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Sleep, Salary, and Successful Occupational Negotiation: Evidence from a Labor Market Survey

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Abstract

We examine the relationship between sleep and wages and then ask a follow-up question: might occupational negotiation be one intermediate factor? That is, are workers of a certain sleep pattern more likely to successfully (re)negotiate the terms of their employment? Popular press, non-economic research articles, self-help guides, and websites often purport relationships between sleep patterns and one's ability to successfully negotiate. Results point to sleeping hours having a statistically significant, positive, and strong relationship with both salary and successful negotiation, though the latter relationship is only apparent for workers in about their 4th or 5th year on the job.

Keywords

Sleep, sleep effects, labor market negotiation, salary negotiation, occupational negotiation

Introduction

Labor economists have long studied worker behavior and time allocation, and how these choices affect labor market outcomes. One activity all humans must devote time to is sleep. How might a worker's sleep patterns be related to their labor market outcomes, and wages specifically? General labor economic theory does have something to say on the matter. The neoclassical model of labor-leisure choice is often the first or second model learned by undergraduate students of labor economics and is presented here as Figure 1 (adapted from Borjas (2015)). In this model, it is assumed workers make a time allocation choice towards an optimal bundle of leisure (in hours) and consumption (in dollars) by combining their preferences for these two "goods" (illustrated through indifference curves) with their budget constraint (which is drawn by combining potential labor market wages with non-labor income). In the model, w, T, and V represent the worker's wage rate, waking hours (time available for work or leisure), and non-labor income, respectively.

Workers are assumed to choose the bundle of leisure (h^*) and consumption (C^*) that yields the highest level of happiness (or "utility") allowed by their budget. Graphically, this is a tangent point between the budget constraint and a specific indifference curve, the highest obtainable one. More hours devoted to sleep would result in a smaller value for T, leaving the worker with a smaller choice set. Except in the case of workers with very high preferences for consumption goods, those with very flat indifference curves in this two-dimensional space, the model would predict lower levels of work and therefore lower salaries for those who sleep more. Alternatively, the economist could choose to consider sleep a type of leisure and redefine T as total time, but the model would still more likely predict lower salaries for those who sleep (leisure) more, ceteris paribus, but again not always and ultimately depending on the shape of the individual's indifference curves.

Conversely, a good night's sleep is widely believed necessary for optimal cognitive function and productivity, implying a generally positive relationship between time devoted to sleep and improved labor market outcomes. Neuroscientists and behavioral scientists estimate that the typical person needs approximately seven to eight hours of sleep (e.g., Krueger & Friedman 2009). Otherwise stated, sleeping at least seven hours, on average, significantly reduces the risks of health-threatening symptoms, while individuals are considered at risk of experiencing reduced cognitive ability below eight hours (e.g., Krueger & Friedman 2009). Sleep habits and general tiredness have been related to academic performance and grade point averages (GPAs), for example (Singleton 2009). Krueger and Friedman (2009) discovered that individuals who are older, those with lower levels of education and/or income, and those engaging in other unhealthy behaviors are more likely to fall outside the recommended duration of sleep. Sleeping too little or too long are associated with increased odds of heart disease, depression, and anxiety, as well as greater fluctuations in body mass (e.g., Krueger & Friedman 2009). Dongen (2003) found that those who sleep 4 or 6 hours per day during a 14day period experienced significant cumulative performance deficits in comparison to those who slept 8 hours. Concerns for sleep deprivation in occupations that require high-level cognitive abilities are growing in the U.S. (Johns 2009).

Before the 1990s, the research literature related to this analysis is scarce, as sleep was largely treated purely as a biological necessity instead of a choice variable for economic modeling and analysis. However, a few prior studies acknowledge that relationships exist between certain activities and sleep, in the form of trade-offs (Mankiw 2017). Hodiri (1973) completed one such study, relating consumption preferences to time spent sleeping, and the resulting model was later expanded by Hoffman (1977). As noted later by Sen (2017), such models may be more realistic when considering collective choice. That is, one may take into account their significant other's preferences and productivity when choosing how much time to devote to sleep, for example. Biddle and Hammermesh (1990) wrote what is sometimes considered the seminal article in this area, which relates higher labor market productivity and activity (working hours) with less sleep. As wages increase, the opportunity cost of sleep increases, so an individual may choose to sleep less, which was the general prediction of the previously mentioned labor-leisure model. The important takeaway from these studies is that sleep is not purely a biological variable, but instead that incentives matter in its determination (Mankiw 2017).

