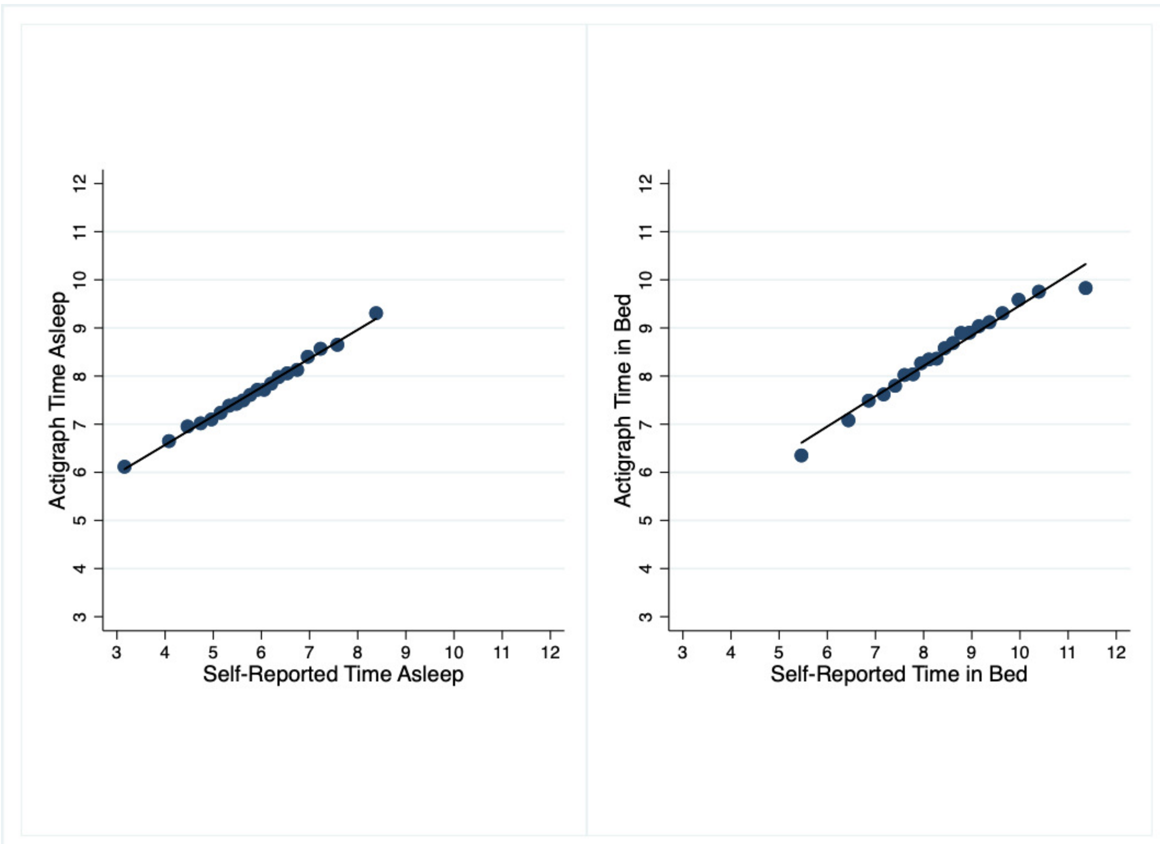
A Online Only Supplementary Tables and Figures

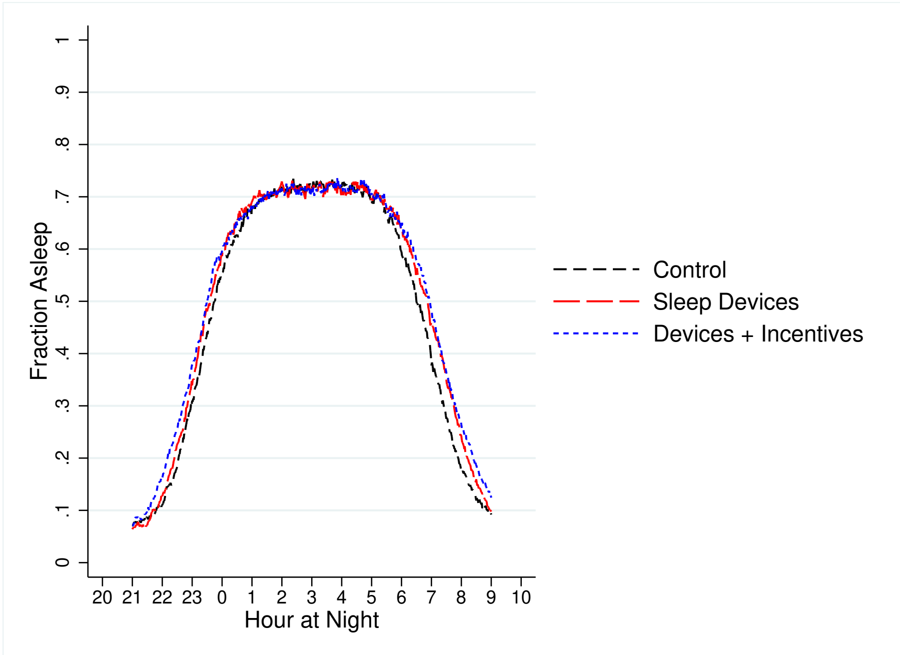
FIGURE A.I: Correlation Between Self-Reports and Actigraph Night Sleep Data



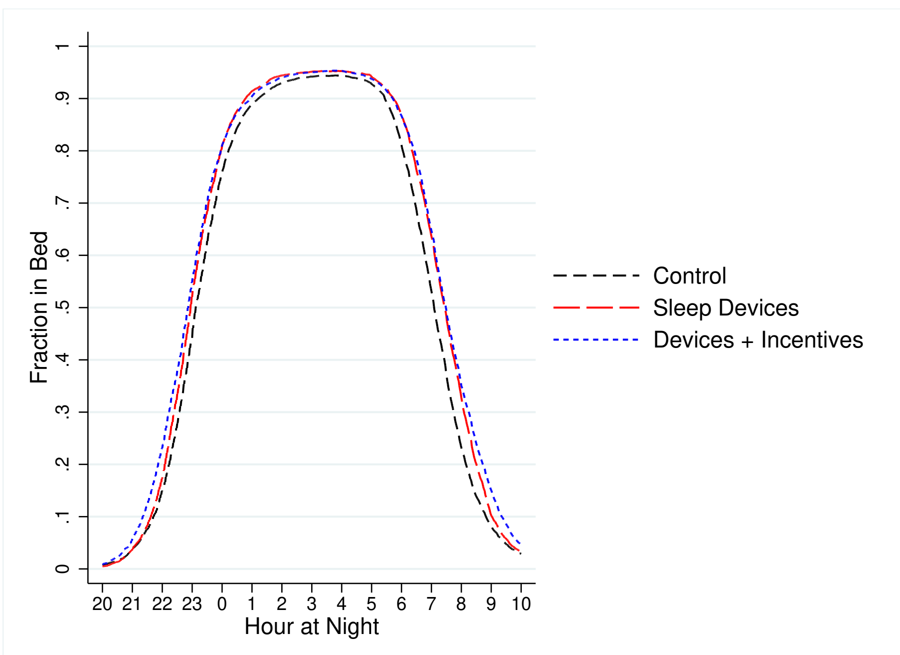
Notes: These figures show the correlations between self-reported and actigraph-measured time asleep (Panel A) and time in bed (Panel B) across all participants during the full study.

FIGURE A.II: Fraction of Individuals in Bed and Asleep by Hour of Night and by Treatment Group

(a) Fraction of Asleep by Hour of the Night

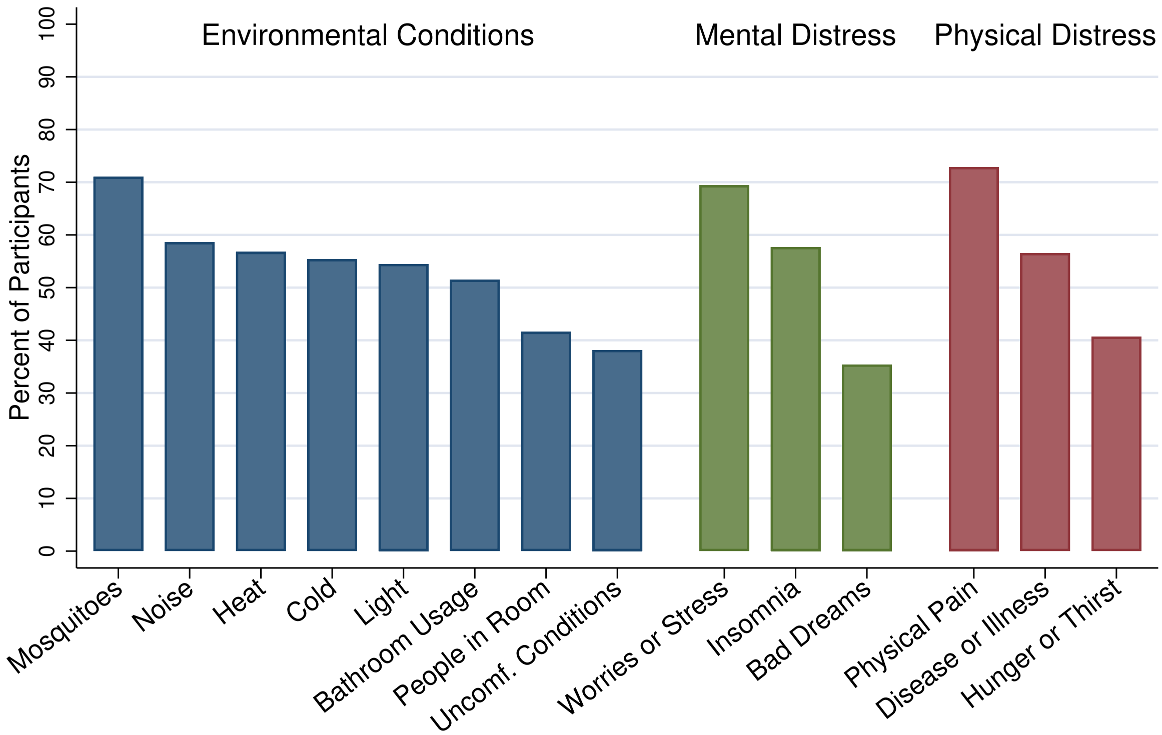


(b) Fraction in Bed by Hour of the Night



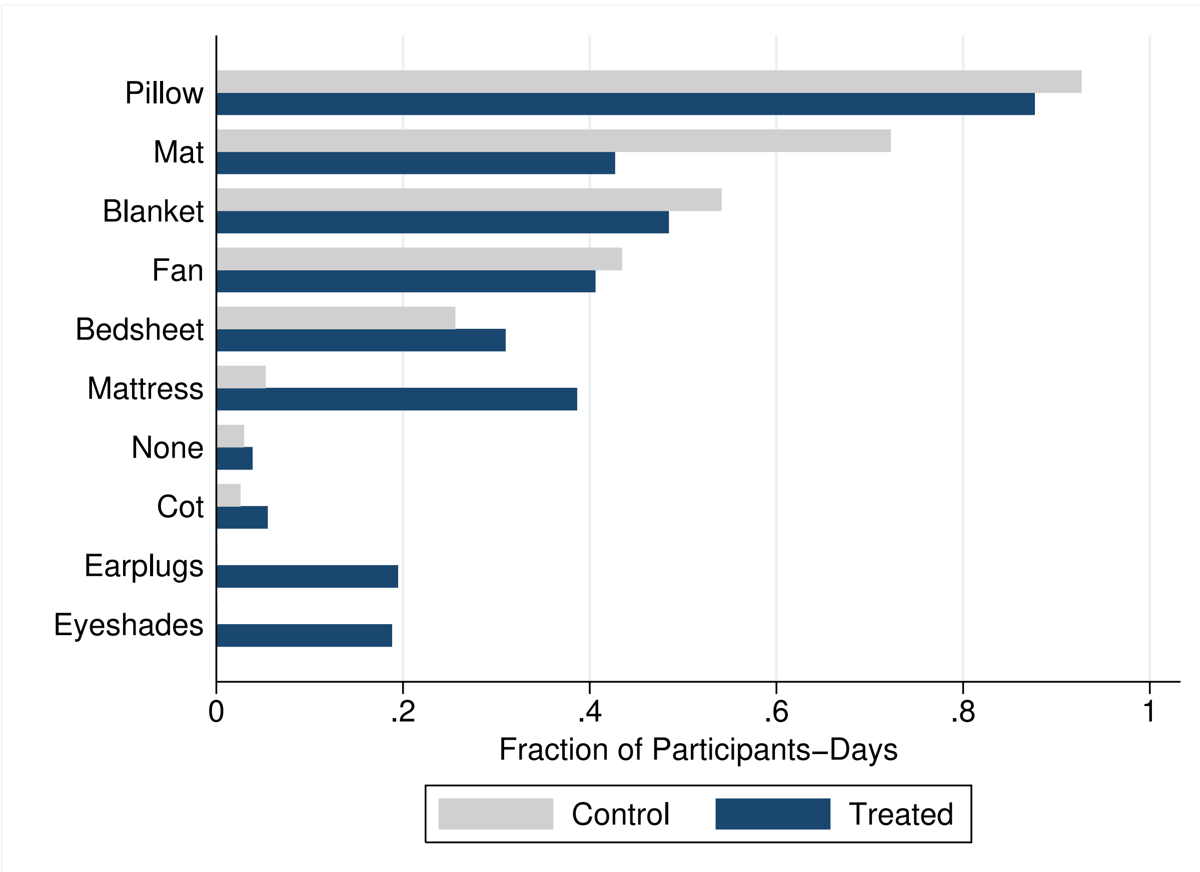
Notes: This figure shows the average fraction of participants asleep and in bed over the course of the night. In panel (a), the lines show the fraction of participants in each night sleep intervention group that are asleep at any time during the night, as measured by the actigraph. In panel (b) the lines show the fraction of participants in each night sleep intervention group that are in bed at any given time during the night, as measured by the actigraph.

FIGURE A.III: Factors Interfering with Study Participants' Sleep



Notes: This figure shows the fraction of participants who reported various factors impacting their sleep, including environmental conditions, mental distress, and physical distress. A participant is considered to have been affected by a awakening if they ever reported the factor bothering them.

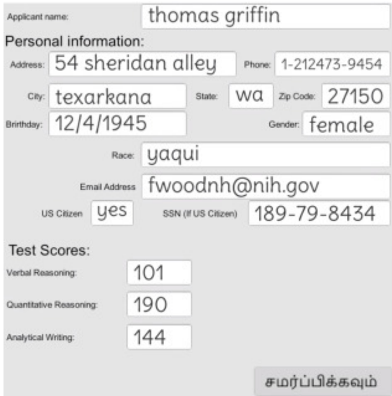
FIGURE A.IV: Sleep Aid Usage



Notes: This figure shows the fraction of participants who reported using each sleep aid provided in the study, divided between the Control group and the Treated group (which pools both night sleep interventions). Control group participants have positive values as some participants had these devices in their homes before entering the study.

FIGURE A.V: Data-Entry Interface with Salient and Non-Salient Piece Rates

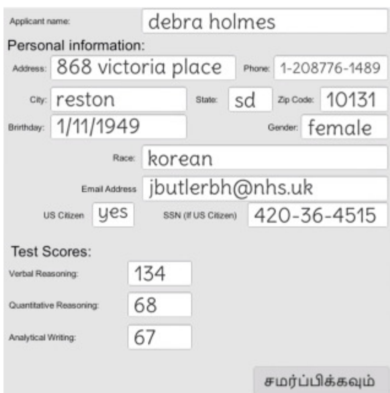
(a) Left side



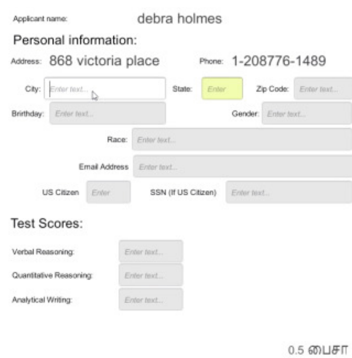
(b) Right side (salient, low)

(c) Right side (salient, high)

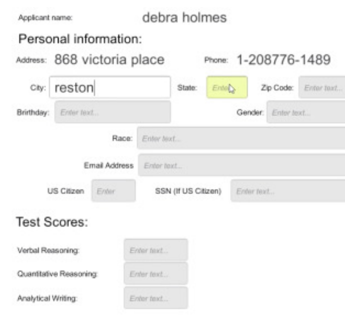
(d) Left side



(e) Right side (non-salient, beginning)



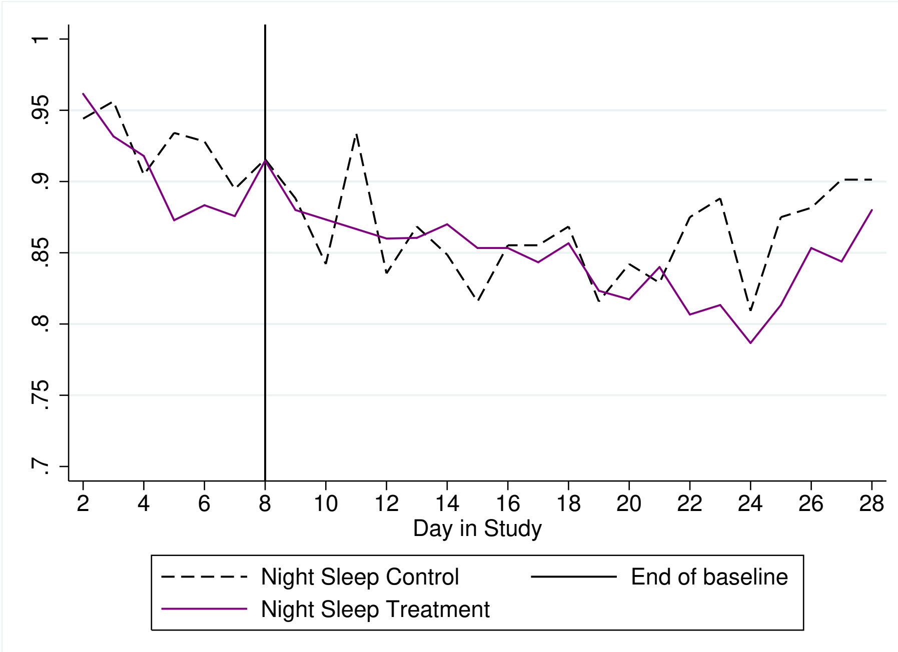
(f) Right side (non-salient, remainder)



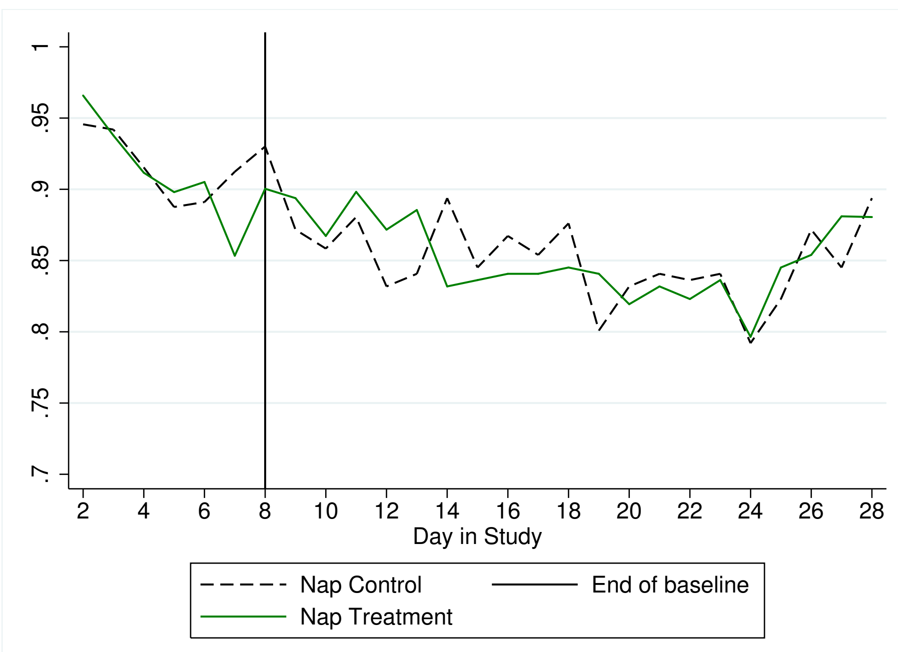
Notes: This figure shows screen shots of the data-entry task interface used by participants. Panels (a) and (d) show the left side of the screen, which contains the data to be transcribed by individuals. The remaining panels show versions of the right side of the screen, where the data is to be entered. Panels (b) and (c) show right side of the screen under salient incentives, once for low incentives (panel (b)) and once for high incentives (panel (c)). Panels (e) and (f) show the right side of the screen under non-salient incentives. Panel (e) is taken from the very beginning of a 30-minute period when individuals can see the (non-colored) piece rate for 15 seconds. Panel (f) is taken from the remaining part of the 30-minute period when the piece rate is no longer visible.

