

Overearning

Christopher K. Hsee¹, Jiao Zhang², Cindy F. Cai³, and Shirley Zhang¹

¹Booth School of Business, University of Chicago; ²School of Business, University of Miami; and ³Antai College, Shanghai Jiao Tong University

Psychological Science
24(6) 852–859
© The Author(s) 2013
Reprints and permissions:
sagepub.com/journalsPermissions.nav
DOI: 10.1177/0956797612464785
pss.sagepub.com


Abstract

High productivity and high earning rates brought about by modern technologies make it possible for people to work less and enjoy more, yet many continue to work assiduously to earn more. Do people *overearn*—forgo leisure to work and earn beyond their needs? This question is understudied, partly because in real life, determining the right amount of earning and defining overearning are difficult. In this research, we introduced a minimalistic paradigm that allows researchers to study overearning in a controlled laboratory setting. Using this paradigm, we found that individuals do overearn, even at the cost of happiness, and that overearning is a result of mindless accumulation—a tendency to work and earn until feeling tired rather than until having enough. Supporting the mindless-accumulation notion, our results show, first, that individuals work about the same amount regardless of earning rates and hence are more likely to overearn when earning rates are high than when they are low, and second, that prompting individuals to consider the consequences of their earnings or denying them excessive earnings can disrupt mindless accumulation and enhance happiness.

Keywords

overworking, overearning, workaholism, medium maximization, earning cap, happiness, subjective well-being, decision making, heuristics

Received 5/31/12; Revision accepted 8/28/12

Human productivity and earning rates are far higher now than ever before; the world's per-capita gross domestic product has increased 200 times in the past 2 centuries, and, despite fluctuations, it keeps rising (De Long, 2002). John Maynard Keynes (1963), one of the greatest thinkers of the 20th century, predicted that by 2030, most people would have to work only 15 hr a week to earn what they need and will be able to enjoy much more leisure than their grandparents did. Yet instead of enjoying leisure, many people who have earned more than they can consume in their lifetime continue to work 40 hr or even 60 hr a week to earn more (e.g., Crouter, Bumpus, Head, & McHale, 2001; Peiperl & Jones, 2001; Schor, 1991; Skidelsky & Skidelsky, 2012). The research presented here explored overearning—the tendency to forgo leisure to work and earn beyond one's needs.

There are normative reasons for overearning, such as enjoyment of work, uncertainty about the future, and desires to bequeath wealth to others. We intended to explore whether individuals still overearn when such normative reasons are controlled for. However, in real

life, eliminating these reasons is impossible. There are always normative reasons for earning more than one needs. So, instead of studying overearning in the field, we introduced a highly simplified yet well-controlled miniature experimental paradigm for exploring the issue.

The Paradigm

Participants are tested individually while seated at a table in front of a computer and wearing a headset. The procedure consists of two consecutive phases, each lasting 5 min. In Phase I, the participant can relax and listen to music (mimicking leisure) or press a key to disrupt the music and listen to a noise (mimicking work). For every certain number of times the participant listens to the noise (e.g., 20 times), he or she earns 1 chocolate; the

Corresponding Author:

Christopher K. Hsee, Booth School of Business, University of Chicago,
5807 South Woodlawn Ave., Chicago, IL 60637
E-mail: chris.hsee@chicagobooth.edu

computer keeps track and shows how many chocolates the participant has earned. The participant can only earn (not eat) the chocolates in Phase I and can only eat (and not earn more of) the chocolates in Phase II. The participant does not need to eat all of the earned chocolates in Phase II, but if any remain, they must be left on the table at the end of the study. Participants learn about these provisions in advance and are informed that they can decide how many chocolates to earn in Phase I and how many to eat in Phase II, and that their only objective is to make themselves as happy as possible during the experiment.

Our paradigm simulates a microcosmic life with a fixed life span; in the first half, one chooses between leisure and labor (earning), and in the second half, one consumes one's earnings and may not bequeath them to others. In designing the paradigm, our priority was minimalism and controllability rather than realism and external validity. The paradigm was inspired by social scientists' approaches to investigating complex real-world issues, such as unselfish motives, using minimalistic simulations, such as the ultimatum game (Camerer, 2003; for more recent examples, see Hsee, Shen, Zhang, Chen, & Zhang, 2012; Shah, Mullainathan & Shafir, 2012). These simulations involve contrived features—for example, players cannot learn each other's identities and need not worry about reputations—but such features are important because they allow researchers to control for normative reasons for unselfish behaviors and test for pure, unselfish motives. Likewise, our paradigm also involves contrived features—for example, rewards are chocolates rather than money, and participants cannot take their rewards from the lab—but these features are crucial for us to control for normative reasons for overearning effects and test for pure overearning tendencies.

