

Multiverse analysis

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The authors made the following contributions. First Author: Conceptualization, Writing - Original Draft Preparation, Writing - Review & Editing; Ernst-August Doelle: Writing - Review & Editing, Supervision.

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Abstract

One or two sentences providing a **basic introduction** to the field, comprehensible to a scientist in any discipline.

Keywords: keywords

Word count: X

Multiverse analysis

Results

Model diagnostics

The model diagnostics for the main analysis, and for all models presented in this document are in Table 1

Fixed Effect Model

In this document we show the results using another analytic technique. Namely treating study ID as a fixed effect. This is what we wrote in the protocol originally.

The effects of physical activity volume on sleep. We estimated the effects of physical activity on sleep (RQ1) using fixed-effects models. We estimated the effect of physical activity volume on sleep by age, and the results are presented in Table 2 and Figure 1.

The effects of physical activity intensity on sleep. We estimated how physical activity intensity affects sleep across different age groups. We present the results controlling for sex, SES, and BMI, in Table 2 and Figure 2.

The effects of sleep duration on physical activity. We estimated the effect of sleep duration on physical activity by age. Results, controlling for sex, SES, and BMI are presented in Table 3 and Figure 3.

The effects of sleep efficiency on physical activity. We estimated the effect of sleep efficiency on physical activity by age. Results, controlling for sex, SES, and BMI are presented in Table 3 and Figure 4.

The effects of sleep onset on physical activity. We estimated the effect of sleep onset on physical activity by age. Results, controlling for sex, SES, and BMI are presented in Table 3 and Figure 5.

The effects of sleep regularity on physical activity. We estimated the effect of sleep regularity on physical activity by age. Results, controlling for sex, SES, and BMI are presented in Table 3 and Figure 6.

Log Transforming PA Volume

Based on preliminary modelling on a subset of the data, we chose to leave physical activity volume in its natural form to enhance interpretability. The log scale meant that the variable became unintepretable towards the edge of its range. Below, we present the results had we not made this decision. These results are all moderated by age, as this was our primary analysis. The associated figures are back-transformed to the scale range.

The effects of physical activity volume on sleep. We estimated the effects of physical activity on sleep (RQ1) using mixed-effects models. We estimated the effect of physical activity volume on sleep by age, and the results are presented in Table 4 and Figure 7.

The effects of sleep duration on physical activity. We estimated the effect of sleep duration on physical activity by age. Results, controlling for sex, SES, and BMI are presented in Table 5 and Figure 8.

The effects of sleep efficiency on physical activity. We estimated the effect of sleep efficiency on physical activity by age. Results, controlling for sex, SES, and BMI are presented in Table 5 and Figure 9.

The effects of sleep onset on physical activity. We estimated the effect of sleep onset on physical activity by age. Results, controlling for sex, SES, and BMI are presented in Table 5 and Figure 10.

The effects of sleep regularity on physical activity. We estimated the effect of sleep regularity on physical activity by age. Results, controlling for sex, SES, and BMI are presented in Table 5 and Figure 11.

Moderation

In the following section we present models for a range of moderators which were pre-defined in our protocol.

BMI

The effects of physical activity volume on sleep by BMI. We estimated the effects of physical activity on sleep (RQ1) using mixed-effects models. We estimated the effect of physical activity volume on sleep by BMI, and the results are presented in Table 6 and Figure 12

The effects of physical activity intensity on sleep by BMI. We estimated how physical activity intensity affects sleep across BMI. We present the results in Table 6 and Figure 13.

The effects of sleep duration on physical activity. We estimated the effect of sleep duration on physical activity by BMI. Results, controlling for sex, SES, and BMI are presented in Table 7 and Figure 14.

The effects of sleep efficiency on physical activity. We estimated the effect of sleep efficiency on physical activity by BMI. Results, controlling for sex, SES, and BMI are presented in Table 7 and Figure 15.

The effects of sleep onset on physical activity. We estimated the effect of sleep onset on physical activity by BMI. Results, controlling for sex, SES, and BMI are presented in Table 7 and Figure 16.

The effects of sleep regularity on physical activity. We estimated the effect of sleep regularity on physical activity by BMI. Results are presented in Table 7 and Figure 17.

SES

The effects of physical activity volume on sleep by SES. We estimated the effects of physical activity on sleep (RQ1) using mixed-effects models. We estimated the effect of physical activity volume on sleep by SES, and the results are presented in Table 8 and Figure 18

The effects of physical activity intensity on sleep by SES. We estimated how physical activity intensity affects sleep across SES. We present the results in Table 8 and Figure 19.

The effects of sleep duration on physical activity. We estimated the effect of sleep duration on physical activity by SES. Results, controlling for sex, SES, and BMI are presented in Table 9 and Figure 20.