FIGURE A.VI: Attendance by Day of Study and Treatment Group

(a) Fraction of Participants Present by Night Sleep Intervention Groups



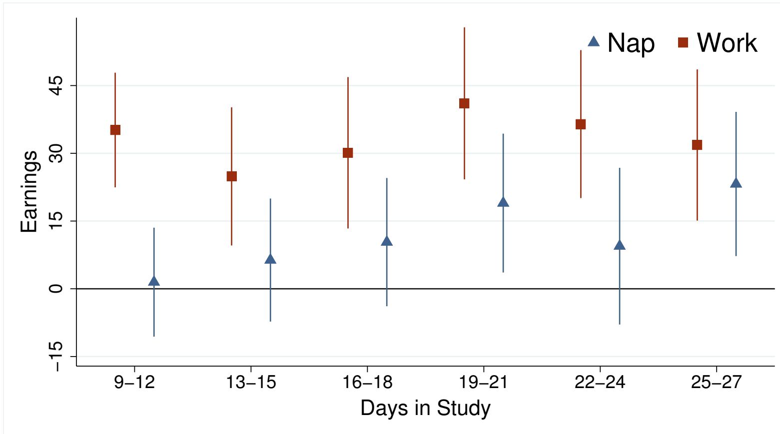
(b) Fraction of Participants Present by Nap Intervention Groups



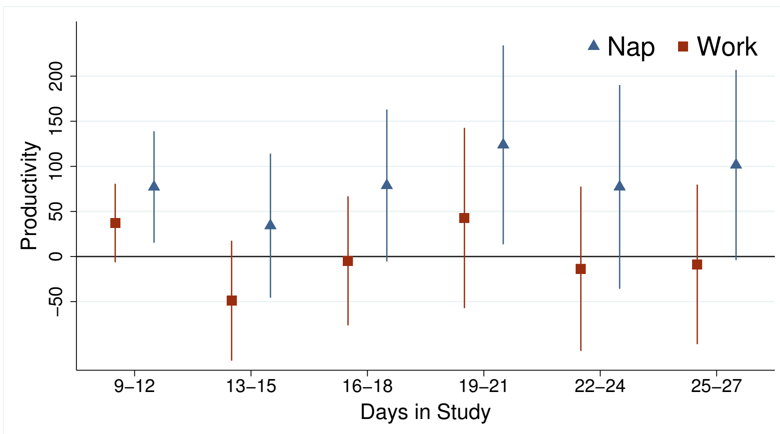
Notes: This figure shows the fraction of participants present during each day in the study by treatment group. In panel (a), the solid purple line shows the fraction of participants in the pooled night sleep intervention group who were present in the study office each day, while the dashed line does the same for night sleep control participants. In panel (b) the solid green line shows the fraction of participants in the nap intervention group who were present in the study office each day, while the dashed line does the same for nap control participants.

FIGURE A.VII: Comparison between Nap and Work Group Over Days

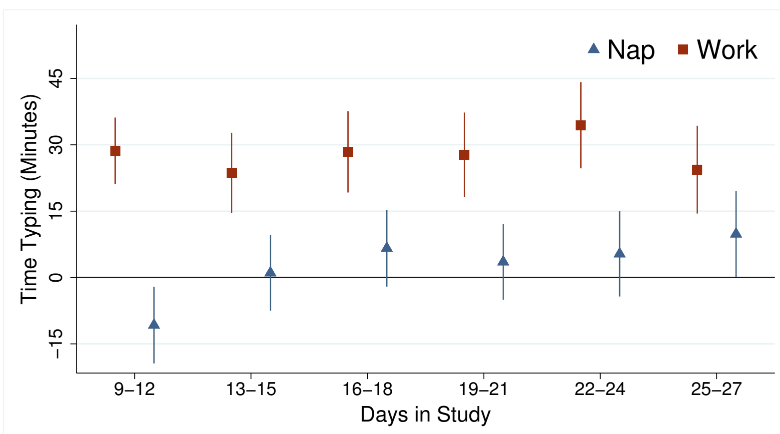
(a) Earnings



(b) Productivity

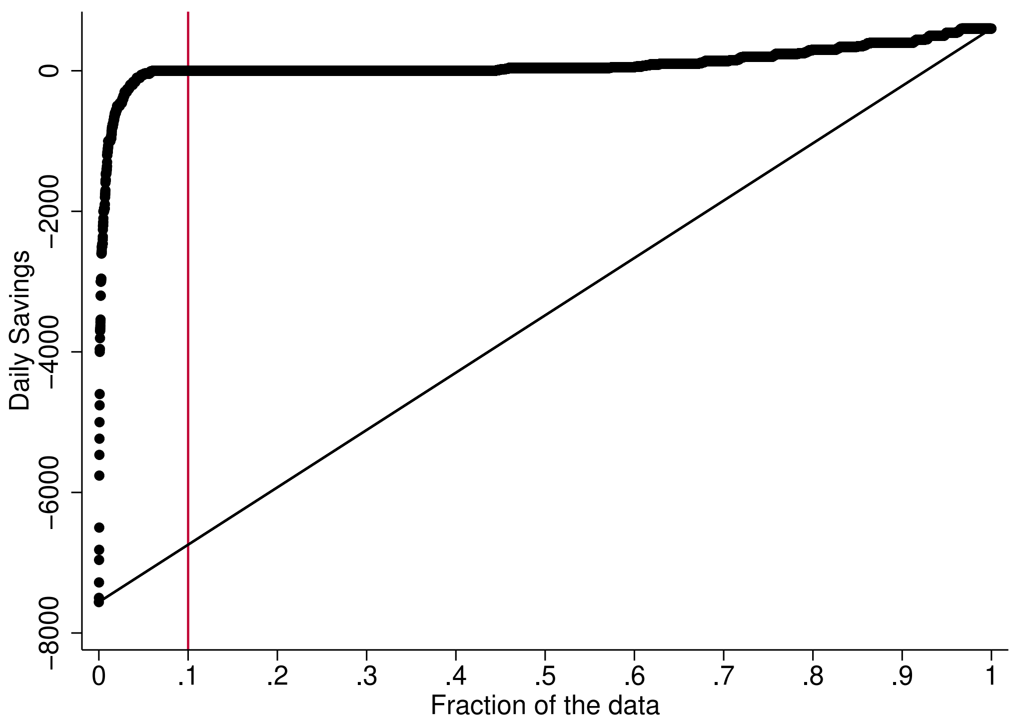


(c) Hours Typing



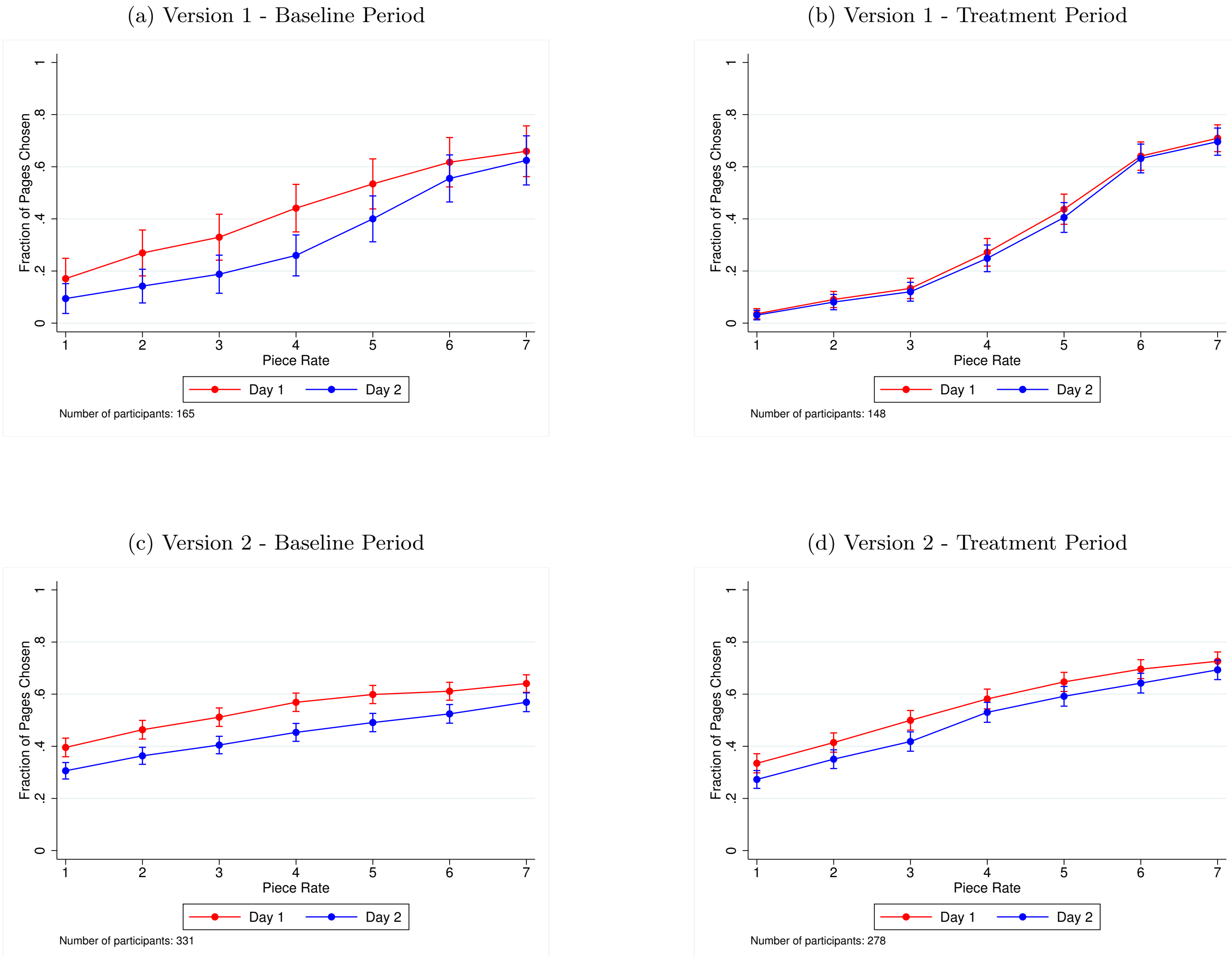
Notes: These figures plot regression coefficients of an outcome variable (productivity, hours typing and earnings, respectively) on the indicators of nap and work groups following specification (2). In this regression, the post-treatment period is grouped in 3-day bins to highlight the dynamics of the nap treatment.

FIGURE A.VIII: Quantile Plot of Daily Net Savings



Notes: This figure shows the ordered values of daily net savings (difference between deposits and withdrawals) in black dots plotted against the quantiles of a theoretical uniform distribution, represented by the solid black line. The solid red line highlights the 5th percentile of the distribution, associated with a daily net savings of -50.

FIGURE A.IX: Present Bias Choices by Piece Rate



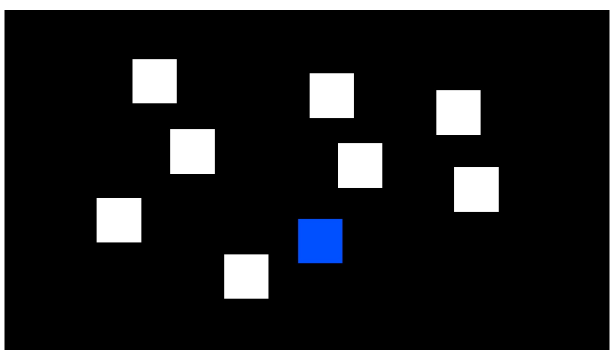
Notes: This figure shows fraction of pages chosen by participants under different piece rates. The figures in the top show the relation between average fraction of pages chosen and piece rate offered (1 is the lowest and 7 is the highest piece rate offered) in the first version of the Present Bias Experiment. The figures in the bottom row are analogous for version 2 of the task. Figures (a) and (c) show the relationship during the baseline period, while Figures (b) and (d) show the results in treatment period.

FIGURE A.X: Images for Cognitive Tests

(a) Psychomotor Vigilance Task (PVT)

(b) Hearts and Flowers

(c) Corsi Blocks



Notes: This figure shows examples of the three cognitive tests used in the study: Psychomotor Vigilance Task (PVT), Hearts and Flowers, and Corsi Blocks. In the PVT task, participants must click the screen when a number appears. In the Hearts and Flowers test, they must click the screen on the same side (for a heart) or opposite side (for a flower) when the image appears. In the Corsi test, a random sequence of blocks light up and the participant must then click on the blocks on the same order that they were highlighted. The number of blocks highlighted increases with each round.

FIGURE A.XI: Survey of Experts: Representative Prediction Page

Question 1: Work capacity - **number of correct entries per day**

The **control group** participants type on average **14,476 correct entries per day**. How many more (fewer) correct entries per day do the treated participants type on average? Please enter your prediction in the box below.

The number of correct entries *changes* by [ ] correct entries per day (You can insert either zero, positive, or negative numbers).

	maps to:	maps to:
hypothetical answer	**% Change**	**SD Change**
±145	±1.0	±0.01
±1,082	±7.5	±0.10
±1,448	±10.0	±0.13
±2,165	±15.0	±0.20
±5,412	±37.4	±0.50
±8,117	±56.1	±0.75
±10,823	±74.8	±1.00
±21,646	±149.6	±2.00

Place mouse here to see benchmark table.

Note: The values in the table below can be used as a reference point to guide your prediction. For example, the first row indicates that if the treated participants type more (less) 145 entries, this corresponds to a 1% increase (decrease) and a 0.01 standard deviation increase (decrease) in working time in comparison to the control group.

← →

Notes: This figure shows a typical page in the Expert Survey. Experts input their prediction by indicating the difference in outcome values between the treatment and the control. Survey participants could use the reference table at the bottom to guide their responses.

Table A.I: Survey of Experts: Summary Statistics

	All					**General Economists**					**Behavioral Economists**					**Medical**				
	Mean (1)	Median (2)	p25 (3)	p75 (4)	N (5)	Mean (6)	Median (7)	p25 (8)	p75 (9)	N (10)	Mean (11)	Median (12)	p25 (13)	p75 (14)	N (15)	Mean (16)	Median (17)	p25 (18)	p75 (19)	N (20)
Correct Entries	0.12	0.07	0.03	0.15	122	0.05	0.05	0.03	0.06	27	0.03	0.02	0.01	0.05	19	0.17	0.10	0.07	0.21	76
Hours Working	0.07	0.04	0.00	0.10	118	0.02	0.02	0.00	0.04	26	0.02	0.02	0.00	0.04	19	0.10	0.09	0.01	0.13	73
Savings	0.05	0.03	0.01	0.07	44	0.04	0.03	0.01	0.06	25	0.05	0.04	0.02	0.08	19	.	.	.	.	0
Attention (PVT)	0.12	0.08	-0.03	0.17	69	.	.	.	.	0	.	.	.	.	0	0.12	0.08	-0.03	0.17	69
Blood Pressure	-0.11	-0.08	-0.23	0.00	66	.	.	.	.	0	.	.	.	.	0	-0.11	-0.08	-0.23	0.00	66

Notes: This table describes survey responses from experts in economics and sleep science.

- Each row presents a different outcome. The values in the table are the intention-to-treat parameters predictions for each outcome divided by the control group's mean, which was provided for respondents in the survey.
- The statistics we consider are the average, median, 25^{th} percentile, 75^{th} percentile, and number of responses for each outcome.
- Correct Entries (row 1) refers to the number of daily correct characters in the data-entry task. The control mean provided in the survey form was 14,476.
- Hours Working (row 2) refer to the daily number of hours working in the typing task (excluding voluntary and scheduled pauses). The control mean provided in the survey form was 5.75 hours.
- Savings (row 3) refers to the daily amount of money (in Rupees) stored in the savings box during the experiment. The control group mean provided in the survey form was 144 Rupees.
- Attention (row 4) refers to an index pooling inverse response times (IRT) and minor lapses (ML) in the Psychomotor Vigilance Task (PVT), which differs from the rest of the paper (where false starts are also a component of PVT indices). Control group averages are 2.9 for inverse reaction time and 2.96 for minor lapses.
- Blood Pressure (row 5) refers to a variable that pools both systolic and diastolic blood pressure. The control group mean for systolic blood pressure was 15.6, while the mean for diastolic blood pressure was 11.

