

Having Too Little or Too Much Time Is Linked to Lower Subjective Well-Being

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Many people living in modern society feel like they do not have enough time and are constantly searching for more. But is having limited discretionary time actually detrimental? And can there be downsides of having too much discretionary time? In two large-scale data sets spanning 35,375 Americans and two experiments, we explore the relationship between the amount of discretionary time individuals have and their subjective well-being. We find and internally replicate a negative quadratic relationship between discretionary time and subjective well-being. These results show that whereas having too little time is indeed linked to lower subjective well-being caused by stress, having more time does not continually translate to greater subjective well-being. Having an abundance of discretionary time is sometimes even linked to lower subjective well-being because of a lacking sense of productivity. In such cases, the negative effect of having too much discretionary time can be attenuated when people spend this time on productive activities.

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Between their many obligations, people today feel like they do not have enough time and want more. This “time famine” reaches across the globe (Hamermesh & Lee, 2007) and is particularly acute among Americans, who report feeling more time-constrained than ever before (Carroll, 2008; Roxburgh, 2004). A nationwide poll shows that nearly half of Americans report they do not have enough time to do what they want to do (Newport, 2016). Hoping to lessen the strain, many people search for ways to save time to increase hours spent doing what they want. For instance, there are more than 35,000 books available on Amazon aiming to improve time management (e.g., *How to Get 12 Hours Out of an 8-Hour Day*), and 50% of Americans spend money to buy out of chores, such as cooking, shopping, and household maintenance (Whillans et al., 2017). Although prioritizing time over money and spending money to buy more free time have been empirically linked to greater happiness (Hershfield et al., 2016; Whillans et al., 2017, 2016), would *actually* having more time make people better off? Pushing this question further, is it possible to have too much discretionary time? Across two large-scale data sets and two experiments,

we examine the relationship between the amount of discretionary time people have and their subjective well-being.

The likely harm of having too little time is straightforward. People who work longer hours and have a greater proportion of their schedules consumed by obligations have less time to do what they want. Less discretionary time means less time spent on activities that are linked to greater happiness (e.g., socializing and engaging in active leisure; Csikszentmihalyi & Hunter, 2003; Kahneman et al., 2004; Lathia et al., 2017; Mogilner, 2010). In addition, feeling pressed for time takes its toll. People who report greater feelings of time-stress exhibit more unhealthy behaviors, such as eating poorly and not exercising (Banwell et al., 2005; Strazdins et al., 2011). Those who report feeling time-stressed also report being less happy (Kasser & Sheldon, 2009; Masuda et al., 2020), more depressed (Roxburgh, 2004), and more emotionally exhausted (Teuchmann et al., 1999).

Although a negative effect of being temporally impoverished seems likely, what is the effect of having an abundance of time? Ample time for discretionary activities may have a diminishing effect on people’s enjoyment of those activities. Both fortunately and unfortunately, people are prone to hedonic adaptation, making them grow accustomed not only to life’s pains but also to life’s pleasures (Frederick & Loewenstein, 1999; Lyubomirsky et al., 2005; Wilson & Gilbert, 2008). For instance, despite socializing being among the most enjoyable ways to spend time, time spent on social activities has been shown to have diminishing returns for subjective well-being (Kushlev et al., 2018). Indeed, excessive access to enjoyed activities leads people to savor them less (Kurtz, 2008; Quidbach et al., 2015). Therefore, spending hours upon hours simply doing what one wants may lose its positive impact on happiness.

Beyond a reduced positive effect, could there ever be a negative effect? Is it possible to have too much discretionary time? Are there cases in which having additional discretionary hours is associated

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OSF Link for data, syntax, materials, and preregistrations: <https://osf.io/hw85m/>.

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with lower subjective well-being? Emerging work tangentially suggests so. People dread being idle and have been observed as happier when busied by a task (Hsee et al., 2010). Recent research suggests that busyness has become a status symbol, signaling competence, ambition, and being in high demand (Bellezza et al., 2017). If people derive satisfaction from being productive with their time (i.e., spending it on worthwhile activities; Keinan & Kivetz, 2011), the effect of having an abundance of time in one's daily life may be more insidious than mere boredom. With too much discretionary time, people may infer lack of productivity and purpose (Csikszentmihalyi, 2000)—thus feeling less happy and less satisfied in their lives.

Even though many people in modern society feel time-stressed and want more time, we hypothesized that actually having more discretionary time would not increasingly make people better off. More specifically, we predicted a negative quadratic relationship between discretionary time and subjective well-being, such that beyond a certain amount, more discretionary time would not be further associated with greater subjective well-being. We further expected that in some cases, a large amount of discretionary time may actually be associated with lower subjective well-being, depending on how this time is spent. In particular, we predicted that an abundance of time spent on nonproductive discretionary activities would exhibit a negative effect on subjective well-being. However, if people spent their discretionary time in productive ways, we predicted that the negative effect of having too much discretionary time would be attenuated.

Drawing on prior research (Holbrook & Lehmann, 1981), we define discretionary time as the amount of time spent on leisure activities or other pursuits where the primary function is the use of time for pleasure or another intrinsically worthwhile purpose. Therefore, discretionary time is not simply whatever time remains outside of paid work hours. For one, not everyone works for pay (e.g., stay-at-home parents and retirees). And among those who do, the amount of time one chooses to spend working might be well over what is obligatory (Snir & Zohar, 2008). Additionally, at least some of one's time outside of work is likely to be absorbed by other obligations, including household chores, going to the dentist, taking a child to the dentist, or standing in line at the DMV¹ (Eriksson et al., 2007). Thus, we define and operationalize discretionary time as the number of hours a person spends in a day doing what they want.

To examine the relationship between discretionary time and subjective well-being, we first analyze two large-scale data sets representing adults from across the United States (Studies 1 and 2). We then supplement these data with two mental simulation experiments to gain insight into mechanisms driving the observed effect. In particular, in Study 3, we measure two theoretically motivated mediators: greater stress from having too little discretionary time and a lacking sense of productivity from having too much discretionary time. In Study 4, we then manipulate whether a high (vs. moderate) amount of discretionary time is spent on productive (vs. nonproductive) activities to test for an attenuation of the negative effect of having too much time.

Study 1: National Study of the Changing Workforce

Method

We analyzed the data of 13,639 working Americans who participated in the National study of the Changing Workforce (NSCW)

between 1992 and 2008.^{2,3} The NSCW surveyed representative samples of the nation's labor force on four occasions: in 1992; in 1997; in 2002; and in 2008 (ages 18–99, $M_{\text{age}} = 42.27$; 47.2% male; 78.8% Caucasian; 58.1% married; 41.7% have children; 36.9% with at least a bachelor's degree; $M_{\text{income}} = \$46,398.47$). To qualify to take this survey, participants had to be working at a paid job or operating an income-producing business as part of the civilian labor force (see Galinsky et al., 1993 for more information about this survey).

Among the survey's many questions, participants reported their amount of discretionary time ("On average, on days when you're working, about how many hours [minutes] do you spend on your own free-time activities?"; $M = 1.80$ hr, $SD = 1.82$, Median = 1 hr, Min = 0 hr, Max = 20 hr; see Figure S1 for distribution) and their subjective well-being, which was measured as life satisfaction ("All things considered, how do you feel about your life these days? Would you say you feel 1 = very satisfied, 2 = somewhat satisfied, 3 = somewhat dissatisfied, or 4 = very dissatisfied?"). For our analysis, we reverse-coded the life satisfaction measure, such that larger numbers correspond with greater subjective well-being ($M = 3.24$, $SD = .71$). Whereas many papers have examined this data set, <https://www.familiesandwork.org/research/workforce-research-national-study-of-the-changing-workforce>, research-to-date has not examined the relationship between the amount of discretionary time people have and their life satisfaction.

Results

We conducted an OLS regression predicting life satisfaction from the linear and quadratic terms of people's reported amount of discretionary time. Consistent with our prediction, we found a significant negative quadratic relationship between the amount of discretionary time people have and their subjective well-being ($N = 13,639$, $B = -.003$, $SE = .001$, $t[13636] = -5.28$, $p < .001$, 95% CI $[-.004, -.002]$, $R^2 = .004$; Figure 1, Table 1).

We also examined whether the quadratic term explained more variance in the model than did the significant linear term alone ($N = 13,639$, $B = .017$, $SE = .003$, $t[13639] = 5.11$, $p < .001$, 95% CI $[.011, .024]$, $R^2 = .002$). Indeed, by adding the quadratic term in the model, there was a significant increase in the variance explained: an increase of .002 in the R^2 , F Change (1, 13636) = 27.85, $p < .001$.

The predicted negative quadratic relationship held when controlling for gender, age, parental status, marital status, race, the natural log of respondent income, employment status (i.e., self-employed or not), and education⁴ ($N = 11,649$, $B = -.003$, $SE = .001$, $t[11638] = -3.72$, $p < .001$, 95% CI $[-.011, -.004]$, $R^2 = .058$; Table 1). We did not find any consistent interactions between these covariates and the predicted quadratic relationship across studies.

