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Time, money, and happiness: How does putting a price on time affect our ability to smell the roses?

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ABSTRACT

In this paper, we investigate how the impatience that results from placing a price on time impairs individuals' ability to derive happiness from pleasurable experiences. Experiment 1 demonstrated that thinking about one's income as an hourly wage reduced the happiness that participants derived from leisure time on the internet. Experiment 2 revealed that a similar manipulation decreased participants' state of happiness after listening to a pleasant song and that this effect was fully mediated by the degree of impatience experienced during the music. Finally, Experiment 3 showed that the deleterious effect on happiness caused by impatience was attenuated by offering participants monetary compensation in exchange for time spent listening to music, suggesting that a sensation of unprofitably wasted time underlay the induced impatience. Together these experiments establish that thinking about time in terms of money can influence how people experience pleasurable events by instigating greater impatience during unpaid time.

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Introduction

Recently there has been substantial interest in how both time and money, arguably two of the most valuable resources individuals possess, affect happiness. If happiness is the most universally agreed upon goal of the human condition (Frey & Stutzer, 2002), then these highly useful and coveted resources should exercise a strong positive influence on happiness. Empirical research, however, reveals a more nuanced relationship between time, money, and happiness. While people typically do predict that earning more money will substantially increase their experience of happiness (Kahneman, Krueger, Schkade, Schwarz, & Stone, 2006), Kahneman and Deaton (2010) find that once income exceeds \$75,000, it fails to explain any variance in people's moment-to-moment experiences of happiness. By contrast, Kahneman, Krueger, Schkade, Schwarz, and Stone (2004) find that people experience much greater moment-to-moment happiness when they spend their time socializing with family and friends as compared to either at work or commuting.

Some researchers have focused on the disconnection between the abundant hedonic possibilities offered by money and the surprisingly weak relationship between money and happiness to argue that people are simply failing to spend their money in ways that maximize happiness (Dunn, Gilbert, & Wilson, 2011). For instance, spending money on one's self or on material goods does not appear to be

very effective at promoting happiness. Specifically, Dunn, Aknin, and Norton (2008) found that spending money on others made people happier than spending money on themselves and Van Boven and Gilovich (2003) found that spending money on positive experiences promotes happiness more than spending money on positive material purchases.

Other researchers have argued that how we spend our time is the key to understanding and maximizing happiness (Aaker, Rudd, & Mogilner, 2011). For example, choosing between experiences has more impact on happiness than similar choices between material goods (Nicolao, Irwin, & Goodman, 2009) and, unsurprisingly, spending time enjoyably on leisure activities (Lloyd & Auld, 2002) or helping others (Borgonovi, 2008) robustly contributes to individuals' happiness.

Time versus money mindsets

The influence of time and money on happiness may extend beyond simply how these resources are spent, however. Increasing evidence suggests that the mindsets associated with the concepts of time and money can differentially affect the happiness we derive from a given activity. It is widely accepted that Anderson and Bower (1973) were correct in proposing that knowledge and concepts are organized in associative networks. As a consequence, the activation of one concept, by internal or external stimuli, reliably leads to the activation of other concepts within that associative network (Dijksterhuis & Bargh, 2001). This is what is meant when it is said that the concepts of time and money activate different 'mindsets'—they are activating different associative networks of constructs

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to which they respectively relate. Importantly, the activation of networks makes their contents more accessible for influencing complex cognitions and behaviors. For example, activating the stereotype associated with the elderly causes undergraduate participants to walk more slowly (Bargh, Chen, & Burrows, 1996) and subliminally priming the Apple computer logo can lead to higher scores on a creativity test due to associations created through that company's marketing campaigns (Fitzsimons, Chartrand, & Fitzsimons, 2008).

In their study of the mindsets associated respectively with time and money, Liu and Aaker (2008) argue that time activates a more emotional mindset, compared to the economic value mindset activated by money. This is because spending time by definition means having an experience and experiences are invariably accompanied by emotions (Schwarz & Clore, 1996) that are usually more intense than those associated with material goods (Van Boven & Gilovich, 2003; Nicolao et al., 2009). Priming individuals with the concept of time activates goals such as seeking emotional meaning (Liu & Aaker, 2007), spending time with friends and family (Mogilner, 2010) and gaining happiness through charitable donations (Liu & Aaker, 2008).

In contrast, money focuses one on a mindset with economic value maximizing goals (Liu & Aaker, 2008). Those primed with the concept of money choose to spend more time on work (Mogilner, 2010) and volunteer less (Pfeffer & DeVoe, 2009; Vohs, Mead, & Goode, 2006). Furthermore, thinking about the amount of money to allocate to a charity decreases attention to the potential happiness that could result from giving (Liu & Aaker, 2008). Recently, Quoidbach, Dunn, Petrides, and Mikolajczak (2010) have found that priming money decreases the time one will spend savoring the consumption of a delicious piece of chocolate.

