymmetry in the weight placed on time scarcity, which leads to a wage-rate asymmetry. We also rule out any asymmetry in the consideration of money scarcity or base wage rates. Finally, two studies demonstrate that because the TEL (vs. MEL) procedure leads to a higher reservation wage rate, the downstream consequence is a greater reluctance to accept a time-money tradeoff. Overall, our theory receives robust evidence across student and adult participants, hypothetical and real settings, moderation and mediation paradigms, and for a variety of consumer contexts.

## Theoretical Implications

*Wage Rates.* In the domain of labor, wage rates are extensively studied, as are its determinants such as skill (Juhn et al. 1993), labor supply (Borjas 2003), unions (Lee 1978) and politics (Waltman and Pittman 2002). But wage rates have not been used to study consumption. We adopt a new perspective of a consumer wage rate, and reveal an asymmetry that can influence the willingness to accept a



time-money tradeoff. Our findings interject philosophical ambiguity into the meaning of a wage rate (Burdett 1978; Burdett and Mortensen 1998; Lee 1978). Paraphrasing Slovic's (1995) musings about the meaning of changing preferences, our results challenge the very basis of what a wage rate is, and in what sense it exists.

*Time versus Money.* Perhaps assuming that the two elicitation procedures are equivalent, TEL and MEL have been used interchangeably in the consumer behavior literatures on time-money tradeoffs and time-money differences (Leclerc et al. 1995; Marmorstein et al. 1992; Okada and Hoch 2004; Saini and Monga 2008; Soman 2001; Soster et al. 2010). Some scholars elicit the time equivalent of an amount of money (Marmorstein et al. 1992, study 2; Okada and Hoch 2004, study 1), and others elicit the money equivalent of an amount of time (Leclerc et al. 1995, study 2; Soster et al. 2010, study 2). Given our results, different equivalencies may have emerged if the alternate procedure had been used. For instance, Okada and Hoch (2004, study 1) found that participants judged \$50 to be equivalent to four hours (i.e., used TEL), and then showed that four hours (vs. \$50) was associated with more ambiguity. The strength of this effect of greater ambiguity for time may have changed if MEL had been used (and four hours had been compared to an amount less than \$50). Time is indeed more ambiguous, but such psychological time-money differences may be influenced by ambiguity in the economic equivalence of time and money.

*Procedural Invariance.* Because a procedure may not simply "reveal" a preference, but "construct" it, asymmetries are known to arise between choice, pricing, and matching procedures (Lichtenstein and Slovic 1971, 1973; Tversky et al. 1988), and between buyers and sellers (Knetsch 1989; Thaler 1980; Tversky and Kahneman 1991). We discover a new failure of procedural invariance for sellers of time, and a new determinant of this failure: time scarcity. Also, this type of invariance influences acceptance of a time-money tradeoff. Our findings also connect to prior research on mere measurement, such as how a purchase-intent question can nudge one toward purchase (Feldman and Lynch 1988; Fitzsimons and Morwitz 1996; Levav and Fitzsimons 2006; Morwitz, Johnson, and Schmittlein 1993; Nedungadi 1990). We show how the simple act of answering a MEL (rather than TEL) question can lower the reservation wage rate, and nudge one toward accepting a time-money tradeoff.

*Scarcity.* We add to a recent surge of research on scarcity (DeVoe and Pfeffer 2011; Etkin et al. 2015; Mani et al. 2013; Mogilner et al. 2012; Mullainathan and Shafir 2013; Shah et al. 2012; Sharma and Alter 2012). It is known that time scarcity makes people reluctant to spend their time on various activities (DeVoe and Pfeffer 2011; Kasser and Sheldon 2009; Rudd et al. 2012). We show that

a greater consideration of time scarcity makes consumers demand a superior wage rate when the elicitation procedure is TEL rather than MEL.

