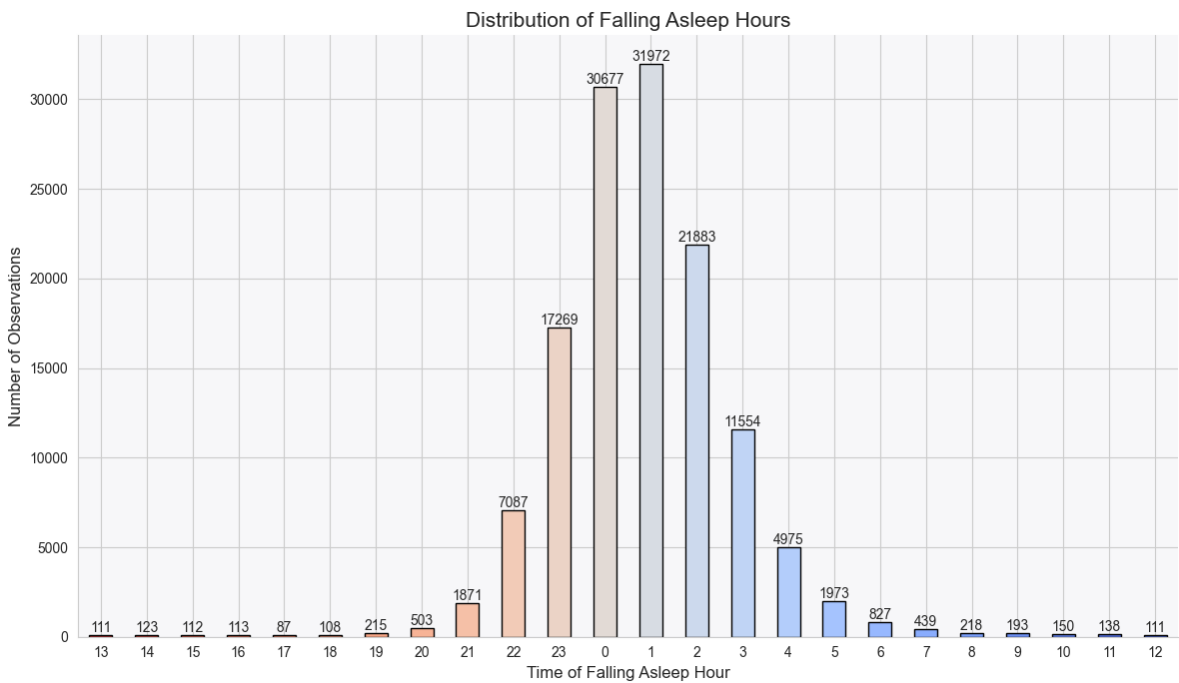


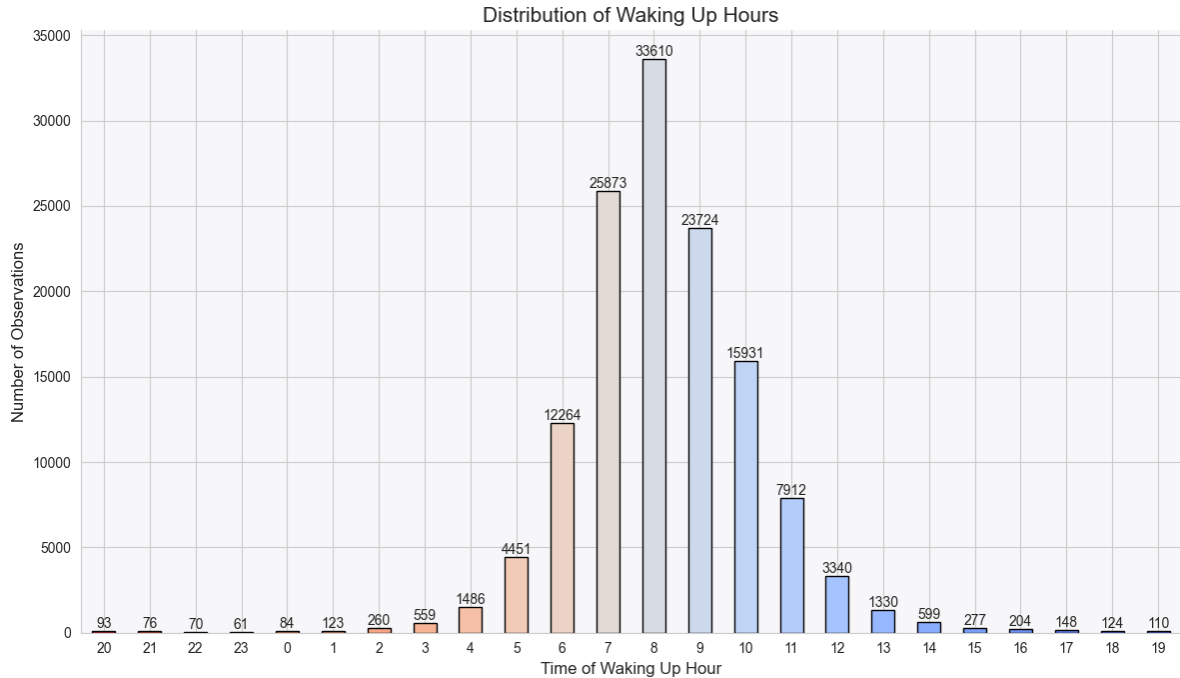
Smartphone Use, Social Support, and Sleep Health

