

Strohmaier et al.

Supplemental Table 1. Percent differences and 95% confidence intervals of diurnal cortisol components comparing GUTS 2 participants born to mothers who never worked night shifts before pregnancy to those whose mothers had worked night shifts before pregnancy, stratified by chronotype.

	Maternal history of night shift work before pregnancy						
	Never	Ever		Ever		Ever	
		Unadjusted		MV model 1 *		MV model 2 **	
		%D	95% CI	%D	95% CI	%D	95% CI
Definite morning types (n=118)	N=34	N=84		N=84		N=84	
Awakening level ^a	0 (ref.)	-2.9	(-23.5, 23.3)	-2.4	(-23.3, 24.1)	-0.2	(-22.0, 27.6)
Awakening response ^b	0 (ref.)	1.4	(-35.5, 59.7)	-1.6	(-37.2, 55.4)	-4.1	(-38.8, 50.5)
Early decline ^c	0 (ref.)	-0.1	(-9.4, 10.3)	0.6	(-8.9, 11.1)	0.9	(-8.5, 11.3)
Late decline ^d	0 (ref.)	2.7	(-0.7, 6.2)	2.6	(-0.8, 6.2)	2.6	(-0.9, 6.1)
Night rise ^e	0 (ref.)	30.7	(-35.4, 164.4)	32.2	(-34.6, 167.4)	35.4	(-34.0, 177.5)
AUC ^f	0 (ref.)	1.6	(-0.8, 3.9)	1.6	(-0.8, 3.9)	1.7	(-1.0, 4.4)
Overall slope ^g	0 (ref.)	2.4	(0.0, 4.8)	2.4	(0.0, 4.8)	2.4	(0.0, 4.8)
Overall slope without peak ^h	0 (ref.)	2.4	(-0.3, 5.2)	2.4	(-0.3, 5.1)	2.3	(-0.4, 5.1)
Not definite morning types (n=225)	N=82	N=143		N=143		N=143	
Awakening level ^a	0 (ref.)	13.4	(-2.5, 31.9)	17.3	(0.9, 36.3)	16.7	(0.4, 35.8)
Awakening response ^b	0 (ref.)	-5.1	(-28.3, 25.7)	-5.0	(-28.3, 26.0)	-4.9	(-28.3, 26.2)
Early decline ^c	0 (ref.)	-3.7	(-9.3, 2.3)	-3.5	(-9.1, 2.5)	-3.6	(-9.2, 2.4)
Late decline ^d	0 (ref.)	1.5	(-0.5, 3.5)	1.5	(-0.6, 3.5)	1.5	(-0.5, 3.5)
Night rise ^e	0 (ref.)	7.5	(-19.8, 44.2)	5.9	(-21.0, 42.0)	4.8	(-21.7, 40.4)
AUC ^f	0 (ref.)	0.8	(-0.7, 2.3)	1.4	(-0.1, 2.9)	1.4	(-0.1, 2.8)
Overall slope ^g	0 (ref.)	0.2	(-1.0, 1.5)	0.2	(-1.1, 1.4)	0.2	(-1.1, 1.4)
Overall slope without peak ^h	0 (ref.)	0.4	(-1.0, 1.7)	0.4	(-1.0, 1.8)	0.3	(-1.0, 1.7)

Abbreviations: %D, Percent Differences; CI, confidence interval; AUC, area under curve;

^a Cortisol level at awakening

^b Change from awakening to 45 minutes after awakening

^c Change from 45 minutes after awakening to 4 hours after awakening

^d Change from 4 hours after awakening to 16 hours after awakening

^e Change from 16 hours after awakening to bedtime

^f Area under the curve, levels from wake up time to 16 hours after awakening

^g Change from wakening to bedtime

^h Change from wakening to bedtime without morning peak (at 45 minutes)

* Adjusted for age at sample collection, wake-up sample within 15 min of waking up (yes/no), saliva collection characteristics (brushed, ate, drank, exercised, happy, worried), usual hours of sleep, last night's hours of sleep, trauma score in last month (0,1, 2+ events), belonging to sexual orientation minority (yes/no); birth control (yes/no, in females only)

** Additionally adjusted for maternal characteristics: maternal age at birth, BMI before pregnancy, smoking status before pregnancy (smoker, past smoker, never smoker), alternative healthy eating score (quintiles), physical activity (MET-hours/week; quintiles), husband's education (less than 2yr college, 4yr college, grad school), maternal lifetime history of depression diagnosis (yes/no)

Supplemental Table 2. Percent differences and 95% confidence intervals of alpha amylase components comparing GUTS 2 participants born to mothers who never worked night shifts before pregnancy to those whose mothers had worked night shifts before pregnancy, stratified by chronotype.