Mindless Accumulation

Given the features of the paradigm, will participants overearn? We define *overearning* as enduring extra noise to earn more than what one would consume, and we define “what one would consume” as the number of chocolates one actually consumes (i.e., *consumed number*) or the number predicted to make one most satisfied (i.e., *predicted optimal number*).

Normatively, participants should not overearn, because overearning entails costs (extra noises) without apparent benefits. However, we predicted that they will overearn and are more likely to do so when earning rates are high rather than low. *Earning rate* refers to the number of times a participant needs to endure the noise to earn 1 chocolate. This rate is higher if one needs to hear the noise, say, 20 rather than 120 times to earn 1 chocolate; it mimics earning rates in real life by reflecting the amount

of work one needs to invest to produce one unit of reward.

We propose that while earning, participants focus on nominal earnings rather than on the consumption consequences of the earnings. Moreover, earning rates are difficult to evaluate independently (Hsee & Zhang, 2010); without comparisons, earning 1 chocolate per 20 instances of noise seems as good (or as bad) as earning 1 chocolate per 120 instances of noise. Thus, regardless of consumption needs or earning rates, participants will work about the same amount—until feeling tired rather than until having earned enough. We refer to this tendency as *mindless accumulation*.

Mindless accumulation predicts a greater overearning tendency under high earning rates than under low earning rates. To illustrate this point, suppose one would feel tired after hearing the noise 240 times in Phase I and would consume 4 chocolates in Phase II. The mindless-accumulation account suggests the participant will earn until he or she has heard the noise 240 times rather than until he or she has earned 4 chocolates. Consequently, when the earning rate is high, say, 1 chocolate per 20 instances of noise, the participant will earn 12 chocolates (240/20), more than 4; when the earning rate is low, say, 1 chocolate per 120 instances of noise, the participant will end up earning 2 chocolates (240/120), fewer than 4. Of course, participants may not be completely insensitive to consumption consequences or earning rates. Therefore, the actual results will be less extreme, but the basic hypothesis still holds; namely, participants may overearn, and they are more likely to do so when earning rates are high as opposed to low. What this hypothesis reflects is that in real life, when making labor-or-leisure decisions, people are insensitive to their income levels (earning rates): Higher-income individuals (or generations) tend to work as many hours as lower-income individuals (or generations), and forgo the leisure they could afford. For a more formal analysis, see the Supplemental Material available online.

The mindless-accumulation notion builds on existing research indicating that decision makers focus on nominal numbers and overlook underlying values (Chinander & Schweitzer, 2003; Keeney, 1996; Peters, 2012; Raghuram & Srivastava, 2009; Shen & Urminsky, 2013; Tyran, 2007; Wertenbroch, Soman, & Chattopadhyay, 2007). Of particular pertinence is the *medium-maximization effect*—a tendency to choose options that offer more “media” (points that are redeemable for something else) rather than better rewards (Hsee, Yu, Zhang, & Zhang, 2003; Kivetz & Simonson, 2003; Van Osselaer, Alba, & Manchanda, 2004). In the research presented here, we extended the medium-maximization notion by proposing that individuals focus on nominal earnings rather than consumption utilities, that they are insensitive to the

absolute earning rate, and that these tendencies exist even when there are no media (points) involved.

Besides medium maximization, themes in several other lines of research are relevant to the present work. One is workaholism (Burke, 2000; Schaufeli, Taris, & Bakker, 2006; Peiperl & Jones, 2001; Spence & Robbins, 1992; Van der Hulst, 2003). Like overearning, workaholism implies working excessively. However, workaholism suggests addiction to work, not excessive earning, whereas overearning suggests ignorance of consequences, not addiction to work. Furthermore, researchers typically use noncontrolled field studies to investigate workaholism, whereas we used controlled laboratory experiments to investigate overearning. Another relevant stream of work is on undersaving, which shows that individuals fail to save enough for retirement (Banks, Blundell, & Tanner, 1998; McKenzie & Liersch, 2011). Although undersaving appears to be the opposite of overearning, a closer look suggests otherwise. Undersaving is often a result of squandering or financial illiteracy rather than of underearning (Goldstein, Johnson, & Sharpe, 2008; Lusardi & Mitchell, 2007). Moreover, undersaving arises more often among individuals with low earning rates than among individuals with high earning rates (Bertrand, Mullainathan, & Shafir, 2004; Soman & Cheema, 2011).