## Practical Implications

Time-money tradeoffs are at the heart of marketing domains, such as salesforce compensation (Basu et al. 1985; John and Weitz 1989; Lal and Staelin 1986), consumer search (Alba et al. 1997; Hoque and Lohse 1999; Lynch and Ariely 2000), and sales promotions (Blattberg and Neslin 1990; Soman 1998). Our results afford implications for all three of these domains, which can be viewed from the lens of a reservation wage rate (money/time).

*Salesforce Compensation.* Salespeople may decline jobs if the available wage rate (compensation/working time) falls short of their reservation wage rate. Therefore, it may be wise for sales managers to measure wage rates using both methods to get a sense of the range of desired wage rates. Given our results from studies 7 and 8, it is possible to influence wage rates during negotiations by discussing one's wage threshold. A manager trying to entice a potential salesperson to accept a position would be better off using a MEL procedure (talking about the time commitment first, while letting the salesperson contemplate the money) than a TEL procedure (talking about wages first, while letting the salesperson contemplate the required time commitment). The lower wage rate for MEL would make it more likely that the position is accepted when the manager eventually divulges all time and money details. Similar effects may arise when compensating study participants. For instance, in study 7, when time information was provided first (i.e., MEL procedure), the reservation wage rate was lower, making participants more willing to participate after all information was provided. Other researchers, whether in academia or marketing research firms, may similarly increase participation in their studies.

*Consumer Search.* Individuals may not search for low prices if the available wage rate (price saving/search time) falls short of their reservation wage rate. Consider the insurance context (such as that of study 6). To find cheaper insurance, consumers need to contact multiple insurance companies to get quotes. They often do not. This is because the wage rate of this search activity seems low—the expected dollar savings do not seem large enough to justify making calls. Capitalizing on this, Geico reminds customers that "a 15-minute call could save you 15% or more on car insurance." Their recent slogans are more implicit, and resemble our MEL ("15 minutes could save you...well, you know") and TEL ("15 percent...need I say more?") procedures. Because the MEL (vs. TEL) version yields a lower wage rate, the eventual saving that Geico offers will seem more substantial.



*Sales Promotions.* Shoppers may forgo discounts if the available wage rate (value of discount/waiting time) falls short of their reservation wage rate. As we showed (studies 3, 5, and 8), the reservation wage rate for spending time in return for a rebate or gift certificate is a function of how the wage rate is elicited. Because managers are interested in offering only the minimum discount that is necessary to lure customers, sales promotions may be advertised (such as in the aforementioned Geico example) to keep the reservation wage rate to a minimum. Such techniques could also be employed to encourage the purchase of do-it-yourself (vs. assembled) products in which consumers spend their own time on assembly in return for a lower price.

## Future Research

*Nonmonetary Contexts.* It remains to be seen if our results extend to nonmonetary contexts, such as those relating to product consumption. Instead of a wage rate (i.e., money/time), what may come into play is a consumption rate (i.e., product quantity/time period of consumption). If there is a consumption-rate asymmetry (depending on which information is provided first), that would have implications for choices of vices versus virtues (Siddiqui, May, and Monga 2017). In the context of product relationships, spending time may evoke a focus on product connection (Liu and Aaker 2008; Mogilner and Aaker 2009), making one even more reluctant to part with one's time in the TEL procedure, thus promoting the wage-rate asymmetry. Conversely, if happiness or awe makes time seem plentiful (Aaker, Rudd, and Mogilner 2011; Rudd et al. 2012), people might spend their time more liberally, thus attenuating the asymmetry. Effects might also emerge due to incidental emotions that often influence sellers (Lerner, Small, and Loewenstein 2004).