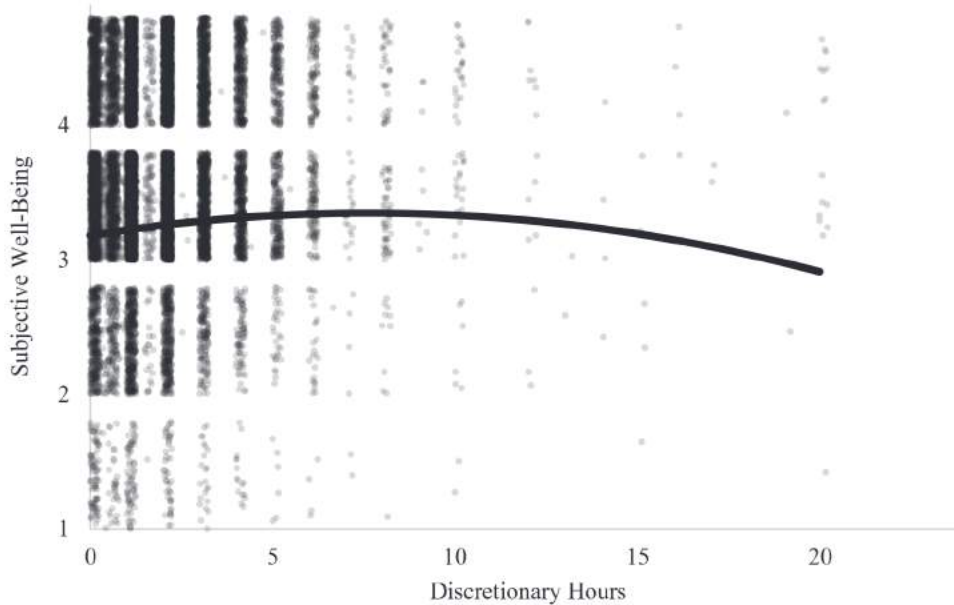
¹ Other than work, these activities were among those viewed as least discretionary (and most obligatory) in the crowdsourcing study we conducted to determine our measure of discretionary time for Study 2. See Table S7 in the online supplemental materials for the complete set of activities listed from most to least discretionary.

² Studies 1 and 2 analyzes large datasets collected by a third party with no identifying information about the participants; thus, IRB approval was not necessary for these studies.

³ Data are not publicly available.

⁴ Gender, age, parental status, marital status, race, education, income, and self-employment status are all mean-centered.

Figure 1
Scatterplot of the Relationship Between Discretionary Time and Subjective Well-Being in Study 1



Note. For ease of visualization, a jitter was added to subjective well-being scores and discretionary hours. Fit line represents the negative curvilinear relationship between discretionary time and subjective well-being.

Outliers

The predicted negative quadratic effect held up to a series of robustness checks. Namely, the effect persisted when we excluded

Table 1
Regression Results of Study 1: The Influence of Discretionary Time on Subjective Well-Being

Variable	(1)	(2)
Hours of discretionary time	0.044*** (0.006)	0.057*** (0.007)
Hours of discretionary time squared	-0.003*** (0.001)	-0.003*** (0.001)
Male		-0.025 ⁺ (0.013)
White		0.012 (0.016)
Age		0.002* (0.001)
Married		0.293*** (0.014)
Children		-0.034* (0.015)
4-year college		0.034* (0.014)
Natural log-transformed income		0.047*** (0.007)
Self-employed		0.078*** (0.018)
Constant	3.18*** (.010)	3.15*** (.011)
R ²	.004	.058

Note. (1) The coefficients reported above are the unstandardized coefficients. (2) All predictor variables, except Hours of Discretionary time and Hours of Discretionary time Squared, are mean-centered.
+ $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

individuals who reported discretionary time four or more standard deviations away from the mean ($n = 108$ with 9.1+ hours of discretionary time; without covariates: $N = 13,531$, $B = -.010$, $SE = .002$, $t[13528] = -6.02$, $p < .001$, 95% CI $[-.014, -.007]$, $R^2 = .006$; with covariates: $N = 11,564$, $B = -.010$, $SE = .002$, $t[11553] = -3.39$, $p < .001$, 95% CI $[-.023, -.006]$, $R^2 = .060$; Table S1). The effect also persisted when we excluded individuals who were identified as outliers using Cook's Distance (without covariates: $n = 290$ with Cook's distance greater than $4/N$, $N = 13,349$, $B = -.004$, $SE = .001$, $t[13346] = -5.75$, $p < .001$, 95% CI $[-.005, -.003]$, $R^2 = .007$; with covariates: $n = 436$ with Cook's distance greater than $4/N$, $N = 11,213$, $B = -.004$, $SE = .001$, $t[11202] = -4.61$, $p < .001$, 95% CI $[-.005, -.002]$, $R^2 = .072$; Table S2). These checks confirm that the observed negative quadratic effect was not driven by a few participants who reported having very large amounts of discretionary time.

U-Shape Test

We then used Simonsohn's (2018) two-lines approach (<http://webstimate.org/twolines/>) to test for an inverted U-shape in the relationship between discretionary time and subjective well-being. This method confirmed that for low values of discretionary time, the regression line was positive and statistically significant ($b = .090$, $z = 9.291$, $p < .001$); however, for high values of discretionary time, the regression line was negative but did not reach statistical significance ($b = -.005$, $z = -.899$, $p = .368$; break point = 2 hr). Thus, as we predicted, having more discretionary time did not show a continued positive effect on subjective well-being. However, in this dataset, we did not observe our predicted significant negative effect among people who had an abundance of discretionary time. In light of our results from Study 2, we later propose why we likely did not observe the predicted drop in this dataset.

Study 2: American Time Use Survey

The dataset we analyzed in Study 2 advances our investigation in several important ways. First, Study 1 only included working Americans. In Study 2, we leveraged data from an even larger and more representative sample of Americans, including those not in the workforce.

Second, Study 1 relied on a fairly subjective measure of discretionary time. Participants used their own interpretation of what constitutes “free-time activities” to report their amount of discretionary time on an average workday. However, an activity that one person views as discretionary (e.g., going for a run) might be viewed as a tortuous chore by someone else, or an activity that someone views as a tedious, incessant obligation (e.g., cooking) might be viewed as an enriching hobby by others. Although the results of Study 1 were informative in capturing individuals’ views of their activities in a typical day, in Study 2 we sought to replicate the predicted negative quadratic effect using a more objective and conservative measure of discretionary time. Based on the activities that most people (i.e., more than 90%) view as discretionary, we calculated the amount of time each of the tens of thousands of individuals in the dataset spent on discretionary activities in a given day. This level of detail in the dataset allowed us to further explore the role that different types of discretionary activities play in affecting the relationship between the amount of discretionary time individuals have and their subjective well-being.

Method

We analyzed the data of 21,736 Americans who participated in the American Time Use Survey (ATUS) between 2012 and 2013, the years in which our key variables were administered (ages 15–85, $M_{\text{age}} = 47.92$; 44.5% male; 79.3% Caucasian; 47.7% married; 43.5% have children; 33.5% with at least a bachelor’s degree; 57.8% employed full time; $M_{\text{income}} = \$52,597.74$). Data are available at: <https://www.bls.gov/tus/#database>. In answering the ATUS, respondents provide a detailed account of the activities that filled their prior 24 hr—indicating the time period and duration of each activity. We assessed discretionary time by calculating the amount of time each individual spent on discretionary activities in a day.

Because there is no standard definition for which specific activities count as discretionary, we used a crowdsourcing platform (Amazon’s Mechanical Turk) to determine the activities that most people (i.e., more than 90%) consider to be discretionary time. Specifically, we conducted a preregistered study in which we first provided a definition of discretionary time (“time spent on leisure activities or other pursuits where the primary function is the use of time for pleasure or some other intrinsically worthwhile purpose”) and then asked participants ($N = 500$; $M_{\text{age}} = 34.59$, $SD_{\text{age}} = 10.83$; 50.8% male) to indicate for each activity in the American Time Use Survey whether it was representative of discretionary time or not (0 = “is NOT discretionary time,” 1 = “IS discretionary time”). The categories of activities that at least 90% of the sample considered discretionary were Relaxing & Leisure (e.g., doing nothing, watching TV, listening to the radio, playing games); Socializing & Communicating with Others (e.g., hanging out with family, hanging out with friends); Arts & Entertainment Other than Sports

(e.g., attending a comedy club, attending an art gallery, attending a movie); Travel Related to Socializing, Relaxing, & Leisure; Personal Activities (e.g., having sex, making out); Attending Sporting/Recreational Events (e.g., watching sports); Playing Sports with Household and Nonhousehold Children (e.g., riding bikes with child, strolling with child); and Participating in Sports, Exercise, or Recreation (e.g., biking, playing basketball, fishing, running, golfing, doing yoga, working out). See Table S7 of the online supplemental materials for more details about Study 2, including the full list of 139 activities and the percentage of participants who identified each as discretionary.