Table A.II: Balance Across Experimental Arms: Demographics and Baseline Sleep

	Night Sleep Treaments						Nap Treatments		
	Control	Devices	Incentives	$1 = 2$	$1 = 3$	$1 = (2 \bigcup 3)$	No Nap	Nap	$7 = 8$
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Panel A. Demographics									
Female	0.66	0.64	0.69	0.74	0.60	0.91	0.65	0.64	0.62
	(0.04)	(0.04)	(0.04)				(0.03)	(0.04)	
Age	35.84	35.28	33.72	0.50	0.01	0.06	34.94	35.28	0.97
	(0.62)	(0.58)	(0.56)				(0.46)	(0.58)	
Number of Children	1.42	1.35	1.29	0.54	0.29	0.34	1.30	1.35	0.29
	(0.09)	(0.08)	(0.09)				(0.07)	(0.08)	
Years of Education	10.35	10.00	10.20	0.29	0.65	0.39	10.34	10.00	0.26
	(0.23)	(0.24)	(0.23)				(0.19)	(0.24)	
Familiar with Computer	0.30	0.28	0.38	0.90	0.41	0.67	0.35	0.28	0.41
	(0.07)	(0.07)	(0.07)				(0.06)	(0.07)	
Unemployed	0.95	0.94	0.94	0.60	0.60	0.54	0.95	0.94	0.84
	(0.02)	(0.02)	(0.02)				(0.01)	(0.02)	
Panel B. Baseline Sleep									
Self-Reported Night Sleep (Hrs)	7.22	7.21	7.14	0.95	0.45	0.63	7.24	7.21	0.24
	(0.08)	(0.07)	(0.07)				(0.07)	(0.07)	
Actigraph Night Sleep (Hrs)	5.57	5.57	5.60	0.99	0.73	0.85	5.57	5.57	0.89
	(0.07)	(0.07)	(0.07)				(0.06)	(0.07)	
Actigraph Time in Bed (Hrs)	8.11	8.08	8.14	0.83	0.73	0.94	8.09	8.08	0.66
	(0.07)	(0.08)	(0.07)				(0.06)	(0.08)	
Sleep Efficiency	0.69	0.70	0.70	0.79	0.77	0.75	0.70	0.70	0.77
	(0.01)	(0.01)	(0.01)				(0.01)	(0.01)	
Number of Sleep Devices Owned	2.52	2.71	2.34	0.30	0.32	0.97	2.54	2.71	0.87
	(0.13)	(0.15)	(0.11)				(0.11)	(0.15)	
Number of Participants	152	150	150				226	226	

Notes: This table considers any underlying differences that may exist between the randomized experimental arms.

- Columns 1 to 3 show baseline means and standard errors by night sleep treatments. Columns 4 to 6 show p-values of t-tests between columns 1 vs. 2, 1 vs. 3, and 1 vs. 2 and 3.
- Columns 7 to 8 show baseline means and standard errors by nap treatment group. Column 9 shows the p-value for the t-test between no nap group and nap group.

Table A.III: Balance Across Experimental Arms: Health, Well-Being, Cognition, Work, and Savings

	Night Sleep Treaments						**Nap Treatments**		
	Control	Devices	Incentives	1 = 2	1 = 3	1 = (2 U 3)	No Nap	Nap	7 = 8
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Panel C. Health, Well-Being, Cognition									
Health Index	0.01	-0.01	0.00	0.66	0.89	0.74	-0.02	-0.01	0.29
	(0.04)	(0.04)	(0.04)				(0.03)	(0.04)	
Well-being	-0.01	0.04	0.02	0.42	0.64	0.46	0.02	0.04	0.90
	(0.04)	(0.05)	(0.04)				(0.04)	(0.05)	
Low Incentive PVT Pay (Rs.)	12.71	12.54	12.63	0.41	0.68	0.48	12.74	12.54	0.21
	(0.14)	(0.16)	(0.15)				(0.11)	(0.16)	
Low Incentive HF Pay (Rs.)	13.56	13.72	13.62	0.31	0.73	0.43	13.65	13.72	0.83
	(0.12)	(0.11)	(0.11)				(0.09)	(0.11)	
Low Incentive Corsi Pay (Rs.)	13.95	13.87	13.79	0.72	0.48	0.54	13.80	13.87	0.47
	(0.15)	(0.16)	(0.17)				(0.13)	(0.16)	
Panel D. Baseline Work and Savings									
Typing Time (Hrs)	4.49	4.55	4.40	0.57	0.39	0.86	4.48	4.55	0.99
	(0.05)	(0.11)	(0.05)				(0.04)	(0.11)	
Time in Office (Hrs)	7.95	7.92	7.86	0.67	0.25	0.36	7.92	7.92	0.70
	(0.06)	(0.06)	(0.06)				(0.05)	(0.06)	
Productivity	2373.51	2451.13	2468.20	0.67	0.61	0.59	2558.52	2451.13	0.09
	(127.65)	(141.07)	(122.99)				(118.05)	(141.07)	
Earnings	403.03	404.78	405.07	0.89	0.87	0.86	413.41	404.78	0.07
	(8.67)	(9.50)	(8.41)				(8.10)	(9.50)	
Attendance	0.94	0.93	0.92	0.14	0.05	0.05	0.93	0.93	0.25
	(0.01)	(0.01)	(0.01)				(0.01)	(0.01)	
Attendance 2	0.95	0.94	0.94	0.12	0.08	0.06	0.94	0.94	0.28
	(0.01)	(0.01)	(0.01)				(0.00)	(0.01)	
Savings (Rs.)	96.70	90.76	112.75	0.67	0.25	0.67	98.69	90.76	0.81
	(9.07)	(9.88)	(10.33)				(7.71)	(9.88)	
Prior Savings (Rs. 1000)	27.17	16.08	32.67	0.29	0.60	0.76	27.71	16.08	0.57
	(5.59)	(4.16)	(10.73)				(7.63)	(4.16)	
Joint Orthogonality Test				0.74	0.25	0.75		0.87	
Number of Participants	152	150	150				226	226	

Notes: This table considers any underlying differences that may exist between the experimental arms.

- Columns 1 to 3 show baseline means and standard errors by night sleep treatments. Columns 4 to 6 show p-values of t-tests between columns 1 vs. 2, 1 vs. 3, and 1 vs. 2 and 3.
- Columns 7 to 8 show baseline means and standard errors by nap treatment group. Column 9 shows the p-value for the t-test between no nap group and nap group.
- The Joint Orthogonality Test row refers to the F-test of a regression of the treatment dummy on all variables present in the balance table. This joint test provides an overall evaluation of the balance between treatments.

Table A.IV: Heterogeneous Treatment Effects on Night Sleep

	Night Sleep				
	(1)	(2)	(3)	(4)	(5)
Night Sleep Treat	0.433***	0.452***	0.467***	0.427***	0.445***
	(0.0749)	(0.0718)	(0.0731)	(0.0780)	(0.0720)
Above Median Sleep Length	-0.0533				
	(0.103)				
NS Treat × Above Median Length	0.0267				
	(0.0980)				
Above Median Sleep Quality		0.198**			
		(0.0883)			
NS Treat × Above Median Quality		-0.0188			
		(0.100)			
Below Median Awakenings			0.193**		
			(0.0869)		
NS Treat × Below Median Awakenings			-0.0350		
			(0.102)		
Above Median Efficiency				0.155*	
				(0.0852)	
NS Treat × Above Median Efficiency				0.0398	
				(0.101)	
Above Median Longest Streak					0.153*
					(0.0863)
NS Treat × Above Median Longest Streak					0.00307
					(0.0997)
Control Mean	5.096	5.152	5.176	5.183	5.168
Control SD	1.141	1.136	1.095	1.191	1.112
N	8428	8428	8428	8428	8428

*** *Significant at the 1 percent level*, ** *Significant at the 5 percent level*, * *Significant at the 10 percent level*

Notes: This table presents heterogeneous treatment effects with respect to the effects of the treatments on quality.

- In all columns we run specification (2) with total night sleep time as the dependent variable. Controls include sex, age, and a dummy for the Nap Treatment.
- We separetely assess heterogeneous night sleep treatment effects with respect to: baseline average sleep length (column 1), the baseline sleep quality index (column 2), baseline average number of awakenings per hour (column 3), baseline average sleep efficiency (column 4), and baseline average longest sleep episode (column 5).
- The quality index is the average of standardized number of awakenings per hour, sleep efficiency and longest sleep episode.
- Standard errors clustered at the participant level.

Table A.V: Heterogeneous Night Sleep Treatment Effects on Sleep Quality

	Quality Index				
	(1)	(2)	(3)	(4)	(5)
Night Sleep Treat	0.0297	0.0684	0.0760*	0.0488	0.0303
	(0.0480)	(0.0441)	(0.0455)	(0.0460)	(0.0526)
Above Median Sleep Length	0.00570				0.00470
	(0.0564)				(0.0577)
NS Treat × Above Median Sleep Length	-0.00519				-0.00352
	(0.0642)				(0.0684)
Above Median Sleep Quality		0.0790			
		(0.0640)			
NS Treat × Above Median Quality		-0.0858			
		(0.0652)			
Below Median Awakenings			0.118*		
			(0.0614)		
NS Treat × Below Median Awakenings			-0.0961		
			(0.0654)		
Above Median Efficiency				0.0589	
				(0.0608)	
NS Treat × Above Median Efficiency				-0.0443	
				(0.0653)	
Above Median Longest Streak					-0.00349
					(0.0633)
NS Treat × Above Median Longest Streak					-0.00263
					(0.0694)
Control Mean	-0.249	-0.451	-0.434	-0.369	-0.418
Control SD	0.857	0.684	0.680	0.810	0.659
N	8392	8392	8392	8392	8392

*** *Significant at the 1 percent level*, ** *Significant at the 5 percent level*, * *Significant at the 10 percent level*

Notes: This table examines potential heterogeneity in the treatment effects on the quality of night time sleep.

- In all columns we run specification (2) with the sleep quality standardized average index as the dependent variable. Controls include sex, age, and a dummy for the Nap Treatment.
- We separetely assess heterogeneous night sleep treatment effects with respect to: baseline average sleep length (column 1), the baseline sleep quality index (column 2), baseline average number of awakenings per hour (column 3), baseline average sleep efficiency (column 4), and baseline average longest sleep episode (column 5).
- The quality index is the average of standardized number of awakenings per hour, sleep efficiency, and longest sleep episode.
- Standard errors clustered at the participant level.

Table A.VI: Decomposing Impacts on Labor Supply and Productivity

	Labor Supply						Productivity		
	Minutes Typing (1)	Total Pause (2)	Voluntary Pause (3)	Minutes in Office (4)	Arrival Time (5)	Leave Time (6)	Productivity (7)	Speed (8)	Accuracy (9)
Night Sleep Treat vs. Control	-10.29***	0.97	1.65**	-8.94***	0.11***	-0.04	44.32	35.47	0.08**
	(3.05)	(1.13)	(0.87)	(2.66)	(0.03)	(0.03)	(39.29)	(40.47)	(0.04)
Nap Treat vs. Break	1.55	3.01***	1.53**	3.41	-0.01	0.05	82.29**	80.10**	0.07*
	(3.06)	(1.05)	(0.77)	(2.66)	(0.03)	(0.03)	(36.49)	(37.37)	(0.04)
Nap Treat vs. No Break	-26.10***	29.07***	-2.61***	3.26	0.01	0.06**	74.47**	74.73**	0.06
	(3.14)	(1.26)	(1.01)	(2.56)	(0.03)	(0.03)	(36.90)	(37.58)	(0.04)
Control Mean	244.04	113.48	10.90	400.32	10.52	18.34	3390.86	3587.47	99.14
Control SD	126.13	55.89	18.69	178.97	0.70	0.97	1839.11	1827.30	0.76
N	6992	6992	6992	6989	6989	6989	6992	6992	6992
Participants	451	451	451	451	451	451	451	451	451

*** *Significant at the 1 percent level*, ** *Significant at the 5 percent level*, * *Significant at the 10 percent level*

Notes: This table considers the treatment effect of the night sleep and the nap interventions on labor supply and productivity outcomes.

- The outcome variables in columns 1 to 6 are various measures of labor supply. Column 1 considers minutes spent typing, column 2 considers total pauses, and column 3 considers voluntary pauses (excluding mandatory pause for participants randomized to stop work instead of napping). Column (4) considers total minutes in office and columns 5 and 6 consider office arrival and departure times (in hours), respectively.
- The outcome variables in columns 7, 8, and 9 are measures of productivity: productivity (output/hour), typing speed, and typing accuracy, respectively.
- Each column shows the OLS estimates of equation (2), controlling for average baseline values (ANCOVA), age, sex, "regular" study day, fraction of high piece-rate sessions, and day in study and date fixed effects. Standard errors are clustered at the participant level.

Table A.VII: Treatment Effect on Sleep Quality

	Efficiency (1)	**Awakenings/Hour** (2)	**Longest Sleep Episode** (3)	**Shortened PSQI** (4)	**Karolinska** (5)
Night Sleep Treat	-0.000751	-0.0256	1.640*	-0.336***	-0.0781
	(0.00421)	(0.0775)	(0.931)	(0.111)	(0.0541)
Nap Treat	0.00273	0.00795	-1.308	0.216**	-0.00469
	(0.00395)	(0.0714)	(0.904)	(0.101)	(0.0539)
Baseline	0.744***	0.780***	0.698***	0.248***	0.144***
	(0.0317)	(0.0257)	(0.0427)	(0.0789)	(0.0407)
Control Mean	0.698	5.887	54.74	2.071	-2.960
Control SD	0.113	2.206	25.74	1.535	1.698
N	8426	8426	8392	399	1800
Participants	451	451	449	399	442

Note: This table presents first-stage regressions regarding quality measures. All regressions include controls for age quartiles and female dummy along with the average baseline value of the dependent variable.

- Efficiency is defined as time asleep divided by time in bed. Both are measured by actigraph.
- Awakenings is defined as a switch from "asleep" to "awake". The actigraph records, minute-by-minute, whether there is enough wrist movement detected ("awake") or not ("asleep").
- Longest Sleep Episode is defined as the duration (in minutes) of the participant's longest episode of uninterrupted sleep in a night.
- Shortened PSQI corresponds to an adapted version of the Pittsburgh Sleep Quality Index. This measure is based on one-time questions conducted in the endline survey. We make use of questions 6, 7, and 8 of the original PSQI (see Buysse et al. (1989)) to create components 1, 6, and 7 (component 7 uses only information from question 8). We also adapt component 5. Instead of using the original disturbance questions (questions 5b-5j in Buysse et al. (1989)), we use our own, which asks whether participants have trouble sleeping because of the presence of heat, light, mosquitoes, stress, bad dreams, diseases, insomnia, physical pain, flooded sleeping areas, noise, hungriness/thirstiness, use of bathroom and/or presence of child/baby. We then code component 5 in accordance to the number of factors reported, with 3 or more factors being assigned value 3 (the maximum score). We then sum our (adapted) components 1, 5, 6, and 7 and standardized the measure according to the control mean and standard deviation.
- The Karolinska variable asks the participant to "describe your sleepiness durnig the previous five minutes" and is asked on some days during the Daily Survey. The nine possible answers range from 0 ("Extremely Alert") to 8 ("Extremely sleepy, fighting sleep"). We then standardize this variable.
- Both the Shortened PSQI and Karolinska measures are multiplied by minus 1 so that higher values indicate more desirable outcomes.
- Standard errors are clustered at the participant level.

Table A.VIII: Correlation Between Sleep Quality Measures

	Sleep Efficiency (1)	**Longest Sleep Episode** (2)	**Awakenings per Hour** (3)	**Awakenings per Hour (5-Min)** (4)
Sleep Efficiency	1.00	-	-	-
Longest Sleep Episode	0.67	1.00	-	-
Awakenings per Hour	0.82	0.78	1.00	-
Awakenings per Hour (5-Min)	0.87	0.64	0.81	1.00

Note: This table presents simple Pearson correlation measures between our sleep quality measures.

- Sleep efficiency is defined as time asleep divided by time in bed. Both are measured by actigraph.
- Awakenings per Hour is defined as a switch from "asleep" to "awake". The actigraph records, minute-by-minute, whether there is enough wrist movement detected ("awake") or not ("asleep"). We flip the sign of the variable so that a positive relationship stands for fewer awakenings (a “better" outcome).
- Awakenings per Hour (5-Min Disruptions) is defined as a switch from "asleep" to "awake" in which participants remain awake for at least 5 minutes. We also flip the sign so that a positive relationship stands for fewer awakenings (a “better" outcome).
- Longest Sleep Episode is defined as the duration (in minutes) of the participant’s longest episode of uninterrupted sleep in a night.

Table A.IX: Heterogeneous Night Sleep Treatment Effects on Productivity

	Productivity				
	(1)	(2)	(3)	(4)	(5)
Night Sleep Treat	107.3**	-36.93	-66.65	14.64	-20.03
	(50.52)	(52.31)	(51.04)	(51.80)	(53.06)
Above Median Sleep Length	93.56				
	(68.47)				
NS Treat × Above Median Sleep Length	-122.2				
	(80.19)				
Above Median Sleep Quality		-139.4**			
		(68.18)			
NS Treat × Above Median Quality		168.8**			
		(78.81)			
Below Median Awakenings			-203.7***		
			(65.67)		
NS Treat × Below Median Awakenings			219.6***		
			(77.30)		
Above Median Sleep Efficiency				21.97	
				(68.69)	
NS Treat × Above Median Efficiency				61.47	
				(81.26)	
Above Median Longest Streak					-134.7**
					(68.31)
NS Treat × Above Median Longest Streak					131.9
					(80.28)
Control Mean	3253.2	3496.5	3549.8	3431.3	3350.2
Control SD	1930.4	2053.2	2078.6	2049.1	2029.4
N	7350	7350	7350	7350	7350

*** *Significant at the 1 percent level*, ** *Significant at the 5 percent level*, * *Significant at the 10 percent level*

Notes: This table presents heterogeneous treatment effects with respect to the effects of the treatments on productivity.