When time equals money

In addition to their individual relationships with happiness, interest in the psychological effects of equating time and money is growing due to the prevalence of institutional practices, such as hourly wages, express services, and high speed products, that place a dollar value on time. Whereas typically the value of time is ambiguous (Okada & Hoch, 2004), placing a monetary value on time in the form of an hourly wage can lead people to treat time more like money (Soman, 2001). In ethnographic interviews with technical contractors (i.e., engineers, software developers, technical writers, and information technology specialists) who billed their time and overwhelmingly sold their services to firms in exchange for an hourly wage, Evans, Kunda, and Barley's (2004) analysis found that their informants tended to be economic evaluators of time—evaluating their time narrowly in terms of monetary criteria. Only a small minority of their informants (9 to 14%) evaluated their time using a broader set of criteria, such as personal satisfaction and social obligations. Evans et al. concluded, "When contractors used an economic metric as the sole measure of time, they often discounted the worth of other activities whose economic value was difficult to calculate" (p. 22). Furthermore these informants were "acutely aware that every hour they failed to work was lost compensation" (p. 21).

Research testing the implications of this economic evaluation of time has shown that prompting people to think about their time in terms of money increases their willingness to give up more of their leisure time to earn more money (DeVoe & Pfeffer, 2007a), decreases their willingness to volunteer time (DeVoe & Pfeffer, 2007b), and increases their reliance upon economic factors in evaluating one's overall life satisfaction (DeVoe & Pfeffer, 2009). By extension, the economic evaluation of time appears poised to change how people experience time on a task that is potentially enjoyable but does not bring direct economic returns that are easily quantifiable. In the next section we elaborate upon how economic evaluation can engender more impatience when people see themselves "wasting" potentially

profitable time as opposed to when they see concrete economic returns for their time.

Economic value of time

The view that time should be thought of in terms of money was crystallized by Franklin (1748/2004, p. 200) when he wrote:

Remember, that *time* is money. He that can earn ten shillings a day by his labor, and goes abroad, or sits idle, one half of that day... has really spent, or rather thrown away, five shillings. [Emphasis original]

The understanding of time espoused by Franklin focuses narrowly on the economic opportunity costs of time (i.e., in terms of money). Thus, it prescribes maximizing time's value in a way narrowly focused on monetary acquisition, which differs from attempts to maximize the enjoyment and happiness of experiences. Max Weber (1920) famously discussed this 'time is money' mentality as engendering a shift to the use of time for the acquisition of money as an end unto itself. Indeed, this shift in mentality makes it meaningful in our society to speak of *wasting time*, *saving time*, and *using time profitably* (Lakoff & Johnson, 1980). But while economists typically assume people implicitly think about the economic value of time in decisions about how to allocate it (e.g., Becker, 1965), decision-making research reveals that people tend not to think of time in terms of money in their everyday decisions unless prompted to do so (e.g., Soman, 2001; Okada & Hoch, 2004). That is because the opportunity costs of time and its economic value are not necessarily always salient until one is prompted to think about them (Frederick, Novemsky, Wang, Dhar, & Nowlis, 2009; Northcraft & Neale, 1986).

Our contention is that an hourly wage rate for one's time encourages a mindset that features the goal of maximizing the economic value of one's time. Such a mindset would be consistent with the findings of DeVoe and Pfeffer (2007a,b, 2009) and Evans et al. (2004), discussed above. As a consequence, individuals prompted to think about their hourly wage are more likely to experience impatience when this goal is obstructed and they feel that their time is being unprofitably wasted. Although impatience has generated substantial academic interest recently (Bartels & Urminsky, 2011; Chen, Ng, Rao, 2005; Li, 2008; Pyone & Isen, 2011; Van den Bergh, Dewitte, & Warlop, 2008; Zhong & DeVoe, 2010), it remains a loosely defined construct. For the purposes of the present investigation, we adopt a working definition consistent with the vernacular usage of the word: "Impatience" is used here to mean the sense of frustration with, or intolerance of, anything which causes delay.

Our hypothesis is that impatience, caused by a hindrance to the goal of maximizing the economic value of time, can interfere with other, less quantifiable benefits of time's expenditure, specifically hedonic pleasure. Instead of savoring a potentially enjoyable experience and thereby enhancing the happiness derived from it (Bryant, Smart, & King, 2005; Quoidbach, 2009; Tugade & Fredrickson, 2007), an experience becomes viewed as a frustrating and intolerable delay when one is impatient. Indeed, savoring a positive experience, in order to maximize its hedonic payout, is about subjectively prolonging an experience (Bryant, 1989, 2003) whereas people wish to expedite experiences when feeling impatient—the two are incompatible. In three separate experiments, we demonstrate that prompting participants to think about their effective hourly wage diminishes their reported happiness subsequent to unexpected pleasant experiences and that this effect is completely mediated by a greater sense of impatience. Intriguingly, we further demonstrate that this effect is eliminated by explicitly compensating participants for their time during the unexpected pleasant experience, which further supports the idea that thinking about the hourly wage rate of one's time induces a goal of maximizing the economic value of time.