A third relevant line of research is the work by Camerer, Babcock, Loewenstein, and Thaler (1997) showing that cabdrivers work too little on days when earning rates are high. This observation appears to contradict our proposition concerning overearning under high rates. However, the two lines of work differ in a critical way. Camerer and colleagues examined daily earning activities in which earnings from one day could be carried to the next so that rational decision makers should work harder on high earning-rate days; our paradigm is meant to represent earning activities over a life span, in which earnings from this life cannot be carried to another, so rational decision makers do not need to work as hard when earning rates are high as when earning rates are low.

Study 1

Method

Study 1 tested the hypothesis that participants would overearn when earning rates were high but not (or not as much) when earning rates were low. The study used the paradigm introduced in the preceding section. The music used was excerpts from *Piano Collections: Final Fantasy X* (Uematsu, Hamauzu, & Nakano, 2002), and the noise was a 0.2-s annoying sound. In a pretest, research participants ($N = 20$) similar to those in the main study rated the pleasantness of the music and the noise, using 6-point scales (1 = *extremely unpleasant*, 6 = *extremely pleasant*); results showed that the music was more pleasant than the noise (music: $M = 3.90$; noise: $M = 2.00$), $t(19) = 4.66$, $p < .001$. Rewards were 6-g bite-sized *Dove* milk-chocolate bars.

Fifty-five students from a large public university (29 female, 26 male; mean age = 20.15 years) participated in the study in return for a nominal payment. We assigned them to either a low-earning-rate or a high-earning-rate condition. In the high-earning-rate condition, they needed to hear the noise 20 times to earn 1 chocolate; in the low-earning-rate condition, they needed to hear the noise 120 times to earn 1 chocolate.

Results and discussion

The study yielded two theoretically relevant findings. The first was that participants in the high-earning-rate condition overearned (Table 1). We tested overearning in two ways. First, we compared the amount of chocolates earned with the amount of chocolates consumed. By this benchmark, participants in the high-earning-rate condition greatly overearned, $t(26) = 4.68$, $p < .001$; on average, these participants earned 10.74 chocolates ($Mdn = 7$) but ate only 4.26 chocolates ($Mdn = 2$), leaving 6.48 chocolates ($Mdn = 5$) on the table. Second, we tested overearning by comparing the earned number of chocolates with the predicted optimal number of chocolates.

Table 1. Results From Study 1

	High-earning-rate condition			Low-earning-rate condition		
	<i>M</i>	<i>Mdn</i>	<i>SD</i>	<i>M</i>	<i>Mdn</i>	<i>SD</i>
Number of chocolates						
Earned	10.74	7.00	11.24 ^a	2.54	2.50	1.97
Consumed	4.26	2.00	5.56	1.68	1.50	1.36
Predicted optimal	3.75	3.00	1.99	3.77	3.00	2.69

^aThe standard deviation for this condition was particularly large (larger than the mean) because 1 participant earned 50 chocolates (and consumed 28). Excluding this participant renders the mean of and standard deviation for the earned number 9.23 and 8.20, respectively, and the mean of and standard deviation for the consumed number 3.35 and 2.97, respectively, and does not affect the significance of any of the results.

We estimated the predicted optimal number by describing the study's procedure to another group of respondents ($N = 52$), telling half of them about the high earning rate and the other half about the low earning rate and asking them to predict how many consumed chocolates in Phase II would make them most satisfied if they could eat as many as they wished. The predicted numbers were 3.75 and 3.77 chocolates, respectively, for the high and the low earning rates. By these benchmarks, participants in the high-earning-rate condition again overearned, $t(51) = 3.08, p < .01$.