Applying this crowdsourced metric for determining which activities count as discretionary, we calculated the total amount of time each American Time Use Survey respondent spent engaging in discretionary activities over the previous 24 hr ($M = 5.48$ hr, $SD = 3.70$, Median = 4.92 hr, Min = 0 hr, Max = 23.98 hr; see Figure S2 for the distribution).⁵ Subjective well-being was assessed with a ladder-style question used in prior research (Kahneman & Deaton, 2010): “Please imagine a ladder with steps numbered from 0 at the bottom to 10 at the top. The top of the ladder represents the best possible life for you. If the top step is 10 and the bottom step is 0, on which step of the ladder do you feel you personally stand at the present time?” ($M = 7.11$, $SD = 2.03$). In doing so, unlike previous research examining this data, <https://www.bls.gov/tus/research.htm>, we were able to uniquely examine how amount of time spent on discretionary activities affects subjective well-being.

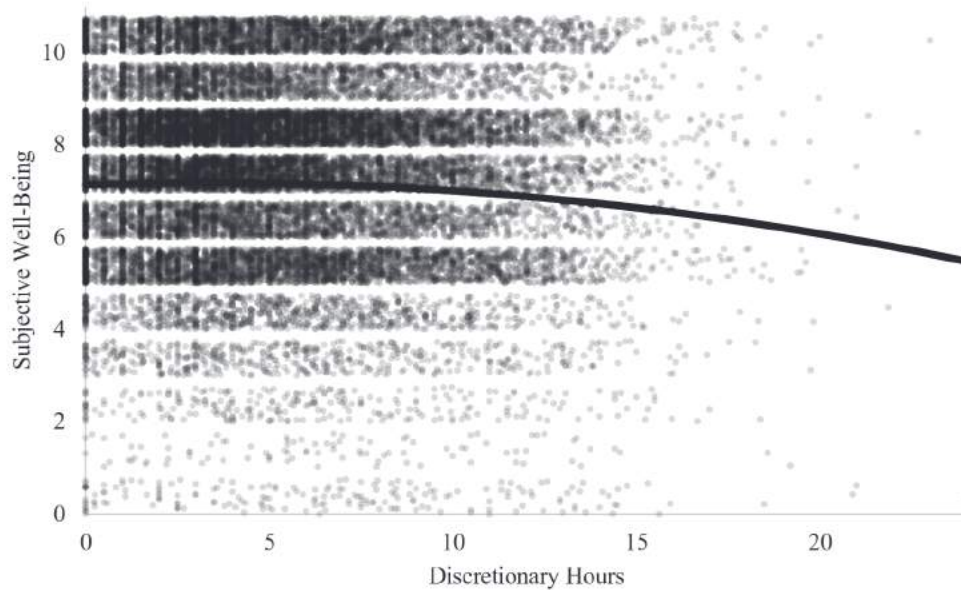
Results

We conducted an OLS regression predicting life satisfaction from the linear and quadratic terms of our calculated amount of individuals’ discretionary time. Replicating the results from Study 1, we found a significant negative quadratic relationship between the amount of discretionary time people have and their subjective well-being ($N = 21,736$, $B = -.004$, $SE = .001$, $t[21733] = -4.88$, $p < .001$, 95% CI $[-.005, -.002]$, $R^2 = .003$; Figure 2 and Table 2). This effect held when controlling for gender, age, parental status, marital status, race, education, natural log-transformed respondent income, and employment status, all of which are mean-centered ($N = 20,275$, $B = -.003$, $SE = .001$, $t[20264] = -4.23$, $p < .001$, 95% CI $[-.005, -.002]$, $R^2 = .032$; Table 2).

Inclusion of the predicted negative quadratic term explained more variance in the model than did the linear term alone, which contrary to Study 1 was significant and negative ($N = 21,736$, $B = -.026$, $SE = .004$, $t[21734] = -6.89$, $p < .001$, 95% CI $[-.033, -.018]$, $R^2 = .002$). By adding the quadratic term in the model, there was a significant increase in the variance explained: an increase of .001 in the R^2 , F Change (1, 21733) = 23.77, $p < .001$.

⁵ It is apparent in Figure S2 that a small portion of respondents had a very large number of discretionary hours in their day. For instance, 5.9% of the sample had more than 12 hours of discretionary time. Although it may seem difficult to have this large amount of discretionary time in a day, it is not unreasonable. The ATUS asks individuals about a randomly selected day, which might be one in which the person had an unusually large number of discretionary hours (with little sleep and/or few obligations)

Figure 2
Scatterplot of the Relationship Between Discretionary Time and Subjective Well-Being in Study 2



Note. For ease of visualization, a jitter was added to subjective well-being scores. Fit line represents the negative curvilinear relationship between discretionary time and subjective well-being.

Robustness Checks

The predicted negative quadratic effect held up to a series of robustness checks.

Table 2
Regression Results of Study 2: The Influence of Discretionary Time on Subjective Well-Being

Variable	(1)	(2)
Hours of discretionary time	0.027* (0.011)	.035 (0.012)
Hours of discretionary time squared	-0.004*** (0.001)	-0.003*** (0.001)
Male		-0.189*** (0.029)
White		-0.051 (0.035)
Age		0.006*** (0.001)
Married		0.577*** (0.031)
Children		0.076* (0.036)
4-year college		0.117*** (0.032)
Natural log-transformed earnings		0.030*** (0.008)
Employed		-0.279** (0.087)
Constant	7.134*** (0.034)	7.070*** (0.037)
R^2	.003	.032

Note. (1) The coefficients reported above are the unstandardized coefficients. (2) All predictor variables, except Hours of Discretionary time and Hours of Discretionary time Squared, are mean-centered.
+ $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

Outliers

The effect held when we excluded individuals who reported discretionary time four or more standard deviations away from the mean ($n = 13$ with 20.28+ hours of discretionary time; without covariates: $N = 21,723$, $B = -.004$, $SE = .001$, $t[21720] = -4.42$, $p < .001$, 95% CI $[-.005, -.002]$, $R^2 = .003$; with covariates: $N = 20,262$, $B = -.003$, $SE = .001$, $t[20251] = -3.76$, $p < .001$, 95% CI $[-.005, -.002]$, $R^2 = .031$; Table S3). It also held when we excluded outliers using Cook's Distance ($n = 1,088$, without covariates: $N = 20,648$, $B = -.003$, $SE = .001$, $t[20645] = -3.21$, $p = .001$, 95% CI $[-.005, -.001]$, $R^2 = .001$; $n = 858$, with covariates: $N = 19,417$, $B = -.002$, $SE = .001$, $t[19406] = -3.01$, $p = .003$, 95% CI $[-.004, -.001]$, $R^2 = .036$; Table S4). These results suggest that the predicted effect is not reliant on the inclusion of outliers who had an extremely large amount of discretionary time that day.

Discretionary Time Calculations

Further, the effect held when we loosened the restriction of what constitutes a discretionary activity from those activities identified by at least 90% of participants as discretionary to those that at least 75% of participants identified as discretionary ($M = 6.08$ hr, $SD = 3.76$, Median = 5.62 hr, Min = 0 hr, Max = 23.98 hr; without covariates: $N = 21,736$, $B = -.004$, $SE = .001$, $t[21733] = -5.56$, $p < .001$, 95% CI $[-.006, -.003]$, $R^2 = .003$; with covariates: $N = 20,275$, $B = -.004$, $SE = .001$, $t[20264] = -4.57$, $p < .001$, 95% CI $[-.005, -.002]$, $R^2 = .031$; Table S5).

The effect also held when we used an alternate measure of discretionary time. For this, we calculated the total amount of time respondents spent doing any activity that fell within the American time Use Survey's predefined category of "Socializing, Relaxing, and Leisure" (e.g., socializing and communicating with others,

attending or hosting social events, etc.). Using this alternative measure, we again observed the predicted negative quadratic relationship ($M = 5.04$ hr, $SD = 3.57$, Median = 4.42 hr, Min = 0 hr, Max = 23.98 hr; without covariates: $N = 21,736$, $B = -.004$, $SE = .001$, $t[21733] = -4.64$, $p < .001$, 95% CI $[-.006, -.002]$, $R^2 = .005$; with covariates: $N = 20,275$, $B = -.003$, $SE = .001$, $t[20264] = -3.91$, $p < .001$, 95% CI $[-.005, -.002]$, $R^2 = .033$; Table S6).

Working Versus Not

Whereas Study 1 only included working Americans, Study 2 included individuals who were working ($n = 12,558$) as well as those who were not working ($n = 9,178$), including those who were employed but absent from work that day ($n = 543$), those who were unemployed ($n = 1,159$), and those not in the labor force ($n = 7,476$). Even though those who were working had less discretionary time on average ($M = 4.39$ hr, $SD = 3.20$) than those who were not working ($M = 6.96$ hr, $SD = 3.82$), we found the predicted negative quadratic relationship between individuals' amount of discretionary time and subjective well-being both among workers ($N = 12,558$, $B = -.003$, $SE = .001$, $t[12555] = -2.23$, $p = .025$, 95% CI $[-.005, -.000]$, $R^2 = .001$) and non-workers ($N = 9,178$, $B = -.004$, $SE = .001$, $t[9175] = -3.43$, $p = .001$, 95% CI $[-.007, -.002]$, $R^2 = .005$). As additional evidence that the effect was not driven by people who were involuntarily unemployed and thus whose abundance of discretionary time was potentially unwelcomed and uncoordinated with their social network (Young & Lim, 2014), we still observed the significant negative quadratic effect when we excluded only individuals who self-identified as being "unemployed" (excluded $n = 1,159$; $M_{\text{Discretionary time of Unemployed Participants}} = 6.40$ hr, $SD = 3.77$; $N = 20,576$, $B = -.004$, $SE = .001$, $t[20574] = -5.03$, $p < .001$, 95% CI $[-.006, -.003]$, $R^2 = .003$).