In contrast to this economic theory-based research vein which purports negative relationships, empirical research has often uncovered evidence of positive relationships between sleep and economic variables, which is more in line with the neuroscience argument. In a medical study of African-American male blood pressure, James et al. (1983) were among the earliest researchers to notice a positive, statistical relationship between sleep and wages. In a much more recent study, Gibson and Shraeder (2014) exploit the exogenous variation of time zones when estimating the wage effect of sleep, finding an extra hour devoted to the activity results in a 16% average wage premium alongside an increase in productivity that is greater than what an additional year of schooling would provide. Interestingly, sleep disparities across racial groups largely mirror socioeconomic disparities (Lauderdale 2006). That is, a racial group with high average socioeconomic status (as measured by income or wealth) will also generally have a high average time allotment to sleep, and vice versa. At the macroeconomic level, and when combining both the direct and indirect economic costs, it has been estimated the inability to sleep exhibited by some workers shrinks the national U.S. economy by $52 to $60 billion (Jan. 2019 USD) annually (Chilcott & Shapiro 1996). Using Canadian data, Sedigh (2017) studied the roles insomnia and business cycles play in the relationship between sleep and wages. Recessions result in job insecurity, which causes many workers to devote more hours to their labor market to maintain or regain said security. Recessions also beget economic uncertainty, which in turn begets stress, and stress increases the difficulty of sleep (Sedigh 2017).

Thus, some previous economic researchers have uncovered a link between workers' sleep patterns and their wages. In our analysis here, we attempt to accomplish two tasks. First, we examine whether this relationship exists, in what direction, and at what strength in a specific labor market area. Second, we ask a follow-up question. Might occupational negotiation be one intermediate factor? Otherwise stated, are workers of a certain sleep pattern more likely to successfully (re)negotiate the terms of their employment? Ex ante, we suspect this possibility has merit since popular press and other non-economic research articles on the topic of negotiation, as well as self-help guides and websites, often purport relationships between sleep patterns and one's ability to successfully negotiate (e.g., Duam 2017 and Whitney 1983). As discussed previously, a healthy level of sleep results in improved cognitive activity. Therefore, we anticipate a generally positive relationship between sleeping hours and successful occupational (re)negotiation. Given that many individuals, particularly younger ones, seem to underestimate the benefits of sleep (Alhola & Polo-Kantola 2007), evidence of such relationships may aid in diminishing this undervaluation. It may also help partially explain the documented but not entirely understood relationship between sleep and wages.

As a preview of our results, we do find evidence of strong, positive, and statistically significant relationships between sleep and both salaries and successful occupational negotiation. However, the relationship between sleep and negotiation success is only apparent for a single subset of the sampled population, workers in their 4th or 5th year on the job. In many occupations, this is approximately the time when workers will be experiencing their first major occupational renegotiation. In the following section, we describe the data used in this study and present the results of a descriptive analysis.

Data and Descriptive Analysis

Data used in this analysis come from a labor market survey conducted in Gwinnett county, Georgia (USA). The survey was conducted over two months during the summer of 2018. In the interest of disclosure, the full survey is presented in an appendix. By design, 100% of respondents lived and worked in the county, were employed at the time of survey, and had been in their current occupation for 5 years or fewer. To protect the confidentiality and anonymity of the respondents, no identifiable information was requested. In fact, at six questions, the survey was shallow in terms of variables collected, but this allowed for a relatively larger sample size to be obtained. Specifically, the survey was terminated after exactly 1,000 participants had responded, and 100% of the resulting data set were made available to the authors of this article. Data collected were the respondent's gender, age, annual salary (2018 USD), current job tenure (in years), typical sleeping hours, and whether the respondent had successfully negotiated any improvement in their terms of employment (job title, salary, or some "other" compensation) during the last 12 months. The first four variables are very typical for labor market surveys. The last two, sleep and successful negotiation, are somewhat unique and allow for the present analysis.

