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Thinking about time as money: Does thinking about the monetary value of time diminish
happiness from leisurely activities?

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Author Note

<https://github.com/kchoi1011/multilevelmodeling.git>

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“Time is money” is one of the most common metaphors that people use to talk about time (Soman, 2001). This is reflected in the various ways we speak about time. We ‘spend’, ‘save’, ‘invest’, ‘budget’ and ‘waste’ time (Lakoff & Johnson, 1980). We talk about time as if it is equivalent to money, and rightfully so. Time and money are both valuable resources that we use to accomplish our goals (Hershfield, Mogilner & Barnea, 2016) and people often find that they do not have enough of both time (DeVoe & Pfeffer, 2011; Perlow, 1999) and money (Rheault, 2011).

Given that both time and money are perceived as scarce and valuable resources that people covet, researchers have been interested in the psychological effects of equating time and money. Although the value of time is often ambiguous (Okada & Hoch, 2004) and is mentally accounted for differently than money (Soman, 2001; Rajagopal & Rha, 2009), thinking about time in terms of its economic value can make the opportunity cost of money salient. For example, previous research suggests that when people calculate income in the form of an hourly wage, the psychological effects of thinking about money extends to time as this procedure primes people to focus on the monetary value of their time (DeVoe & House, 2011; DeVoe & Pfeffer, 2007a; 2007b; DeVoe & Pfeffer, 2009).

When this time-as-money mindset is activated, it has downstream consequences on people’s everyday behavior. When the time-as-money mindset is made accessible, researchers find that people become impatient (DeVoe & House, 2011), are more willing to give up leisure time to work (DeVoe & Pfeffer, 2007a), are less likely to volunteer their time (DeVoe & Pfeffer, 2007b), and are more likely to focus on material factors over experiences in evaluating one’s

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subjective well-being (DeVoe & Pfeffer, 2009). Extant research therefore suggests that once people attach a monetary value to time, thoughts about the opportunity cost and economic returns of their time become salient such that experiences become less enjoyable. The overarching goal of the current research is to further explore how making economic evaluations of time can affect the level of happiness people derive from leisurely activities.

Leisure Activities

Leisure is often defined as time spent outside of paid work and other obligations (Voss, 1967). Engaging in leisurely activities has a host of benefits: It is one of the main sources of people's happiness (Aaker, Rudd & Mogilner, 2011; Van Boven & Gilovich, 2003), it facilitates social relationships (Glover & Parry, 2008), and it decreases the risk of psychological disorders (Iwasaki et al, 2006).

Despite the positive effects of leisure, people increasingly perceive time spent on leisure to be wasteful. This view around leisure has worsened in recent years due to social norms around busyness (Bellezza, Paharia & Keinan, 2017; Darier, 1998; Gershuny, 2005) and productivity (Malkoc & Tonietto, 2019). Prior research finds that the culture of relentless productivity and people's desire for continual progress can make people perceive leisure to be wasteful (e.g. Tonietto et al., 2021).

Leisure and the Time-as-money Mindset

Prior work on leisure has identified various factors that can undermine people's happiness in engaging in leisurely activities, such as scheduling time for leisure (Tonietto & Malkoc, 2016) or tracking time spent on leisure (Etkin, 2016). However, no research to date has explored whether focusing on the monetary value of time can influence the value people derive from leisure. People often perceive themselves as victims of a time famine – having too much to do

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but not enough time to do it all (Perlow, 1999). Likewise, when time is perceived as a commodity in short supply, people often feel guilty of wasting time on idle pursuits (Foley, 2017), as consciousness of the limited nature of time reminds people to purposely spend it (Southerton, 2003). When time seems increasingly scarce, anything that detracts us from the goal at hand should potentially be interpreted as a costly problem.