We also found that the effect was not driven by retirees. As evidence, the predicted negative quadratic relationship persisted when we excluded individuals who were above the standard retirement age of 66 (excluded $n = 3,709$; $M_{\text{Discretionary time of individuals over 66}} = 7.50$ hr, $SD = 3.65$; $N = 18,027$, $B = -.004$, $SE = .001$, $t[18024] = -4.61$, $p < .001$, 95% CI $[-.006, -.002]$, $R^2 = .007$). Furthermore, whether or not an individual was above the standard age of retirement or not did not moderate the negative quadratic term: the interaction effect was not significant ($B = .000$, $SE = .002$, $t[20261] = -.198$, $p = .843$, 95% CI $[-.005, .004]$).

Weekday Versus Weekend

Further, even though people on average have more discretionary time on the weekends ($n = 11,039$; $M = 6.16$ hr, $SD = 3.71$) than on the weekdays ($n = 10,697$; $M = 4.77$ hr, $SD = 3.56$), the negative quadratic effect persisted among people reporting their discretionary activities either on a weekend ($N = 11,039$, $B = -.004$, $SE = .001$, $t[11036] = -3.98$, $p < .001$, 95% CI $[-.006, -.002]$, $R^2 = .003$) or on a weekday ($N = 10,697$, $B = -.004$, $SE = .001$, $t[10694] = -3.21$, $p = .001$, 95% CI $[-.006, -.001]$, $R^2 = .004$). This analysis suggests that people can experience too little time and too much discretionary time irrespective of whether it's during the week or on the weekend.

U-Shape Test

We again used Simonsohn's (2018) two-lines procedure to test for an inverted U-shape relationship between discretionary time

and subjective well-being. Here, the regression line for low values of discretionary time was again positive and statistically significant ($b = .068$, $z = 3.105$, $p = .002$). However, unlike in Study 1, the regression line for the high values of discretionary time was negative and statistically significant, as we had initially predicted ($b = -.041$, $z = -6.657$, $p < .001$; break point = 3.42 hr). That is, in this dataset, we again found evidence for having too little time; at the low end of the continuum for discretionary time, having more time was associated with greater subjective well-being. However, we also found evidence for having too much time; at the high end of the continuum for discretionary time, having more time was associated with lower subjective well-being.

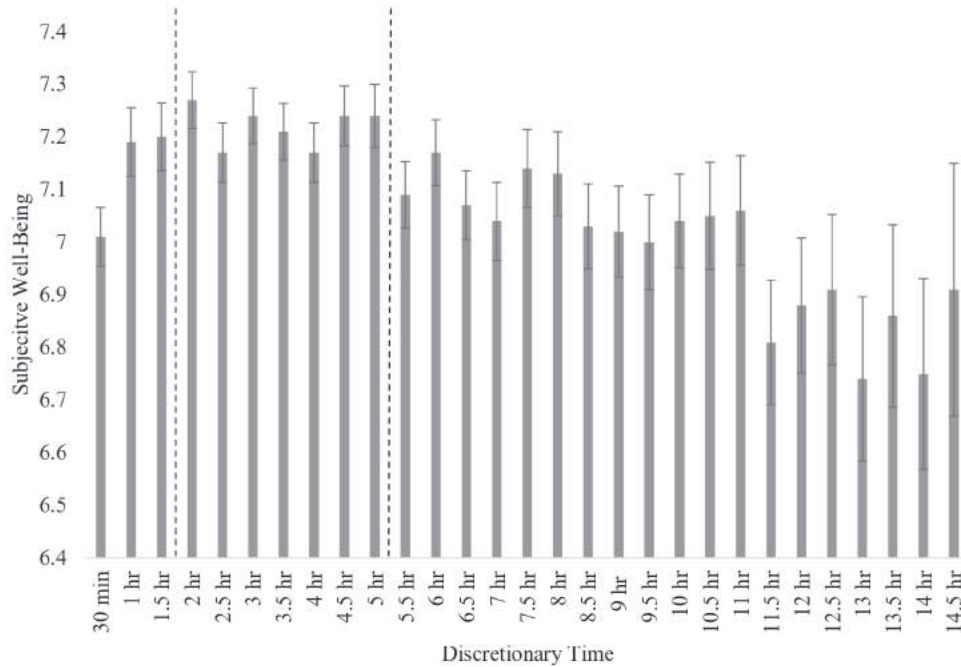
For a clearer view into the results, we supplemented this analysis with a histogram of respondents' amount of discretionary time binned per 30 minutes. Based on Figure 3, it appears that subjective well-being increases as discretionary time increases between zero and two hours, peaks between two and five hours, and decreases above five hours. These results provide a rough approximation that having less than two hours of discretionary time is "too little," whereas having more than five hours of discretionary time is "too much."

This identification of what counts as too little or too much discretionary time offers a potential clue into why we did not observe the "too much" effect in Study 1. Although both studies showed a significant negative quadratic effect, the U-shape test in Study 1 showed that the positive relationship between discretionary time and life satisfaction leveled off after the break point, whereas the U-shape test in Study 2 showed that the relationship became significantly negative after a point. If having more than five hours of discretionary time counts as too much, we see that while 48.1% of participants in Study 2 qualified as having too much, only 3.5% of participants in Study 1 did. See Figure S1 and Figure S2 in the online supplemental materials for the distribution of discretionary time in each study. The very small proportion of individuals in Study 1 with too much discretionary time may not have provided enough power to detect a significant negative effect on subjective well-being from having an overabundance of discretionary time.

Yet another difference between the two studies was the measure for discretionary time. Whereas Study 1 asked participants to report their amount of discretionary time on average, in Study 2 we calculated the amount of time people actually spent on discretionary activities on a given day. With its larger dataset that represents individuals both in and out of the workforce, and its more precise and objective measure of discretionary time, we suggest that the pattern of results found in Study 2 is more conclusive.

Types of Discretionary Time

With the robustness of the predicted negative quadratic effect, along with the significant test confirming the inverted U-shape, the results of Study 2 suggest that not only is it possible to have too little discretionary time, it is also possible to have too much. We found that having an abundance of discretionary time is associated with lower subjective well-being. We then wondered whether the way people spent their discretionary time might affect this relationship. That is, if people were to spend their discretionary time in more worthwhile ways, we may see the too much time effect attenuated. For instance, prior research has identified socializing and active leisure as particularly positive uses of time (Csikszentmihalyi

Figure 3*Histogram of the Relationship Between Discretionary Time and Subjective Well-Being in Study 2*

Note. Discretionary time is split into bins of 30 minutes. Error bars represent standard error of the mean.

& Hunter, 2003; Kahneman et al., 2004; Mogilner et al., 2018). Research has also shown that being productive with one's time produces greater subjective well-being (Etkin & Mogilner, 2016; Keinan & Kivetz, 2011). To explore whether the type of discretionary time moderates the relationship between amount of discretionary time and subjective well-being, we reexamined the data from the ATUS. For this analysis, we calculated the amount of time participants spent in these more worthwhile ways (Kuykendall et al., 2018): on social (vs. solo) discretionary activities, active (vs. passive) discretionary activities, and productive (vs. nonproductive) discretionary activities.

To determine which uses of discretionary time most people consider to be social (vs. solo), active (vs. passive), and productive (vs. nonproductive), we again conducted a crowdsourcing study on Amazon Mechanical Turk among a separate set of participants ($N = 901$; ages 18–74, $M_{\text{age}} = 37.55$; 60.7% male). In this preregistered study, we provided the same definition of discretionary time and presented participants with the discretionary activities identified in our previous crowdsourcing study (see Table S8–S10). To reduce the chance of respondent fatigue, each participant was presented with a random subset of 31 activities from the full list of 94 discretionary activities. For each discretionary activity, participants indicated whether it was *social* versus *solo* (“A social activity is one that would be more likely to involve engaging with other people (vs. alone)”; 0 = *solo activity*, 1 = *social activity*); whether it was *active* versus *passive* (“An active activity is one that is physically or mentally engaging. The opposite of an active activity is a passive activity”; 0 = *passive activity*, 1 = *active activity*) and whether it was *productive* versus *nonproductive* (“By productive, we mean that you consider this use of discretionary time to not be

“wasted.” This use of time might feel useful, accomplished, fulfilling, helpful, purposeful, and/or worthwhile”; 0 = *not productive*, 1 = *productive*).