Gwinnett county is located in the north central portion of Georgia and is part of the Atlanta metropolitan statistical area, Atlanta being the state's capital. Its 2017 population was estimated to be 920,260, making it the 2nd most populous county in the state. It is one of the nation's fastest growing counties (e.g., Wickert 2016), and not just a "minority majority" county but in fact the most racially/ethnically diverse county in the southeast U.S. (e.g., Scott 2010 and Estep 2017). Several large national and international firms (such as AGCO, Waffle House, Primerica, and American Megatrends) choose to have their primary headquarters in the county. Other well-known firms, such as Canon, choose to have their regional headquarters there. Overall, Gwinnett has several characteristics making it a better than-average, or at least interesting, location to conduct a labor market survey.

Table 1 presents several descriptive statistics calculated from the labor market sample. The average respondent was earning $54,865 dollars (2018 USD) annually, is 40.8 years old, and has been at their current post for 3.4 years. At 51.4%, about half of the respondents are male. Almost exactly half, 50.3%, of respondents were able to successfully obtain some form of occupational improvement, large or small, through negotiation during the last year. The survey administer chose to make the sleep question categorical, specifically ordinal, as opposed to allowing for continuous responses. Specifically, respondents were asked "How many hours of sleep do you typically receive on a nightly basis?" and could choose among five response options: (*i*) About 5, or fewer; (*ii*) About 6; (*iii*) About 7; (*iv*) About 8; or (*v*) About 9, or more. For the purpose of Table 1, this variable is treated as continuous, but in the rest of our analysis it is treated as categorical. The average respondent reports a typical sleep pattern of just shy of 7 hours, a typical 6.945 hours per night.

Now treating the variable as categorical, Figure 2 presents a graphical representation of the sleep variable. Though not exactly uniform in nature, the response frequencies for each sleep category are not all that different. Specifically, 18.7% chose the least common response category (9+ hours) while 21.5% chose the most common response category (5 hours or less), yielding a range of only 2.8 percentage points. We begin our analysis of sleep in earnest by calculating descriptive statistics, means and relative frequencies, for the other available variables within each of the five sleep response options. Table 2 displays these statistics. The most apparent pattern in this table is that average salary increases monotonically moving up the distribution of sleep, from an average salary of $31,307 (2018 USD) for those with the lowest typical sleep level to $84,650 for those with the highest. No other clear or monotonic pattern emerges, but a few other estimates are worth noting. Average ages are all within three years of one another. Those with more experience appear to be getting more sleep, on average. Finally, females make up relatively larger proportions of the samples with low levels of sleep. In the following section, we describe our primary empirical methodologies and present their findings.

Regression Analysis

Sleep and Salary

Figure 3 presents a graphical representation of the within-sample relationship between sleep habits and salary. There is a well-known gender wage gap in the US and most nations. Thus, Figure 3 contains two panels, one for each gender represented in the sample. Each black dot represents a sampled worker, while the blue lines connect the average salaries across levels of sleep. Within both genders, one sees a clear positive relationship between typical hours of sleep and salary. This is in fact true for not just the average salaries (shown by the blue lines), but for the minimum and maximum salaries within each sleep level (shown by the lowest and highest dot within each bin), again across both genders. As one moves up the distribution of sleep, income inequality also increases, as shown by the spread of dots within each sleep category. Once again, this is apparent for both genders. Overall, these graphical statistics lead us to expect a generally positive relationship between sleep and salary, but do not control for any potentially confounding factors, save examination within gender.

Our primary methodology for examining the relationship between sleep and salary involves regressing workers' salaries on their sleep habits, alongside a set of individual-specific controls. These models take the form

$$\log(salary_i) = \alpha + \beta sleep_i + \gamma \mathbf{X}_i + \varepsilon_i \tag{1}$$

where $salary_i$ is worker i's annual salary in 2018 (in 2018 USD); α a constant or intercept term; $sleep_i$ a vector of indicators describing worker i's typical sleeping habits, with β its corresponding vector of parameters; $\mathbf{X}_i$ a vector of worker-specific control variables, with γ its corresponding vector of parameters; and ε_i the typical (in this case, well-behaved) error term. Since $salary_i$ is a continuous variable, these models are estimated using ordinary least squares (OLS). Two versions of this variable are used in this regression framework, one where salary enters to model logged (as shown in Equation (1)) and one where it is not. When used as dependent variables in labor economics, measures of earnings are often log-transformed (with the resulting models typically called "log wage models") since this yields two empirical benefits: (*i*) it, by shrinking the values, addresses the well-known right-tailed distribution of such variables, which may also include high-end outliers; and (*ii*) it allows the coefficients to be interpreted as percent estimates, which are often more useful, instead of dollar estimates. At the same time, it may prove useful to interpret coefficients as dollar amounts, thus we attempt both methods.