Our second theoretically relevant finding was that participants in the low-earning-rate condition earned less than participants in the high-earning-rate condition did, $t(53) = 3.80, p < .001$;¹ they either overearned less, $t(53) = 4.01, p < .001$, using the consumed number as a benchmark, or underearned, $t(52) = 2.25, p < .05$, using the predicted optimal number as a benchmark.

We wish to address several potential alternative explanations for the overearning effect in the high-earning-rate condition. One was that the participants overpredicted their consumption needs. Although individuals sometimes do mispredict their consumption needs (Hsee & Zhang, 2004; Wilson & Gilbert, 2005), misprediction was not a viable cause for overearning in this research. Recall that the predicted optimal amount of chocolates was 3.75, which was quite close to the consumed amount of chocolates (4.26), which suggests that participants' predictions were rather accurate. Another potential explanation concerns uncertainty protection: Participants might have been unsure about their prediction and earned more just in case. In our opinion, uncertainty protection could explain a modest amount of overearning but not the magnitude of overearning observed in Study 1. (In Study 2, we tested whether participants overearned even when overearning would hurt their consumption experience.) A third potential explanation concerns enjoyment of work (e.g., Norton, Mochon, & Ariely, 2012; Ryan & Deci, 2000) or aversion to idleness (Hsee, Yang, & Wang, 2010). To test for this, at the end of the study, we asked participants to rate their experience listening to noises and earning chocolates (working) and their experience listening to music and doing nothing (being idle). Using a 6-point scale (1 = *very unhappy*, 6 = *very happy*), participants rated the latter experience as more pleasant ($M_s = 5.05$ vs. 2.80), $t(54) = 13.22, p < .001$, rendering the idleness-aversion and work-enjoyment accounts unviable.²

In real life, incorrect prediction, uncertainty protection, enjoyment of work, and idleness aversion may be important and sufficient reasons for overearning, but our analyses suggested that they were not necessary reasons. In the next two studies, we further explored overearning and mindless accumulation. For simplicity, we focused only on high-earning-rate situations.

Study 2

We had two objectives in Study 2: (a) to test the robustness of the overearning effect by replicating the effect in a context in which overearning would worsen consumption experiences and (b) to provide further support for the mindless-accumulation account by testing two hypotheses derived therefrom. According to the mindless-accumulation account, individuals do not spontaneously predict consumption consequences while earning, even if the consequences are predictable. Therefore, prompting participants to predict the consequences before earning should (a) reduce their overearning tendencies and (b) increase their happiness during consumption. Study 2 tested these hypotheses.

Method

Study 2 used a variation of the paradigm used in Study 1. In the original paradigm, overearning would not hurt consumption, because participants did not have to eat all of the earned chocolates. In Study 2, we wanted to create a situation in which overearning would hurt consumption. One way to achieve this was to force participants to eat all of their earned chocolates, but doing so was not ethically justifiable. Instead, we used jokes as rewards and "forced" participants to read all of the earned jokes in Phase II.

The experiment lasted 6 min and was divided into two 3-min phases. In Phase I, a participant earned one joke for every five times he or she listened to a noise (the same noise used in Study 1). The jokes were of similar lengths. In Phase II, all of the earned jokes were automatically displayed, one at a time, on the computer. The more jokes a participant earned in Phase I, the less time each joke would be displayed on the computer in Phase II. If a participant earned too many jokes, each joke would remain on the screen for so short a time that the participant would not be able to finish reading it before it was replaced by the next joke. We told participants about the procedure and showed them multiple sample jokes before the experiment so they would know what the jokes were like.

Forty students from a large public university (19 female, 21 male, mean age = 20.00 years) participated in the study in return for a nominal payment. We assigned them to one of two conditions. In the experimental (*with-prediction*) condition, participants were prompted to answer the following question right before beginning Phase I of the study: "What is the optimal number of jokes you want to read in Phase II?" In the control (*without-prediction*) condition, the question was omitted. At the end of Phase II, we asked participants in both conditions to report their feelings while reading the jokes, using a 6-point scale (1 = *very unhappy*, 6 = *very happy*).

Results and discussion

Three findings emerged from Study 2 (Table 2). First, replicating the overearning effect in Study 1, results showed that participants in the control condition overearned. We tested overearning in this study only by comparing the earned number of jokes with the predicted optimal number of jokes, which was the prediction that participants in the with-prediction condition made. By this benchmark, participants in the without-prediction condition significantly overearned, $t(31) = 2.29, p < .05$. (We could not test overearning by comparing the earned number with the consumed number in this study, because, by design, the two values were identical.)