As preregistered, we coded discretionary activities to be social, active, or productive if 90% or more of the participants rated the activity as such. Otherwise, the activity was coded as solo, passive, or nonproductive. See Tables S8–S10 in the online supplemental materials for a complete list of the activities and the percentage of participants who categorized them as social, active, and productive. Notably, this crowdsourcing study revealed a large degree of overlap between the discretionary activities that were viewed as active and productive, with all but one of the productive activities (i.e., Hobbies) also identified as active. These results, along with our rationale that productive discretionary time is likely to be worthwhile by being physically *or* mentally engaging, led us to combine these two categories into discretionary activities that are productive (vs. nonproductive).⁶

Based on this classification process, the discretionary activities counted as *social* were Socializing and Communication with Others, Playing Sports with Household Children, Playing Volleyball, Playing Football, Playing Racquet Sports, and Playing Billiards. The discretionary activities we counted as *productive* were Working Out, Running, Hobbies, Bowling, Participating in Water Sports, Playing Volleyball, Playing Rugby, Participating in Equestrian Sports, Playing Baseball, Weightlifting/Strength Training, Biking, Playing Sports with Household or Non-Household

⁶The pattern of the results is consistent when the active and productive categorizations are kept separate. See the online supplemental materials for the separated results.

Children, Doing Aerobics, Participating in Martial Arts, Personal/Private Activities (e.g., making out, having sex), Rollerblading, Wrestling, Fencing, Playing Hockey, Playing Soccer, Playing Racquet Sports, and Golfing. Using these classifications, we calculated the amount of time each participant in the ATUS spent on discretionary activities that were social (vs. solo) and productive (vs. nonproductive) that day.

For each type of discretionary time, we examined whether there was a significant negative quadratic effect by conducting OLS regressions predicting subjective well-being from the linear and quadratic term of each type of discretionary time. Following this, we examined if there was a significant inverted U-shape for each type of discretionary time.

Social Versus Solo Discretionary Time

For solo discretionary time, we found a significant negative quadratic effect ($N = 21,736$, $B = -.003$, $SE = .001$, $t[21733] = -4.04$, $p < .001$, 95% CI $[-.005, -.002]$, $\beta = -.079$, $R^2 = .004$; with covariates: $N = 20,275$, $B = -.003$, $SE = .001$, $t[20264] = -3.87$, $p < .001$, 95% CI $[-.005, -.002]$, $\beta = -.078$, $R^2 = .032$). Simonsohn's (2018) two-lines approach confirmed an inverted U-shape. For low values of solo discretionary time, the relationship with subjective well-being was positive and statistically significant ($b = .05$, $z = 1.91$, $p = .056$); however, for high values of solo discretionary time, the regression line was negative and statistically significant ($b = -.05$, $z = -7.59$, $p < .001$; break point = 2.53 hr).

However, for social discretionary time, we did not find a significant negative quadratic effect ($N = 21,736$, $B = -.003$, $SE = .003$, $t[21733] = -1.11$, $p = .269$, 95% CI $[-.008, .002]$, $\beta = -.015$, $R^2 = .001$; with covariates: $N = 20,275$, $B = -.000$, $SE = .003$, $t[20264] = -.012$, $p = .991$, 95% CI $[-.005, .005]$, $\beta = -.000$, $R^2 = .031$). This nonsignificant quadratic effect was thus significantly smaller than for solo discretionary time activities, comparing the standardized coefficients of the quadratics,⁷ $F(1, 21731) = 8.26$. We instead only found a significant positive linear effect of social discretionary time on life satisfaction ($N = 21,736$, $B = .033$, $SE = .009$, $t[21734] = 3.63$, $p < .001$, 95% CI $[.015, .052]$, $R^2 = .001$; with covariates: $N = 20,275$, $B = .041$, $SE = .009$, $t[20265] = 4.36$, $p < .001$, 95% CI $[.023, .059]$, $R^2 = .030$).

Together these results suggest that when people spend their discretionary time socially, more is better. We only observed the too much time effect when that discretionary time did not offer the value of social connection.

Productive Versus Nonproductive Discretionary time

For nonproductive discretionary time, we found a significant negative quadratic effect ($N = 21,736$, $B = -.004$, $SE = .001$, $t[21733] = -4.67$, $p < .001$, 95% CI $[-.005, -.002]$, $\beta = -.095$, $R^2 = .004$; with covariates: $N = 20,275$, $B = -.003$, $SE = .001$, $t[20264] = -3.91$, $p < .001$, 95% CI $[-.005, -.002]$, $\beta = -.082$, $R^2 = .032$). Furthermore, we found evidence for the inverted U-shape. For low values of nonproductive discretionary time, the regression line was positive and statistically significant ($b = .059$, $z = 2.43$, $p = .015$); and for high values of nonproductive discretionary time, the regression line was negative and statistically significant ($b = -.044$, $z = -7.49$, $p < .001$; break point = 3 hr).

For productive discretionary time, we also found a significant negative quadratic effect ($N = 21,736$, $B = -.016$, $SE = .007$, $t[21733] = -2.36$, $p = .018$, 95% CI $[-.030, -.003]$, $\beta = -.030$, $R^2 = .002$; with covariates: $N = 20,275$, $B = -.016$, $SE = .007$, $t[20264] = -2.27$, $p = .023$, 95% CI $[-.030, -.002]$, $\beta = -.029$, $R^2 = .033$). However, the negative quadratic effect was significantly smaller for productive (vs. nonproductive) uses of discretionary time, comparing the standardized coefficients of the quadratics, $F(1, 21731) = 6.16$ ($p = .013$).⁸ Furthermore, we did not find evidence for the inverted U-shape. For low values of productive discretionary time, the regression line was positive and statistically significant ($b = 4.09$, $z = 2.41$, $p = .016$); however, for high values of productive discretionary time, the regression line did not reach statistical significance ($b = .032$, $z = 1.35$, $p = .176$; break point = .22 hr).

Altogether, this exploration into types of discretionary time suggests that how people spend their time does affect the relationship between the amount of discretionary time people have and their subjective well-being. In particular, the manner in which people spend their discretionary time appears to largely determine whether we observe the negative effect of having too much discretionary time. Although an abundance of discretionary time spent on solo and nonproductive activities did produce a negative effect on subjective well-being, discretionary time spent on activities that were social or productive did not. With an already vast literature asserting the emotional benefits of social connection (Diener & Seligman, 2002; Gable & Bromberg, 2018), we were particularly interested in the moderating role of discretionary activities that were productive (vs. nonproductive), revealing that only when people spent large amounts of discretionary time nonproductively did they report lower subjective well-being. In light of prior work showing that people enjoy increased satisfaction from feeling productive and busy (Etkin & Mogilner, 2016; Hsee et al., 2010), this finding suggests that a lacking sense of productivity may be one underlying mechanism driving the negative effect of having too much time. We further examine this finding in the subsequent two studies.

Study 3: Discretionary Time Experiment

Even though our analyses of the large nationally representative data sets in Studies 1 and 2 controlled for likely covariates (e.g.,

⁷ To compute this statistic, we z-scored each of the following terms: amount of discretionary time people spent on solo activities, amount of discretionary time people spent on social activities, the amount of discretionary time people had on solo activities squared, the amount of discretionary time people had on social activities squared, and life satisfaction. We then conducted a linear regression predicting life satisfaction from this set of predictor variables. The statistic examines whether the quadratic terms for social vs. solo discretionary time are statistically different from each other in this regression model.

⁸ To compute this statistic, we z-scored each of the following terms: amount of discretionary time people spent on productive activities, amount of discretionary time people spent on nonproductive activities, the amount of discretionary time people spent on productive activities squared, the amount of discretionary time people spent on nonproductive activities squared, and life satisfaction. We then conducted a linear regression predicting life satisfaction from this set of predictor variables. The statistic examines whether the quadratic terms for productive vs. nonproductive discretionary time are statistically different from each other in this regression model.

employment status, marital and parental status, income, etc.), it remains plausible that inherent differences between people with low, moderate, and high amounts of discretionary time account for their differing levels of subjective well-being. For instance, because we did not have data on mental health status, it is possible that individuals with depressive symptoms and who are dissatisfied with life may also be unmotivated to fulfill their obligations, which would leave them with large amounts of discretionary time. To address such alternate explanations, in Study 3, we randomly assigned participants to the experience of having a low, moderate, or high amount of discretionary time.

Study 3 thus employed a between-subjects experimental design. Because it is infeasible to manipulate the actual number of discretionary and nondiscretionary hours individuals typically have in their day-to-day lives, we relied on a mental simulation manipulation that required participants to vividly imagine and describe having a given number of discretionary hours every day for an extended period of their lives. This mental simulation approach helped ensure that participants considered the nuanced and actual experience of being in that situation, rather than reporting based on their superficial assumptions (Morewedge et al., 2010; O'Brien et al., 2018).

In the previous studies, we had to rely on the measures that were available in those data sets. In Studies 1 and 2, subjective well-being was measured using items that assessed satisfaction in life. However, life satisfaction is just one component of subjective well-being, and it is one that is more cognitive in nature (Kahneman & Deaton, 2010). In these next studies, we used a more comprehensive measure of subjective well-being that encompasses both life satisfaction and positive emotion (Diener et al., 2017; Lyubomirsky et al., 2005).

Perhaps most important, Study 3 sought to illuminate the underlying mechanism for the negative quadratic effect observed in Studies 1 and 2. In light of previous work showing the detrimental emotional consequences of feeling time-stressed (Kasser & Sheldon, 2009; Roxburgh, 2004), we proposed that compared with having a moderate amount of discretionary time, having a small amount of discretionary time would make people feel more stressed and thus experience lower subjective well-being. On the other end of the continuum, in light of the moderating role of discretionary time spent productively (vs. nonproductively) in Study 2, as well as work showing the benefits of being productive (Etkin & Mogilner, 2016; Hsee et al., 2010; Keinan & Kivetz, 2011), we proposed that compared with having a moderate amount of discretionary time, having too much discretionary time would make people feel unproductive and thus experience lower subjective well-being.