	Maternal history of night shift work before pregnancy						
	Never	Ever		Ever		Ever	
		Unadjusted	MV model 1 *		MV model 2 **		
		%D	95% CI	%D	95% CI	%D	95% CI
Definite morning types (n=118)	N=31	N=71		N=71		N=71	
Awakening level ^a	0 (ref.)	29.2	(-18.7, 105.3)	-32.1	(-17.2, 110.6)	57.7	(-4.8, 161.1)
Awakening response ^b	0 (ref.)	-29.1	(-65.6, 46.1)	-28.6	(-65.4, 47.7)	-32.0	(-67.1, 41.0)
Early decline ^c	0 (ref.)	-0.3	(-14.5, 16.3)	-1.0	(-15.1, 15.5)	-0.4	(-14.7, 16.3)
Late decline ^d	0 (ref.)	-0.8	(-74.3, 178.1)	-0.8	(-5.6, 4.3)	-0.8	(-5.6, 4.3)
Night rise ^e	0 (ref.)	-15.5	(-35.4, 164.4)	-15.3	(-74.5, 181.7)	-28.9	(-78.3, 133.2)
AUC ^f	0 (ref.)	-0.6	(-5.2, 4.0)	-0.5	(-5.2, 4.3)	2.0	(-3.3, 7.4)
Overall slope ^g	0 (ref.)	-1.6	(-4.6, 1.5)	-1.7	(-4.7, 1.5)	-1.8	(-4.7, 1.3)
Overall slope without peak ^h	0 (ref.)	-2.1	(-5.6, 1.4)	-2.0	(-5.4, 1.6)	-2.1	(-5.5, 1.4)
Not definite morning types (n=225)	N=76	N=132		N=132		N=132	
Awakening level ^a	0 (ref.)	11.8	(-21.4, 59.1)	13.6	(-20.2, 61.7)	8.0	(-24.3, 54.3)
Awakening response ^b	0 (ref.)	-30.3	(-59.2, 19.0)	-32.6	(-60.5, 15.0)	-32.6	(-60.5, 15.1)
Early decline ^c	0 (ref.)	3.5	(-7.3, 15.7)	4.4	(-6.5, 16.7)	4.4	(-6.6, 16.6)
Late decline ^d	0 (ref.)	0.7	(-2.8, 4.2)	0.5	(-2.9, 4.1)	0.6	(-2.9, 4.1)
Night rise ^e	0 (ref.)	-45.6	(-63.9, -17.8)	-47.5	(-65.4, -20.6)	-46.5	(-64.7, -19.1)
AUC ^f	0 (ref.)	-0.4	(-3.6, 2.8)	-0.3	(-3.6, 2.9)	-1.1	(-4.4, 2.2)
Overall slope ^g	0 (ref.)	-0.7	(-2.7, 1.4)	-0.7	(-2.7, 1.4)	-0.6	(-2.6, 1.5)
Overall slope without peak ^h	0 (ref.)	-1.1	(-3.5, 1.5)	-1.3	(-3.8, 1.3)	-1.2	(-3.7, 1.3)

Abbreviations: %D, Percent Differences; CI, confidence interval; AUC, area under curve;

^a Amylase level at awakening^b Change from awakening to 45 minutes after awakening^c Change from 45 minutes after awakening to 4 hours after awakening^d Change from 4 hours after awakening to 16 hours after awakening^e Change from 16 hours after awakening to bedtime^f Area under the curve, levels from wake up time to 16 hours after awakening^g Change from wakening to bedtime^h Change from wakening to bedtime without morning peak (at 45 minutes)

* Adjusted for age at sample collection, wake-up sample within 15 min of waking up (yes/no), saliva collection characteristics (brushed, ate, drank, exercised, happy, worried), usual hours of sleep, last night's hours of sleep, trauma score in last month (0,1, 2+ events), belonging to sexual orientation minority (yes/no); birth control (yes/no, in females only)

** Additionally adjusted for maternal characteristics: maternal age at birth, BMI before pregnancy, smoking status before pregnancy (smoker, past smoker, never smoker), alternative healthy eating score (quintiles), physical activity (MET-hours/week; quintiles), husband's education (less than 2yr college, 4yr college, grad school), maternal lifetime history of depression diagnosis (yes/no)

Supplemental Table 3. Geometric means and geometric standard deviation factors of outlier- and batch corrected **observed cortisol values** at each of the 5 measurement points obtained from GUTS 2 participants born to mothers who never worked night shifts before pregnancy and those whose mothers had worked night shifts before pregnancy.