Second, participants in the with-prediction condition earned less than participants in the without-prediction condition did, $t(38) = 2.17, p < .05$; most of them stopped as soon as they reached the predicted optimal point. Note that participants in the with-prediction condition received no privileged information from us; we simply asked them to predict the number of jokes they would want to read. Participants in the without-prediction (control) condition could have done so, too, but, as predicted by the mindless-accumulation account, they apparently did not spontaneously do so.

Finally, and most important, participants in the with-prediction condition were happier than those in the control condition were, $t(38) = 2.08, p < .05$. Overall, the more jokes participants earned, the less happy they were, $r = -.33, p < .05$.

In summary, Study 2 showed that even when overearning would undermine consumption experiences, participants still overearned, and that prompting them to predict consequences produced an ameliorating effect. The result of this study further ruled out uncertainty protection as a necessary explanation for overearning. People would overearn for uncertainty protection only if overearning would not hurt consumption, but in this study, it would hurt.

Study 3

In Study 3, we sought to test another hypothesis derived from the mindless-accumulation notion—that disallowance of excessive earnings could increase happiness. In our original paradigm, this strategy would mean disallowing the earning of additional chocolates after participants had earned enough for consumption. Normatively, this strategy cannot increase happiness, just as, normatively, setting an earning cap for wealthy people cannot increase their happiness. But we predict that this strategy can increase happiness. According to the mindless-accumulation notion, if no earning cap is present, participants will keep working until feeling tired. If an earning cap is present, they will realize that continuing to work makes no sense and will stop (even if they could continue to work if they wished to), and, because stopping working will save them the pain of the extra work, it should make them happier.

Method

The procedure of Study 3 was similar to that of Study 1, and the same noise and the same music were used. In Study 3, the reward was Hershey's Kisses, and the earning rate was one Hershey's Kiss for every 10 instances of noise.

Forty-two students from a large public university (22 female, 20 male, mean age = 22.32 years) participated in the study in return for a nominal payment. We assigned them to one of two conditions: without earning cap (control) and with earning cap (experimental). In both conditions, participants learned in advance that once they earned a certain number of chocolates, they would receive a message about whether they could earn more chocolates, and that even if they could not earn more chocolates, they could still listen to noises if they wished. Once they had earned 12 chocolates, participants in the with-earning-cap condition received a message saying

Table 2. Results From Study 2

Variable	Without-prediction condition			With-prediction condition		
	<i>M</i>	<i>Mdn</i>	<i>SD</i>	<i>M</i>	<i>Mdn</i>	<i>SD</i>
Number of jokes						
Earned	11.32	9.00	9.04	6.86	7.00	2.57
Consumed	11.32	9.00	9.04	6.86	7.00	2.57
Predicted optimal	6.57	6.00	2.80	6.57	6.00	2.80
Happiness	3.37	3.00	1.46	4.24	4.00	1.18

Note: The earned and the consumed numbers of jokes were identical by design in this study. Happiness was rated on a 6-point scale, with higher values indicating greater happiness.

they could not earn additional chocolates. We chose 12 chocolates as the cap, because in a pretest that allowed participants to eat as many Hershey's Kisses as they wanted, most ate only 5, and none ate more than 12. To make the control condition comparable to the experimental condition, we also included a message in the control condition that was shown to participants when they had earned 12 Hershey's Kisses: It said that they could still earn additional chocolates after that point. At the end of each phase, we asked participants to rate their feelings during that phase, using a 6-point scale (1 = *very unhappy*, 6 = *very happy*).

Results and discussion

Study 3 yielded three noteworthy findings (Table 3). First, in the control (without-earning-cap) condition, participants again overearned, relative to both the actual consumed number, $t(21) = 4.38, p < .001$, and the predicted optimal number, $t(40) = 4.01, p < .001$. As in Study 1, we elicited the predicted optimal number on the basis of the results of a pretest with a separate group of respondents ($N = 21$).

Second, compared with those in the control condition, participants in the with-earning-cap condition not only earned less, $t(40) = 2.19, p < .05$, but also worked less, $t(40) = 2.05, p = .05$. The former finding was not interesting, because they could not earn more than 12 chocolates. More interesting was the latter finding. According to the instructions, participants could continue to work (listen to the noise) after earning was disallowed. But they did not continue, which suggests that they did not enjoy working for the sake of working.