As discussed previously, the labor market survey was shallow in terms of questions. Thus, the available control variables for $\mathbf{X}_i$ only include the worker's age, job experience, and gender. However, we add to this control set two higher order terms, the squares of worker age and experience, as these are well-known to have quadratic relationships with labor market variables (e.g., Murphy & Welch 1990 and Hushimoto & Raisian 1985). By adding and dropping individual control variables from $\mathbf{X}_i$, we also check whether the primary estimates (those of β) are robust to included controls and find this to be the case. Finally, these models pass the typical post-regression diagnostic tests such as variance inflation factors to test for multicollinearity (Stine 1995); the Durbin Watson test for autocorrelated errors (Durbin & Watson 1951); the Ramsey RESET test for general specification (Ramsey 1969); and graphical diagnostic tests for influential observations, non-normality, and heteroscedasticity.

Key results from the two primary salary models (the estimates of β) are presented in Table 3. The first uses $salary_i$ as the dependent variable, and marginal effects are therefore interpreted as dollar effects (in thousands). The second uses $\log(salary_i)$ as the dependent variable, and marginal effects are therefore interpreted as percent effects. As mentioned previously, the labor market survey allowed respondents to choose among five sleep habit responses. In all our presented regressions, we use the lowest level of typical sleep, about five or fewer hours per night, as the omitted (or baseline) category and report marginal effects from the other four indicators. Estimates from the first model in Table 3 show a positive relationship between sleep and wages that is monotonically increasing as one moves up the sleep distribution. Workers who typically sleep 6 hours instead of about 5 are estimated to earn \$4,224 more per year on average. For those who instead sleep about 7 hours, this premium increases to \$9,610. Those who generally sleep 8 hours are shown to earn \$15,438 more. Finally, those with the highest level of average sleep (9+ hours) are estimated to earn an impressive \$22,457 more, on average. Switching over to the log-transformed salary model, we see the same pattern. Now the 4 marginal effects can be interpreted as a 26.1% wage premium on average, 50.0%, 72.7%, and 94.9%, respectively. All eight marginal effects in Table 3 are statistically significant at the 99% confidence level. Post-regression hypothesis tests find the estimates to additionally be jointly significant with one another in all potential cases. In short, there appears to be a strong, positive, monotonic, and statistically significant relationship between workers' sleep habits and salaries in the county.

Sleep and Occupational Negotiation

Figure 4 presents a graphical representation, in the form of a bar chart, of the within-sample relationship between sleep habits and negotiation success. Each bar represents one of the five sleep patterns captured through survey, with the height of the bar displaying the percent frequency of that subsample who successfully (re)negotiated some aspect of their employment during the last year. These statistics were presented previously in tabular form as one of the rows in Table 2. As a reminder, the theory reviewed would lead one to expect a positive relationship between these two variables. The pattern in the figure does perhaps show a generally positive relationship, but one that is less clear than the relationship between sleep and wages. At an almost 53% frequency, those who sleep the most (9+ hours) are the most likely to have successfully negotiated. However, those with the lowest sleep levels (5 hours or fewer) have the 3rd highest percent frequency at almost 50%. Additionally, the range of these 5 percent frequencies is quite small, at about 47-53%. Thus, we enter our regression analysis of negotiation success with fewer expectations than we did with the salary analysis, given these statistics in Figure 4.

Our primary methodology for examining the relationship between sleep and occupational negotiation success involves regressing such success on sleep habits, alongside a set of individual-specific controls. These models take the form

$$\textit{negotiation success}_i = \alpha + \beta \textit{sleep}_i + \gamma \mathbf{X}_i + \varepsilon_i \tag{2}$$

where *negotiation success*$_i$ is an indicator for a successful occupational (re)negotiation, and all other terms in Equation (2) are as described in Equation (1). Since the dependent variable here is binary, these models are estimated using logistic regression, a statistical regression methodology specifically designed for binary dependent variables (e.g., Hosmer et al. 2013). Here, $\mathbf{X}_i$ again includes the worker's age, its square, job experience, its square, and gender.