*Descriptive Invariance.* We examined procedural invariance, but not descriptive invariance, such as due to framing effects (Tversky and Kahneman 1981). For instance, if we were to provide complete information, but change the sequence (10 minutes for \$5 vs. \$5 for 10 minutes), that may change the perception of the tradeoff (Bagchi and Davis 2012). Similarly, prior research shows that units may influence judgments (Gourville 1998; Monga and Bagchi 2012; Raghuram and Srivastava 2002; Wertenbroch, Soman, and Chattopadhyay 2007). We observed the wage-rate asymmetry for different units of time, but did not manipulate units within any single study. Consider the same TEL question asked in terms of minutes versus seconds. The former may elicit a round "1 minute" from a participant while the latter elicits "50 seconds" or "70 seconds." Such rounding for larger units in the case of time or money could potentially influence the wage-rate

asymmetry. Future research could examine whether and how such an influence emerges.

*Demographics.* While income and gender may influence how time is perceived (DeVoe and Pfeffer 2011; Hamermesh and Lee 2007; Roxburgh 1996, 2006), we observed that the wage-rate asymmetry is robust to such influences. However, our results may have been a function of how our participants perceived time-money connections (DeVoe and Pfeffer 2007, 2009; DeVoe, Lee, and Pfeffer 2010). Future research could test our theory on broader demographic samples.

## Conclusion

The current research introduces a construct to capture time-money tradeoffs across diverse consumption situations (i.e., consumer wage rate), reveals a new effect (i.e., wage-rate asymmetry), identifies the antecedent (i.e., elicitation procedure), documents a consequence (i.e., willingness to accept a time-money tradeoff), and isolates the underlying process (i.e., time scarcity). These findings afford interesting implications for both theory and practice.

## DATA COLLECTION INFORMATION

The data in this manuscript were collected on MTurk (studies 1, 2, 3, 4, 6, 7, and corresponding pretests), at the University of South Carolina (study 5), and at Virginia Tech (study 8 and corresponding pretest) by research assistants and the authors between spring 2013 and spring 2016. The data were analyzed by the second author under the guidance of the other two authors.

## REFERENCES

- Aaker, Jennifer, Malanie, Rudd, and Cassie, Mogilner (2011), "If Money Does Not Make You Happy, Consider Time," *Journal of Consumer Psychology*, 21 (2), 126–30.
- Alba, Joseph, John Lynch, Barton Weitz, Chris Janiszewski, Richard Lutz, Alan Sawyer, and Stacy Wood (1997), "Interactive Home Shopping: Consumer, Retailer, and Manufacturer Incentives to Participate in Electronic Marketplaces," *Journal of Marketing*, 61 (3), 38–53.
- Bagchi, Rajesh and Derick F. Davis (2012), "\$29 for 70 items or 70 items for \$29? How Presentation Order Affects Package Perceptions," *Journal of Consumer Research*, 39 (1), 62–73.
- Basu, Amiya, Rajiv Lal, V. Srinivasan, and Richard Staelin (1985), "Salesforce Compensation Plans: An Agency Theoretic Perspective," *Marketing Science*, 4 (Fall), 267–91.
- Becker, Gary (1965), "A Theory of the Allocation of Time," *Economic Journal*, 75 (299), 493–517.
- Berinsky, Adam J., Gregory A. Huber, and Gabriel S. Lenz (2012), "Evaluating Online Labor Markets for Experimental Research: Amazon.com's Mechanical Turk," *Political Analysis*, 20 (3), 351–68.
- Birnbaum, Michael and Steven Stegner (1979), "Source Credibility in Social Judgment: Bias, Expertise, and the