- In all columns we run specification (2) with productivity as the dependent variable. Controls include sex, age, a dummy for long days, fraction of high incentive sessions, and a dummy for the Nap Treatment.
- We separately assess heterogeneous night sleep treatment effects with respect to: baseline average sleep length (column 1), the baseline sleep quality index (column 2), baseline average number of awakenings per hour (column 3), baseline average sleep efficiency (column 4), and baseline average longest sleep episode (column 5).
- The quality index is the average of standardized number of awakenings per hour, sleep efficiency, and longest sleep episode.
- Standard errors clustered at the participant level.

Table A.X: Heterogeneous Night Sleep Treatment Effects on Earnings

	Earnings				
	(1)	(2)	(3)	(4)	(5)
Night Sleep Treat	1.927	-21.04*	-32.79***	-11.98	-18.14*
	(10.09)	(10.78)	(11.70)	(10.21)	(10.33)
Above Median Sleep Length	16.41				
	(12.98)				
NS Treat × Above Median Sleep Length	-29.07*				
	(15.26)				
Above Median Sleep Quality		-0.223			
		(12.92)			
NS Treat × Above Median Quality		16.04			
		(15.37)			
Below Median Awakenings			-16.71		
			(13.24)		
NS Treat × Below Median Awakenings			39.36**		
			(15.50)		
Above Median Sleep Efficiency				17.15	
				(13.05)	
NS Treat × Above Median Efficiency				-1.981	
				(15.19)	
Above Median Longest Streak					-8.527
					(13.05)
NS Treat × Above Median Longest Streak					10.65
					(15.57)
Control Mean	262.2	277.0	293.2	267.2	284.5
Control SD	194.5	214.1	221.6	219.3	206.2
N	8647	8647	8647	8647	8647

*** *Significant at the 1 percent level*, ** *Significant at the 5 percent level*, * *Significant at the 10 percent level*

Notes: This table examines heterogeneous treatment effects on earnings.

- In all columns we run specification (2) with productivity as the dependent variable. Controls include sex, age, a dummy for long days, fraction of high incentive sessions, and a dummy for the Nap Treatment.
- We separetely assess heterogeneous night sleep treatment effects with respect to: baseline average sleep length (column 1), the baseline sleep quality index (column 2), baseline average number of awakenings per hour (column 3), baseline average sleep efficiency (column 4), and baseline average longest sleep episode (column 5).
- The quality index is the average of standardized number of awakenings per hour, sleep efficiency, and longest sleep episode.
- Standard errors clustered at the participant level.

Table A.XI: Heterogeneous Night Sleep Treatment Effects on Hours Typing

	Hours Typing				
	(1)	(2)	(3)	(4)	(5)
Night Sleep Treat	-0.123	-0.214	-0.443**	-0.162	-0.264
	(0.150)	(0.161)	(0.171)	(0.166)	(0.161)
Above Median Sleep Length	0.0579				
	(0.182)				
NS Treat × Above Median Sleep Length	-0.192				
	(0.213)				
Above Median Sleep Quality		0.0789			
		(0.189)			
NS Treat × Above Median Quality		-0.0174			
		(0.217)			
Below Median Awakenings			-0.151		
			(0.196)		
NS Treat × Below Median Awakenings			0.438*		
			(0.226)		
Above Median Sleep Efficiency				0.224	
				(0.191)	
NS Treat × Above Median Efficiency				-0.119	
				(0.219)	
Above Median Longest Streak					-0.0770
					(0.190)
NS Treat × Above Median Longest Streak					0.0875
					(0.220)
Control Mean	4.057	4.059	4.235	3.924	4.287
Control SD	2.116	2.136	2.137	2.254	2.025
N	8647	8647	8647	8647	8647

*** *Significant at the 1 percent level*, ** *Significant at the 5 percent level*, * *Significant at the 10 percent level*

Notes: This table examines heterogeneous treatment effects on hours typing.

- In all columns we run specification (2) with productivity as the dependent variable. Controls include sex, age, a dummy for long days, fraction of high incentive sessions, and a dummy for the Nap Treatment.
- We separetely assess heterogeneous night sleep treatment effects with respect to: baseline average sleep length (column 1), the baseline sleep quality index (column 2), baseline average number of awakenings per hour (column 3), baseline average sleep efficiency (column 4), and baseline average longest sleep episode (column 5).
- The quality index is the average of standardized number of awakenings per hour, sleep efficiency, and longest sleep episode.
- Standard errors clustered at the participant level.

Table A.XII: Treatment Effects on Default Pass-Through

	Follow Default		**Default Pass-Through**	
	(1)	(2)	(3)	(4)
Default	0.24***	0.24***	0.42***	0.44**
	(0.01)	(0.03)	(0.09)	(0.19)
Night Sleep Treat × Default		-0.03		-0.03
		(0.03)		(0.21)
				[1.000]
Nap Treat × Default		0.04		0.00
		(0.03)		(0.20)
				[1.000]
Control Mean	0.01	0.01	120.44	120.44
Control SD	0.08	0.08	174.62	174.62
N	7280	7280	7280	7280
Participants	452	452	452	452

*** *Significant at the 1 percent level*, ** *Significant at the 5 percent level*, * *Significant at the 10 percent level*

Note: This table considers the treatment effect of the night sleep and the nap interventions on participants' propensity to follow the default and on default pass-through.

- The dependent variable in columns 1 and 2 is an indicator of whether the participant saved exactly Rs. 40, the default amount. Columns 3 and 4 capture daily deposits.
- Columns 1 and 2 show the OLS estimates of equation (5), whereas columns 3 an 4 show the OLS estimates of equation (4). At all four specifications we control for the participant's average baseline outcome (ANCOVA), age, sex, daily piece rate, interest rate, maximum payment from cognitive tasks and randomized piece rate for the present bias task.
- For columns 1 and 2, row 1 is the estimated coefficient associated with a dummy equal to one if the participant was randomized to the default condition on that day. In columns 3 and 4, row 1 shows the estimates for the default pass-through effect on daily deposits (i.e. what fraction of the amount defaulted into savings was passed through to the savings account). Rows 2 and 3 interact each of these variables with the night sleep and nap treatments, respectively.
- In columns 1 and 2, the control mean is the fraction of participants in the control group in non-default days that saved exactly Rs. 40. For columns 3 and 4, it is the average daily deposit in non-default days in the control group.
- Corrected p-values that control for the Family-Wise Error Rates are included in brackets in Column 4. A full description of our approach to multiple hypothesis corrections can be found in Appendix E.
- Standard errors are clustered at the participant level.

Table A.XIII: Treatment Effects on Inhibitory Control and Memory

	Inhibitory Control			**Memory**
	Payment	Frac. Correct	Avg. Reaction	Payment
Night Sleep Treat	0.0418	0.0751	0.0010	0.0143
	(0.0467)	(0.0654)	(0.0527)	(0.0460)
Nap Treat	0.0451	-0.0557	0.1051**	-0.0159
	(0.0430)	(0.0588)	(0.0487)	(0.0444)
Baseline	0.681***	0.604***	0.589***	0.671***
	(0.0382)	(0.0640)	(0.0404)	(0.0307)
Control Mean	14.98	0.891	551.9	14.64
Control SD	1.37	0.097	60.2	2.67
N	3554	3554	3554	3506
Participants	449	449	449	449

*** *Significant at the 1 percent level*, ** *Significant at the 5 percent level*, * *Significant at the 10 percent level*

Notes: This table considers the treatment effect of the night sleep and nap interventions on inhibitory control and memory.

- All columns show the OLS estimates of equation (2), controlling for baseline values (ANCOVA), age, sex, whether participants faced high or low incentives for the task (which varied randomly within-participant each day), and day in study and date fixed effects.
- All variables are standardized by the control group's average and standard deviation, with signs flipped as needed such that higher outcomes indicate more desirable outcomes.
- The outcomes in columns 1-3 are all related to inhibitory control, measured by the Hearts and Flowers task. The outcome variable in Column 1 is the payment participants earn for completing the H&F task, where the payment is a weighted average of the fraction of correct entries and reaction time. Columns 2 and 3 break apart performance, respectively, by the fraction of correct entries, out of 40, and average reaction time.
- The outcome variable in column 4 is the payment participants earn for completing the Corsi blocks task, which measures working memory. Payment depends on the maximum number of blocks they can recall within the task.
- Standard errors are clustered at the participant level.

Table A.XIV: Goodness of Fit for Structural Present Bias Models

	Cost Function (1)	Censoring (2)	Alpha (3)	N (4)	N Fail (5)	NLL (6)	Avg (7)	Sd (8)	Min (9)	Max (10)	P10 (11)	P25 (12)	P50 (13)	P75 (14)	P90 (15)
All periods	Power	Yes	Yes	443	26	8593.06	18.47	363.53	0.00	7651.51	0.51	0.74	0.92	1.00	1.12
	Power	Yes	No	443	9	10354.10	3480.41	7.32E+04	0.00	1.54E+06	0.29	0.61	0.85	1.02	1.26
	Power	No	Yes	443	19	8570.95	0.91	0.31	0.16	2.82	0.56	0.78	0.93	1.00	1.14
	Power	No	No	443	5	10589.73	1.01	1.58	0.01	21.61	0.35	0.63	0.86	1.02	1.24
	Exp	Yes	Yes	443	53	49247.10	1.39	4.46	0.04	60.85	0.26	0.51	0.79	1.04	1.53
	Exp	Yes	No	443	51	50478.62	13.65	234.64	0.00	4930.92	0.27	0.52	0.78	1.13	1.60
	Exp	No	Yes	443	62	66734.72	1.05	2.95	0.04	55.37	0.24	0.48	0.78	1.00	1.29
	Exp	No	No	443	46	68750.85	1.87	16.81	0.00	346.84	0.24	0.49	0.77	1.02	1.41
Treatment Period	Power	Yes	Yes	398	46	718.16	1.20	4.97	0.00	99.66	0.62	0.84	0.98	1.03	1.17
	Power	Yes	No	398	27	3303.24	2.03	20.90	0.00	417.55	0.43	0.75	0.95	1.07	1.32
	Power	No	Yes	398	35	1406.77	0.96	0.31	0.06	3.68	0.64	0.85	0.98	1.02	1.16
	Power	No	No	398	15	4384.23	0.99	0.95	0.00	17.21	0.46	0.77	0.95	1.07	1.29
	Exp	Yes	Yes	398	79	25073.50	5.71	57.30	0.03	964.75	0.30	0.57	0.92	1.07	1.72
	Exp	Yes	No	398	65	26787.38	1940.45	3.76E+04	0.00	7.49E+05	0.36	0.61	0.93	1.17	1.79
	Exp	No	Yes	398	84	38183.22	1.39	4.13	0.03	46.57	0.30	0.57	0.91	1.03	1.41
	Exp	No	No	398	55	40020.84	1.99	19.44	0.00	386.61	0.35	0.60	0.88	1.07	1.45
Baseline Period	Power	Yes	Yes	430	74	-4685.44	35.41	426.88	0.00	7651.51	0.27	0.54	0.86	1.03	1.36
	Power	Yes	No	430	25	-148.29	1.36E+04	1.46E+05	0.00	2.01E+06	0.10	0.33	0.76	1.16	1.94
	Power	No	Yes	430	68	-5089.91	1.14	3.56	0.03	59.85	0.33	0.60	0.87	1.02	1.31
	Power	No	No	430	14	-95.16	1688.41	3.02E+04	0.00	6.19E+05	0.12	0.38	0.77	1.14	1.75
	Exp	Yes	Yes	430	98	13157.07	25.92	281.53	0.02	5117.04	0.16	0.37	0.78	1.13	2.51
	Exp	Yes	No	430	64	17277.05	6158.21	5.90E+04	0.00	9.41E+05	0.10	0.32	0.76	1.23	3.23
	Exp	No	Yes	430	81	17437.87	13.37	141.02	0.01	2504.40	0.13	0.34	0.73	1.06	1.77
	Exp	No	No	430	62	21829.83	7739.36	8.49E+04	0.00	1.27E+06	0.09	0.29	0.67	1.21	2.47

Notes: This table shows the model fit and key statistics of the distribution of present bias for different parametrizations of the participant's utility function in the structural estimation.

- The first panel pools data from the entire experiment, while the second and third panels use only data from the treatment and from the baseline period, respectively.
- The first 3 columns indicate, respectively, (1) whether the cost function is a power or an exponential function; (2) Whether we use a normal-Tobit model for censoring top and bottom observation; (iii) Whether we allow the parameter α to be different than zero.
- Columns 4 and 5 show, respectively (i) the number of participants who successfully completed at least one round of the Present Bias experiment; (ii) the number of participants for whom the structural estimation algorithm does not converge.
- Column 6 is the *Negative* Log-Likelihood (NLL) of the model summing across all participants. Smaller values indicate better fit.
- Columns 7-15 show key statistics of the distribution of individual-level present bias estimated from the model with specifications described in columns 1-3. PXX stands for percentile XX of the distribution.

Table A.XV: Present Bias - Experimental Integrity

	Night Sleep Treatments			Nap Treatments		
	Control	Night Sleep	P-Value	Control	Nap	P-Value
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: All Study						
Individual-level PB estimate	0.77	0.78	0.74	0.78	0.77	0.82
Make decisions but do not work	0.05	0.05	0.86	0.05	0.04	0.38
Work on a different date than assigned	0.11	0.14	0.45	0.13	0.13	0.94
Panel B: Version 1						
Individual-level PB estimate	0.88	0.93	0.36	0.90	0.92	0.64
Make decisions but do not work	0.04	0.04	0.83	0.05	0.03	0.40
Work on a different date than assigned	0.08	0.09	0.88	0.07	0.10	0.21
Panel C: Version 2						
Individual-level PB estimate	0.71	0.71	0.98	0.73	0.69	0.52
Make decisions but do not work	0.05	0.05	0.92	0.06	0.04	0.56
Work on a different date than assigned	0.13	0.16	0.47	0.16	0.14	0.69

Notes: This table provides information on the experimental integrity of the present bias task.

- Panel A shows all 452 observations, while Panel B focus on participants that did the first version of the Present Bias Experiment and Panel C on the participants who did the second version of the Present Bias Experiment.
- *Individual-level PB estimate* (row 1) is a dummy indicating whether we can estimate the individual-level present bias parameter in our preferred specification using only data from the treatment period. There are two reasons why we might not be able to estimate present bias in the individual-level: the participants did not complete the second day of the task or the structural estimator did not converge for the participant.
- *Make decisions but do not work* (row 2) is a dummy indicating whether the participant makes the work decisions but does not complete the work. Participants that did not complete either rounds of choice are excluded.
- *Work on a different date than assigned* (row 3) is a dummy indicating whether the date the participants completed the task ("work date") is different than the date they were assigned to complete when they made the first round of choices. Most of the time this happens because participants were absent from the office in the date they were supposed to complete the task.
- Columns 1, 2, 5, and 6 show the average of the variables in column 1 for control (night sleep), night sleep, control (nap), and nap groups. Column 3 and 6 show the p-value of the difference between control and treatment groups.

Table A.XVI: Relation between Present Bias (β) and Behaviors Involving Time Preferences

	Daily Deposits		Lateness		Voluntary Pauses		Night Sleep	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Beta Structural	39.66*	38.81*	-6.485	-7.360*	0.662	1.438	0.0724	0.0985
	(21.11)	(21.66)	(4.474)	(4.421)	(2.243)	(2.026)	(0.154)	(0.154)
Controls	No	Yes	No	Yes	No	Yes	No	Yes
Control Mean	127.1	127.1	42.37	42.37	15.44	15.44	5.603	5.603
Control SD	121.3	121.3	25.94	25.94	11.23	11.23	0.824	0.824
Observations	351	351	351	351	351	351	351	351

*** *Significant at the 1 percent level*, ** *Significant at the 5 percent level*, * *Significant at the 10 percent level*

Notes: This table reports correlation measures between the present bias coefficient (β) and participants' behavior.

- The independent variable of interest is the present bias measure β, estimated via the benchmark structural estimation method, which excludes participants for whom the maximization problem in the structural estimation does not converge.
- The dependent variables are: daily deposits (from the savings task), lateness (how long after the office opening the participant arrives), voluntary pauses (total daily length of voluntary pauses from the typing task), and night sleep (actigraph measured). All the dependent variables are study long averages (including the baseline period).
- Even columns shows the OLS estimates when controlling for participant's age and sex.

Table A.XVII: Treatment Effects on Risk and Social Preferences

	Risk Preferences				Social Preferences						
	Indices		Components		Indices		Components				
	Anderson	Average	Risk Aversion	Loss Aversion	Anderson	Average	Dictator Send	Ultimatum Send	Trust Send	Ultimatum Receive	Trust Send Back
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Night Sleep Treat	-0.038	-0.037	-0.111	0.007	-0.035	-0.041	-0.045	0.009	-0.135	-0.066	-0.049
	(0.081)	(0.081)	(0.099)	(0.096)	(0.056)	(0.061)	(0.102)	(0.097)	(0.102)	(0.116)	(0.125)
		[1.000]				[0.999]					
Nap Treat	0.073	0.074	-0.009	0.086	0.038	0.054	0.177*	0.005	0.055	0.063	0.121
	(0.076)	(0.076)	(0.093)	(0.091)	(0.053)	(0.057)	(0.095)	(0.092)	(0.096)	(0.113)	(0.117)
		[0.996]				[0.996]					
Amount Received										0.966***	1.290***
										(0.060)	(0.047)
Baseline	0.430***	0.461***	0.290***	0.376***	0.339***	0.418***	0.224***	0.203***	0.385***	0.492***	0.388***
	(0.050)	(0.053)	(0.051)	(0.049)	(0.060)	(0.061)	(0.050)	(0.050)	(0.057)	(0.086)	(0.079)
N	415	415	383	403	415	415	415	415	415	3465	2629
Participants	415	415	383	403	415	415	415	415	415	315	239

Notes: This table considers the treatment effect of the night sleep and nap interventions on risk and social preferences.