Experiment 1

As a first test of how thinking about time in terms of money might affect the experience of happiness derived from an enjoyable experience, we provided participants with 10 min of leisure time to do whatever they liked on the internet. The internet offers a plethora of enjoyable experiences capable of boosting happiness (Yu & Chou, 2009). Participants could peruse the cornucopia of content available on the web, play internet based games or communicate with their friends via email or popular social networking sites such as Facebook and Twitter, the use of which has been correlated to positive feelings of satisfaction and social connection (Valenzuela, Park, & Kee, 2009; Chen, 2011). As a consequence of the innumerable entertainment opportunities available to participants on the internet our experimental control was substantially diminished. Nevertheless, the virtue of 10 min of leisure time on the internet is a high degree of ecological validity. One nationwide study in the United States found that fully 80% of computer-using employees report using the internet for personal use on the job (Garrett & Danziger, 2008). Such employees report that short periods of leisure time on the internet at work help them to relieve boredom and stress and lead to greater job satisfaction, well-being and overall happiness (Eastin, Glynn, & Griffiths, 2007; Oravec, 2002; Reinecke, 2009; Stanton, 2002).

Thus we predicted that this unexpected period of free time on the internet would increase participants' situational happiness. However, we hypothesized that participants prompted to think about their time in terms of money would derive less happiness from the internet if indeed this manipulation activates a mindset featuring the goal of maximizing the economic value of time. This result was predicted because participants were paid a fixed amount of compensation and a mandatory 10 minute break would effectively reduce their compensation rate (compensation/time). In other words, because the leisure time on the internet served to stall participants' efficient completion of the experimental task, it therefore frustrated the goal of maximizing the economic value of time. Those participants for whom that goal was made salient would therefore be more likely to experience the internet break as an impediment rather than an enjoyable event.

Method

Participants

Fifty-three undergraduates from a large Canadian university participated in exchange for a \$5 session participation fee. Thirty-two participants were female and the average age was 22.08 ($SD = 3.31$).

Procedure

Upon arrival, participants provided informed consent and filled out a brief survey. After completing this portion of the study, participants were told that the researchers wanted to wipe the slate clean by giving them 10 min to do whatever they liked on the internet. At the conclusion of the 10 minute period, the experimenter administered the final questionnaire that also included basic demographic information.

Independent variable

All study participants responded to three questions about their most accurate expectation for their employment during the first full year after graduation, including: 1) how many hours per week they expected to work on average; 2) how many weeks per year they expected to work; and 3) how much they expected to earn per year before taxes and other deductions. After answering these three questions about their anticipated time spent working and income, participants randomly assigned to the control condition proceeded directly

to the rest of the study session without calculating their expected hourly wage.

Participants in the time/money condition calculated their expected hourly wage before proceeding to the rest of the study session. In this experimental condition, people were asked to multiply the number of weeks they expected to work in the coming year times the number of hours they anticipated working per week to compute the total number of hours they expected to work that year. Then participants were asked to divide their anticipated annual income for that year by the total number of hours they expected to work. Participants were told to feel free to use scratch paper or a calculator for these calculations. At the end of this calculation, the participants in this time/money condition were told, "the number you just entered above is your best estimate of your approximate hourly wage after you graduate (i.e., the amount of money you will earn per hour)."

Dependent variable

In order to measure participants' experience of happiness, we accessed their state of happiness immediately prior to the experimental manipulation and again at the conclusion of the 10 minute leisure period. In both instances, participants rated their general feeling of happiness at that moment by answering the question "Do you feel happy, in general?" on a 5-point scale, such that higher numbers indicate greater happiness. This question has been shown to correlate strongly with scores on the 29-item Oxford Happiness Inventory (Argyle, Martin, & Lu, 1995), as well as possessing good convergent and divergent validity (Abdel-Khalek, 2006).

Results and discussion

To analyze this pretest–posttest design, we conducted a 2 (condition: time/money vs. separate income/hours control) by 2 (assessment: pre-leisure vs. post-leisure) analysis of variance (ANOVA) with repeated measures on the second factor, which revealed no significant main effect of assessment, $F(1, 44) = 1.49, p = .23, \eta_p^2 = .033$, but a significant interaction between condition and assessment, $F(1, 44) = 5.97, p = .02, \eta_p^2 = .119$. In order to probe the nature of the interaction, we conducted separate follow-up paired *t*-tests for each experimental condition. In the separate income/hours control condition, participants reported being happier after the leisure period ($M = 3.61, SE = .89$) than prior to the leisure period ($M = 3.35, SE = .88$), $t(22) = 2.79, p = .01$. This confirmed our expectation that giving participants free time on the internet in which they could do as they pleased is an enjoyable experience that boosts happiness. However, those participants randomly assigned to calculate their expected hourly wage showed no increase in happiness after the leisure period ($M = 3.47, SE = 1.12$) compared to before the leisure period ($M = 3.56, SE = .99$), $t(22) = -.81, p = .43$. Thus, when participants were reminded of the economic value of their time, their experience of this leisure period lost some of its hedonic value and failed to bring about any improvement in their happiness. Our aim in the subsequent two experiments was to illuminate why thinking about time in terms of money has this effect on enjoyment of pleasant experiences.

Experiment 2

In Experiment 2 our intention was to uncover the mechanism underlying the deleterious effect of thinking about time in terms of money on the enjoyment of pleasurable experiences. We hypothesized that calculating the monetary value of one's time induces a sense of impatience because of the feeling that this potentially valuable resource is being wasted. Furthermore, we predicted that it is this induced impatience that mediates the causal relationship between thinking about the economic value of time and the failure to derive happiness from pleasant experiences.