- Judge's Point of View," *Journal of Personality and Social Psychology*, 37 (1), 48–84.
- Birnbaum, Michael H., Sherry Yeary, R. Duncan Luce, and Li Zhao (2016), "Empirical Evaluation of Four Models of Buying and Selling Prices of Gambles," *Journal of Mathematical Psychology*, 75 (December), 183–93.
- Blattberg, Robert and Scott Neslin (1990), *Sales Promotion: Concepts, Methods, and Strategies*, Englewood Cliffs, NJ: Prentice-Hall.
- Bleichrodt, Han and Jose Lius Pinto (2002), "Loss Aversion and Scale Compatibility in Two-Attribute Trade-Offs," *Journal of Mathematical Psychology*, 46 (3), 315–37.
- Borjas, George J. (2003), "The Labor Demand Curve Is Downward Sloping: Reexamining the Impact of Immigration on the Labor Market," *Quarterly Journal of Economics*, 118 (4), 1335–74.
- Braverman, Harry (1974), *Labor and Monopoly Capital: The Degradation of Work in the Twentieth Century*, New York: NYU Press.
- Burdett, Kenneth (1978), "A Theory of Employee Job Search and Quit Rates," *American Economic Review*, 68 (1), 212–20.
- Burdett, Kenneth and Dale Mortensen (1998), "Wage Differentials, Employer Size, and Unemployment," *International Economic Review*, 39 (2), 257–73.
- Carmon, Ziv and Dan Ariely (2000), "Focusing on the Forgone: How Value Can Appear So Different to Buyers and Sellers," *Journal of Consumer Research*, 27 (3), 360–70.
- DeVoe, Sanford E. and Jeffrey Pfeffer (2007), "When Time Is Money: The Effect of Hourly Payment on the Evaluation of Time," *Organizational Behavior and Human Decision Processes*, 104 (1), 1–13.
- (2009), "The Economic Evaluation of Time: Organizational Causes and Individual Consequences," *Research in Organizational Behavior*, 32 (August), 47–62.
- (2011), "Time Is Tight: How Higher Economic Value of Time Increases Feelings of Time Pressure," *Journal of Applied Psychology*, 96 (4), 665–76.
- DeVoe, Sanford E., Bryon Y. Lee, and Jeffrey Pfeffer (2010), "Hourly versus Salaried Payment and Decisions about Trading Time and Money over Time," *Industrial and Labor Relations Review*, 63 (July), 627–40.
- Etkin, Jordan, Ioannis Evangelidis, and Jennifer Aaker (2015), "Pressed for Time? Goal Conflict Shapes How Time Is Perceived, Spent, and Valued," *Journal of Marketing Research*, 52 (3), 394–406.
- Feldman, Jack and John Lynch (1988), "Self-Generated Validity and Other Effects of Measurement or Belief, Attitude, Intention, and Behavior," *Journal of Applied Psychology*, 73 (3), 421–35.
- Fishbach, Ayelet and Ravi Dhar (2005), "Goals as Excuses or Guides: The Liberating Effect of Perceived Goal Progress on Choice," *Journal of Consumer Research*, 32 (3), 370–7.
- Fitzsimons, Gavan and Vicki Morwitz (1996), "The Effect of Measuring Intent on Brand-Level Purchase Behavior," *Journal of Consumer Research*, 23 (1), 1–11.
- Frederick, Shane, Nathan Novemsky, Jing Wang, Ravi Dhar, and Stephen Nowlis (2009), "Opportunity Cost Neglect," *Journal of Consumer Research*, 36 (4), 553–61.
- Gourville, John (1998), "Pennies-a-Day: The Effect of Temporal Reframing on Transaction Evaluation," *Journal of Consumer Research*, 24 (4), 395–403.
- Hamermesh, Daniel S. and Jungmin Lee (2007), "Stressed Out on Four Continents: Time Crunch or Yuppie Kvetch?" *Review of Economics and Statistics*, 89 (2), 374–83.