Method

As preregistered, 2,550 American adults were recruited on Amazon's Mechanical Turk to participate in this study.⁹ Two thousand, five hundred sixty-five participants ($M_{\text{age}} = 37.83$; 40.9% male; 58.1% employed; 47.7% married; 50.6% have children; 69.2% with at least a bachelor's degree; $M_{\text{HoursWork/Week}} = 30.26$ hours¹⁰; $M_{\text{DiscretionaryTime/Day}} = 3.54$ ¹¹ hr) completed the three-cell (amount of discretionary time: low vs. moderate vs. high) between-subjects experiment.

After being presented with the definition of discretionary time, "time spent on leisure activities or on other pursuits where the primary function is the use of time for pleasure or some other

intrinsically worthwhile purpose," participants were led to mentally simulate having a given amount of discretionary time every day for at least 6 months of their lives. Participants were randomly assigned to have a low (15 minutes per day), moderate (3.5 hr per day), or high (7 hr per day) amount of discretionary time.¹² We specified that they would have this amount of time consistently over a minimum six-month period to ensure that participants in the high time condition did not imagine a single vacation day or weekend day that was uncharacteristically relaxed, and that participants in the low time condition did not imagine a single workday that was uncharacteristically busy.

For each condition, participants were prompted to imagine and vividly describe what it would be like to have the given amount of discretionary time (e.g., how they would spend this time, what they would be doing during the other portion of the day, and how they would be feeling that day) after 1 day, 1 month, 3 months, and 6 months of having that amount of discretionary time every day.

Participants then reported their subjective well-being by rating the extent to which they would experience enjoyment, happiness, and satisfaction on a 7-point Likert scale, with 1 = *would not feel this at all* to 7 = *would feel this a lot* ($\alpha_{\text{low}} = .96$, $\alpha_{\text{moderate}} = .94$, $\alpha_{\text{high}} = .94$). To test our proposed mechanisms, we then asked participants to rate on the same 7-point scale their stress (stressful, rushed, exhausting; $\alpha_{\text{low}} = .91$, $\alpha_{\text{moderate}} = .91$, $\alpha_{\text{high}} = .88$) and their sense of productivity (productive, purposeful, I accomplished a lot; $\alpha_{\text{low}} = .90$, $\alpha_{\text{moderate}} = .91$, $\alpha_{\text{high}} = .93$) during this period of their lives.

Lastly, participants were asked a series of questions capturing features of their imagined time period: employment status, the number of hours worked per day, occupation, marital status, parental status, whether on vacation, whether in-between jobs, and whether they had experienced any significant life changes right before this period of their life.

All materials, data, syntax, and preregistrations for both Study 3 and 4 can be found at <https://osf.io/hw85m/>. Both Studies 3 and 4 were conducted with Institutional Review Board approval from the University of California, Los Angeles under protocol IRB# 16-000935-AM-00006, "Time, Money, and Happiness."

Results

The results of this experiment were consistent with the negative quadratic effect observed in Studies 1 and 2. We conducted an OLS regression predicting subjective well-being from two dummy variables representing conditions, with the moderate discretionary time condition serving as the reference group. Participants reported lower subjective well-being from having a

⁹ The sample size was determined based on a power analysis of a pilot of this study.

¹⁰ Two participants reported working more hours than the number of hours in a week and were excluded from this statistic.

¹¹ One hundred fifty-four participants reported more than 24 hours of discretionary time in a day and were excluded from this statistic.

¹² These amounts were determined based on the data from Study 2. The moderate amount (3.5 hours) was set to be halfway between the identified range of optimal discretionary time (between 2 and 5 hours). The high amount of discretionary time was set to be double this amount of time (7 hours).

low amount of discretionary time than from having a moderate amount of discretionary time ($M_{\text{Low}} = 5.52$, $SD = 1.55$ vs. $M_{\text{Moderate}} = 6.00$, $SD = 1.14$; $B = -.480$, $t[2562] = -7.36$, $p < .001$, 95% CI $[-.607, -.352]$, $d = .35$), and participants reported lower subjective well-being from having a high amount of discretionary time than from having a moderate amount of discretionary time ($M_{\text{High}} = 5.88$, $SD = 1.30$ vs. $M_{\text{Moderate}} = 6.00$, $SD = 1.14$; $B = -.119$, $t[2562] = -1.84$, $p = .066$, 95% CI $[-.247, .008]$, $d = .10$). This effect held when controlling for characteristics of the imagined time period, including employment status (employed or not), number of working hours,¹³ marital status (married or not), parental status (have children or not), whether they imagined being on a vacation or not, whether they imagined being between jobs or not, and whether they imagined there was any significant life change right before the imagined time period or not (Low vs. Moderate Discretionary Time: $B = -.463$, $t[2554] = -7.16$, $p < .001$, 95% CI $[-.590, -.337]$; High vs. Moderate Discretionary Time: $B = -.152$, $t[2554] = -2.35$, $p = .02$, 95% CI $[-.279, -.025]$).

We also found support for our proposed mechanisms. Participants reported they would feel significantly more stress from having a low amount of discretionary time than from having a moderate amount ($M_{\text{Low}} = 3.24$, $SD = 1.89$ vs. $M_{\text{Moderate}} = 2.56$, $SD = 1.62$; $B = .673$, $t[2562] = 8.17$, $p < .001$, 95% CI $[.511, .835]$, $d = .38$); and these feelings of stress partially mediated the negative effect of having a low (vs. moderate) amount of discretionary time on subjective well-being ($B = -.26$, $SE = .04$, 95% CI $[-.339, -.193]$) based on 10,000 bootstrap samples with a reduced direct effect ($B = -.22$, $SE = .06$, $t[2562] = -3.78$, $p < .001$, 95% CI $[-.330, -.104]$). Additionally, participants reported they would feel significantly less productive having a high amount of discretionary time than having a moderate amount ($M_{\text{High}} = 5.11$, $SD = 1.71$ vs. $M_{\text{Moderate}} = 5.31$, $SD = 1.48$; $B = -.20$, $t[2562] = -2.64$, $p < .01$, 95% CI $[-.355, -.052]$, $d = .13$), and this lacking sense of productivity significantly mediated the negative effect of having a high (vs. moderate) amount of discretionary time on subjective well-being ($B = -.09$, $SE = .04$, 95% CI $[-.167, -.024]$) based on 10,000 bootstrap samples with no significant direct effect ($B = -.03$, $SE = .05$, $t[2562] = -.464$, 95% CI $[-.131, .081]$).

Study 3 revealed that a lacking sense of productivity is one mechanism explaining the negative effect on subjective well-being from having a large (vs. moderate) amount of discretionary time. Along with the moderating role of productive (vs. nonproductive) discretionary activities in Study 2, these results suggest that the negative effect of having too much discretionary time would be attenuated when that discretionary time is spent productively. We tested this in the next study.

Study 4: Productive Versus Nonproductive Discretionary Time

In Study 4, we focus on the negative effect of having too much discretionary time for subjective well-being. In particular, based on our findings in Studies 2 and 3, we predicted that if people spent their discretionary time nonproductively, they would report lower subjective well-being with high (vs. moderate) amounts of discretionary time. However, if they instead spent their discretionary time on productive activities, the negative effect of having a high (vs. moderate) amount of discretionary time would be attenuated. Study 4 thus sought to provide additional evidence for the

exploratory analyses in Study 2 using random assignment in a between-subjects experimental design.

Method

As preregistered, 5,000 American adults¹⁴ were recruited on Amazon's Mechanical Turk to participate in this study. Five thousand and one participants (ages 18–91, $M_{\text{age}} = 38.30$; 50.3% male¹⁵) completed this 2 (amount of discretionary time: moderate vs. high) \times 2 (type of discretionary time: productive vs. nonproductive) between-subjects experiment.

Participants were asked to mentally simulate having either 3.5 hr of discretionary time (moderate discretionary time condition) or 7 hr of discretionary time (high discretionary time condition) for at least 6 months of their life. They were presented with a revised and more straightforward definition of discretionary time: "time spent on activities that are pleasurable or meaningful to you."¹⁶ In addition, participants were instructed to imagine spending this time on productive [nonproductive] activities: "you consider this use of discretionary time to NOT be wasted [to be wasted]. This use of time would feel [would NOT feel] useful, accomplished, fulfilling, helpful, purposeful, and/or worthwhile." We specified that they would have this amount of time consistently over at least a six-month period, and this is how they would spend it.

For each condition, participants were prompted to imagine and vividly describe what it would be like to have the given amount of discretionary time (i.e., how they would spend this time, what they would be doing during the other portion of their days, and how they would be feeling each day) throughout this period of their life.

Participants then reported their subjective well-being by rating the extent to which they would experience enjoyment, happiness, and satisfaction on a 7-point Likert scale, with 1 = *would not feel this at all* to 7 = *would feel this a lot* ($\alpha_{\text{moderate, productive}} = .90$, $\alpha_{\text{moderate, not productive}} = .95$; $\alpha_{\text{high, productive}} = .91$, $\alpha_{\text{high, not productive}} = .96$).