Participants	Maternal history of night shift work before pregnancy			
	Never		Ever	
	N=112		N=208	
	Geometric mean	Geometric SD factor	Geometric mean	Geometric SD factor
Overall				
Awakening level ^a	16.5	0.7	18.0	0.5
45 min after awakening ^b	19.4	0.8	20.6	0.7
4h after awakening ^c	7.5	0.4	7.3	0.3
10h after awakening ^d	4.1	0.2	4.9	0.2
Bed time ^e	2.1	0.1	2.4	0.1
Females	N=73		N=161	
Awakening level ^a	17.8	1.0	17.5	0.6
45 min after awakening ^b	21.9	1.1	21.1	0.7
4h after awakening ^c	7.2	0.5	7.6	0.3
10h after awakening ^d	4.2	0.3	5.0	0.2
Bed time ^e	2.3	0.2	2.6	0.1
Males	N=39		N=47	
Awakening level ^a	14.5	1.1	19.5	1.3
45 min after awakening ^b	15.6	1.1	19.3	1.4
4h after awakening ^c	8.0	0.6	6.4	0.5
10h after awakening ^d	4.0	0.4	4.7	0.5
Bed time ^e	1.9	0.2	2.1	0.2

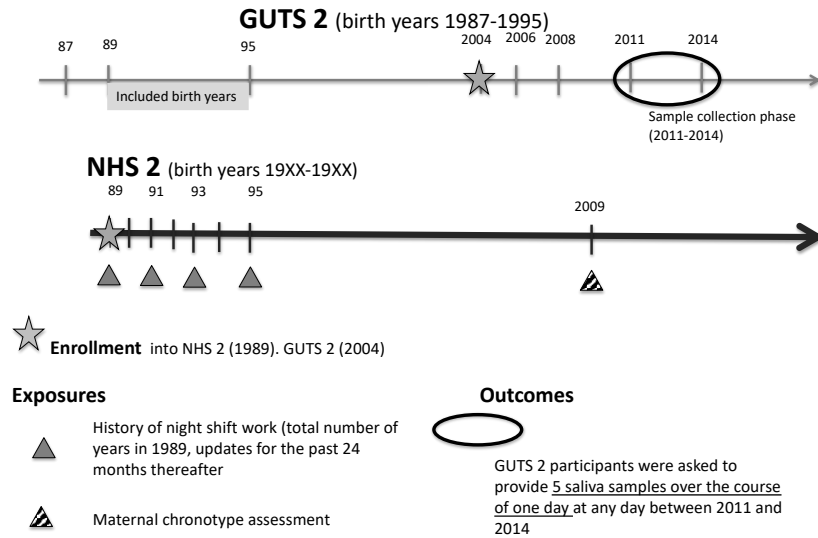
^a Cortisol level at awakening^b Cortisol level at 45 minutes after awakening^c Cortisol level at 4 hours after awakening^d Cortisol level at 10 hours after awakening^e Cortisol level at bed time

Supplemental Table 4. Geometric means and geometric standard deviation factors of outlier- and batch corrected **observed salivary alpha amylase values** at each of the 5 measurement points obtained from GUTS 2 participants born to mothers who never worked night shifts before pregnancy and those whose mothers had worked night shifts before pregnancy.

Participants	Maternal history of night shift work before pregnancy			
	Never N=112		Ever N=208	
	Geometric mean	Geometric SD factor	Geometric mean	Geometric SD factor
Overall				
Awakening level ^a	37.0	5.6	44.7	4.4
45 min after awakening ^b	26.0	2.5	23.7	2.0
4h after awakening ^c	58.9	4.7	58.9	3.0
10h after awakening ^d	70.9	4.5	63.3	3.9
Bed time ^e	48.0	4.0	45.2	3.1
Females	N=73		N=161	
Awakening level ^a	43.3	7.7	45.8	5.3
45 min after awakening ^b	24.6	3.1	23.9	2.3
4h after awakening ^c	59.2	6.4	56.2	3.2
10h after awakening ^d	74.3	5.6	63.1	4.0
Bed time ^e	53.3	5.6	47.0	3.6
Males	N=39		N=47	
Awakening level ^a	27.4	7.5	40.8	7.4
45 min after awakening ^b	28.8	4.1	22.7	4.2
4h after awakening ^c	58.3	6.7	69.9	7.1
10h after awakening ^d	65.0	7.6	63.8	10.3
Bed time ^e	42.5	5.6	39.6	5.6

^a Amylase level at awakening^b Amylase level at 45 minutes after awakening^c Amylase level at 4 hours after awakening^d Amylase level at 10 hours after awakening^e Amylase level at bedtime

Timeline of exposure and outcome assessment



Supplemental Figure 1: Time line of exposure and outcome assessments