- All variables are standardized by the control group's average and standard deviation, with signs flipped when needed such that higher outcomes indicate lower risk preferences or more pro-social preferences.
- The dependent variables are separated into two panels: risk preferences components and social preferences components. Risk preferences components include the point at which the participant switched from the risky to safe choice in the risk aversion game (column 3) and the point at which the participant switched from the risky to safe choice in the loss aversion game (column 4). Social preferences components include the amount of money the sender sent in the dictator game (column 7), the amount of money the sender sent in the ultimatum game (column 8), the amount of money the sender sent in the trust game (column 9), whether the recipient accepted the sender's offer in the ultimatum game (column 10) and the amount of money the recipient sent back to the sender in the trust game (column 11).
- Columns 1 and 2 are weighted averages of the two standardized risk and loss aversion outcomes outcomes. Column 1 averages the outcomes optimally accounting for correlation across measures (Anderson, 2008), while Column 2 is a simple unweighted average of the standardized outcomes. Similarly, Columns 5 and 6 are the weighted averages of the five standardized social preferences outcomes. Column 5 averages the outcomes optimally accounting for correlation across measures, while Column 6 is a simple unweighted average.
- We include all observations, even those with non-monotonic decisions, when calculating the indices, while non-monotonic observations are excluded in the component regressions. We also take the average of recipients' choices across different amounts of money they received from senders when calculating indices, while we separate different recipients' choices in component regressions.
- Each column shows the OLS estimates of an equation similar to (2). In the regression, we pooled the two night sleep treatments and controlled for age, sex, and baseline measures of the dependant variable (ANCOVA) when available. When the dependent variable is an index, we control for the index at baseline. When the outcomes are recipients' choices, we control for the amount of money they received from senders, which is also standardized.
- Corrected p-values that control for the Family-Wise Error Rates are included in brackets in columns 2 and 6. A full description of our approach to multiple hypothesis corrections can be found in Appendix E.

Table A.XVIII: Summary of Decision Making Outcomes

	Savings	Default Pass-Through	Present Bias	Salience	Risk Preferences	Social Preferences
Night Sleep Treat	-3.46	-0.03	0.01	0.01	-0.04	-0.04
	(9.30)	(0.21)	(0.03)	(0.04)	(0.08)	(0.06)
	[1.000]	[1.000]	[1.000]	[1.000]	[1.000]	[0.999]
Nap Treat	16.37	0.00	0.06	0.10	0.07	0.05
	(8.28)	(0.20)	(0.03)	(0.04)	(0.08)	(0.06)
	[0.434]	[1.000]	[0.416]	[0.130]	[0.996]	[0.996]

*** *Significant at the 1 percent level*, ** *Significant at the 5 percent level*, * *Significant at the 10 percent level*

Notes: This table considers the treatment effect of the Night Sleep and Nap interventions on the six outcomes in the decision making family, as defined in the body of the paper: daily savings deposits, default pass-through, present bias, susceptibility to the salience of piece-rates, risk preferences, and social preferences.

- All signs are flipped as needed such that higher outcomes indicate more desirable outcomes.
- Risk preferences components include a standardized average of the point at which the participant switched from the risky to safe choice in the risk aversion game and the point at which the participant switched from the risky to safe choice in the loss aversion game. Social preferences components include a standardized average of the amount of money the sender sent in the dictator game, the amount of money the sender sent in the ultimatum game, the amount of money the sender sent in the trust game, whether the recipient accepted the sender's offer in the ultimatum game and the amount of money the recipient sent back to the sender in the trust game.
- Each column shows the OLS estimates of an equation similar to (2). In the regression, we pooled the two night-sleep treatments and controls for age, sex, and average baseline measures of the dependant variable (ANCOVA) when available. When the dependent variable is an index, we control for the index at baseline. Additional controls, such as the incentive reward rate, are included as relevant to match the primary specification in which each outcome is referenced in the body of the paper.
- Corrected p-values that control for the Family-Wise Error Rate are included in brackets. A full description of our approach to multiple hypothesis corrections can be found in Appendix E.

Table A.XIX: Timing and Frequency of the Study Tasks

	Time (1)	Day in Study (2)
Blood Pressure	Morning	Every 4 days
Weight	Morning	1, 28
Well-Being Survey	Morning	All days
Information about Sleep Treatment Assignment	10:00 - 12:30	8
Risk and Social Preferences Task	10:00 - 12:30	7, 26
BDM Task for sleep devices	10:00 - 17:00	31
Biking Task	11:00 - 20:00	28
Depositing Defaulted Savings (if applicable)	Morning	All days
Lunch	12:30 - 13:00	All days
Nap Explanation	13:00 - 13:30	9
Nap Time	13:30 - 14:00	9 - 27
Cognitive tasks - H&F, Corsi and PVT	14:20 - 16:00	2 - 27
Present Bias Task	17:00 - 20:00	4, 5, 6, 19, 20, 23
Sleep Devices Delivery	18:00	8
Savings Decision	End of the day	All days
Payment for the Day's Work	End of the day	All days

Notes: This table reports the timing of all the tasks in study.

- The time is recorded for standard days. When present bias and cognitive tasks are conducted on the first day, the time is longer than normal days for participants' understanding.
- Depositing defaulted savings happens at the end of daily survey. The savings survey is conducted at the end of the day and payment happens after saving survey. "Regular" day work ends by 20:00, while shorter day work ends by 17:00.
- Cognitive tasks have four slots daily. The total daily time each participant spends on cognitive tasks is 25 minutes, the duration of one slot. PVT is done daily (10 minutes), while Hearts and Flowers and Corsi are rotated by randomization (roughly 10 minutes each).
- See Appendix B.6 for additional details regarding the timing of the Present Bias task.

Table A.XX: Summary of Averages for Main Study (RCT) and Sleep Survey

	Survey Self-report (1)	RCT Self-report (2)	Survey Actigraph (3)	RCT Actigraph (4)
Night sleep	6.49	7.19	5.45	5.58
	(1.37)	(1.38)	(1.14)	(1.19)
Total sleep	6.92	-	5.84	-
	(1.48)	-	(1.22)	-
Night sleep efficiency	0.88	0.90	0.71	0.70
	(0.09)	(0.08)	(0.10)	(0.11)
$\mathbb{1}$(Any nap in preceding week).	0.57	0.73	0.46	-
	(0.49)	(0.44)	(0.50)	-
Naps per day	1.05	1.13	1.04	-
	(0.43)	(0.83)	(0.15)	-
Average nap duration (hr.)	1.19	1.52	0.85	0.25[1]
	(0.86)	(2.42)	(0.61)	(0.08)
Nap efficiency	-	-	0.72	0.85[1]
	-	-	(0.23)	(0.25)

Notes: This table presents summary statistics (averages) for relevant sleep variables comparing the main study (RCT) to the sleep survey (SS). Standard deviations are presetend below averages in parenthesis.

- Data from sleep survey actigraphy are cross-referenced with participants self-reports of sleep.
- Data from the main study (RCT) comes from the baseline period to ensure comparability with the sleep survey data.
- Main study (RCT) data on self-reported naps comes from the baseline survey where people answer questions about their usual sleep habits.
- Survey self-reports contain data from 3,387 participants, while survey actigraph data contains information on 440 participants.
- Nap time and average nap duration are conditional on napping.
- [1]: Conditional on napping for at least 1 minute.
- -: Data not available.

Table A.XXI: Sleep Survey Stagewise Take Up

	Percent of last stage (1)	Percent of total (2)	Frequency (3)
Census	49.93	49.93	3833
Baseline Survey	88.49	44.18	3392
Interest to hear about actigraph	39.15	17.30	1328
Willingness to wear actigraph	61.60	10.66	818
Actigraph installation	61.74	6.58	505
Endline Survey	97.43	6.41	492
Actigraph component participants (all)	89.23	5.72	439
Actigraph component participants (completed)	82.52	5.29	406
N			7677

Notes: This table presents take-up across the different stages in the sleep survey.

- *N* represents the total number of participants approached for the study, including refusals to the census.
- Installation of actigraphs could not be done for all willing participants for multiple reasons such as non-availability of the participant on the day of installation, refusal to wear the actigraph at the time of installation, shortage of actigraph devices at our disposal, and compliance with the upper limit of installing 20 actigraphs per locality.
- The difference between the number of participants for whom actigraphs had been installed and the number of those who participated in the actigraph component is the number of participants who dropped-out from the study after installation.
- “Actigraph component participants (all)" includes all participants who wore the actigraph for 1 night or more.
- “Actigraph component participants (completed)" includes only those participants who complied with the study’s requirement of wearing the actigraph for 3 nights.

Table A.XXII: Sleep Survey Demographics

	Census (1)	Baseline (2)	Actigraph (3)
Gender (female)	0.72	0.72	0.65
Low income (by self-reported)		0.43	0.53
Middle income (by self-reported)		0.28	0.28
High income (by self-reported)		0.17	0.16
Low income (by house type)	0.11	0.12	0.18
Middle income (by house type)	0.65	0.67	0.64
High income (by house type)	0.24	0.21	0.18
Low income (by area)	0.06	0.07	0.10
Middle income (by area)	0.58	0.60	0.63
High income (by area)	0.36	0.33	0.27
Age	45.81	45.19	45.76
	(15.74)	(15.10)	(15.05)
Employed		0.39	0.43
No schooling		0.06	0.08
Highest grade attended		9.38	8.64
		(3.38)	(3.67)
College degree		0.31	0.22
N	3833	3392	439

Notes: This table presents demographics of participants who agreed to take part in the three stages of the study - census, baseline survey, and actigraph component.

- Different categories of income include - "self-reported" income data, collected through the baseline; income based on "house type" and "area", based on observation by surveyors. Income categories for "self-reported" income data are as follows: Low income - monthly household income below Rs. 20,000; middle income - monthly household income Rs. 20,000 and above, but below Rs. 40,000; high income - monthly household income above Rs. 40,000.
- The percents in the income categories based on self-reporting do not add up to 100 since the data here excludes the two categories - "Do not know" and "Do not want to disclose."
- 0 for the employment dummy denotes the following categories - unemployed, housewives, and retired without pension.

Table A.XXIII: Sleep Survey - Sleep Correlates

	Self-reported Night Sleep		**Actigraph Night Sleep**			**Actigraph Total Sleep**			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	PW
Self-report Sleep Q2			0.54***			0.43***			
			(0.10)			(0.11)			
Self-report Sleep Q3			0.59***			0.56***			
			(0.10)			(0.11)			
Self-report Sleep Q4			0.88***			0.82***			
			(0.10)			(0.11)			
Middle Income	0.071	0.053		0.20	0.17		0.15	0.13	0.13
	(0.10)	(0.10)		(0.12)	(0.13)		(0.12)	(0.13)	(0.13)
Higher Income	0.056	0.0041		0.035	0.027		0.016	0.036	0.026
	(0.11)	(0.11)		(0.13)	(0.14)		(0.13)	(0.14)	(0.14)
Female	-0.039	-0.065		0.19**	0.18*		0.13	0.11	0.097
	(0.054)	(0.064)		(0.086)	(0.098)		(0.090)	(0.10)	(0.11)
Age 34 - 45	-0.54***	-0.50***		0.014	0.0046		0.026	0.0047	0.026
	(0.062)	(0.064)		(0.11)	(0.11)		(0.11)	(0.12)	(0.12)
Age 46 - 58	-0.58***	-0.52***		-0.55***	-0.57***		-0.50***	-0.55***	-0.49***
	(0.069)	(0.072)		(0.11)	(0.12)		(0.12)	(0.13)	(0.13)
Age 59 - 92	-0.45***	-0.40***		-0.058	-0.077		-0.032	-0.072	-0.021
	(0.072)	(0.075)		(0.11)	(0.11)		(0.12)	(0.12)	(0.12)
Children (numb)	-0.068***	-0.062**		-0.10**	-0.11**		-0.092*	-0.10**	-0.099**
	(0.026)	(0.026)		(0.045)	(0.045)		(0.047)	(0.047)	(0.050)
School No Col		-0.11			0.26*			0.20	0.22
		(0.11)			(0.13)			(0.13)	(0.14)
College		0.046			0.12			0.016	0.058
		(0.12)			(0.15)			(0.16)	(0.16)
Employment		-0.090			0.0030			-0.0022	-0.00025
		(0.057)			(0.088)			(0.093)	(0.096)
Constant	6.90***	6.99***	4.98***	5.42***	5.27***	5.25***	5.69***	5.61***	5.57***
	(0.12)	(0.17)	(0.070)	(0.16)	(0.20)	(0.076)	(0.16)	(0.21)	(0.22)
Mean	6.5	6.5	5.5	5.5	5.5	5.7	5.7	5.7	5.7
N	3389	3387	1367	1367	1367	1367	1367	1367	1367
Participants	3387	3387	439	439	439	439	439	439	439

*** *Significant at the 1 percent level*, ** *Significant at the 5 percent level*, * *Significant at the 10 percent level*

Notes: This table considers correlations between a series of covariates (such as age and income) and self-reported night sleep, day-level actigraph-measured night sleep and total sleep.

- Actigraph total sleep is calculated from adding actigraph night sleep and naps.
- Covariates include self-reported sleep quartiles calculated from multiple survey questions and participants' demographic characteristics: age quartiles, sex, education level dummies, number of children, and whether the respondent is employed. Income levels are derived from the surveyors assessment of the income level of the participants neighborhood. Education level dummies include whether the participant attended school but stopped before college and whether they ever attended college, compared to no schooling.
- Column 9 uses probability weights, which are calculated by dividing income proportions in census data by income proportions of population from SES Mapping data.

Table A.XXIV: Sleep Survey Nap Correlates

	Whether Nap		**Acti Nap Cond. on Napping**	
	(1)	(2)	(3)	(4)
Middle Income	-0.10**	-0.10**	0.082	0.11
	(0.044)	(0.045)	(0.089)	(0.099)
Higher Income	-0.093**	-0.080	0.18*	0.21**
	(0.047)	(0.050)	(0.098)	(0.11)
Female	0.025	0.0079	-0.32***	-0.28***
	(0.025)	(0.028)	(0.084)	(0.096)
Age 34 - 45	0.028	0.020	-0.019	-0.0080
	(0.033)	(0.034)	(0.12)	(0.12)
Age 46 - 58	0.067**	0.049	-0.031	-0.056
	(0.033)	(0.035)	(0.12)	(0.12)
Age 59 - 92	0.062*	0.041	-0.096	-0.11
	(0.033)	(0.035)	(0.12)	(0.12)
Children (numb)	0.0034	0.00096	0.016	0.019
	(0.015)	(0.015)	(0.043)	(0.042)
School No Col		0.031		-0.35**
		(0.046)		(0.14)
College		-0.035		-0.29*
		(0.051)		(0.16)
Employment		-0.019		0.085
		(0.027)		(0.085)
Constant	0.29***	0.31***	1.03***	1.26***
	(0.051)	(0.066)	(0.15)	(0.22)
Mean	.26	.26	.89	.89
N	1367	1367	345	345
Participants	439	439	203	203

*** *Significant at the 1 percent level*, ** *Significant at the 5 percent level*, * *Significant at the 10 percent level*

Notes: This table considers the correlation between demographic controls and whether someone naps as measured by the actigraph, and actigraph nap time conditional on napping.

- Dependent variables are recorded on the participant-day level.
- Controls include income levels by the respondent's neighborhood and participants' characteristics: age quartiles, sex, education level dummies, number of children, and whether the respondent is employed. Education level dummies include whether the participant attended school but stopped before college and whether they ever attended college, compared to no schooling.
- Standard errors are clustered at the participant level.

Table A.XXV: Work Outcomes - Sensitivity to Measurement and Coding

	Labor Supply		**Earnings**			
	Code NA	Input Zero	Code NA		Input Zero	
Comparison	Levels (1)	Levels (2)	IHS (3)	Levels (4)	IHS (5)	Levels (6)
Night Sleep vs. Control	-0.17***	-0.22**	-0.01	-7.55	-0.10	-12.88*
	(0.05)	(0.11)	(0.02)	(5.12)	(0.12)	(7.66)
Nap vs. Break	0.03	0.00	0.03*	11.11**	0.05	11.49
	(0.05)	(0.11)	(0.02)	(4.88)	(0.12)	(7.48)
Nap vs. No Break	-0.44***	-0.34***	-0.08***	-22.67***	0.02	-14.84*
	(0.05)	(0.11)	(0.02)	(5.00)	(0.12)	(7.81)
Control Mean	4.10	4.10	5.36	285.09	5.36	285.09
Control SD	2.20	2.20	2.37	224.08	2.37	224.08
N	6992	8288	6992	6992	8288	8288
Participants	451	452	451	451	452	452

Notes: This table considers the sensitivity of our results with respect to differences in coding and measurement of the earnings and labor supply variables.

- Row 1 shows treatment effects of the two Night-Sleep interventions (pooled) in comparison to the Control Group. Row 2 shows treatment effect of the Nap intervention in comparison to participants not randomized to naps who took a break during the nap time. Row 3 is analogous, but the comparison group consists of participants who worked during the nap period.
- The dependent variables are: labor supply (capturing hours actively typing) and total earnings from data-entry work.
- Each column shows the OLS estimates of equation (2), controlling for average baseline values of the dependant variable (ANCOVA), age, sex, "regular" study day, fraction of high piece-rate sessions, and day in study and date fixed effects. Standard errors are clustered at the participant level.
- In columns 1, 3 and 4 we drop participant-day observations in which the participant was absent to the office, whereas in columns 2, 5, and 6 we use the entire sample and input zero for all outcomes when the participant was absent. In columns 3 and 5 the dependent variable is the IHS transformation in earnings level, whereas in the remaining columns the dependent variable is in levels.

B Detailed Description of Tasks and Surveys

B.1 Survey of Experts

B.1.1 Data collection

Three versions of the expert survey were used in order to ensure that respondents were all well-informed regarding the questions asked and that the survey could be conducted in language familiar to the respondents (e.g. the statistical methods used). The three different surveys have similar introductory and concluding sections and all surveys asked for predictions on the impact of night sleep in the data entry task. Both economists surveys also elicited predictions on savings, while the behavioral economists survey additionally elicited predictions on present bias. For the sleep experts, we elicited predictions on cognitive and health outcomes, asking about outcomes in the Psychomotor Vigilance Task (PVT) and blood pressure. In order to make all predictions comparable despite survey administration over an extended period, all the statistics we provide to the respondents only used data from study participants that had finished the study by the time we sent the first survey wave.