Last, participants were asked a series of questions capturing features of their imagined time period: employment status, the number of hours worked per day, occupation, marital status, parental status, whether on vacation, whether in between jobs, and whether they had experienced any significant life changes right before this period of their life. They were also asked manipulation check questions about the amount of discretionary time they imagined having ("During the period of your life that you previously described, how much discretionary time did you have?" on a 11-point scale with $-5 = \textit{very little discretionary time}$ and $5 = \textit{a lot of discretionary time}$) and about how productively they imagined using this time ("To what extent would you describe this period of your life as the following?" for "productive," "purposeful," and "I accomplished a lot" on 7-point Likert scales with 1 = *would not feel this at all* and 7 = *would feel this a lot*; $\alpha_{\text{moderate, productive}} = .88$, $\alpha_{\text{moderate, not productive}} = .95$; $\alpha_{\text{high, productive}} = .88$, $\alpha_{\text{high, not productive}} = .96$).

¹³ One participant reported imagining working more than 24 hours a day and was excluded from this analysis.

¹⁴ This sample size was determined by a power analysis based on Study 3.

¹⁵ Because of an experimenter error, we did not collect information on additional participant demographics.

¹⁶ This definition was suggested by one of the reviewers during this paper's review process.

Results

Eight hundred fifteen participants failed the attention check. Of those who passed the attention check, 140 participants wrote meaningless/nonsensical responses when describing how they would spend their discretionary time. As preregistered, we excluded these participants, leaving a final sample of 4,046 participants (ages 18–91, $M_{\text{age}} = 38.51$; 46.3% male). First, confirming our manipulation check, participants considered their time to be more productive in the productive conditions than the nonproductive conditions ($M_{\text{Productive}} = 6.12$, $SD = .98$ vs. $M_{\text{NotProductive}} = 3.31$, $SD = 1.94$; $t[4044] = -58.21$, $p < .001$, 95% CI [-2.89, -2.71]). Participants also perceived they had more discretionary time in the high versus moderate amount of discretionary time conditions ($M_{\text{High}} = 9.67$, $SD = 1.86$ vs. $M_{\text{Moderate}} = 8.76$, $SD = 2.01$; $t[4044] = -14.90$, $p < .001$, 95% CI [-1.03, -.789]).

We conducted an OLS regression predicting subjective well-being from a dummy variable representing the amount of discretionary time (high vs. moderate), a dummy variable representing the type of discretionary time (productive vs. nonproductive), and a variable representing their interaction. As predicted, we found a significant 2 (amount of discretionary time: high vs. moderate) \times 2 (type of discretionary time: productive vs. nonproductive) interaction ($B = .514$, $SE = .089$, $t[4042] = 5.76$, $p < .001$, 95% CI [.339, .689]).^{17,18} Simple effect analysis revealed that when people spent their discretionary time nonproductively, people reported lower subjective well-being when they had a high (7 hr) versus moderate (3.5 hr) amount of discretionary time ($M_{\text{High}} = 4.90$, $SD = 1.84$ vs. $M_{\text{Moderate}} = 5.30$, $SD = 1.66$; $B = -.400$, $SE = .064$, $t[4042] = -6.27$, $p < .001$, 95% CI [-.524, -.275], $d = .23$; Figure 4). However, when people spent their time productively, they reported marginally higher subjective well-being when they had a high (7 hr) versus moderate (3.5 hr) amount of discretionary time ($M_{\text{High}} = 6.20$, $SD = .98$ vs. $M_{\text{Moderate}} = 6.08$, $SD = 1.02$; $B = .114$, $SE = .063$, $t[4042] = 1.83$, $p = .068$, 95% CI [-.008, .237], $d = .11$; Figure 4).

This interaction held when controlling for characteristics of their imagined time period: employment status, number of working hours,¹⁹ marital status, parental status, whether on vacation, whether in-between jobs, and whether there had been any significant life change right before, all of which were mean-centered ($B = .482$, $SE = .088$, $t[4031] = 5.47$, $p < .001$, 95% CI [.309, .655]).²⁰ Simple effect analysis revealed that when people spent their discretionary time nonproductively, they reported lower subjective well-being when they had a high (7 hr) versus moderate (3.5 hr) amount of discretionary time ($B = -.378$, $SE = .064$, $t[4031] = -5.94$, $p < .001$, 95% CI [-.503, -.253]). However, when people spent their discretionary time productively, they reported a marginally higher subjective well-being when they had a high (7 hr) versus moderate (3.5 hr) amount of discretionary time ($B = .104$, $SE = .062$, $t[4031] = 1.67$, $p = .095$, 95% CI [-.018, .227]).

As in the exploratory analyses in Study 2, Study 4 further demonstrates that the type of discretionary time moderates the effect of amount of discretionary time on subjective well-being. In particular, productive uses of discretionary time attenuate the negative effect of having too much discretionary time.

General Discussion

In two large-scale nationally representative data sets and two experiments, we investigated the relationship between the amount of discretionary time people have in their daily lives and their subjective well-being. Leveraging larger sample sizes and more objective assessments of time affluence, these results substantiate the previously observed emotional burden of feeling time-constrained (Hamermesh & Lee, 2007; Kasser & Sheldon, 2009). We found that having a dearth of discretionary hours in one's day indeed results in greater stress and lower subjective well-being. Although too little time is bad, we further found that having more time is not always better. In fact, the results from Studies 2–4 suggest it is possible to have too much time. With prior literatures having separately examined the negative effects of being too busy (e.g., Kasser & Sheldon, 2009; Roxburgh, 2004) or not being busy enough (e.g., Bellezza et al., 2017; Hsee et al., 2010; Keinan & Kivetz, 2011), our research is among the first to bring these perspectives together. By testing across the full range of daily discretionary hours, our findings clarify the suboptimal emotional impact of having either too little or too much time.

Because discretionary time is the amount of time one spends on activities that are pleasurable or intrinsically rewarding (i.e., activities one wants to do), how is it possible to have too much? In line with the Aristotelian urging against excess and toward moderation, as well as mounting evidence for the possibility of having “too much of [any] good thing” (Grant & Schwartz, 2011), our findings indicate that an overabundance of discretionary hours in one's days can too be associated with lower subjective well-being. The attenuating role of whether people's discretionary time was spent productively (Studies 2 and 4), along with the reduced feelings of productivity reported among those who had been allocated a high amount of discretionary time (Study 3), point to an explanation. These results suggest that having too much discretionary time undermines people's sense of productivity and purpose, thus leaving them less satisfied overall.

Although our investigation centered on the relationship between amount of discretionary time and subjective well-being, our additional exploration into how individuals spend their discretionary time proved revealing. In particular, we

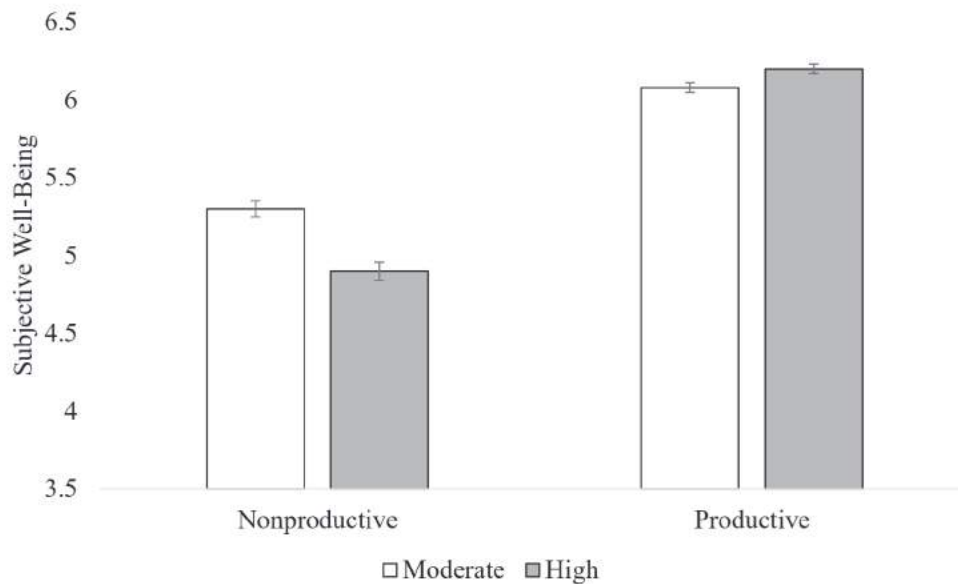
¹⁷ Preregistered as an exploratory analysis, examining just the satisfaction item as the dependent variable similarly showed a significant interaction ($B = .510$, $SE = .096$, $t[4042] = 5.30$, $p < .001$, 95% CI [.321, .698]).

¹⁸ Although qualified by the significant interaction, the results also showed a significant negative main effect of having a high (vs. moderate) amount of discretionary time on subjective well-being ($B = -.138$, $SE = .045$, $t[4043] = -3.08$, $p < .001$, 95% CI [-.226, -.050]), as well as a significant positive main effect of productive (vs. nonproductive) use of that time on subjective well-being ($B = 1.03$, $SE = .045$, $t[4043] = 23.08$, $p < .001$, 95% CI [.946, 1.122]).