Although the 10 minute internet leisure period in **Experiment 1** was a good laboratory analog for real life opportunities to smell the roses, it also introduced a large amount of variance into the experiment. Thus, the difference in participants' situational happiness after accessing the internet is uncertain; it could be that the participants prompted to think about their time in terms of money pursued different, less joyful activities on the web, or it could be that they simply enjoyed the leisure time less irrespective of the activities they undertook. We considered the latter possibility to be more interesting and important for happiness research and therefore explored how our manipulation affected the experience of a single pleasant stimulus. One such pleasant stimulus known to boost individuals' state of happiness, both inside the laboratory (Suda, Morimoto, Obata, Koizumi, & Maki, 2008) and out (Juslin, Lijestrom, Vastfjall, Barradas, & Silva, 2008) is the experience of listening to music. Participants were therefore exposed to the same manipulation as in the previous study and then rated their state of happiness after listening to the first 86 s of 'The Flower Duet' from the opera *Lakmé*.

Method

Participants

Four hundred one participants (237 female) residing in the United States were recruited from Amazon.com's Mechanical Turk (MTurk) worker pool to fill out an online survey on consumer preferences in exchange for \$1. MTurk is an efficient tool for collecting self-report data and compensating participants online (Buhrmester, Kwang, & Gosling, 2011; Paolacci, Chandler, & Ipeirotis, 2010). The average age of the sample was 31.6 ($SD = 10.38$). Thirty-nine participants who reported that they had experienced some technical problem listening to the music that played during the study were excluded from analyses.

Independent variable

We used the same time/money treatment and separate income/hours control as in the previous study, but this time the questions referred to participants' income from the previous year (as opposed to expected income). Additionally, we added a pure control condition, in which no mention was made of work or income, as a baseline from which the manipulation's effect could be better understood. We theorized that the phenomenon of valuing time in terms of money is different from the effects observed when participants merely think about time or money separately (e.g. Mogilner, 2010; Mogilner & Aaker, 2009; Quoidbach et al., 2010) and we therefore hypothesized that although the experimental group would differ from both control groups, there would be no differences between the two control groups.

Dependent variables

Happiness

Subsequent to the manipulation, participants were told that the experimenters wanted to wipe the slate clean before proceeding to the final task of the study by playing them an enjoyable piece of music. The music that played was the first 86 s of 'The Flower Duet' from the opera *Lakmé*. Immediately following the music, participants were asked "to what extent are you happy right now?" and they responded on a visual analog scale (VAS) that was scored out of 100 with the left side labeled "Not at all happy" and the right side labeled "Very happy."

Experience of impatience

Six self-report items were generated to measure the degree to which participants felt impatient while listening to the music.

Specifically, participants rated how well each statement described their thoughts during the music on a VAS scored out of 100 with "not at all" on the left hand side and "very much" on the right hand side: "I was impatient for the music to end so I could finish the survey," "I thought the music was a waste of my time," "My thoughts were completely absorbed by the music" (R), "I felt the music was a relaxing break" (R), "I was thinking about what I was going to do when the survey was done" and "I was thinking that the music was playing for a long time." The order in which participants viewed each item was randomized and two of the items were reverse coded. The items exhibited high reliability (Cronbach's $\alpha = .84$) and were averaged to create a composite so that higher values indicated greater impatience during the music.

Results and discussion

Participants in the time/money condition reported significantly less happiness after listening to the music ($M = 63.33$, $SE = 1.78$) compared to those in either the separate income/hours control condition ($M = 67.99$, $SE = 1.77$) or pure control condition ($M = 69.97$, $SE = 1.82$), $F(2, 370) = 3.61$, $p = .03$, $\eta_p^2 = .019$. We planned Helmert contrasts to test our hypothesis that the time/money condition differed from the two control conditions but that the two control conditions did not differ from each other. Our hypotheses were confirmed, with participants in the time/money condition being significantly less happy than their counterparts in the control conditions, $t(370) = -2.58$, $p = .01$, but the two control conditions not differing significantly from one another, $t(370) = .78$, $p = .44$.

The impatience participants experienced during the music was also significantly influenced by the experimental manipulation. Participants reported experiencing greater impatience while listening to the music when prompted to think about their time in terms of money ($M = 37.67$, $SE = 2.03$) compared to either the separate income/hours control condition ($M = 32.52$, $SE = 2.03$) or pure control condition ($M = 27.97$, $SE = 2.08$), $F(2, 370) = 5.54$, $p = .004$, $\eta_p^2 = .029$. Again, Helmert contrasts confirmed that although participants in the calculate hourly wage condition were significantly more impatient than their counterparts in the control conditions, $t(370) = 2.97$, $p = .003$, there was no significant difference between the two control conditions, $t(370) = 1.56$, $p = .119$.

To test whether impatience had a mediating role in explaining the effect of calculating one's hourly wage on the happiness that resulted from the music, we conducted regression analyses testing for mediation (Baron & Kenny, 1986). Since post-hoc tests did not reveal any significant differences between the two control conditions, we collapsed them into a common variable (both coded as "0" and the time/money condition coded as "1"). Happiness was first regressed on experimental condition, $\beta = -.13$, $t(371) = -2.57$, $p = .01$, and then on impatience, $\beta = -.57$, $t(371) = -13.31$, $p < .001$. The standardized regression coefficient paths for the mediational analysis are reported in Fig. 1.