Table 4 presents the key results (estimates of this new β) from three models that can be described by Equation (2). As shown by the first column of estimates in the table, in the full sample there appears to be no statistically significant relationship between sleep patterns and negotiation success. The point estimates, however, are as hypothesized - they are all positive in sign and monotonically increasing in magnitude moving up the distribution of typical sleep hours. At this point in the analysis, we tried subsampling the data across gender, age, and job tenure, and found only one case where these estimates are statistically significant. Key results from this model, one of the subsample of workers in their 4th or 5th year on the job, are presented as the last column in Table 4. Workers who typically sleep about 6 hours are found to be statistically indistinguishable from those who typically sleep less. However, those typically sleeping 7 hours are shown to have been 30.2% more likely to have successfully (re)negotiated an aspect of their employment during the last year. For those typically sleeping about 8 hours, this premium increases to 39.7%. For those typically sleeping 9 or more hours, the premium increases further to 56.2%. All of these 3 estimates are statistically significant at the 95% confidence level, with the final one being additionally significant at the 99% level. They are also found to be jointly significant, based on post-regression hypothesis testing. Finally, this model passes several post-estimation diagnostic tests such as variance inflation factors for multicollinearity (Stine 1995); Cook's distance for influential values (Kim & Storer 1996); and graphical examinations for the linearity-related assumption.

As shown by the middle column of estimates in Table 4, workers in the first 3 years on the job do not exhibit any statistically significant relationship between sleep and negotiation success, though point estimates are still all of the expected (positive) sign and monotonically increasing. In short, there does appear to be a strong, positive, monotonic, and statistically significant relationship between workers' sleep habits and negotiation success in the county, but only for workers in their 4th or 5th years on the job. We remind the reader that the relevant labor market survey was not designed to capture workers beyond their 5th year of current employment. Thus, nothing here can be said of these workers. In the following section, we offer some concluding remarks.

Discussion and Conclusions

We studied the relationships between sleep, salary, and successful occupational negotiation using data collected through survey of 1,000 Gwinnett county, Georgia (USA) residents who were employed and in the early stages of their current career. We performed a descriptive analysis and estimated multiple linear and logistic regressions. Our primary contribution to the literature is the analysis of occupational (re)negotiation, a variable that has until now been empirically ignored by labor economists studying sleep. This undoubtedly stems from data scarcity. Negotiation success is very rarely captured through labor market and other surveys. From 1973 to today, average worker productivity increased 6.2 times more than average real wage growth, with partial explanations including weakened unions, minimum wage laws, and rare cost-of-living adjustments (Bivens et al. 2014). These trends increase the room for and importance of workers successfully asking or negotiating for improved salaries and other employment characteristics.

Our analysis of sleep and salary demonstrated a strong, positive relationship between these two variables. The nature of the data here do not allow for us to truly test for any causal direction or fully address potential endogeneity. That is, it may be that more sleep results in higher wages, but if may also (or additionally) be that those who earn higher wages can afford to sleep more. Longitudinal data, or even data which include typical working hours, would shed light on this. Still, there is clearly a relationship between these two variables, at least within Gwinnett county. An additional hour of typical sleep was always associated with an increased annual salary of about $4,000-$7,000 (or a 20+% wage premium per additional sleep hour), with the statistical significance of the relationships always at the highest level. Again, we are not the first to examine sleep and wages, but possibly the first to examine sleep and the (re)negotiation of wages and other employment benefits. A descriptive analysis and full sample models demonstrated a lack of a statistical relationship between sleep and successful occupational negotiation. However, when only considering workers in their 4th or 5th year on the job, a significant relationship was indeed uncovered. Those who sleep about 7 hours were shown to have been over 30% more likely to have recently successfully renegotiated than those who sleep less; those who sleep about 8 hours were almost 40% more likely; and those with a typical 9+ hours of sleep were over 56% more likely. This pattern only became apparent after controlling for a handful of worker characteristics and, to reiterate, still only for those in their 4th or 5th year of current employment. This is more likely the time, compared to 0-3 years, when workers are experiencing their first chance of a significant occupational renegotiation. As with salaries, causality or its direction cannot be confirmed here, but we can make the general claim with a large degree of confidence these successful negotiators are sleeping more than others, on average and all else equal.