The survey can be divided in three main parts. In the first part, we introduce important information necessary to be able to take the survey. Each key information was separated in an individual page, and participants could move back and forth between these different pages using buttons in the bottom of the page. The introductory pages had the following information: (i) explanation of the survey's goal, who was it directed for, and informed consent; (ii) overview of the study, explaining the night sleep intervention and how we measured sleep, (iii) average and variance of night sleep in the control and treatment groups; (iv) explanation of the data-entry task; (v) a benchmark treatment, in which we provided the treatment effect of quadrupling the piece rate on the number of correct entries in the data-entry task and, in a some versions of the survey, also the predictive effect of an additional year of education on the same outcome. In versions of the survey that were distributed via email list, we also asked the participants to identify themselves with their name, degree, and institution they worked for. Even though the participants could not move before entering this information, nothing impeded them of entering false information.

In the second part of the survey, we elicited the experts' predictions. In each page we elicited a single prediction, and participants could move back and forth between the pages to check and modify their answers. The typical page is represented in Figure A.XI. There are a few elements worth highlighting:

1. The predictions were supposed to be entered numerically in the white box in the middle of the screen.

Participants were asked to input their prediction as the difference in levels of the outcome variable between treatment and control groups.

2. In each question, we inform the respondent about the level of the outcome variable during the treatment period for the RCT's control group participants. We also provided a table at the bottom of the screen which mapped participant's answers to percentage and standard deviation changes for ease of interpretation. Finally, if the respondent passed the mouse over the red text below the table, a pop-up message appeared with the benchmark effects we had showed them in the last page of the introductory section.

3. Sleep medicine experts were asked to predict the intention-to-treat (ITT), i.e., the effect of being randomized to one of the night sleep interventions on outcomes. In both economists' surveys, we asked the respondent to predict the 2SLS coefficient associated with an hour increase in sleep. These differences are in accordance to common practice within each field.

4. For both groups, we informed then that the treatment effect of the pooled night sleep treatments on sleep was 32 minutes. So to make the predictions comparable across experts and with our own ITT results, we divide the economists' answers by 2 and the sleep science experts by 32/30.

5. To guarantee that the respondents had answered correctly, Qualtrics prompted the participants, just after they submitted their prediction, with a page repeating their answer, saying what it meant in percentage and s.d. terms, and asking if they wanted to continue with the survey or go back to modify their answer.

6. We allowed the respondents to skip any of the questions. They would be prompted with a pop-up asking whether they were sure they wanted to move on without answering the question, but they could just dismiss it, skipping to the next section.

The third part of the survey was a check-out page, thanking the respondents for their time and inviting them to add their email address in case they wished to receive information about the final results of the study and if they had any comments about the survey.

B.1.2 Data collection

We piloted the survey with PhD students from Harvard and MIT. In this phase we made constant alterations to the survey based on the comments and answers of the respondents.

In the first wave of data collection, we sent 68 personalized emails to researchers we know personally to the PIs. We classified 35 of the potential respondents as non-behavioral economists, 26 as behavioral economists, and 7 as sleep medicine experts. Of those 45 completed the entire survey and an additional 7 answered some of the questions.

We performed a second wave of data collection specifically for the sleep experts survey through an email list one of the authors in the paper was part of. This email list included young scholars studying topics related to sleep science. We obtained 2 additional completed responses from this source.

Because of the low number of answers from sleep science experts, we performed a third round of data collection with the sleep scientists. We sent an email to three email lists of professionals in the field of sleep medicine, including doctors and full-time researchers. Those emails were kindly sent by Dr. PhD Michael Perlis to email lists he was a part of. [42] In this wave, we were able to obtain 60 complete answers and an additional 10 incomplete answers.

In total, we use 107 complete surveys and 17 incomplete surveys.

A final issue important emphasizing is that our results were not available in any format publicly and we did not present them before the last wave of the survey of experts. Colleagues that were aware of early stage results through conversations with us were purposefully excluded. For the second and third waves of the sleep scientists, even though we cannot guarantee their identities, all participants included their names and we do not know any of them personally nor believe to be possible they would know the partial results of the study.

B.2 Attention in the Work Environment: Estimation Strategy

For each of the treatment groups j (i.e. night sleep, nap, and control), we estimate the (average) reaction to high piece-rate under the salient and non-salient conditions for output, productivity, and labor supply, denoted by ϵ_j^S and ϵ_j^{NS}, respectively. The attention parameter θ_j is defined as the ratio between the reaction to incentives under non-salient and salient conditions, i.e. $\frac{\epsilon_j^{NS}}{\epsilon_j^S}$. Importantly, we assume that the response to piece-rates under the salient condition is the full-attention benchmark, as in Chetty et al. (2009) and Allcott and Taubinsky (2015). We interpret θ_j as the deviation from the "full-attention benchmark" caused by inattention to non-salient incentives. Participants are fully-attentive even in the non-salient condition when $\theta_j = 1$ and completely inattentive when $\theta_j = 0$.

[42] We are extremely grateful to Michael Perlis for the help in reaching out to a vast network of sleep medicine experts. We would not have been able to reach nearly as many people without his unflagging support and generosity.

We estimate the treatment effect of the sleep interventions by comparing the attention parameter θ in each treatment group to the control group's θ. We first estimate the average reaction to incentives for each group j during the full salience and non-salient periods, using the OLS regression

$$y_{iwtd} = \sum_j \mathbb{1}_{\text{Treat}_i=j} \cdot \left(\beta_1^j \text{High}_{iwt} + \beta_2^j \text{Sal}_{it} + \beta_3^j \text{High}_{iwt} \cdot \text{Sal}_{it}\right) + \delta_i + \delta_t + \delta_d + \nu_{iwtd}, \tag{3}$$

where $\mathbb{1}_{\text{Treat}_i=j}$ captures whether participant i was in treatment group j, High_{iwt} captures whether the participant faced a high piece-rate during the 30-minute incentive window w (as described above), and Sal_{it} whether participant i was randomized to the salient condition on day t.

This equation differs from the benchmark reduced-form regression (2) in two ways. First, rather than using an ANCOVA specification as with other outcomes, we used participant-level fixed effects given the within-person variation in salience *during* the treatment period. Second, the unit of observation is the 30-minute window rather than the day given the frequency of potential incentive changes. We use the OLS estimates from equation (3) to recover $\hat{\epsilon}_j^{NS} = \hat{\beta}_1^j$ and $\hat{\epsilon}_j^S = \hat{\beta}_1^j + \hat{\beta}_3^j$. Finally, we estimate the attention parameter for each group by $\hat{\theta}_j = \frac{\hat{\epsilon}_j^{NS}}{\hat{\epsilon}_j^S}$. Standard errors in equation (3) are clustered at the participant level, while standard errors for $\hat{\theta}_j$ are estimated using the Delta Method.

B.3 Savings Task

Construction of counterfactual interest accrued variable. We define that savings at day 9 was zero, $s_9 = 0$, and take the participant's actual savings flow at date t, x_t, as given. Then for any day $t > 9$ we set counterfactual savings as $s_t = \max\{0, 1.01 \cdot (s_{t-1} + x_{t-1})\}$. It is necessary to introduce the maximum operator since because we set $s_9 = 0$ it is now possible to have negative balance sheets - that would be the case for participants deciding to withdraw quantities at day 10, $x_{10} < 0$, for example. Interest accrued at t is defined as $y_t = 0.01 \cdot (s_t + x_t)$ for $t \geq 9$.

For our ANCOVA specification, we repeat the same procedure but for the baseline period, setting $s_1 = 0$. We then control for the total interest accrued during baseline.

B.4 Default Task

Overview.

We implemented an experiment to measure the propensity to override default options in savings decisions. Each day, participants were randomized to have their survey completion fee deposited in their savings account or to be paid out along with their other payments at the end of the day. They could choose to override the default allocation each day when making their daily savings decision. The intention of this design was to identify possible effects of increased sleep on the strenght of default effects. We speculated that increased sleep could boost attention and memory or change the cognitive costs of making active decisions and thus reduce the stregth of default effects. Ultimately, the outcome measure ended up being severely under-powered, and thus we do not report it in the main text of the paper. Details are presented below.

B.4.1 Task Design

Default Process. As described participants, participants responded to a daily survey that elicited details about sleep, well-being, earnings, and consumption and expenditure patterns. Starting on the second day of the study, payments for completing the daily survey (Rs. 40) were either paid out in cash at the end of the day or put into the savings box (i.e. defaulted into savings) in the morning, right after the daily survey. That is, default savings were either Rs. 0 or Rs. 40. Once participants reached the end of the day, they made their savings decisions where they could choose to save any additional amount (up to the daily maximum of Rs. 400, including any amount defaulted into savings) or to withdraw any amount that was in the savings box, including any payment deposited earlier in the day (default savings) or in previous days. Accordingly, default savings were not binding in any way. Participants learned whether their survey payment would be defaulted into their savings account after completing their daily survey but would not be reminded again of their default type over the course of the day.

Varying Frequency. Participants were randomly assigned to receive the default either once every three days or twice every three days. We randomized defaults in that manner to investigate whether timing or expectation of the defaults were driving participants' responses.

Participant Instructions. Already on their first day at the study office participants learned that every day, upon completion of the daily survey, they would receive Rs. 40. Also, they were told that whether they received the survey payment in cash or would have it added to their savings in the box would be randomly decided by a computer. From the second day on, each day they after finishing the daily survey participants were informed whether they had been selected to receive the money in cash or in savings. In the case of the latter, the money would be added to the savings box in their presence and they would sign a receipt (as was standard practice for all deposits). Throughout the entire study, participants were unaware that they had been randomized in two groups according to the frequency in which their payment would be defaulted to savings; one-third of two-thirds of the time.

B.4.2 Treatment Effect on Default Pass-Through

The first default specification follows the savings specification but includes an interaction between the default amount (Rs. 0 or Rs. 40) and the sleep treatment. Since we are adding a variable that takes the value of the default, rather than a 0-1 variable, the coefficients associated with it should be interpreted as the difference in pass-through: the difference between the treatment and control groups in the percentage of the defaulted payment that the participants save due to the default effect alone.

Intuitively, we want to measure whether participants in the sleep treatment save less on days when the payment is defaulted into savings than do control participants, i.e. whether they are less susceptible to the default.

To estimate the treatment effect of the night sleep and the nap interventions, we estimate the following equation by OLS:

$$y_{itd} = \beta_1 T_i^{NS} + \beta_2 T_i^{Nap} + \alpha_1 D_{itd} + \alpha_2 T_i^{NS} * D_{itd} + \alpha_3 T_i^{Nap} * D_{itd} + \gamma_1 \overline{y}_{ib} + \gamma_2' X_{it} + \delta_t + \delta_d + \delta_s + \epsilon_{itd} \quad (4)$$

The outcome variable in this regression, y_{itd}, is daily deposits and the estimation mimics our benchmark specification, except for the inclusion of the default variable D_{itd}, which is either 0 or 40, and its interactions with night sleep and nap treatments.

The coefficients of interest are α_2 and α_3, respectively the night sleep and nap treatment effects on default pass-through. The term X_{it} captures control variables, including age, sex, daily piece rate, interest rate, maximum payment from cognitive tasks and randomized piece rate for the present bias task. Additionally, we control for the baseline daily average deposits ($\overline{y}_{ib}$) and for date (δ_t), day in study (δ_d), and surveyor (δ_s) fixed effects. Because participants were not informed of their default status until completing the daily survey, we exclude from our analysis absent days.

B.4.3 Treatment Effect on Propensity to Overrule Default

In the second specification, the key outcome of interest is whether the night sleep or the nap treatments affect an individual's propensity to be an active saver, i.e. to make decisions defying the defaulted amount. The specification we employ to capture that uses an indicator of whether the participant followed the default amount as an outcome variable (saving an amount other than Rs. 0 or Rs. 40, depending on whether the payment was defaulting into cash versus savings).

We run the following specification:

$$y_{itd} = \beta_1 T_i^{NS} + \beta_2 T_i^{Nap} + \alpha_1 \text{Type}_{itd} + \alpha_2 T_i^{NS} * \text{Type}_{itd} + \alpha_3 T_i^{Nap} * \text{Type}_{itd} + \\ + \gamma_1 \overline{y}_{ib} + \gamma_2' X_{it} + \delta_t + \delta_d + \delta_s + \epsilon_{itd} \quad (5)$$

where the outcome variable y_{itd} is an indicator of whether the participant followed the default amount. Accordingly, $\overline{y}_{ib}$ is defined as the fraction of baseline days in which participant i did not deviate from the default option. The remaining controls variables are the same as in (4).

Distinct from (4), we do not estimate the default pass-through but instead are interested in treatments interactions with Type_{itd}, a dummy variable equal to one if the daily survey payment is defaulted into savings account rather than given to participants in cash. Again, we do not include absent days.

Results. Default days were associated with a 24 percentage point increase on the probability of saving exactly Rs. 40 and an average increase of Rs. 17.6 in deposits (44% of the default amount).

Because the default pass-through was not very high relative the savings overall, we are under-powered to detect any treatment effects on the adherence to the default condition. We would only be able to capture an effect if the treatment changed the daily deposit by Rs. 17, i.e., a 42 percentage points decrease in comparison to the control group. Correspondingly, we find no evidence of night time or nap treatment effects on individuals' propensity to overrule default or changing the default follow-through (Table A.XII). However, we also do not view this result as conclusive evidence of a lack of impact given the low power for this particular outcome.

B.5 Health Outcomes

We captured a battery of different outcomes relevant to participants' health over the course of the study. These measures include:

- *Stationary biking outcomes:* On the last day of the study, participants were asked to bike on a stationary bike for 30 minutes, with incentive payments for total distance. We recorded total distance covered in the 30 minutes and the maximum speed attained. *Pre-registered*

- *Self-reported illness:* Participants are asked about any symptoms of sickness (e.x., fever, cold, headache, etc.) they have experienced in the last seven days, recorded at baseline and endline. We record the maximum number of days in a week that the participant experienced at least one symptom. *Pre-registered*

- *Pain levels.* Participants are asked to self report pain on a scale of 1 to 10, recorded at baseline and endline. *Pre-registered*

- *Daily Activity.* Participants are asked how much their health has limited them in a certain number of activities. The possible answers range from "they did not limit you at all" (0, the best outcome) to "limited you a lot" (3, the worse outcome). The final scale, which is the sum of the answers, goes from 0 for people who are not limited at all in their daily life by their health to 36 for people who are substantially limited in their daily life by their health. Questions come from the SF-36 Health survey and are recorded at baseline and endline. *Pre-registered*

- *Blood pressure:* Systolic and diastolic blood pressure are measured 5 times for each participant over their time in the study using a digital blood pressure monitor and set protocol to ensure consistency. Blood pressure is winsorized at the 5% level. *Pre-registered*

- *Daytime steps:* In addition to tracking sleep, the actigraphs also count steps. We tracked daytime steps (defined as steps between 9am and 8pm) as a measure of physical activity.

B.6 Present Bias

B.6.1 Experimental Design

Real-Effort Experiment. Similarly to Augenblick and Rabin (2018), participants make decisions about how many pages to type on a fixed date (“work day", henceforth) under different piece rates. The work is very similar to the data-entry work they are used to, except that the pages are shorter to allow for a less coarse choice set for the participants. This work is completed at a fixed time after the completion of their regular working day, but before they get paid.

Choices. Participants have to make a total of 14 decisions. On each of them, the participants is offered a w^c and must choose how many pages they would like to type for that piece-rate. We impose a minimum and a maximum number of pages each participant can choose. All participants must choose to type at least 5 pages, which we impose to avoid fixed costs associated with moving from 0 pages to 1 page, as in Augenblick et al. (2015). We also impose an upper limit of pages the participants can choose. We define a participant-specific upper limit, which we determine based on the participant's typing speed up to that point in the study. We impose this limit so every participant can easily finish the task within two hours even when they choose the maximum number of pages, avoiding considerations of risk of not being able to complete the task by lack of time from the participants[43] Immediately after they make their last decision, we randomly select one of the decisions made by the participant to be the one that counts for the task they need to perform. For example, if decision c is selected, the choice's associated piece rate, w^c, and the participants choice, e^c, will be the piece rate and the output target of the participant on the work day.

Timeline. The decisions are made on two different dates: 7 on a day prior to the work day (prospective date), and 7 on the work day. The prospective date can be 1 to 5 days before the work date. The payment date is always at least one day after the work day. Moreover, the payment date is a function of the randomly selected choice: we designed it so the payment distance is fixed between the date of a given choice and the payment if that choice is selected. The difference in choices between the two decision dates is the base of the identification of time preferences.

Participants completed the present bias experiment once in baseline and 1 to 3 times during the treatment period.

Earnings from the Task. Earnings from the tasks consist of a lump-sum plus $w^s \cdot e^s$, where w^s is the piece rate and e^s is the number of pages in the selected choice. The participant only gets paid if they complete all the committed to within 2 hours, otherwise they receive nothing from the present bias task.

Changes during the Study. The major change in design during the experiment was that in the first design we repeated the same 7 piece rates on the two decision dates. However, the debriefing of participants revealed that they sometimes deliberately tried to choose the same number of pages across dates for any given piece rate for what we understood as a preference for consistency. In order to avoid that issue, we changed the piece rates so there were 7 pairs of pieces that were randomized in blocks between day 1 and day 2 of the task. All the 14 piece-rates would therefore be different, which might make it harder for choices to be guided by participants' demand for consistency. Also, to allow more time to elapse between the two

[43] We do that as a priori sleep could impact risk-aversion, which would then affect this trade-off. We do not find however any treatment effect in risk preferences.

decisions, we reduced the number of times participants completed the present bias experiment from 3 to 1 in the treatment period. That was necessary since participants only have 3 weeks during the treatment period.

Exclusion Criteria. Of the 452 participants in the study, we cannot estimate a present bias parameter for 54 of those. These 54 are broken down as follows: (i) 24 participants never completed a single date of the present bias experiment in the treatment period; (ii) 11 participants completed date 1 at least once but no date 2 in the treatment period; (iii) 19 participants always choose the maximum or always choose the minimum number of pages during the treatment period. Since we cannot identify time preferences for those, we exclude them. Of the 398 participants that do not meet any of these criteria, we cannot estimate the structural β for 46 because the algorithm does not converge. In our preferred specification we also exclude those, leaving us with a sample of 352 participants.

Experimental Integrity. Table A.XV present evidence that the present bias tasks was well implemented and that compliance with the experiment was similar across treatment arms. In the first row, we show that we can estimate individual-level β for 77%-78% of participants. This falls in the second version because we only attempt to measure present bias once per participant. Of those, only 5% of the participants make the first round choices but then never completed the work they had committed to do. Importantly, not only this is a very high compliance rate, but there are no differences across experimental arms. It is also worth noticing that when participants were absent on the "work date", we allowed them to complete the second day of the Present Bias Experiment on the next day they came to office. We find that this is only the case for 11%-14% of the participants, with no distinguishable differences across treatment arms (third row).