The effect of calculating an hourly wage rate for one's time became non-significant when impatience scores were entered into the multiple regression equation, $\beta = -.05$, $t(370) = -1.19$, $p = .269$. This pattern of statistical results indicates that the effect of thinking about time in terms of money on happiness was completely mediated by impatience. This conclusion was confirmed by the Sobel test of mediation, $z = -2.87$, $p = .004$.

Thus, **Experiment 2** was able to replicate and extend our findings from the previous experiment. Prompting participants to think about the monetary value of their time again diminished the happiness they were able to derive from an enjoyable event. By using a beautiful piece of music to standardize the enjoyable event for all participants in **Experiment 2** we were able to ascertain several things. In addition to demonstrating that this effect is generalizable across domains of pleasant stimuli, standardizing the pleasant stimuli across

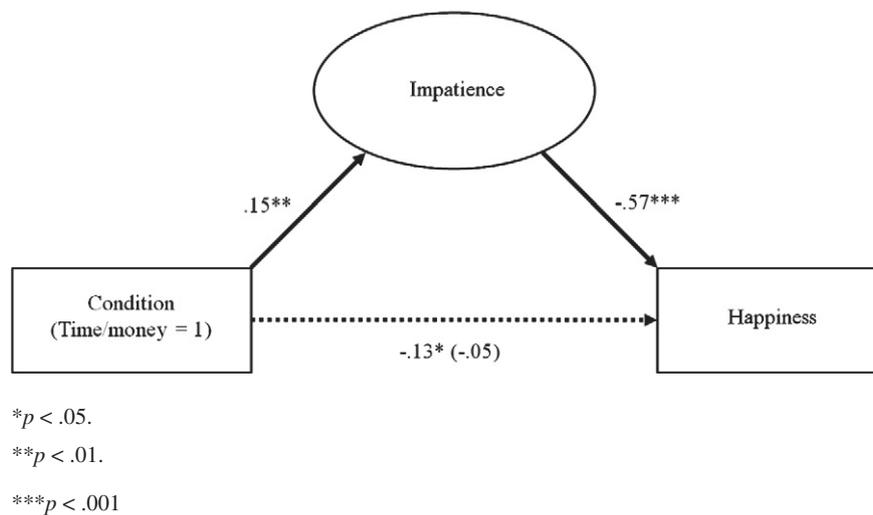


Fig. 1. Mediation in Experiment 2.

all participants allows us to conclude that it was not how participants spent their time that contributed to the difference in happiness (Aaker et al., 2011), but how they experienced it while the music played. This view is supported by the complete mediation of the effect on happiness by participants' self-reported experience of impatience. The degree to which participants felt impatient during the music determined how happy the music made them.

A final implication from the results of Experiment 2 is that thinking about time in terms of money affected impatience in ways that appeared to be distinct from thinking about time and money separately. As in Experiment 1, the experimental group provided exactly the same information as the control group regarding their income and the amount of time spent at work, the only difference being that the experimental group performed basic calculations that highlighted the economic value they received for their time. In Experiment 2, we found that simply providing information about your income and time spent working did not cause a significant reduction in the happiness that resulted from the music as compared to a pure control condition. One alternate explanation of the observed effect on the experimental group, which we sought to exclude in Experiment 3, is that merely performing calculations could have these effects on impatience by placing people in an analytic, as opposed to emotional, mindset (Hsee & Rottenstreich, 2004; Small, Loewenstein, & Slovic, 2007).

Experiment 3

The main purpose behind Experiment 3 was to try to demonstrate that it is the feeling of wasting time's economic value which leads to an increase in impatience and reduction in happiness. We theorized that raising someone's hourly wage to their attention reminds them that time is a valuable commodity that should not be spent frivolously but used instead to pursue the acquisition of economic value. If this is the case, then when people who are thinking about their time in terms of money receive explicit monetary compensation for their time, this feeling of wasted time should abate, allowing them to derive greater pleasure from enjoyable experiences.

We therefore designed a 2 (calculation: time/money vs. control) by 2 (compensation: additional explicit compensation for listening to music vs. no additional compensation) between participants factorial design. Our hypothesis was that being explicitly compensated to listen to the music would boost enjoyment of the music for participants prompted to think about their time in terms of money and

would have no effect on those participants asked to complete the same computations with meaningless numbers.

Method

Participants

Two hundred five participants (117 female) from the United States were recruited on MTurk to complete a consumer preferences survey in exchange for \$1. The average age of the participants was 34.2 ($SD = 11.6$). Twenty-one participants were excluded from analyses because they reported some problem listening to the music over the internet and thirty-nine participants were excluded because they reported that they had participated in Study 2.

Independent variables

Calculation manipulation

We used the same time/money treatment as in the previous study but replaced the control condition with meaningless calculations that required participants to carry out the same numeric and arithmetic computations as in the time/money condition (i.e., "Please enter a five to six digit number in the space provided", "Please enter a two digit number in the space provided", "Please enter a different two digit number in the space provided", "Please multiple your answer to question 2 by your answer to question 3 and type the product in the space provided", and "Now divide your answer to question 1 by your answer to question 4 and type the quotient in the space provided"). This allowed us to ensure that the observed effects were not the result of merely placing participants in an analytic mindset (Hsee & Rottenstreich, 2004).