The last and the most important result concerned happiness. Contrary to normative intuitions, participants in the with-earning-cap condition were happier than participants in the without-earning-cap condition in both Phase I, $t(40) = 3.11, p < .01$, and Phase II, $t(40) = 2.48, p < .02$. Participants in the with-earning-cap condition were happier in Phase I presumably because they worked less (spent less time listening to noises) and relaxed more (spent more time listening to music), and they were happier in Phase II presumably because at the end of the experiment, they did not have to leave as many chocolates on the table as did those in the without-earning-cap condition.

Previously, we addressed several potential alternative explanations for overearning. Study 3 enabled us to address another potential alternative explanation—desires to brag about one's earnings. Should that explanation hold, participants who earned more—and hence owned more bragging rights—should feel happier than those who earned less. But results suggested otherwise: Happiness ratings in both Phase I and Phase II were negatively correlated with earnings, $r = -.38, p < .02$, and $r = -.31, p < .05$, respectively.

Our results from Study 3 suggested that earners do not spontaneously monitor the utility of their earning or control their decisions to stop earning. Setting an earning cap serves as a controlling device, disrupting mindless accumulation and enhancing happiness.

General Discussion

In this research, we introduced a minimalistic experimental paradigm for exploring earning decisions, provided

Table 3. Results From Study 3

Variable	Without-earning-cap condition			With-earning-cap condition		
	<i>M</i>	<i>Mdn</i>	<i>SD</i>	<i>M</i>	<i>Mdn</i>	<i>SD</i>
Number of chocolates						
Earned	14.59	13.50	11.76	8.80	10.00	3.79
Worked toward	14.84	13.50	11.84	9.32	10.00	4.22
Consumed	6.68	4.50	5.38	6.65	6.00	3.83
Predicted optimal	4.67	4.00	2.44	4.67	4.00	2.44
Phase I happiness	3.86	4.00	0.94	4.70	5.00	0.80
Phase II happiness	4.14	4.00	1.08	4.90	5.00	0.91

Note: The number of chocolates worked toward is the number of chocolates participants would have earned given the number of times they heard the noise. This number is greater than the earned number because participants could not earn a fraction of a chocolate and because in the with-earning-cap condition, participants could not earn more than 12 chocolates. Happiness was rated on 6-point scales, with higher values indicating greater happiness.

preliminary evidence for overearning, attributed overearning to mindless accumulation, and identified several moderators. In this section, we speculate on the origin and implications of overearning.

Overearning may be an overgeneralized heuristic. For much of human history, earning rates were low. To earn and accumulate as much as possible was a functional heuristic for survival; individuals did not need to worry about earning too much, because they could not earn too much. However, as with many other heuristics (Arkes & Ayton, 1999; Klayman & Brown, 1993), people overapply this earning-and-accumulation tendency to situations in which earning rates are high. Although speculative, this proposition is consistent with the results (especially the earning-rate effect) of our research.

Like overeating, overearning is a modern-era issue stemming from advancements in productivity, and it carries potential costs for humans. But unlike overeating, overearning has attracted little attention, for multiple reasons. For one, productivity and earning rates have not reached the point where most people are overearning; many people still live in poverty. In addition, working seems enjoyable. Moreover, overearning seems innocuous: "It never hurts to earn more."

However, these reasons are disputable. First, although overearning is not yet prevalent, it may become so in the near future. Again consider overeating: A century ago, overeating was an issue among only the affluent; now it is a global concern (Flegal, Carroll, Ogden, & Curtin, 2010). As technologies keep advancing and earning rates keep rising, overearning may also become widespread. Second, although working is a joy for some, it is a toil for many others. Finally, overearning is not costless. Overearners forgo the pleasure of leisure and endure the pain of extra work. Overearners may also lower the well-being of people around them by imposing more pressure on peers ("Joe worked last weekend and earned a lot, so I should work this weekend, too") and giving less time to loved ones ("My parents are so busy they rarely play with me"). Overearning is also wasteful: Because earning usually requires resources, overearning consumes resources that could otherwise be conserved.