B.6.2 Structural Estimation of Present Bias

We estimate individual-level short-term discounting parameters β assuming participants choose the number of pages they would like to type by maximizing the utility function[44]

$$U(e, w, k, t, T) = -\beta^{-D_{k,t}} \delta^{t-k} C(e) + \delta^{T-k} U_m(e \cdot w) \tag{6}$$

where T is the date of payment, t is the date of the work, k is the date of the choice, and $D_{k,t}$ is an indicator of whether $k = t$.

The first part of the utility function captures the cost of effort from the extra work. Following Augen-

[44] We estimate one model per participant

blick and Rabin (2016) (AR, henceforth), we assume the cost function has a power form in our benchmark specification , i.e.

$$c\left(e\right)=\frac{1}{\gamma}e^{\gamma} \tag{7}$$

In robustness checks we impose an exponential cost function, like in DellaVigna and Pope (2016), of the form:

$$c\left(e\right)=\frac{1}{\gamma}\exp\left(\gamma\cdot e\right) \tag{8}$$

The second part of the utility function captures the utility from choosing effort e under piece rate r, parameterized as

$$U_m(e\cdot w)=\phi\cdot w\cdot e+\alpha\cdot e \tag{9}$$

The first term of this function captures the utility of money. We found that some participants also appear to have an intrinsic motivation in working, which based on participants' debriefings is often linked to either reputation building (although we are explicit that we just want to know their preferences) or gift-exchange. We capture this effect with the term $\alpha\cdot e$ above. In practice adding this term improved our fit considerably. In our benchmark specification, optimal effort is given by

$$e^{*}\equiv e^{*}(k,t,T,w)=\left(\phi\cdot w\frac{\delta^{T-t}}{\cdot\beta^{\{t>k\}}}\right)^{\dfrac{1}{\gamma-1}} \tag{FOC}$$

Finally, we assume that we observe the data with noise and with censoring at 5 and $\max_i>5$. Thus, for choices interior to the participant's choice set, we assume we observe $\tilde{e}=e^{*}(k,t,T,w)\cdot\tilde{\varepsilon}$, where $\tilde{\varepsilon}$ is a log-normal error term independent across observations and from the covariates. When accounting for the possibility of censoring, we assume that the pages we observe being chosen is determined by

$$e_i=\begin{cases}5 & \text{if } \tilde{e}_i<5\\ \tilde{e}_i & \text{if } 5\leq\tilde{e}_i\leq\max_i\\ \max_i & \text{if } \tilde{e}_i>\max_i\end{cases}$$

In our benchmark specification, we estimate the utility parameters in 12 using a 2-sided Tobit model, with cost function 7 and return to effort 9. We also impose that $\delta=1$ in our preferred specification, which improved the quality of estimation of our key parameter of interest, β.

Finally, we estimate one model per participant that completed the present bias experiment at least once during the treatment period only using data from the treatment period. We do the same for the baseline period, so we end up with one baseline and one treatment period estimate of present bias per participant. The structural estimation does not converge for 47 participants in the treatment period in our preferred specification, so we drop those from the sample. The structural estimation also does not converge to 10 participants in the baseline period. We replace those missing values with the average value across participants during baseline, since we only use this variable as a control.

B.6.3 Treatment Effect on Present Bias

To estimate the treatment effect of the night sleep and the nap interventions, we estimate the following equation by OLS:

$$y_i = \theta_{NS} D_i^{NS} + \theta_{Nap} D_i^{Nap} + \omega X_i + \varepsilon_i \tag{10}$$

The outcome variable in this regression is an individual-level estimate of present bias, measured by the structurally estimated β in our benchmark specification described above. We also show results when y_i is the OLS estimate $\hat{\beta}_i^{raw}$ from the following regression

$$\log e_{cit} = \beta_i^{raw} \text{Now}_{cit} + \gamma_i^0 + \gamma_i^1 \log w_{cit} + \epsilon_{cit} \tag{11}$$

where Now_{cit} is an indicator of whether t is the work date, $\log e_{cit}$ is the log of pages chosen and $\log w_{cit}$ is the piece-rate in choice c.

The coefficients of interest are θ_{NS} and θ_{Nap}, the intention-to-treat estimates for the night sleep and the nap treatments, respectively. The term X_i captures control variables, including the baseline present bias parameter, estimated in the same way as the dependent variable, except using only observations from the baseline, rather than the treatment, period. We also control for participant's sex and age, as specified in our benchmark reduced form equation in the PAP.

C A Model of Sleep

To clarify our argument regarding the roles of sleep quantity and quality, and to help interpret our findings, we present a simple time-allocation model, building on Biddle and Hamermesh (1990) and extending their setup to incorporate sleep quality as well as quantity. In this model, in addition to work and leisure, the agent has a third time-consuming activity: sleep. In our model, sleep is both a consumption good generating utility directly and an investment good affecting the agent's productivity.

C.1 Setup

The agent's preferences are described by the utility function

$$u(c, l, s) = c + \alpha z(s) + v(l) \tag{12}$$

where $\alpha z(s)$ captures the consumption value of sleep quantity s, and $v(l)$ captures the utility of leisure time, l. We assume that $z(\cdot)$ is an increasing and concave function such that $z'(0) \to \infty$, and we simplify the problem by assuming that $v(l) = -\frac{k}{2}(T - l)^2$.[45]

Time budget. The agent chooses the time spent in bed, b, which in turn produces a quantity of sleep $s \leq b$. We assume that sleep quantity is given by $s = b \cdot \chi$, where χ represents sleep efficiency, our main empirical measure of sleep quality.[46] Highlighting the fact that people with higher sleep quality have a smaller opportunity cost of sleep, the agent's time budget constraint is given by

$$T = h + l + \frac{s}{\chi} \tag{13}$$

where h represents time working.

Financial Budget. We assume that the agent earns $\lambda(s, \chi) \cdot h$, where $\lambda(s, \chi)$ is the productivity of an agent who sleeps s hours a day with quality level χ. This specification allows us to capture important features of the link between sleep and productivity. First, we assume that λ_s, the partial derivative of productivity with respect to sleep quantity s, is weakly positive. Holding quality fixed, we thus assume that more sleep cannot decrease productivity.[47] Additionally, we assume that gains in productivity from sleep come at diminishing rates, i.e. $\lambda_{ss} < 0$. Second, we assume that $\lambda_\chi \geq 0$. Holding quantity fixed, improved sleep quality will weakly increase productivity. This is consistent with evidence from sleep science finding that more interrupted sleep leads to worse daytime alertness, even controlling for total sleep time (Stepanski, 2002). The cross-partial derivative $\lambda_{s\chi}$ captures whether sleep quantity and quality are complements (> 0) or substitutes (< 0) for the agent's productivity. Finally, for the problem to be well-defined, we assume that $\lambda_{s^2} < 0$, i.e., there are

[45] This leisure function is chosen to simplify the calculations for comparative statics, but the results hold more generally for any increasing and strictly concave function v.

[46] More generally, the results are substantively the same if we assume that $s = b \cdot f(\chi)$, where f is a twice-differentiable function satisfying $f' > 0$ and $f'' \leq 0$.

[47] Some correlational studies indicate that sleeping more than 10 hours per night is associated with worse outcomes for adults. However, increases in sleep in the range typically achieved by our participants has been shown to increase productivity (Gibson and Shrader, 2018; Cappuccio et al., 2011).

decreasing marginal returns to sleep on productivity.

In this model, all of the agent's wage is used for consumption, implying that

$$c = \lambda(s, \chi) \cdot h \tag{14}$$

Agent's Problem. The agent's problem is to decide how much to consume and how much time to allocate to work, leisure, and sleep, while respecting their time and financial budget constraints. Formally, the agent solves:

$$\arg\max_{c,h,l,s} c + \alpha z(s) + v(l) \tag{15}$$

$$\text{s.t.} \quad T = h + l + \frac{s}{\chi} \tag{TC}$$

$$c = \lambda(s, \chi) \cdot h. \tag{BC}$$

Substituting in the time and budget constraints and using the assumed functional form of v, the problem becomes

$$\arg\max_{h,s} \lambda(s, \chi) \cdot h + \alpha z(s) - \frac{k}{2}\left(h + \frac{s}{\chi}\right)^2 \tag{16}$$

We denote this utility function by $U(h, s; \alpha, \chi)$.

C.2 Propositions and Discussion

The first proposition addresses the impact of increasing the consumption value of sleep, including due to our randomly-assigned financial incentives to sleep more. Such incentives to sleep can be modeled as an increase in α, which affects productivity $\lambda^*(\alpha, \chi) \equiv \lambda(s^*, \chi)$ via changes in sleep quantity s^* and work hours h^*. How sleep hours and work hours respond to changes in any parameter depends on two forces. First, the direct effect of the parameter on the marginal utility of sleep or work hours. These effects are straightforward. Second, and less obvious, whether sleep and work act as complements or substitutes in equilibrium. This relationship is an equilibrium condition which we denote by

$$U_{sh} = \lambda_s(s^*, \chi) - \frac{k}{\chi} \tag{17}$$

If $U_{sh} > 0$, then work and sleep are complements in equilibrium, meaning that an increase in sleep quantity will act as a force to increase work and vice versa. If $U_{sh} < 0$ sleep and work are substitutes, such that an increase in sleep will decrease work. There are two opposing forces determining the sign of U_{sh}. First, $\lambda_s(s^*, \chi)$ captures the effect of increased sleep on productivity, which we assume to be (weakly) positive. Second, $\frac{k}{\chi} < 0$, captures the fact that increasing sleep reduces leisure, driving an increase in the shadow price of work. The relative strength of these two forces will determine whether work and sleep are complements or substitutes.

Proposition 1. *Increasing the consumption value of sleep (or external incentive to sleep), α, will:*

i. Strictly increase sleep quantity s^*.

ii. Alter hours worked, h^*, by $h^*_\alpha = \frac{s^*_\alpha}{k} \cdot U_{sh}$, which is positive if and only if $U_{sh} > 0$, i.e., work and sleep are complements in equilibrium.

iii. Weakly increase productivity by $\lambda^*_\alpha = s^*_\alpha \cdot \lambda_s \geq 0$

The consumption value of sleep parameter α directly alters the marginal utility of sleep, but does not directly impact either work or leisure. Therefore, sleep increases with α, crowding out either work or leisure. As discussed above, the sign of $U_{sh} = \lambda_s - \frac{k}{\chi}$, the substitution pattern between sleep and work, determines which of these activities is crowded out. The sign of this term is ambiguous, hence, the treatments impact on labor supply must be determined empirically.

Moving from time allocation to productivity, Proposition 1 implies that the impact of the consumption value of sleep α on productivity should be non-negative. This follows from the fact that the impact of α on productivity is mediated by the increase in sleep. Because we assume that sleep quantity has a non-negative impact on productivity ($\lambda_s > 0$), increasing the consumption value of sleep will also (weakly) increase productivity.

The next proposition considers the sleep quality parameter, χ, and derives similar comparative statics for sleep, work, and productivity.

Proposition 2. *An increase in sleep quality χ has the following implications:*

i. Increases sleep s^* iff[48]

$$s^*_\chi \propto \left[\lambda_{s\chi} \cdot h + \frac{1}{\chi^2} \cdot \left(v'(l) + \frac{k}{\chi} \cdot s\right)\right] + U_{sh} \cdot h^*_\chi > 0 \tag{18}$$

[48]The term $\propto$ denotes that the terms have the same sign. We use this notation to suppress additional positive terms which do not alter the results or intuition. The complete derivation is presented in the proof of the proposition

ii. Increases work h^* iff

$$h^*_\chi \propto \left[\lambda_\chi + \frac{k}{\chi^2}\right] + U_{sh} \cdot s^*_\chi > 0$$

iii. Increases productivity λ^* iff

$$\lambda^*_\chi = \lambda_\chi + s^*_\chi \cdot \lambda_s > 0 \tag{19}$$

In addition, a sufficient condition for $\lambda^*_\chi > 0$ is that $s^*_\chi \geq 0$.

There are two key results in Proposition 2. The first concerns time use. Items 1 and 2 decompose the effect of sleep quality χ on time allotted to sleep and work. Both expressions have a similar structure. First, sleep quality affects the variables directly, by modifying the marginal utility of each activity keeping the other constant (terms in brackets). In addition, when sleep and work are complements in equilibrium ($U_{sh} > 0$), there will be a reinforcing effect as an increase in work increases the marginal return to sleep and vice-versa. If, however, sleep and work are substitutes in equilibrium ($U_{sh} < 0$), the opposite holds, and the effect of χ on both variables may be mitigated.

In more detail, Equation 18 highlights the three channels through which sleep quality χ affects sleep quantity. There are two elements of the direct effect. $\lambda_{s\chi} \cdot h$ captures the fact that increased sleep quality may change the marginal effect of sleep quantity on productivity. If quantity and quality are complements for work productivity, $\lambda_{s\chi} > 0$, whereas the opposite holds when they are substitutes. A second element of the direct effect, $\frac{1}{\chi^2} \cdot \left(v'(l) + \frac{k}{\chi} \cdot s\right) > 0$, captures the fact that an increase in sleep quality reduces the shadow cost of sleeping. This happens because as sleep quality improves, each minute in bed translates into more time asleep. This effectively reduces the price of sleep, causing the agent to consume more of it. Finally, as discussed above, there is also an indirect effect. Sleep quantity will also be affected by how hours worked react to sleep quality (χ), which is captured by h^*_χ in the end of equation 18.

Sleep quality similarly affects work via three channels. First, λ_χ captures the effect sleep quality has on productivity holding sleep quantity fixed. Second, similarly to the the effect on sleep quantity, increasing χ also reduces the shadow price of work. The reason is the same: for a given quantity of sleep, there is greater slack in the time constraint, allowing work to increase. The third channel, as before, captures the complementarity between work and sleep.

An important corollary to items 1 and 2 of Proposition 2 is that if sleep and hours worked are complements in equilibrium $u_{sh} > 0$ and if sleep quantity and quality are also complements for work productivity, an increase in sleep quality χ must increase both sleep quantity and work.

The second key result – in item (3) – details how sleep quality χ affects productivity. Equation 19 highlights the two channels through which sleep quality affects productivity. First, $\lambda_\chi \geq 0$ captures the fact that sleep quality may have a direct and weakly positive impact on productivity holding sleep quantity constant. Second, an increase in χ affects the optimal sleep quantity s^*. If the effect is positive, this feedback effect should further improve productivity, implying that χ increases productivity. However, it is possible that the net impact of increased quality could be negative if an increase in χ reduces sleep by enough to offset any direct productivity gain from χ.

C.3 Proof of Propositions

Lemma 1 provides sufficient conditions such that there is a unique optimum to problem 15 and that this optimum corresponds to the solution to the first order conditions (FOCs).

Lemma 1. *The following conditions are sufficient to guarantee that the solution to problem 15 is (i) unique, (ii) determined by its FOCs, (iii) and that the optimal choices of work, sleep, and leisure are positive.*

1. $k > \dfrac{\lambda_s^2(s,\chi)}{\alpha|z''(s)|}, \qquad \forall s \in [0,T]$
2. $k > \dfrac{\lambda(T,\chi)}{T}$
3. *Define* $\beta(s) = \frac{s}{z'(s)}$. *Then*

$$\lambda\left(\beta^{-1}\left(\frac{\alpha\chi^2}{k}\right),\chi\right) - \frac{k}{\chi}\cdot\beta^{-1}\left(\frac{\alpha\chi^2}{k}\right) > 0$$

Proof. To prove (i) and (ii) we argue that, under minor restrictions on k, the utility function $U(h,s)$ is strictly concave. Together with the interiority conditions (iii), we can conclude that there is an unique pair (s^*, h^*) that solves the problem and that the solution is completely characterized by the FOCs.

Because $U(h,s)$ is twice differentiable we can establish strict concavity by analyzing the definiteness of its Hessian matrix. The first order derivatives are given by

$$U_h = \lambda(s,\chi) - v'(T-h-sg(\chi)) \tag{20}$$

$$U_s = \lambda_s(s,\chi)\cdot h + \alpha z'(s) - g(\chi)v'(T-h-sg(\chi)) \tag{21}$$

where $g(\chi) \equiv \frac{1}{\chi}$. Using the functional form we imposed to $v(\cdot)$, we have $v''(\cdot) = -k$. Then, the first row of the hessian of $U(s,h)$ is given by

$$U_{hh} = -k \tag{22}$$

$$U_{sh} = \lambda_s - g(\chi)k \tag{23}$$

The second row of the hessian is given by

$$U_{sh} = \lambda_s - g(\chi)k \tag{24}$$

$$U_{ss} = \lambda_{ss} \cdot h + \alpha z''(s) - g(\chi)^2 \cdot k \tag{25}$$

The Hessian is then given by

$$H = \begin{bmatrix} -k & \lambda_s - g(\chi)k \\ \lambda_s - g(\chi)k & \lambda_{ss} \cdot h + \alpha z''(s) + g(\chi)^2 \cdot k \end{bmatrix} \tag{26}$$

The problem is strictly concave if

$$D \equiv \det(H) = -k[\lambda_{ss} \cdot h + \alpha z''(s) - g(\chi)^2 \cdot k] - [\lambda_s - g(\chi)k]^2 > 0 \tag{27}$$

for all s, h given α and χ.

Note that for any value of s, h we have $|\lambda_{ss}|k + 2\lambda_s g(\chi)k > 0$. This implies that for any value of s, h, the determinant $D > \tilde{D}(s) \equiv k\alpha|z''(s)| - \lambda_s^2$. Thus, a sufficient condition for problem 16 to be strictly concave is that $\tilde{D}(s) > 0$ for any $s \in [0, T]$. This condition is equivalent to

$$k > \frac{\lambda_s^2(s,\chi)}{\alpha|z''(s)|}, \qquad \forall s \in [0,T] \tag{28}$$

We know separately present sufficient conditions we ought to impose on the problem so that optimal choices of s, l, and h are positive.

Positive sleep. It is easy to impose that optimal sleep is positive. We just need to impose that $z'(0) \to \infty$. In that way, the marginal benefit of the first minute of sleep is large enough to hinder a zero sleep equilibrium.