¹⁹ Four participants reported imagining working more than 24 hours a day and were thus excluded from this analysis.

²⁰ Although qualified by the significant interaction, the results also showed a significant negative main effect of having a high (vs. moderate) amount of discretionary time on subjective well-being ($B = -.134$, $SE = .045$, $t[4043] = -2.97$, $p < .001$, 95% CI [-.222, -.045]), as well as a significant positive main effect of productive (vs. nonproductive) use of that time on subjective well-being ($B = .977$, $SE = .045$, $t[4043] = 21.89$, $p < .001$, 95% CI [.889, 1.06]).

Figure 4
Means of Subjective Well-Being by Condition in Study 4



Note. Error bars represent standard error of the mean.

found that if people spent their discretionary time in worthwhile ways—on productive or social activities—the negative effect of having too much time was attenuated. Thus, if the particular way people spend their discretionary time is not accounted for (as in Study 1 and Study 3), the detrimental effect of having an overabundance may be weak or nonexistent. These findings support self-determination theory's assertion that well-being requires fulfillment of three fundamental psychological needs: autonomy, relatedness, and competence (e.g., Sheldon et al., 2010; Sheldon & Niemiec, 2006). With having discretion in what activities one does likely contributing to a sense of autonomy, engaging in social activities likely contributing to a sense of relatedness, and engaging in productive activities likely contributing to a sense of competence, our research importantly highlights that the number of daily hours an individual has available to spend as they choose, as well as how they allocate those hours, is critical to well-being.

These findings also have clear practical implications for individuals—particularly those who experience time poverty. For the many who feel unhappy from the stress of having too much to do and not enough time to do it, the answer is not to quit all obligations. Our findings suggest that ending up with entire days free to fill at one's discretion may leave one similarly unhappy. Figure 3 from Study 2, for instance, suggests that beyond having two hours of discretionary time in the day, having more time does not promise greater happiness. That figure also suggests that beyond approximately five hours of discretionary time in the day, having more is linked to less happiness. Thus, the time poor should not quit everything and neglect all of their obligations; instead, they should strive for the reasonably attainable amount of having a little over two hours to spend how they want during their days. To be clear though, these amounts are inexact and based merely on eyeballing a graph, which represents one dataset

and buckets together many types of individuals according to the amount of time each spent on discretionary activities in one given day. However, the overall inverted U-shaped pattern is robust across people and does offer useful general guidance. Namely, the significant negative quadratic relationship identified across multiple large data sets representing the diversity of American adults, as well as the nonsignificant interaction effects comparing segments of the population, preliminarily suggest that—whether young or old, working or unemployed, male or female, married or single, with children or without—most would benefit from having a moderate amount of discretionary time: not too little and not too much.

In cases when individuals do find themselves in circumstances with excessive amounts of discretionary time (e.g., upon retirement or having left a job), our results suggest these individuals would benefit from spending their newfound time with purpose (e.g., productively or connecting with others). These findings are consistent with prior research conducted among retirees (a population with ample discretionary time), showing that retirees' well-being depends on their level of social interaction (Longino & Kart, 1982) and participation in clubs or volunteer work (Kelly & Ross, 1989; Mishra, 1992; Morrow-Howell, 2010).

Limitations and Directions for Future Research

Although robust, it is worth noting that the observed effect of discretionary time on subjective well-being is small. However, we would not expect the quantity of one's hours spent on discretionary activities in a day to have any larger of an effect on subjective well-being than we observed. This is because, in addition to other time-related variables that influence subjective well-being (e.g., how people spend their hours, Kahneman et al., 2004; their mindset during those hours, Killingsworth & Gilbert, 2010; West et al.,

2021; and how their obligatory time is filled, Judge & Shinichiro, 1993); there are a slew of other variables that play into people's overall assessment of their satisfaction in life (Lyubomirsky et al., 2005). Furthermore, despite it being small, we are confident in its existence and shape. Our predicted negative quadratic effect replicated across data sets and subsets of the data sets, and it persisted with and without the inclusion of relevant covariates. The negative effect of having too much discretionary time is particularly small, which we found is partly explained by its sensitivity to the particular ways that time is spent. Albeit small, together these findings provide preliminary theoretically and practically important insights about the role of discretionary time allocation and usage for well-being.

As an initial exploration into the relationship between time affluence and subjective well-being, our hope is that this work spurs future investigations into more precise research questions. For instance, the current findings examine how the amount of discretionary time a person has on a typical day relates to well-being, but it does not inform the experience of atypical days, like when on vacation or on a holiday. Furthermore, although we have provided initial insight into possible mechanisms (i.e., stress for too little time and lack of productivity for too much time), our identified effect is likely multiply determined. For example, boredom may also contribute to reduced well-being from having an overabundance of discretionary time. Thus, it is possible that factors that have been previously identified as effective in offsetting hedonic adaptation (e.g., variety across activities; Etkin & Mogilner, 2016; or taking breaks between enjoyable experiences; Quoidbach & Dunn, 2013) may be similarly effective in informing people how to optimally allocate their discretionary time across a day or week.

Additionally, building off of our proposed mechanism, we tested a few ways in which our effect might be attenuated (i.e., spending discretionary time on worthwhile endeavors, such as activities that are productive or socially connecting). However, there are a number of additional ways to characterize the way people spend their discretionary time that might also influence our observed relationship. We hope future research investigates the psychological and behavioral nuances within the category of discretionary activities.

Future work should also experimentally examine the precise point at which an abundance of discretionary time starts to negatively affect subjective well-being. The correlational data in Figure 3 suggest that people are happiest having between two and five hours of discretionary time, and that the slope is negative beyond that point. The results from our experimental studies similarly show that people with 7 hr of discretionary time experience less subjective well-being than people with 3.5 hr of discretionary time. However, future work should experimentally manipulate at a more granular level the amount of discretionary time participants have to more precisely identify the optimal amount of discretionary time.

Relatedly, the results of Study 2 suggest that people can benefit from a greater amount of discretionary time before it negatively affects their subjective well-being as long as the time is spent productively or with others. Thus, future work should also identify optimal amounts of discretionary time depending on how that time is used, as well as how to optimally allocate given amounts of discretionary time between relaxation, socializing, and productive

use. Our data cannot speak to, for instance, whether a small amount of discretionary time is better spent relaxing and unwinding in front of the TV, or whether that limited spare time should be diligently spent going for a run or knitting a sweater.

It is also possible that the relationship between amount of discretionary time and subjective well-being varies cross-culturally. For example, although busyness is associated with higher social status in the United States (Bellezza et al., 2017), this may not be the case in other countries that place greater value on relaxation (Brislin & Kim, 2003). Without the same compulsion toward productivity (Mogilner & Norton, 2019), the negative effect of having too much discretionary time that we identified in our American samples may not extend more broadly.

People often complain about being too busy and express wanting more time (Trupia et al., 2021). However, Studies 3 and 4 suggest that when people mentally simulate the experience of having an abundance of discretionary time, they are able to forecast its detrimental effects when spent unproductively. Although prior research has validated the veracity of mental simulation in capturing actual experience (Morewedge et al., 2010; O'Brien et al., 2018), future research should examine when people are able to correctly forecast that an abundance of discretionary time would have a negative impact on their well-being. For example, when people are simply asked (without being encouraged to mentally simulate the experience), do they think that having more discretionary time would always make them happier?

Other open questions involve the role of choice and whether there is an end point to the period of time in which people have an ample amount of discretionary time during their days. For instance, would we observe the same pattern of results among those on a sabbatical (for whom it was a choice, and there is an endpoint) and for those who decided to retire early (for whom it was a choice, but there is no endpoint)? Even though the results from Study 2 persisted for those in and out of the workforce, and even though the results from Studies 3 and 4 persisted when controlling for whether participants were imagining being employed or unemployed, it may be the case that if one's ample amount of discretionary time is imposed (e.g., being laid off), the relationship between too much discretionary time and subjective well-being may be even more pronounced.

Lastly, although our pattern of results persisted across multiple large-scale correlational data sets and two experiments, future experimental work is needed to test these findings outside of a hypothetical paradigm. Our causal evidence for how the amount of discretionary time people have influences their subjective well-being relied on hypothetical mental simulations (Studies 3 and 4), and our manipulation for unproductive versus productive uses of time (Study 4) was rather heavy-handed. Although resources limited our ability to actually assign very small or very large amounts of discretionary time in people's actual daily lives, we hope that future experimentalists find a way to test and confirm these findings among participants who actually live through the varied conditions.

Conclusion

Despite our observed effect being small, the impact of time affluence (or scarcity) for subjective well-being is important. These findings inform the ongoing investigation into the role of

affluence as a significant predictor of subjective well-being—but extend the focus from money (Kahneman & Deaton, 2010; Killingsworth, 2021) to include humans' other principle resource: time. This work thus contributes to the burgeoning literature on time and subjective well-being (Mogilner et al., 2018) and adds a qualification to research that has identified particularly happy ways to spend time (Kahneman et al., 2004): solely filling one's days with those activities may undermine feelings of purpose and thus reduce satisfaction in life.

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