To curtail overearning, we suggested setting an earning cap, and we demonstrated the happiness-enhancing effect of this strategy in Study 3. Nevertheless, curtailing overearning may or may not enhance happiness, depending on what individuals can do if they do not work and earn. In Study 3, participants who worked less could listen to pleasant music and therefore were happier than were those who worked more. If people who worked less had nothing else to do and were therefore idle, they might be less happy (Hsee et al., 2010). Thus, to take full advantage of the leisure brought about by modern technologies and high earning rates, policymakers and

individuals should devise enjoyable and meaningful alternative activities to occupy time (Keynes, 1963).

The research presented here, using contrived procedures, was far from able to capture the richness of real earning environments. Nevertheless, it is a first attempt at demonstrating, in controlled experiments, an overearning tendency, exploring its consequences, and testing its potential remedies. We therefore believe that it deserves a place in the literature and warrants attention.

Acknowledgments

The authors thank the following individuals for their helpful comments on drafts of this article: David Levari, Mike Norton, Luxi Shen, Oleg Urminsky, Xueer Yu, and Irene Zhang.

Declaration of Conflicting Interests

The authors declared that they had no conflicts of interest with respect to their authorship or the publication of this article.

Funding

The authors thank their respective schools, the Templeton Foundation, and the University of Chicago Confucius Institute for research support.

Supplemental Material

Additional supporting information may be found at <http://pss.sagepub.com/content/by/supplemental-data>

Notes

1. The finding that low-earning-rate participants earned less than high-earning-rate participants did not seem to be due to a ceiling effect. If low-earning-rate participants had kept working, they could have earned 12.5 chocolates, but none of them did; the median number of chocolates earned was only 2.5, and the maximum only 8.
2. To further rule out the idleness-aversion explanation, we conducted another experiment in which participants who did not work could kill their time by switching between different pieces of music. Again, we observed overearning.

References

- Arkes, H. R., & Ayton, P. (1999). The sunk cost and Concorde effects: Are humans less rational than lower animals? *Psychological Bulletin*, *125*, 591–600.
- Banks, J., Blundell, R., & Tanner, S. (1998). Is there a retirement-savings puzzle? *American Economic Review*, *88*, 769–788.
- Bertrand, M., Mullainathan, S., & Shafir, E. (2004). A behavioral-economics view of poverty. *American Economic Review*, *94*, 419–423.
- Burke, R. J. (2000). Workaholism in organizations: Psychological and physical well-being consequences. *Stress & Health*, *16*, 11–16.
- Camerer, C. (2003). *Behavioral game theory: Experiments in strategic interaction*. Princeton, NJ: Princeton University Press.