People are likely not perfectly rational when it comes to deciding how their time should be allocated. Willingness and rationality aside, despite the possible economic incentives and advancement possibilities from increasing sleep, not everyone could adjust their sleep patterns due to restrictive circumstances. Thus, while our results imply “more sleep is better for labor market outcomes,” it is unfortunately difficult to imagine a significant proportion of informed individuals acting on this information. Also, at this point, much more research on the relationships between sleep and various labor market outcomes, including negotiation success, is needed. The limitations of this study provide opportunities for future researchers. First, the volume of available control variables was shallow. Second, longitudinal data which captures sleep and various labor market outcomes would prove more useful and reliable than a cross-sectional analysis. Third, a nationally representative sample would have the benefit of greatly increased external validity. Finally, it may prove particularly interesting to see if relationships and estimated effects differ across industry. We leave these and other tasks for future researchers but hope our analysis can convey the following three messages: (*i*) sleep is a worthy area of labor economic research; (*ii*) wages are not the only labor market variable related to sleep; and (*iii*) successful occupational negotiation may very well be one channel through which sleep is related to higher average wages.

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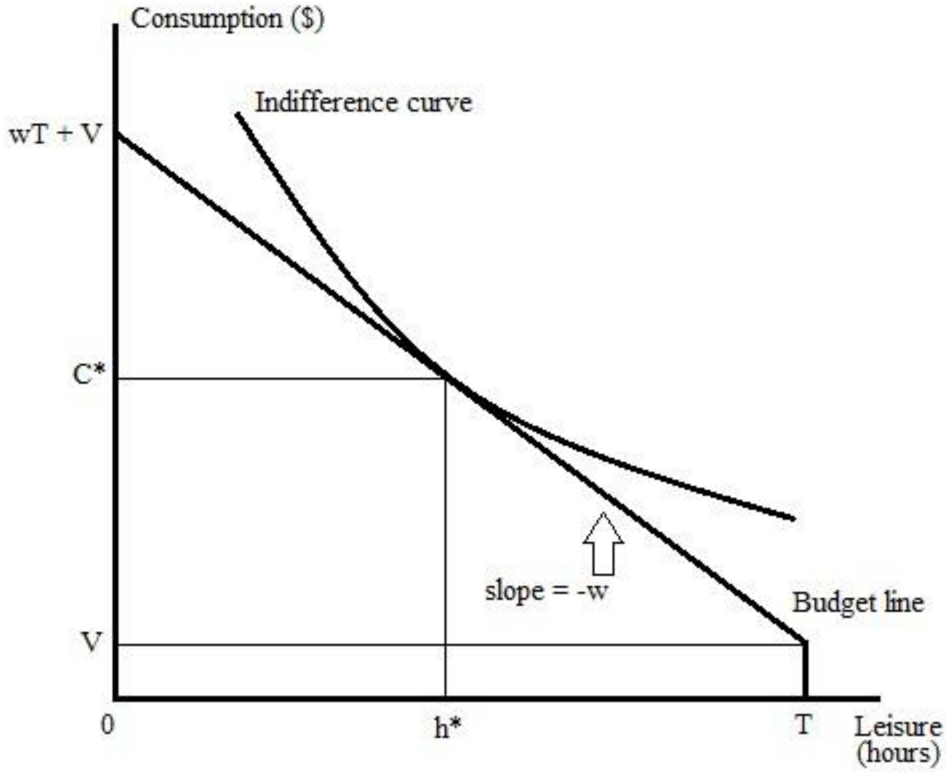
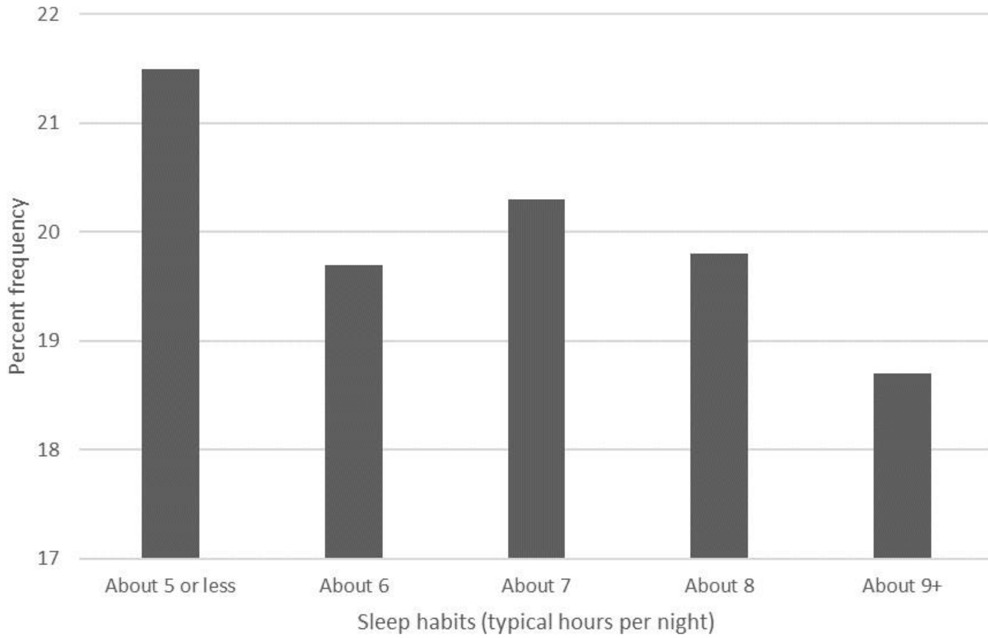
Figures