Compensation manipulation

We also introduced a new independent variable whereby half of the participants were explicitly compensated an additional 50 cents for the time they spent listening to music. Both groups were given the previous explanation that the music was being played to wipe the slate clean before proceeding to the final portion of the survey, but participants in the additional compensation for listening to the music condition were also told "for the time you spend listening to the music, you will be paid an additional \$0.50 cents on your MTurk account automatically." Although all participants were being compensated for the time it took them to complete the study, this

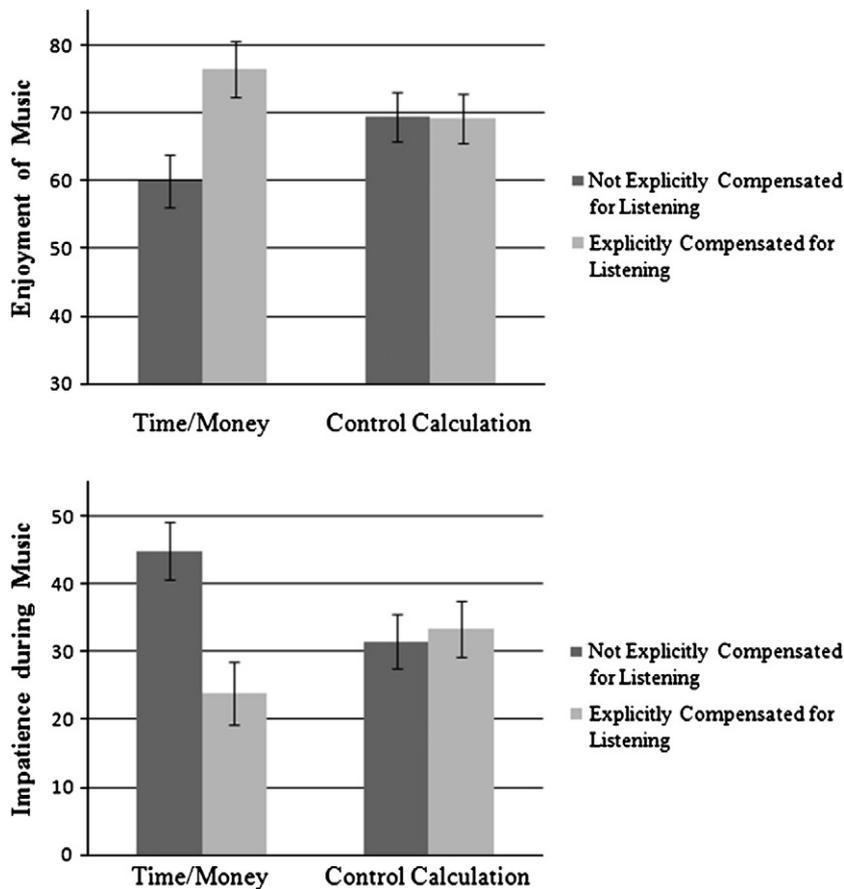


Fig. 2. Mean levels of the dependent variables' enjoyment of the music (top panel) and impatience experienced during the music (bottom panel) as a function of condition in Experiment 3. Error bars represent standard errors.

additional 50 cents represented a marked increase in the rate of compensation for listening to the music relative to the time spent filling out the entire study.

Dependent variables

In order to better focus on the happiness that resulted from the music rather than the happiness that resulted merely from the additional compensation, an additional two VAS items were added immediately after the question tapping state happiness used in the previous study. These questions were "how much did you enjoy the music?" and "how beautiful did you find the music?". These three items were highly intercorrelated (Cronbach's $\alpha = .80$) so they were averaged together to make a composite measure of the pleasure participants derived from the music. We also administered the identical impatience measures used in the previous study (Cronbach's $\alpha = .90$).

Results and discussion

We conducted a 2 (calculation: time/money vs. control) by 2 (compensation: additional explicit compensation for listening to music vs. no additional compensation) between-participant ANOVA first for enjoyment derived from the music and then for impatience experienced while listening to the music.

A main effect of additional compensation emerged as significant where those paid to listen to the music derived greater enjoyment from the music ($M = 72.79$, $SE = 2.77$) than did those who were not paid ($M = 64.66$, $SE = 2.63$), $F(1, 141) = 4.53$, $p = .04$, $\eta_p^2 = .031$. The main effect of calculation was not significant, $F < 1$; but this main effect was qualified by a significant calculation by compensation interaction, $F(1, 141) = 4.81$, $p = .03$, $\eta_p^2 = .033$. The top panel of Fig. 2

reports the means by condition. Simple effects analyses based on our hypotheses about the nature of the interaction revealed that the main effect of compensation for listening to the music was driven exclusively by participants in the time/money condition. Participants who calculated their hourly wage reported that they derived significantly more enjoyment from the music when explicitly compensated to listen to it ($M = 76.45$, $SE = 4.11$) compared to when not compensated ($M = 59.91$, $SE = 3.82$), $F(1, 141) = 8.78$, $p = .004$. In contrast, those participants who performed meaningless calculations did not differ in their reported enjoyment of the music whether they were explicitly compensated to listen to it ($M = 69.16$, $SE = 3.72$) or not ($M = 69.41$, $SE = 3.62$), $F < 1$. Experiment 3 also replicated the findings of the previous two studies in which no additional compensation was provided; for those participants who were not explicitly compensated for listening to the music, the time/money condition resulted in marginally less enjoyment of the music compared to the meaningless calculation condition, $F(1, 141) = 2.99$, $p = .09$.