- Hayes, Andrew F. (2013), *Introduction to Mediation, Moderation, and Conditional Process Analysis: A Regression-based Approach*, New York: Guilford Press.
- Hoque, Abeer and Gerald Lohse (1999), "An Information Search Cost Perspective for Designing Interfaces for Electronic Commerce," *Journal of Marketing Research*, 36 (August), 387–94.
- John, George and Barton Weitz (1989), "Salesforce Compensation: An Empirical Investigation of Factors Related to Use of Salary versus Incentive Compensation," *Journal of Marketing Research*, 26 (1), 1–14.
- Johnson, William, Yuichi Kitamura, and Derek Neal (2000), "Evaluating a Simple Method for Estimating Black-White Gaps in Median Wages," *American Economic Review*, 90 (2), 339–43.
- Juhn, Chinhui, Kevin M. Murphy, and Brooks Pierce (1993), "Wage Inequality and the Rise in Returns to Skill," *Journal of Political Economy*, 101 (3), 410–42.
- Kahneman, Daniel and Amos Tversky (1979), "Prospect Theory: An Analysis of Decision under Risk," *Econometrica*, 47 (2), 263–92.
- Kasser, Tim and Kennon M. Sheldon (2009), "Time Affluence as a Path toward Personal Happiness and Ethical Business Practice: Empirical Evidence from Four Studies," *Journal of Business Ethics*, 84 (2), 243–55.
- King, Laura, Joshua Hicks, and Justin Abdelkhalik (2009), "Death, Life, Scarcity, and Value: An Alternative Perspective on the Meaning of Death," *Psychological Science*, 20 (12), 1459–62.
- Knetsch, Jack L. (1989), "The Endowment Effect and Evidence of Nonreversible Indifference Curves," *American Economic Review*, 79 (December), 1277–84.
- Lal, Rajiv and Richard Staelin (1986), "Salesforce Compensation Plans in Environments with Asymmetric Information," *Marketing Science*, 5 (3), 179–98.
- Leclerc, France, Bernd Schmitt, and Laurette Dube (1995), "Waiting Time and Decision Making: Is Time Like Money?" *Journal of Consumer Research*, 22 (1), 110–19.
- Lee, Lung-Fei (1978), "Unionism and Wage Rates: A Simultaneous Equations Model with Qualitative and Limited Dependent Variables," *International Economic Review*, 19 (2), 415–33.
- Lenert, Leslie and Jonathan Treadwell (1999), "Effects on Preferences of Violations of Procedural Invariance," *Medical Decision Making*, 19 (4), 473–81.
- Lerner, Jennifer S., Deborah A. Small, and George Loewenstein (2004), "Heart Strings and Purse Strings: Carryover Effects of Emotions on Economic Decisions," *Psychological Science*, 15 (5), 337–41.
- Levav, Jonathan and Gavan Fitzsimons (2006), "When Questions Change Behavior: The Role of Ease of Representation," *Psychological Science*, 17 (3), 201–13.
- Lichtenstein, Sarah and Paul Slovic (1971), "Reversals of Preference between Bids and Choices in Gambling Decisions," *Journal of Experimental Psychology*, 89 (1), 46–55.
- (1973), "Response-Induced Reversals of Preference in Gambling: An Extended Replication in Las Vegas," *Journal of Experimental Psychology*, 101 (1), 16–20.
- Liu, Wendy and Jennifer Aaker (2008), "The Happiness of Giving: The Time-Elicit Effect," *Journal of Consumer Research*, 35 (3), 543–57.
- Lynch, John and Dan Ariely (2000), "Wine Online: Search Costs Affect Competition on Price, Quality, and Distribution," *Marketing Science*, 19 (1), 83–103.