Figure 1: The neoclassical model of labor-leisure choice



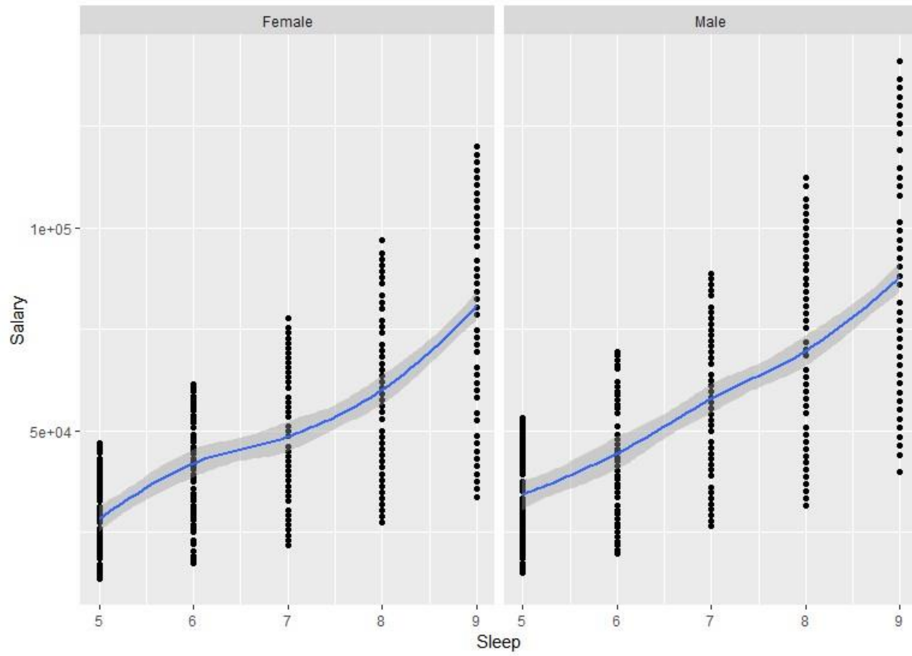
Notes: w = wage rate; T = waking hours (time available for work); V = non-labor income; C = consumption expenditures; & h = hours devoted to work. Asterisks denote optimal choices.

Figure 2: Distribution of sleep patterns in Gwinnett county



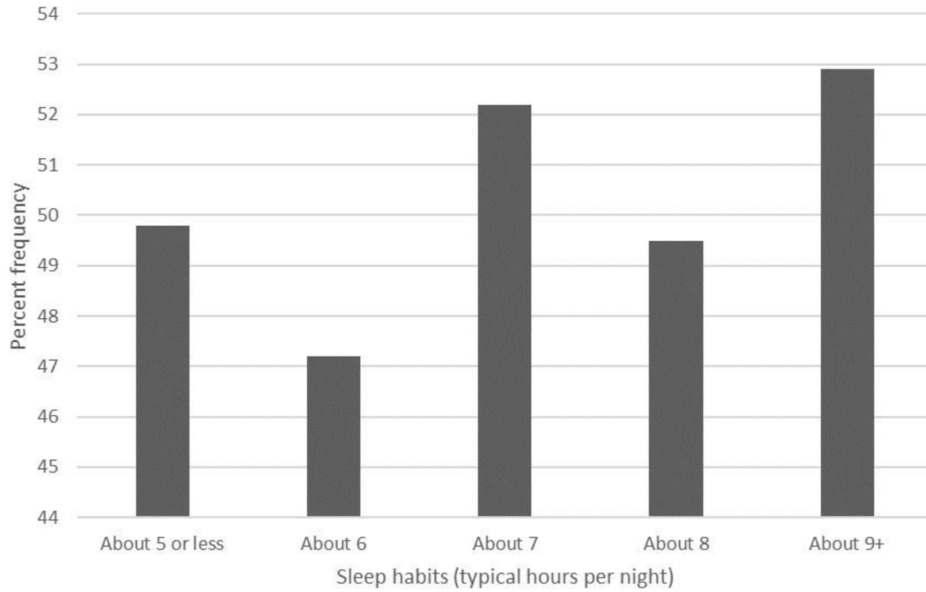
Notes: n = 1,000.