Similar results were obtained on the impatience measure. A main effect of compensation emerged as significant whereby those explicitly paid to listen to the music reported feeling less impatient ($M = 28.58$, $SE = 3.08$) than those who were not paid ($M = 38.15$, $SE = 2.92$), $F(1, 141) = 5.08$, $p = .026$, $\eta_p^2 = .035$. The main effect of calculation was not significant, $F < 1$; but this main effect was qualified by a significant calculation by compensation interaction, $F(1, 141) = 7.13$, $p = .008$, $\eta_p^2 = .048$. The bottom panel of Fig. 2 reports the means by condition. Planned simple effects analyses revealed a pattern of results that mirrored enjoyment of the music. Participants that calculated their hourly wage for their time reported significantly less impatience during the music if they were compensated for listening ($M = 23.88$, $SE = 4.57$) compared to not compensated ($M = 44.78$, $SE = 4.24$), $F(1, 141) =$

11.45, $p = .001$. In contrast, participants that performed the meaningless calculations did not differ in their impatience depending upon whether they were explicitly compensated for listening to the music ($M = 33.41$, $SE = 4.13$) versus not compensated ($M = 31.51$, $SE = 4.02$), $F < 1$. The results of this study also replicated our findings in Experiment 2, with the time/money condition inducing more impatience than the control condition if participants were not explicitly compensated for listening to the music, $F(1, 141) = 4.79$, $p = .03$.

Regression analyses were conducted to determine whether the calculation by compensation interaction on enjoyment of the music was mediated by experienced impatience (i.e., mediated moderation; Baron & Kenny, 1986). The measure of enjoyment derived from the music was first regressed on the full effects coded model and then also on experienced impatience. Fig. 3 reports the standardized regression coefficient paths for this mediated moderation analysis.

The calculation \times compensation interaction was initially significant when predicting derived pleasure, $\beta = -.18$, $t(141) = 2.19$, $p = .03$, and became non-significant when experienced impatience was entered into the model, $\beta = -.01$, $t(140) = .26$, $p = .795$. The effect of experienced impatience also significantly predicted happiness, $\beta = -.77$, $t(143) = -14.51$, $p < .001$. This pattern of effects indicated that the compensation \times calculation interaction predicting enjoyment of the music was fully mediated by participants' experienced impatience, and this mediated moderation effect was confirmed by a significant Sobel test, $z = 2.63$, $p = .01$.

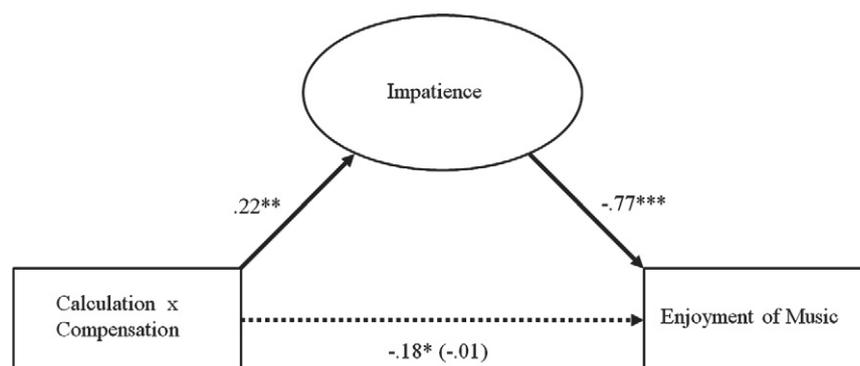
Experiment 3 was able to make two important contributions to our understanding of the links between thinking about time in terms of money, impatience, and happiness. The use of a control condition similar to the manipulations used by Hsee and Rottenstreich (2004) to induce an analytic mindset provides evidence that thinking about time in terms of money is a distinct phenomenon. As well, the compensation dependent moderation of the effect of calculating one's hourly wage on enjoyment and impatience suggests that thinking about time in terms of money leads to impatience when one perceives that the economic value of time is not being maximized (i.e. perceiving that time is being wasted economically). While the music played, participants were unable to maximize the economic value of their time by completing the study in an efficient manner and instead were forced to wait for the end of the music. Compensating participants for listening to the music at a substantially higher rate than for the rest of the experiment, however, likely reduced the perception that the economic value of time was being wasted during the song. The pattern of mediated moderation we observed in this study is consistent with this interpretation. Providing a high rate of

compensation for listening to the music allowed those participants that were thinking about the economic value of their time to enjoy the music more and experience less impatience while having no effect on participants in the control condition.