- Lynch, John and Thomas Srull (1982), "Memory and Attentional Factors in Consumer Choice: Concepts and Research Methods," *Journal of Consumer Research*, 9 (1), 18–37.
- Magen, Eran, Carol Dweck, and James Gross (2008), "The Hidden-Zero Effect: Representing a Single Choice as an Extended Sequence Reduces Impulsive Choice," *Psychological Science*, 19 (7), 648–49.
- Mani, Anandi, Sendhil Mullainathan, Eldar Shafir, and Jiaying Zhao (2013), "Poverty Impedes Cognitive Function," *Science*, 341 (6149), 976–80.
- Marmorstein, Howard, Dhruv Grewal, and Raymond Fishe (1992), "The Value of Time Spent in Price-Comparison Shopping: Survey and Experimental Evidence," *Journal of Consumer Research*, 19 (1), 52–61.
- Menzies, Heather (2005), *No Time: Stress and the Crisis of Modern Life*, Berkely, CA: Douglas and McIntyre.
- Mitra, Anusree and John Lynch (1995), "Toward a Reconciliation of Market Power and Information Theories of Advertising Effects on Price Elasticity," *Journal of Consumer Research*, 21 (4), 644–59.
- Mogilner, Cassie and Jennifer Aaker (2009), "The Time vs. Money Effect: Shifting Product Attitudes and Decisions through Personal Connection," *Journal of Consumer Research*, 36 (2), 277–91.
- Mogilner, Cassie, Zoe Chance, and Michael Norton (2012), "Giving Time Gives You Time," *Psychological Science*, 23 (10), 1233–38.
- Monga, Ashwani and Rajesh Bagchi (2012), "Years, Months, and Days versus 1, 12, and 365: The Influence of Units versus Numbers," *Journal of Consumer Research*, 39 (1), 185–98.
- Morwitz, Vicki, Eric Johnson, and David Schmittlein (1993), "Does Measuring Intent Change Behavior?" *Journal of Consumer Research*, 20 (1), 46–61.
- Mullainathan, Sendhil and Eldar Shafir (2013), *Scarcity: Why Having Too Little Means So Much*, New York: Macmillan.
- Nayakankuppam, Dhananjay and Himanshu Mishra (2005), "The Endowment Effect: Rose-Tinted and Dark-Tinted Glasses," *Journal of Consumer Research*, 32 (3), 390–5.
- Nedungadi, Prakash (1990), "Recall and Consumer Consideration Sets: Influencing Choice without Altering Brand Evaluations," *Journal of Consumer Research*, 17 (3), 263–76.
- Okada, Erica Mina and Stephen J. Hoch (2004), "Spending Time versus Spending Money," *Journal of Consumer Research*, 31 (2), 313–23.
- Payne, John, James Bettman, and Eric Johnson (1992), "Behavioral Decision Research: A Constructive Processing Perspective," *Annual Review of Psychology*, 43 (1), 87–131.
- Pollak, Robert and Michael Wachter (1975), "The Relevance of the Household Production Function and Its Implications for the Allocation of Time," *Journal of Political Economy*, 83 (2), 255–78.
- Posavac, Steven, David Sanbonmatsu, and Russell Fazio (1997), "Considering the Best Choice: Effects of the Salience and Accessibility of Alternatives on Attitude-Decision Consistency," *Journal of Personality and Social Psychology*, 72 (2), 253–61.
- Preacher, Kristopher J. and Andrew F. Hayes (2004), "SPSS and SAS Procedures for Estimating Indirect Effects in Simple Mediation Models," *Behavior Research Methods, Instruments, and Computers*, 36 (4), 717–31.
- Priester, Joseph, Uptal Dholakia, and Monique Fleming (2004), "When and Why the Background Contrast Effect Emerges: Thought Engenders Meaning by Influencing the Perception of Applicability," *Journal of Consumer Research*, 31 (December), 491–501.
- Raghubir, Priya and Joydeep Srivastava (2002), "Effect of Face Value on Product Valuation in Foreign Currencies," *Journal of Consumer Research*, 29 (3), 335–47.
- Roxburgh, Susan (1996), "Gender Difference in Work and Well-Being: Effects of Exposure and Vulnerability," *Journal of Health and Social Behavior*, 37 (3), 265–77. [PMC][8898497]
- (2004), "There Just Aren't Enough Hours in the Day: The Mental Health Consequences of Time Pressure," *Journal of Health and Social Behavior*, 45 (2), 115–31.
- (2006), "I Wish We Had More Time to Spend Together... The Distribution and Predictors of Perceived Family Time Pressures Among Married Men and Women in the Paid Labor Force," *Journal of Family Issues*, 27 (4), 529–53.
- Rudd, Melanie, Kathleen D. Vohs, and Jennifer Aaker (2012), "Awe Expands People's Perception of Time, Alters Decision Making, and Enhances Well-Being," *Psychological Science*, 23 (10), 1130–36.
- Saini, Ritesh and Ashwani Monga (2008), "How I Decide Depends on What I Spend: Use of Heuristics Is Greater for Time than for Money," *Journal of Consumer Research*, 34 (6), 914–22.
- Shah, Anuj, Sendhil Mullainathan, and Eldar Shafir (2012), "Some Consequences of Having Too Little," *Science*, 338 (6107), 682–85.
- Sharma, Eesha and Adam Alter (2012), "Financial Deprivation Prompts Consumers to Seek Scarce Goods," *Journal of Consumer Research*, 39 (3), 545–60.
- Siddiqui, Rafay A., Frank May, and Ashwani Monga (2017), "Time Window as a Self-Control Denominator: Shorter Windows Shift Preference toward Virtues and Longer Windows toward Vices," *Journal of Consumer Research*, 43 (6), 932–49.
- Slovic, Paul (1995), "The Construction of Preference," *American Psychologist*, 50 (5), 364–71.
- Slovic, Paul, Dale Griffin, and Amos Tversky (1990), "Compatibility Effects in Judgment and Choice," in *Heuristics and Biases: The Psychology of Intuitive Judgment*, New York: Cambridge University Press, 217–29.
- Slovic, Paul and Sarah Lichtenstein (1968), "Relative Importance of Probabilities and Payoffs in Risk Taking," *Journal of Experimental Psychology*, 3 (2), 1–18.
- Soman, Dilip (1998), "The Illusion of Delayed Incentives: Evaluating Future Effort-Money Transactions," *Journal of Marketing Research*, 35 (4), 427–37.
- (2001), "The Mental Accounting of Sunk Time Costs: Why Time Is Not Like Money," *Journal of Behavioral Decision Making*, 14 (3), 169–85.
- Soster, Robin L., Ashwani Monga, and William O. Bearden (2010), "Tracking Costs of Time and Money: How Accounting Periods Affect Mental Accounting," *Journal of Consumer Research*, 37 (4), 712–21.
- Spiller, Stephen A. (2011), "Opportunity Cost Consideration," *Journal of Consumer Research*, 38 (4), 595–610.
- Thaler, Richard (1980), "Toward a Positive Theory of Consumer Choice," *Journal of Economic Behavior and Organization*, 1 (1), 39–60.
- Tulving, Endel and Zena Pearlstone (1966), "Availability versus Accessibility of Information in Memory for Words," *Journal of Verbal Learning and Verbal Behavior*, 5 (4), 381–91.