Figure 3: The relationship between sleep habits and salary in Gwinnett county



Notes: *n* (female) = 486. *n* (male) = 514.

Figure 4: Negotiation success rates across the distribution of sleep in Gwinnett county



Notes: n = 1,000.

Tables

Table 1.
Sample Statistics for Gwinnett county, 2018

Continuous variable	Mean	SD	Min.	Max.
Sleep (typical hours)	6.945	1.415	5	9
Salary ($0,000)	54.865	26.344	13	141
Age (years)	40.800	13.350	18	64
Experience (years)	3.413	1.157	0	5
Indicator variable	Percent frequency			
Negotiation success	50.3			
Male	51.4			

Notes: Data come from a survey of 1,000 workers who were in the early stages (5 years or fewer) of their current career. Minimums and maximums rounded. to the integer. SD = standard deviation.

Table 2.
Differences across sleep habits, means for each variable

Variable	Typical hours of sleep				
	About 5	About 6	About 7	About 8	About 9
Salary ($0,000)	31.207	43.147	53.847	65.124	84.650
Negotiation success	0.498	0.472	0.522	0.495	0.529
Experience (years)	3.047	3.269	3.236	3.525	4.059
Age (years)	39.567	42.350	40.990	39.722	41.497
Male	0.484	0.477	0.562	0.525	0.524
Observations (*n*)	215	197	203	198	187

Notes: Means (relative frequencies) rounded to the 3rd decimal place.

Table 3. OLS models of salary

Typical nightly sleep (baseline ≤ 5 hours)	Dependent variable: Salary ($0,000)	Dependent variable: log(Salary)
About 6 hours	4.224***	0.261***
	(0.236)	(0.001)
About 7 hours	9.610***	0.500***
	(0.234)	(0.001)
About 8 hours	15.438***	0.727***
	(0.256)	(0.002)
About 9+ hours	22.457***	0.949***
	(0.310)	(0.002)
Observations	1,000	1,000

Notes: Values are marginal effects with standard errors in parentheses. *p < 0.10; **p < 0.05; ***p < 0.01. Controls include the worker's age and its square, gender, and experience (in years) and its square.

Table 4. Logit models of negotiation success

Typical nightly sleep (baseline ≤ 5 hours)	Job tenure		
	1-5 years	1-3 years	4-5 years
About 6 hours	0.004	0.020	0.088
	(0.054)	(0.094)	(0.096)
About 7 hours	0.088	0.042	0.302**
	(0.070)	(0.150)	(0.135)
About 8 hours	0.098	0.135	0.397**
	(0.097)	(0.231)	(0.168)
About 9+ hours	0.180	0.213	0.562***
	(0.130)	(0.302)	(0.164)
Observations	1,000	434	566

Notes: Values are marginal effects with standard errors in parentheses. *$p < 0.10$; **$p < 0.05$; ***$p < 0.01$. Controls include the worker's age and its square, gender, and experience (in years) and its square.

Appendix: Labor Market Survey

Sampled population: Residents of Gwinnett county, Georgia (USA), who are currently employed, and who have been in their current occupation for at most five years.

Time of survey: Summer 2018

Sample size: 1,000

Survey questions:

1. How many hours of sleep do you typically receive on a nightly basis?
   - About 5 or fewer
   - About 6
   - About 7
   - About 8
   - About 9 or more

2. What is your gender?
   - Male
   - Female

3. How many years have you been at your current occupation?

4. Were you able to negotiate for a higher job title, salary, or other compensation package in the last 12 months?
   - Yes
   - No

5. What is your age, in years?

6. What is your annual salary, in dollars?