General discussion

In three separate experiments we have demonstrated that bringing individuals' effective hourly wage to their attention impairs the ability to derive happiness from pleasurable experiences. This effect was observed both when participants were free to create their own pleasant experience on the internet and when the pleasant experience was held constant in the form of listening to a beautiful piece of music. That participants' reported different degrees of happiness subsequent to identical pleasant events suggest that thinking about time in terms of money impairs happiness by influencing the 'how' rather than the 'what' of pleasant experiences. Such a conclusion is also supported by the results of our mediational analyses. Using a self-report measure of participants' impatience, we found that the impatience participants experienced during the music fully mediated their enjoyment of that music. Future studies should be undertaken to understand how impatience exercises this deleterious effect on the ability to derive happiness from pleasant experiences. One possible explanation is that impatience discourages savoring. Savoring is a form of emotional regulation which augments the happiness individuals derive from experiences (e.g. Bryant et al., 2005; Quoidbach, 2009; Tugade & Fredrickson, 2007). It is likely that savoring and impatience are incompatible because savoring involves trying to subjectively prolong the present experience (Bryant, 1989, 2003) while impatience is the desire to curtail it.

In our final study we attempted to further demonstrate the underlying process by which thinking about the economic value of time affects the experience of impatience and enjoyment. We hypothesized that thinking about time in terms of money focuses people on the goal of maximizing the economic value of their time and consequently directs attention away from non-economic returns of otherwise pleasurable experiences. Under these conditions, time spent without explicit economic returns is more likely to be viewed as wasted time, despite the presence of pleasant stimuli. By explicitly compensating participants economically for listening to the music, however, we were able to prevent both the increase in impatience experienced and the decrements in the enjoyment of the music caused by thinking about time in terms of money. Thus, we conclude that when the goal of maximizing the economic value of time is satisfied, people thinking



* $p < .05$.

** $p < .01$.

*** $p < .001$

Fig. 3. Mediated moderation in Experiment 3.

about time in terms of money no longer feel impatient and are free to enjoy the pleasant experiences available to them.

The data presented in this paper are consistent with recent ethnographic research which found that people who are paid by the hour narrowly evaluate their time use in terms of its economic returns. As a consequence, they tend to discount the worth of activities with non-economic benefits (Evans et al., 2004). Our data also accord with the work of DeVoe and Pfeffer (2009) showing that thinking about one's hourly wage increases reliance on economic factors when evaluating life satisfaction. The present research extends our understanding of these previous findings to a much smaller scale of time and suggests an intuitive but empirically novel mechanism linking the economic evaluation of time and happiness. Because thinking about one's hourly wage encourages a narrow, economic evaluation of time, it can lead to the impatient perception that time is being wasted when its economic value is not being maximized. Unfortunately, this impatience can blind people to unexpected non-economic sources of happiness afforded by breaks from a task or beautiful music that they would have otherwise enjoyed.

In all three experiments, the mindset that resulted from prompting participants to think about the economic value of time was similar to the mindset associated with money. Liu and Aaker (2008) found that the construct of time activates a more emotionally cognizant mindset whereas money activates an economic value maximizing one. In the present research, the constructs of time and money were effectively equated (spending time at work equaled monetary compensation at one's effect hourly wage rate), yet it was the mindset associated with the latter that came to predominate participants' experience of a pleasant event. It remains to be determined whether equating time and money always results in an economic value maximizing mindset or whether the effect varies depending on the structure of the equation. While calculating one's effective hourly wage promotes the view that money is the more valuable resource because it is the object of the exchange (i.e. spending time at work in order to earn money), other equations of time and money favor time as the more valuable resource. When people pay a premium for timesaving services, for example, it is easier to speak of the time value of money (i.e. the price of extra time provided by express delivery or a direct flight). It is possible, therefore, that prompting participants to think about paying for time, rather than being paid for their time, may have a different effect on participants' impatience and happiness. Nevertheless, any difference caused by rearranging the time equals money equation is unlikely to be qualitative in nature because the end result is still the commodification of time. Whether one is buying or selling time, time is being treated as an economic good with an ascertainable value which is therefore capable of being squandered. Ironically, this very concern for maximizing the economic value of time can lead to squandering the resource of time itself by failing to appreciate other, less tangible benefits like smelling the roses.

Conclusion

Whereas the emergence of money is relatively recent in human history (Burgoyne & Lea, 2006; Grierson, 1978), time is the fundamental resource of human society. The conceptualization of time in terms of money primarily emerged as a product of the Industrial Revolution. The eminent historian E. P. Thompson (1967, p. 61) pointed to the psychological shifts in how people and society conceive of time in the wake of this period by stating:

And the employer must use the time of his labor, and see it is not wasted: not the task but the value of time when reduced to money is dominant. Time is now currency: it is not passed but spent.

While the monetary value of time is not necessarily salient unless one is prompted to think about it, over the last several decades

practices that highlight this connection have proliferated in the United States (Hamermesh, 2002) and Canada (Shannon, 2008). While the prevalence of these practices may affect how people choose to spend their time, the present findings suggest that thinking about time in terms of money is poised to affect our ability to smell the proverbial roses. Indeed, national surveys have shown that despite the fact that over the last five decades the number of leisure hours in the US has increased (Aguiar & Hurst, 2007), over that same period there have been no concomitant improvements in happiness (Layard, 2005) but instead increasing reports of greater subjective time pressure (Robinson & Godbey, 1999). We therefore suggest that greater attention to the psychological consequences of practices that remind people of the precise economic value of their time is warranted.

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