Like money, time is perceived to be something subject to a degree of personal control, but also liable to be wasted if control is relaxed. This can consequently make us obsessed with the danger of wasting time. In the current research, I hypothesize that people will show a heightened sensitivity to wasting time when time is psychologically associated with money. Prior research suggests that thinking about money or being in a money mindset focuses one's attention to the self (Vohs et al., 2006; 2008) and opportunities to pursue one's goal (Liu & Aaker, 2008). This hyperfocus on goal maximization can increase productivity (Mogilner, 2010), but comes at a cost. When people are reminded of the opportunity cost of time, they exhibit similar behaviors as people who are primed to think about money (DeVoe & Pfeffer, 2007a,b; 2009; Evans et al., 2004). For example, people derive less happiness from giving (Liu & Aaker, 2010) and are less likely to savor experiences (Quoidbach et al., 2010).

While the opportunity cost of time is not always salient, being paid by an hourly wage rate should make people more calculative about their time. Indeed, research finds that people who are paid by an hourly wage rate or are prompted to think about their income in the form of an hourly wage are more likely to endorse statements associating time with money and show a preference for spending more time on paid work (DeVoe & Pfeffer, 2007). This is believed to be the result of equating time to money, which should remind people that any time not used to earn money is wasted opportunity (DeVoe & House, 2012). Hence, I propose that being paid an

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hourly wage should increase people's propensity to make monetary evaluations of time. As a result, they should perceive leisure as wasteful and thus derive less happiness from engaging in leisurely activities.

Method

If hourly workers are more likely to focus on the monetary value of time, I predict that hourly workers should derive less happiness from engaging in leisurely activity as the opportunity cost of time for the activity increases. To test this hypothesis, I used time-diary data from the American Time Use Survey from 2021 when data for the Well-Being Module was collected (<https://www.bls.gov/tus/modules/wbdatafiles.htm>). This data set is the first federally administered survey on time use in the United States, with the objective to “measure how people divide their time among life's activities”. Respondents of the survey report the activities that they engaged in the day prior to the interview. From the list of activities reported, three activities are randomly selected for the Well-Being Module, which collects various measures of subjective well-being such as perceived levels of happiness, meaning and stress.

Measures

Independent Variable

To measure people's hourly wage status, I dummy coded “1” for non hourly workers and “2” for hourly workers. In addition, to account for the opportunity cost of time spent on the activities, the duration of the activity (in minutes) was included in the models (DeVoe & Pai, 2021). If there is evidence for an interaction between hourly wage status and the duration of activity, I will also test for a three way interaction between hourly wage status, duration of activity, and logged income per week of the respondent to account for the foregone income for engaging in leisurely activities.

Dependent Variable

Since the goal of this research was to study the happiness derived from engaging in leisurely activities, a subset of the data with only activities categorized as “leisure-related activities” were used for analysis. The main dependent variable was the respondent’s rating of how happy they felt during the activity, which was measured using a scale from 1 (Not At All) to 7 (Very).

Control Variables

Hourly and non hourly workers are likely to be different in many aspects, and engagement in different leisurely activities are also likely to be influenced by various factors. To account for these differences, I statistically controlled for a number of variables that were previously shown to affect people’s allocation of time: sex (1 = male, 2 = female) age, marital status (1 = not married, 2 = married), number of hours worked (per week), and number of children under 18 (DeVoe & Pfeffer, 2007; Whillans & Dunn, 2015). The ATUS survey interviews respondents on both weekends and weekdays, which can influence factors like the time people spend on leisurely activities, the type of leisurely activities people engage in, and the perceived opportunity cost of one’s time. Hence, we also included a variable to capture the ‘day of diary’, for whether the respondent was interviewed on a weekday or on a weekend day (1 = weekday, 2 = weekend day).

Model

The ATUS data has a multi-level structure with activities nested in each individual. The intraclass correlation for the happiness variable was 0.621, indicating evidence that happiness derived from engaging in leisurely activities varies across people. I therefore employed a multilevel modeling approach (Raudenbush & Bryk, 2002) to appropriately account for the

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nested nature of the data and to explore associations of activity-level and person-level variables.