2023-11-28

Falling Asleep Hours Distribution



Normal Sleep: fall asleep from 22 pm to 6 am. (**95.99** % of Total.)



Falling Wake Hours Distribution

Interaction of Time terms

- **Insession x Day of Week x Go2Bed Hour:**
1 x 5 x 2: 2 am on Friday of a Semester
- Abnormal Screen Time Threshold: 12 -> 3.5 hours
- Screen time as control: We focus on **Technology** impact under the influence of **Human** factors

Conclusion

- Social interaction via smartphone can **benefit** sleep quality
- Interaction with **close** contacts prolong sleep
- Interaction with certain **relationships** of contacts (e.g. family) prolong sleep

Moderating Impact: The Way of Interaction

- Message: **Positive** moderation
- Call: Depends on the **relationship** and **closeness**

Result 1: Social Closeness via Message

Table 17 Impact of Message and Social Closeness On Sleep(Wake Control, Percentile)

VARIABLES	(1) Sleep	(2) Sleep	(3) Sleep	(4) Sleep	(5) Sleep
D.Message	5.864*** (0.900)				
Message		0.897*** (0.133)			
Close			0.586*** (0.126)		
Distant				0.216* (0.117)	
Unknown					0.408*** (0.097)
Constant	104.407*** (14.967)	103.835*** (14.970)	104.589*** (13.280)	104.589*** (13.280)	104.589*** (13.280)
Observations	127,390	127,390	127,390	127,390	127,390
R-squared	0.479	0.479	0.479	0.479	0.479
Number of egoid	509	509	509	509	509

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 14 Impact of Call and Social Closeness On Sleep (Wake)

VARIABLES	(1) Sleep	(2) Sleep	(3) Sleep	(4) Sleep
Call	-1.688*** (0.647)			
Close-Call		-1.022 (0.897)		
Distant-Call			-4.991** (2.282)	
Unknown				-2.157*** (0.785)
Constant	118.693*** (10.317)	118.581*** (10.312)	118.581*** (10.312)	118.581*** (10.312)
Observations	127,390	127,390	127,390	127,390
R-squared	0.475	0.475	0.475	0.475
Number of egoid	509	509	509	509
Sleep Control	Go2Bed	Go2Bed	Go2Bed	Go2Bed

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 11 Impact of Message and Social Relationship On Sleep (Wake, Percentile)