Positive leisure. If leisure is zero, then the time constraint implies that $h + sg(\chi) = T$. Substituting this on U_h and using the functional form we impose on $v(\cdot)$ we have that $U_h = \lambda(s,\chi) - kT$. Suppose we had $U_h = \lambda(s,\chi) - kT < 0$. Agents would then be better off reducing their amount of time allotted to h. A sufficient condition for $l > 0$ in equilibrium is then that $U_h < 0$ when s attains its upper bound, $s = T$. This would imply that no matter what combination we had of s, h, to increase s in response to h would never lead to $U_h = 0$ as long as $l = 0$, since $\lambda_s \geq 0$. Hence, we must increase l. The condition can be re-written as

$$k > \frac{\lambda(T, \chi)}{T} \tag{29}$$

Positive hours working. Assume that $h = 0$. Then, the optimal s, denoted by $s(0)$, solves $U_s(s(0), h = 0)$, or

$$U_s = \alpha z'(s(0)) - \frac{k}{\chi^2} \cdot s(0) = 0$$

Rearranging this condition we have that

$$\beta(s(0)) \equiv \frac{s(0)}{z'(s(0))} = \frac{\alpha \chi^2}{k}$$

Note that $\beta(s)$ is an increasing function, so we can rewrite this equation as

$$s(0) = \beta^{-1}\left(\frac{\alpha\chi^2}{k}\right)$$

Then, we would like to find the condition that guarantees that $(s(0), h)$ is not a solution to the agent's problem. This will be the case when $U_h(s(0), 0) > 0$. Imposing that we get

$$\lambda\left(\beta^{-1}\left(\frac{\alpha\chi^2}{k}\right), \chi\right) - \frac{k}{\chi} \cdot \beta^{-1}\left(\frac{\alpha\chi^2}{k}\right) > 0 \tag{30}$$

□

Proof of Proposition 1.

In order to derive s^*_α and h^*_α we must first get the partial derivatives with respect to α. They are

$$U_{h\alpha} = 0 \tag{31}$$

$$U_{s\alpha} = z'(s) \tag{32}$$

Expanding the FOCs equations with respect to h, s, and any parameter θ and solving for ds and dh yields:

$$ds/d\theta = \frac{U_{s\theta}}{|U_{ss}|} + \frac{U_{sh}}{|U_{ss}|} dh/d\theta \tag{33}$$

$$dh/d\theta = \frac{U_{h\theta}}{|U_{hh}|} + \frac{U_{sh}}{|U_{hh}|} ds/d\theta \tag{34}$$

Isolating the endogenous and exogenous variables yields

$$ds/d\theta = |U_{hh}| \cdot D^{-1} \cdot \left[U_{s\theta} + \frac{U_{sh}}{|U_{hh}|} U_{h\theta} \right] \tag{35}$$

$$dh/d\theta = |U_{ss}| \cdot D^{-1} \cdot \left[U_{h\theta} + \frac{U_{sh}}{|U_{ss}|} U_{s\theta} \right] \tag{36}$$

where D is the determinant of the Hessian above.

To arrive at items i. and ii. we set $\theta = \alpha$:

$$\frac{\partial s^*}{\partial \alpha} = D^{-1} \cdot kz'(s) > 0 \tag{37}$$

$$\frac{\partial h^*}{\partial \alpha} = \frac{s^*_\alpha}{k} \cdot U_{sh} \tag{38}$$

Finally, to show iii. we derive the marginal gain in productivity from altering α:

$$\lambda^*_\alpha = \lambda_s \cdot s^*_\alpha \tag{39}$$

This is weakly positive because $s^*_\alpha > 0$ and, by assumption, $\lambda_s \geq 0$. □

Proof of Proposition 2.

The partial derivatives for χ are given by

$$U_{h\chi} = \lambda_\chi - sg'(\chi) \cdot k \tag{40}$$

$$U_{s\chi} = \lambda_{s\chi} \cdot h - g'(\chi)[v'(l) + sg(\chi)k] \tag{41}$$

We then set $\theta = \chi$ and use equation (35) to derive item i. This yields:

$$\begin{aligned} s^*_\chi &= |U_{hh}| D^{-1} \left(U_{s\chi} + \frac{U_{sh}}{|U_{hh}|} \cdot U_{h\chi} \right) \\ &= |U_{hh}| D^{-1} \left[\lambda_{s\chi} \cdot h - g'(\chi)[v'(l) + sg(\chi)k] + \frac{(\lambda_s - g(\chi)k)}{|U_{hh}|} \cdot (\lambda_\chi - sg'(\chi) \cdot k) \right] \end{aligned}$$

Because $|U_{hh}|D^{-1}$ and $|U_{hh}|$ is positive we may write, after substituting $g(\chi)$ for its functional form

$$s^*_\chi \propto \left[\lambda_{s\chi} \cdot h + \frac{1}{\chi^2} \cdot \left(v'(l) + \frac{k}{\chi} \cdot s \right) \right] + U_{sh} \cdot h^*_\chi$$

We use equation (36) to derive ii. We then have

$$\begin{aligned} h^*_\chi &= |U_{ss}| D^{-1} \left(U_{h\chi} + \frac{U_{sh}}{|U_{ss}|} \cdot U_{s\chi} \right) \\ &= |U_{ss}| D^{-1} \left[(\lambda_\chi - sg'(\chi) \cdot k) + \frac{(\lambda_s - g(\chi) \cdot k)}{|U_{ss}|} \cdot (\lambda_{s\chi} \cdot h - g'(\chi)[v'(l) + sg(\chi)k]) \right] \end{aligned}$$

The same reasoning as before implies that

$$h^*_\chi \propto \left[\lambda_\chi + \frac{k}{\chi^2} \cdot s\right] + U_{sh} \cdot s^*_\chi$$

Finally, we apply the chain rule to derive λ^*_χ:

$$\lambda^*_\chi = \lambda_\chi + \lambda_s \cdot s^*_\chi \tag{42}$$

and get that $\lambda^*_\chi > 0$ if $s^*_\chi > 0$, since λ_χ is weakly positive and $\lambda_s > 0$, by assumption.

□

D Additional results

D.1 Present Bias

Model Selection. We test 8 different variations on the estimation procedure. We tried two different cost functions 7 and 8 – power and exponential, respectively – with and without the α parameters capturing non-pecuniary reasons to exert effort - and with or without censoring. In Table A.XIV we show that the specification with power cost function and allowing for $\alpha \neq 0$ is far superior than the other options, regardless of censoring. First, we show in column 5 that that the number of failures in convergence of the non-linear estimation algorithm is 2 to 3 times larger for the exponential than for the power cost function. Second, in column 6 we show that the model's fit, as measured by the Negative Log-Likelihood (NNL) of the estimated parameter, is orders of magnitude better for the power cost function. Estimating the model allowing for $\alpha \neq 0$ also increases the fit substantially as measured by NNL.

These results underpin our choice to use the specification with power cost function and non-pecuniary $\alpha \neq 0$ as our benchmark estimates.

D.1.1 Evidence of Present Bias

Figure A.IX shows two important features of the choices participants are making in the present bias experiment. First, we show that participants make, on average, monotonic choices, increasing the amount of work they choose for higher piece-rates. Second, there is a clear shift in the "labor supply" curve when decisions are made in the first date of the present bias experiment. This shift is at the root of our strategy to identify present bias, as it suggests participants demand a premium to exert effort immediately in comparison to only a few days afterwards.

There are two additional noteworthy features in Figure A.IX. First, participants seem to be more present bias in baseline than in the treatment period, especially in the first version of the task. Second, there is very little evidence of present bias in the first version of the task during the treatment period. As we discussed in detail in Section B.6, we identified and corrected a couple of shortcomings with our original design. Reassuringly, in our second design – the one used to estimate present bias for two-thirds of our sample – there is a clear shift in labor supply in the treatment period, indicating the presence of present bias in the sample.

Shifting to the structural estimation of present bias, in Table A.XIV we also present key moments of the present bias distribution in the population for each of the estimating methods. In our preferred specification (first row of each panel), there is little evidence of present bias *in the median* ($\beta_{med} = 0.98$)[49] of the distribution. However, this masks substantial evidence of present bias on lower parts of the distribution. For example, in the treatment period (Panel B), the participant in percentile 25 has $\beta_{25} = 0.84$.

One concern is that the results in the tail are simply driven by estimating noise. If that is true, the percentiles of the present bias distribution should be roughly symmetric around the median.[50] For example, the participant in percentile 75 should have β_{75} close to $1 + (1 - \beta_{25}) = 1.16$. However, $\beta_{75} = 1.03$, which is very close to the median. Moreover, the estimated distribution has a large mass on values close to the median, much larger than it should for a normal distribution considering the observed kurtosis, and is also skewed to the left. Those facts are consistent with a population where many participants (perhaps more than 50%) are time consistent (i.e., $\beta = 1$) and that the rest of the participants are time-inconsistent, most being present, rather than future, biased.

D.1.2 Present Bias Correlates

In this section, we provide more supporting evidence that the measure of β we estimate do capture present bias in the population. We complement these findings with outcomes in our study.

In Table A.XVI, we regress a series of behaviors that should be affected by time preferences on our preferred, structurally estimated measure of present-bias. [51]

[52]

[49] We focus on the median as a few very large outliers drive the average up.

[50] Assuming the noise has a symmetric distribution which we, of course, cannot guarantee in small samples

[51] Incentivized lab experiments in the spirit we use to elicit present bias have been shown to correlate with real world outcomes expected to be affected by present bias. (Meier and Sprenger, 2010) for credit card debt and (Martinez et al., 2017) for procrastination in tax filing.

[52] We average the dependent variable on the participant level throughout all the study (including baseline period).

In column 2, we show that an increase of 0.1 in β is associated with an increase of Rs. 3.78 in daily deposits (approx. 3% increase). We also show that participants are more often late to office when β is smaller. An increase of 0.1 in β is associated with a 2% decrease in lateness (column 4). This could be especially costly for participants in "short days", when arriving late makes them lose a relatively large financial bonus (Rs. 50). This could be explained by present bias if individuals underweight the future benefits of punctuality relatively to leaving earlier from home, for example, where the cost is immediate. We also test whether present bias correlates with length of voluntary pauses (columns 5 and 6) and with night sleep duration (columns 7 and 8), but find no positive association with those. Our results, albeit small, are in line with the existing evidence in the literature which shows a robust small correlation betwen experimentally elicited measures of present bias and real-world behavior.(Cohen et al., 2019)

Our present bias measure only uses the treatment period. The results are similar when we pool across baseline and treatment period, but less significant.

E Multiple Hypothesis Corrections

We pre-registered adjusting p-values for multiple hypothesis corrections within our two primary families of outcomes: (i) work-related outcomes (productivity, hours worked, and earnings) and (ii) decision-making (savings, default effects, time preference, inattention, risk preferences, and social preferences). The corrected p-values for the work-related outcomes are reported in Table III. For the decision-making outcomes, no tests of significance survive our corrections. A summary of these outcomes along with the corrected p-values can be found in A.XVIII.

To apply these corrections we ran simulations to control the Family-Wise Error Rate. We took this approach rather than applying a formulaic correction (e.g. Holm or Bonferroni) so that we could capture correlations across outcomes in our data.

More specifically, our simulations followed the steps described below:

1. Select one of the primary families of outcomes, defined above.
2. Run 5000 iterations according to the following sub-steps:
    - Re-randomize the treatment assignments (night sleep and nap). When randomizing, follow the same stratification procedures as in the RCT.
    - Run the core regressions relevant to the family in question. For instance, for the work-related outcomes run the main productivity, labor supply, and earnings specifications.
    - Save the z-scores computed for each regression coefficient, so the result is 5000 z-scores multiplied by the number of outcomes in our family.
3. For each test of interest (for instance, the impact of night sleep on labor supply), examine the distribution of z-scores arrived at through the simulation. Identify the percentage of iterations for which at least one of the tests within the family would have been rejected at the critical value actually observed for the test in question in the RCT data. Because the treatment assignments underlying these tests were re-randomized, all observed rejections are rejections of a true null. As such, the observed percentage of iterations for which at least one test is rejected corresponds to the corrected p-value and is what is reported in Table III for the work-related outcomes.
4. Repeat for each family of outcomes.

F Sleep Survey

To explore the external validity of our RCT sample and deepen our understanding of sleep characteristics among different segments of the population - in particular the relationship between sleep and income - we conducted a larger-scale survey supplemented by actigraph data across a more representative sample of the adult Chennai population.

Recruitment. Neighborhoods were randomly selected from a stratified sample of geo-locations across Chennai. Lower-income households were more likely to participate in our study, so we over-sampled individuals from higher-income neighborhoods. In total, 7,677 participants were approached, 3,833 agreed to participate in at least the first stage of the survey, and 439 completed three nights of actigraph measurements.

Survey Stages. The survey consisted of three key stages: (i) a Census and Baseline survey, in which individuals were asked a set of questions about their personal and self-reported sleep characteristics; (ii) an Actigraph study, where participants wore an actigraph for three nights; and (iii) and Endline survey, where participants who undertook the Actigraph study were asked to self-report their sleep patterns over the previous four days. The portion of participants who agreed to participate at each stage (and sub-stage) of the study can be found in Appendix Table A.XXI, and the demographic characteristics across the first two stages can be found in Appendix Table A.XXII.

Findings. The first key takeaway is that this boarder sample of Chennai is severely sleep deprived, sleeping just 5.5 hours on average per night according to the Actigraph.[53] This result is nearly identical to the 5.6 hours of sleep found among RCT participants. Similarly, the individuals in the sleep survey also have similar sleep quality to RCT participants, with 71% sleep efficiency.

Sleep characteristics do not vary substantially by household income, education, or employment status.[54] Women, meanwhile, do sleep more than men; the more children someone has the less they sleep; and middle-aged individuals sleep less than younger or older adults (Appendix Table A.XXIII). The survey also revealed

[53]Although only a fraction of participants agreed to wear the actigraphs, based on self-reports, those individuals do not appear to be selected on sleep duration.

[54]It is important to note however, that given the income distribution of the city, very few participants in the survey would be considered "middle class" or "wealthy" by international standards.

that daytime naps are common in this population - 37% of individuals report napping on any given day. Higher-income individuals are less likely to nap, but conditional on napping spend more time asleep. Older participants are also more likely to nap on any given day (Appendix Table A.XXIV).

G Deviations from the Pre-Analysis Plan and Original Study Design

This study was pre-registered with AEA (ID: AEARCTR-0002494) under the title "Sleepless in Chennai: The Consequences of Sleep Deprivation Among the Urban Poor." Pre-registration took place before endline data collection began. All changes, and rationales for the changes, are listed below. Adjustments were typically made because the pre-registered specification or variable definitions presented unforeseen conceptual issues or due to changes in study design (e.g. reduced frequency of a task). We show specifications we had pre-registered whenever possible for comparison in Appendix A.

Empirical Specification

- **IV Specification.** We pre-registered IV specifications which instrumented sleeping time with treatment status. However, reduced form regressions provided similar results that were less subject to extrapolation outside of the observed range of treatment effects (i.e. the average increase in night time sleep was roughly 30 minutes, but IV effects would be reported per additional hour of sleep for ease of interpretation).

Typing

- **Absent Days.** The PAP specifies that earnings from the typing task and the labor supply variables would be coded as zero on days when participants were absent. This plan was made to account for potential imbalances in attendance across the treatment groups. In practice, however, attendance is very well balanced across treatment groups (Table A.III) and excluding missing observations improves statistical power without changing results qualitatively (See Table A.XXV for a comparison of the main estimates under different hypothesis).

- **Typing Earnings Variable.** In the PAP we specify that we would transform earnings in Rupees using an inverse hyperbolic sine transformation (IHS). However, this transformation is not needed given that earnings are not heavily right-tailed and missing days are omitted. Hence, we report earnings in levels for ease of interpretation. In Table A.XXV, we show the results with the IHS transformation of earnings, which present qualitatively similar results.

- **Speed and Accuracy.** The definitions of the speed and accuracy variables used in Table A.VI were altered in order to be able to decompose the effects linearly and interpret which channels was driving changes in productivity.

- **Special Days Controls.** The PAP called for control variables to be used for days which differed from a "typical" day (e.g. days with unusual activities such as the real effort task used to measure present bias). Including this control did not matter for our results so we ended up choosing to drop it.

Savings

- **Savings dependent variable.** We pre-registered daily net savings as our primary outcome variable for savings. However, we discovered during data collection that this measure was problematic as the estimation was driven by a few individuals with huge large withdrawals close to the end of the study. As discussed in Section 7.1, we believe these withdrawals were driven by the study design rather than participants underlying savings behavior. Hence, in addition to this measure, we daily deposits and interest accrued.

- **Interest Rates.** Interest rates were changed in reaction to participant understanding and to allow estimation semi-elasticities to benchmark treatment effects. Specifically, in the first 7 months of the study participants received the pre-registered *daily* interest rates of 1% and 2%. In December 2017, we switched from computing interest only on days when we administered the savings survey to computing it every day, including weekends. In May 2018, we briefly changed interest rates to 1% and 2% *weekly*. Finally, in June 2018, the interest rates were changed to 0% to 1% percent for new participants to enable us to calculate the semi-elasticity both from 1% to 2% as well from 0% to 1%. Importantly, given the rolling enrollment the allocation of treated and control participants across these changes is well balanced.

- **Cap on savings.** The limit on daily deposits was increased from Rs. 400 to Rs. 600 because participants were frequently reaching the original cap.

Preferences and Cognitive Function (Attention)

- **Present Bias.** Deviations from the PAP and our current procedures are described in Appendix B.6.

- **Attention in the Work Environment.** The contrast between the salient and non-salient versions of the incentives was increased 11 months after the study began. As a result, 47% of the participants were exposed to the old design, while the remainder was exposed to the new, more salient design.

Risk and Social Preferences

- **Level of observations.** Regressions for the Risk and Social Preferences tasks were mistakenly pre-registered in the participant-day level. However, the participants only complete the Risk and Social task twice in the study, once before and once after the treatment. Accordingly, we specify our regressions in the paper at the participant level using the first measurement as the baseline control.

Well-being

- **Outcome components.** Our pre-registrations included three measures to rely on when creating the subjective well-being index - happiness, depression, and life possibilities, as measured by a Gallup Cantril Scale. We later added questions on life satisfaction and self-reported stress. In Table V we present the results for both indices, one reflecting what was pre-registered and the other including the additional measures.