This approach allowed separation of variables into activity-level and person-level effects by using person-centered means and person means of the predictor variable at level 1 of the hierarchical linear model. The random slope variance for cluster-mean centered variable ‘duration’ was significant, so it was included in the model. Equations for the model at the two levels were as follows:

Level 1:

$$\text{SCHAPPY}_{ij} = \beta_{0j} + \beta_{1j}\text{DURATION_CMC}_{ij} + e_{ij}$$

Level 2:

$$\begin{aligned}\beta_{0j} &= \gamma_{00} + \gamma_{01}\text{DURATION_CM}_j + \gamma_{02}\text{PAIDHOUR}_j + X_{3j}\gamma_{03} + \dots + X_{8j}\gamma_{08} + u_{0j} \\ \beta_{1j} &= \gamma_{10} + \gamma_{11}\text{PAIDHOUR}_j + u_{1j}\end{aligned}$$

where γ_{02} = regression coefficient of person-level hourly status variable representing the expected difference in happiness levels between two activities with the same duration and from two people with the same person-level duration, but one is paid by the hour and the other is not. γ_{11} = cross-level interaction coefficient of the expected slope difference between a worker who is paid by the hour and a worker who is not paid by the hour with the same person-level duration. X_{3j} to X_{8j} indicate the person-level covariates included in the model (sex, age, marital status, day of diary, number of hours worked weekly, and number of children under 18)

Results and Discussion

Descriptive statistics and the intercorrelations among the study variables are provided in Table 1. Respondent’s hourly work status was significantly correlated with several variables: age,

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sex, marital status, number of hours worked per week, number of children under age 18, and duration of activity. However, in contrast to my hypothesis, hourly status was not significantly related to happiness derived from leisure activities. The only variables that were significantly correlated with happiness was sex and duration of activity.

Table 2 shows the result of our full model (Model 3) predicting happiness from leisurely activities based on the activity-level and person-level variables detailed above. Results suggest that the full model shows a better fit in comparison to simpler alternative models. The primary result of interest for this study was whether the respondent's hourly pay status is associated with happiness derived from participating in leisure activities, and if so, whether there would be an interaction between hourly pay status and the duration that people participate in the leisure activities. Results suggest that when people are paid by the hour, they are less likely to derive happiness from leisurely activities, but only at trend level. The cross-level interaction between hourly pay status and duration of activity was also not significant. On average, the estimated slopes for duration between non hourly workers and hourly workers did not differ significantly (Table 3).

Prior research on people's propensity to adopt a time-as-money mindset when being paid by the hour has found downstream consequences on various behaviors like volunteering (DeVoe & Pfeffer, 2007), helping behavior (Liu & Aaker, 2010), and pro-environmental behavior (Whilans & Dunn, 2015). The current study aimed to explore whether similar effects would be observed for people's decision to engage in leisurely activities and the happiness people derive from participating in such activities. To test this proposal, the current study used data from a nationally representative survey on people's time use. The pattern of findings from this study suggest that there isn't a significant relationship between happiness levels and people's hourly

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pay status. Put differently, people who were paid by the hour were not likely to feel less happy from engaging in leisurely activities.

Although the current study failed to find a significant relationship between hourly pay status and happiness derived from leisure activities, there are several limitations of this study that may have influenced the accuracy of the findings. Firstly, there are many other variables that may influence people's decision to engage in leisurely activities that are not captured in the model used in this study. For example, the sector of the respondent's job may influence both whether people are normatively paid by the hour and whether people have more or less time available to engage in leisure activities. Secondly, while prior studies have found associations between behavior and hourly pay status using the same dataset, the effects were rather small (e.g. DeVoe & Pai, 2021). Although it may be theoretically plausible to predict that being paid by the hour would make the economic evaluation of time to be temporarily accessible to people, there may be other psychological and environmental factors that may influence whether a time-as-money mindset is made salient. It is possible that effects may be observed in more controlled experimental settings where people are primed to think about the opportunity cost of their time. Lastly, because the ATUS did not include the Well-Being module in prior years, the current study was limited to analyzing data from 2021. Additionally, the Well-Being module was collected for 3 randomly selected activities that participants engaged in, which could include activities that were not leisure related activities. Hence, limiting the sample to a single year and examining participants who were randomly selected to report on their leisure activities significantly reduced the sample size, potentially contributing to the small effect size found in this and prior studies. Future research should therefore try to utilize experience sampling methods or other

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experimental methods to collect data on people's happiness levels in real-time and how it may be associated with people's propensity to make monetary evaluations of their time.