- Camerer, C., Babcock, L., Loewenstein, G., & Thaler, R. (1997). Labor supply of New York City cabdrivers: One day at a time. *Quarterly Journal of Economics*, *112*, 407–441.
- Chinander, K. R., & Schweitzer, M. (2003). The input bias: The misuse of input information in judgments of outcomes. *Organizational Behavior and Human Decision Processes*, *91*, 243–253.
- Crouter, A., Bumpus, M., Head, M., & McHale, S. (2001). Implications of overwork and overload for the quality of men's family relationships. *Journal of Marriage and Family*, *63*, 404–416.
- De Long, J. B. (2002). *Macroeconomics*. Burr Ridge, IL: McGraw-Hill Higher Education.
- Flegal, K., Carroll, M., Ogden, C., & Curtin, L. (2010). Prevalence and trends in obesity among U.S. adults, 1999–2008. *Journal of American Medical Association*, *303*, 235–241.
- Goldstein, D. G., Johnson, E., & Sharpe, W. (2008). Choosing outcomes versus choosing products: Consumer-focused retirement investment advice. *Journal of Consumer Research*, *35*, 440–456.
- Hsee, C. K., Shen, L., Zhang, S., Chen, J., & Zhang, L. (2012). Fate or fight: Exploring the hedonic costs of competition. *Organizational Behavior and Human Decision Processes*, *119*, 177–186.
- Hsee, C. K., Yang, A. X., & Wang, L. (2010). Idleness aversion and the need for justified busyness. *Psychological Science*, *21*, 926–930.
- Hsee, C. K., Yu, F., Zhang, J., & Zhang, Y. (2003). Medium maximization. *Journal of Consumer Research*, *30*, 1–14.
- Hsee, C. K., & Zhang, J. (2004). Distinction bias: Misprediction and mischoice due to joint evaluation. *Journal of Personality and Social Psychology*, *86*, 680–695.
- Hsee, C. K., & Zhang, J. (2010). General evaluability theory. *Perspectives on Psychological Science*, *5*, 343–355.
- Keeney, R. L. (1996). Value-focused thinking: Identifying decision opportunities and creating alternatives. *European Journal of Operational Research*, *9*, 537–549.
- Keynes, J. M. (1963). Economic possibilities for our grandchildren. In J. M. Keynes (Ed.), *Essays in persuasion* (pp. 358–373). New York, NY: W.W. Norton.
- Kivetz, R., & Simonson, I. (2003). The idiosyncratic fit heuristic: Effort advantage as a determinant of consumer response to loyalty programs. *Journal of Marketing Research*, *40*, 454–467.
- Klayman, J., & Brown, K. (1993). Debias the environment instead of the judge: An alternative approach to reducing error in diagnostic (and other) judgment. *Cognition*, *49*, 97–122.
- Lusardi, A., & Mitchell, O. (2007). Financial literacy and retirement preparedness: Evidence and implications for financial education. *Business Economics*, *42*(1), 35–44.
- McKenzie, C. R. M., & Liersch, M. (2011). Misunderstanding savings growth: Implications for retirement savings behavior. *Journal of Marketing Research*, *48*, 1–13.
- Norton, M. I., Mochon, D., & Ariely, D. (2012). The IKEA effect: When labor leads to love. *Journal of Consumer Psychology*, *22*, 453–460.
- Peiperl, M., & Jones, B. (2001). Workaholics and overworkers: Productivity or pathology? *Group & Organization Management*, *26*, 369–393.
- Peters, E. (2012). Beyond comprehension: The role of numeracy in judgments and decisions. *Current Directions in Psychological Science*, *21*, 31–35.
- Raghubir, P., & Srivastava, J. (2009). The denomination effect. *Journal of Consumer Research*, *36*, 701–713.
- Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, *55*, 68–78.
- Schaufeli, W. B., Taris, T. W., & Bakker, A. B. (2006). Dr. Jekyll or Mr. Hyde? On the differences between work engagement and workaholism. In R. J. Burke (Ed.), *Research companion to working time and work addiction* (pp. 193–217). Northampton, England: Edward Elgar.
- Schor, J. B. (1991). *The overworked American: The unexpected decline of leisure*. New York, NY: Basic Books.
- Shah, A., Mullainathan, S., & Shafir, E. (2012). Some consequences of having too little. *Science*, *338*, 682–685.
- Shen, L., & Urminsky, O. (2013). Making sense of nonsense: The visual salience of units determines sensitivity to magnitude. *Psychological Science*, *24*, 297–304.
- Skidelsky, R., & Skidelsky, E. (2012). In praise of leisure. *Chronicle of Higher Education*. Retrieved from <http://chronicle.com/article/In-Praise-of-Leisure/132251/>
- Soman, D., & Cheema, A. (2011). Earmarking and partitioning: Increasing saving by low-income households. *Journal of Marketing Research*, *48*, S14–S22.
- Spence, J. T., & Robbins, A. S. (1992). Workaholism: Definition, measurement, and preliminary results. *Journal of Personality Assessment*, *58*, 160–178.
- Tyran, J. (2007). Money illusion and the market. *Science*, *317*, 1042–1043.
- Uematsu, N., Hamazu, M., & Nakano, J. (2002). *Piano collections: Final Fantasy X* [CD]. [Recorded by A. Kuroda]. Digicube: Tokyo, Japan.
- Van der Hulst, M. (2003). Long work hours and health. *Scandinavian Journal of Work, Environment & Health*, *29*, 171–188.
- Van Osselaer, S. M. J., Alba, J. W., & Manchanda, P. (2004). Irrelevant information and mediated intertemporal choice. *Journal of Consumer Psychology*, *14*, 257–270.
- Wertenbroch, K., Soman, D., & Chattopadhyay, A. (2007). On the perceived value of money: The reference dependence of currency numerosity effects. *Journal of Consumer Research*, *34*, 1–10.
- Wilson, T. D., & Gilbert, D. T. (2005). Affective forecasting: Knowing what to want. *Current Directions in Psychological Science*, *14*, 131–134.