VARIABLES	(1) Sleep	(2) Sleep	(3) Sleep	(4) Sleep	(5) Sleep	(6) Sleep	(7) Sleep	(8) Sleep	(9) Sleep	(10) Sleep	(11) Sleep	(12) Sleep	(13) Sleep	(14) Sleep	(15) Sleep
Message	1.155*** (0.132)														
Family		1.263*** (0.167)													
Parent.			1.416*** (0.154)												
Sibling				1.059*** (0.263)											
StepParent					-7.804 (6.128)										
StepSibling						1.308 (0.819)									
OtherFamily							1.040 (0.660)								
Friend								0.428*** (0.098)							
Romantic									0.907*** (0.215)						
Acquaintance										1.666 (1.169)					
Other											0.345 (0.419)				
Comemember												0.747* (0.421)			
Colleague.													-0.117 (1.155)		
Neighbor.														-0.136 (0.489)	
Unknown.															0.669*** (0.097)
Constant	-99.306** (41.438)	-99.934** (40.151)	-88.093** (40.242)	-98.532** (39.990)	-81.210** (40.823)	-90.408** (40.518)	-90.417** (40.437)	-93.111** (40.531)	-89.584** (40.514)	-90.629** (40.426)	-89.314** (40.455)	-89.816** (40.466)	-88.922** (40.469)	-88.861** (40.448)	-89.781** (41.059)
Observations	127,390	127,390	127,390	127,390	127,390	127,390	127,390	127,390	127,390	127,390	127,390	127,390	127,390	127,390	127,390
R-squared	0.478	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477	0.477
Number of egoid	509	509	509	509	509	509	509	509	509	509	509	509	509	509	509
Wake Up Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Result 2: Social Closeness via Call

Result 3: Relationship via Message

Result 4: Relationship via Call

Table 9 Impact of Call and Social Relationship On Sleep(Wake Controlled)

VARIABLES	(1) Sleep	(2) Sleep	(3) Sleep	(4) Sleep	(5) Sleep	(6) Sleep	(7) Sleep	(8) Sleep	(9) Sleep	(10) Sleep	(11) Sleep	(12) Sleep
Call	-1.653** (0.644)											
Friend		-6.827*** (1.177)										
Romantic			0.011 (1.331)									
Family				7.147*** (1.898)								
Parent					8.909*** (2.120)							
Sibling						4.095 (3.339)						
Stepsibling							45.465*** (13.110)					
OtherFamily								-3.961 (4.213)				
Comember									-2.386*** (0.438)			
Neighbor											25.715 (16.006)	
Unknown												-2.293*** (0.774)
Constant	106.394*** (12.905)	106.579*** (12.954)	106.650*** (12.950)	106.575*** (12.921)	106.650*** (12.872)	106.666*** (12.942)	106.637*** (12.951)	106.657*** (12.954)	106.657*** (12.949)	106.651*** (12.950)	106.622*** (12.953)	106.252*** (12.866)
Observations	127,390	127,390	127,390	127,390	127,390	127,390	127,390	127,390	127,390	127,390	127,390	127,390
R-squared	0.478	0.478	0.478	0.478	0.478	0.478	0.478	0.478	0.478	0.478	0.478	0.478
Number of egoid	509	509	509	509	509	509	509	509	509	509	509	509
Wake Up Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Result 5: Pre-Sleep Communication benefit Sleep Quality

Table 3 Impact of Pre-Sleep Smartphone Communication On Sleep

VARIABLES	(1) Sleep	(2) Sleep	(3) Sleep	(4) Sleep	(5) Sleep	(6) Sleep	(7) Sleep	(8) Sleep	(9) Sleep	(10) Sleep	(11) Sleep	(12) Sleep
D.COMM	6.589*** (0.850)						5.743*** (0.847)					
COMM		1.086*** (0.131)						0.944*** (0.131)				
D.Call			-0.614 (1.299)						-2.266* (1.273)			
Call				-1.089* (0.618)						-1.757*** (0.599)		
D.Message					7.747*** (0.914)						6.287*** (0.895)	
Message						1.173*** (0.130)						0.924*** (0.127)
Constant	162.985*** (13.663)	161.978*** (13.807)	165.655*** (12.081)	165.557*** (12.066)	162.638*** (13.914)	161.495*** (13.953)	147.144*** (14.140)	146.430*** (14.256)	148.748*** (12.665)	148.687*** (12.655)	146.440*** (14.317)	145.953*** (14.275)
Observations	127,390	127,390	127,390	127,390	127,390	127,390	127,390	127,390	127,390	127,390	127,390	127,390
R-squared	0.473	0.473	0.472	0.472	0.473	0.473	0.479	0.479	0.478	0.478	0.479	0.479
Number of egoid	509	509	509	509	509	509	509	509	509	509	509	509
Screen Control	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Sleep Control	Wake	Wake	Wake	Wake	Wake	Wake	Wake	Wake	Wake	Wake	Wake	Wake

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1