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Tables

Table 1

Means, standard deviations, and correlations with confidence intervals

Variable	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8
1. DAY	1.62	0.49								
2. AGE	44.14	15.18	.03 [-.04, .09]							
3. SEX	1.44	0.50	-.06 [-.13, .00]	.01 [-.06, .07]						
4. MARST	1.46	0.50	.04 [-.03, .10]	.29** [.23, .35]	-.08* [-.14, -.01]					
5. UHRSWORK T	39.24	10.69	-.05 [-.12, .01]	-.04 [-.11, .02]	-.17** [-.23, -.11]	.11** [.04, .17]				
6. PAIDHOUR	1.46	0.50	.05 [-.01, .12]	.09** [.03, .16]	-.16** [-.23, -.10]	.16** [.09, .22]	.35** [.29, .40]			
7. HH_NUMOW NKIDS	0.48	0.87	-.02 [-.09, .04]	-.09** [-.16, -.03]	-.08* [-.15, -.02]	.40** [.34, .45]	.13** [.06, .19]	.03 [-.04, .10]		
8.	120.03	112.22	.22**	.05	-.04	-.03	-.08*	-.09**	-.01	

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DURATION

			[.16, .29]	[-.01, .12]	[-.11, .02]	[-.09, .04]	[-.14, -.01]	[-.15, -.03]	[-.08, .05]	
9. SCHAPPY	5.29	1.56	.00	.03	.13**	.04	-.03	-.05	.07*	.05
			[-.06, .07]	[-.03, .10]	[.07, .19]	[-.03, .10]	[-.09, .04]	[-.12, .01]	[.01, .14]	[-.02, .12]

Note. *M* and *SD* are used to represent mean and standard deviation, respectively. Values in square brackets indicate the 95% confidence interval for each correlation. The confidence interval is a plausible range of population correlations that could have caused the sample correlation (Cumming, 2014). * indicates $p < .05$. ** indicates $p < .01$.

Table 2

Model Predicting Happiness from Leisure

	Model 1	Model 2	Model 3
(Intercept)	5.058 (0.217)	5.017 (0.228)	4.134 (0.648)
PAIDHOUR	0.166 (0.135)	0.156 (0.136)	0.113 (0.160)
SD (Intercept)	1.221	1.240	1.397
SD (Observations)	0.955	0.903	0.818
DURATION_C MC		0.003 (0.002)	0.003 (0.002)
DURATION_C M		0.000 (0.001)	0.001 (0.001)
PAIDHOUR × DURATION_C MC		-0.001 (0.001)	-0.001 (0.001)
SD (DURATION_ CMC)		0.003	0.004
Cor (Intercept~DU RATION_CMC)		-0.157	-0.118

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	Model 1	Model 2	Model 3
SEX			0.399 (0.151)
AGE			0.004 (0.005)
MARST			0.082 (0.173)
DAY			0.027 (0.158)
UHRSWORKT			-0.001 (0.007)
HH_NUMOW NKIDS			0.140 (0.094)
Num.Obs.	896	896	896
RMSE	0.76	0.69	0.63

Table 3

Model Coefficients

	Model 3
(Intercept)	4.134 [2.863, 5.406]
PAIDHOUR	0.113 [-0.201, 0.428]
DURATION_CMC	0.003 [-0.001, 0.006]

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	Model 3
DURATION_CM	0.001 [-0.001, 0.002]
SEX	0.399 [0.102, 0.696]
AGE	0.004 [-0.007, 0.014]
MARST	0.082 [-0.259, 0.422]
DAY	0.027 [-0.283, 0.337]
UHRSWORKT	-0.001 [-0.015, 0.014]
HH_NUMOWNKIDS	0.140 [-0.045, 0.325]
PAIDHOUR × DURATION_CMC	-0.001 [-0.003, 0.001]
SD (Intercept)	1.397
SD (DURATION_CMC)	0.004
Cor (Intercept~DURATION_CMC)	-0.118
SD (Observations)	0.818
Num.Obs.	896

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Model 3	
RMSE	0.63