- Tversky, Amos and Daniel Kahneman (1981), "The Framing of Decisions and the Psychology of Choice," *Science*, 211 (4481), 453–8.
- (1991), "Loss Aversion in Riskless Choice: A Reference-Dependent Model," *Quarterly Journal of Economics*, 106 (4), 1039–61.
- Tversky, Amos, Shmuel Sattath, and Paul Slovic (1988), "Contingent Weighting in Judgment and Choice," *Psychological Review*, 95 (3), 371–84.
- Tversky, Amos, Paul Slovic, and Daniel Kahneman (1990), "The Causes of Preference Reversal," *American Economic Review*, 80 (1), 204–17.
- Waltman, Jerold and Sarah Pittman (2002), "The Determinants of State Minimum Wage Rates: A Public Policy Approach," *Journal of Labor Research*, 23 (1), 51–6.
- Wertenbroch, Klaus, Dilip Soman, and Amitava Chattopadhyay (2007), "On the Perceived Value of Money: The Reference Dependence of Currency Numerosity Effects," *Journal of Consumer Research*, 3 (1), 1–10.
- Zauberman, Gal and John G. Lynch Jr. (2005), "Resource Slack and Propensity to Discount Delayed Investments of Time versus Money," *Journal of Experimental Psychology: General*, 134 (1), 23–37.



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