The effects of sleep efficiency on physical activity. We estimated the effect of sleep efficiency on physical activity by SES. Results, controlling for sex, SES, and BMI are presented in Table 9 and Figure 21.

The effects of sleep onset on physical activity. We estimated the effect of sleep onset on physical activity by SES. Results, controlling for sex, SES, and BMI are presented in Table 9 and Figure 22.

The effects of sleep regularity on physical activity. We estimated the effect of sleep regularity on physical activity by SES. Results are presented in Table 9 and Figure 23.

sex

The effects of physical activity volume on sleep by sex. We estimated the effects of physical activity on sleep (RQ1) using mixed-effects models. We estimated the effect of physical activity volume on sleep by sex, and the results are presented in Table 10 and Figure 24

The effects of physical activity intensity on sleep by sex. We estimated how physical activity intensity affects sleep across sex. We present the results in Table 10 and Figure 25.

The effects of sleep duration on physical activity. We estimated the effect of sleep duration on physical activity by sex. Results, controlling for sex, SES, and BMI are presented in Table 11 and Figure 26.

The effects of sleep efficiency on physical activity. We estimated the effect of sleep efficiency on physical activity by sex. Results, controlling for sex, SES, and BMI are presented in Table 11 and Figure 27.

The effects of sleep onset on physical activity. We estimated the effect of sleep onset on physical activity by sex. Results, controlling for sex, SES, and BMI are presented in Table 11 and Figure 28.

The effects of sleep regularity on physical activity. We estimated the effect of sleep regularity on physical activity by sex. Results are presented in Table 11 and Figure 29.

weekday

The effects of physical activity volume on sleep by weekday. We estimated the effects of physical activity on sleep (RQ1) using mixed-effects models. We estimated the effect of physical activity volume on sleep by weekday, and the results are presented in Table 12 and Figure 30

The effects of physical activity intensity on sleep by weekday. We estimated how physical activity intensity affects sleep across weekday. We present the results in Table 12 and Figure 31.

The effects of sleep duration on physical activity. We estimated the effect of sleep duration on physical activity by weekday. Results, controlling for sex, SES, and BMI are presented in Table 13 and Figure 32.

The effects of sleep efficiency on physical activity. We estimated the effect of sleep efficiency on physical activity by weekday. Results, controlling for sex, SES, and BMI are presented in Table 13 and Figure 33.

The effects of sleep onset on physical activity. We estimated the effect of sleep onset on physical activity by weekday. Results, controlling for sex, SES, and BMI are presented in Table 13 and Figure 34.

The effects of sleep regularity on physical activity. We estimated the effect of sleep regularity on physical activity by weekday. Results are presented in Table 13 and Figure 35.

season

The effects of physical activity volume on sleep by season. We estimated the effects of physical activity on sleep (RQ1) using mixed-effects models. We estimated the effect of physical activity volume on sleep by season, and the results are presented in Table 14 and Figure 36

The effects of physical activity intensity on sleep by season. We estimated how physical activity intensity affects sleep across season. We present the results in Table 14 and Figure 37.

The effects of sleep duration on physical activity. We estimated the effect of sleep duration on physical activity by season. Results, controlling for sex, SES, and BMI are presented in Table 15 and Figure 38.

The effects of sleep efficiency on physical activity. We estimated the effect of sleep efficiency on physical activity by season. Results, controlling for sex, SES, and BMI are presented in Table 15 and Figure 39.

The effects of sleep onset on physical activity. We estimated the effect of sleep onset on physical activity by season. Results, controlling for sex, SES, and BMI are presented in Table 15 and Figure 40.

The effects of sleep regularity on physical activity. We estimated the effect of sleep regularity on physical activity by season. Results are presented in Table 15 and Figure 41.

region

The effects of physical activity volume on sleep by region. We estimated the effects of physical activity on sleep (RQ1) using mixed-effects models. We estimated the effect of physical activity volume on sleep by region, and the results are presented in Table 16 and Figure 42

The effects of physical activity intensity on sleep by region. We estimated how physical activity intensity affects sleep across region. We present the results in Table 16 and Figure 43.

The effects of sleep duration on physical activity. We estimated the effect of sleep duration on physical activity by region. Results, controlling for sex, SES, and BMI are presented in Table 17 and Figure 44.

The effects of sleep efficiency on physical activity. We estimated the effect of sleep efficiency on physical activity by region. Results, controlling for sex, SES, and BMI are presented in Table 17 and Figure 45.

The effects of sleep onset on physical activity. We estimated the effect of sleep onset on physical activity by region. Results, controlling for sex, SES, and BMI are presented in Table 17 and Figure 46.

The effects of sleep regularity on physical activity. We estimated the effect of sleep regularity on physical activity by region. Results are presented in Table 17 and Figure 47.

daylight hours

The effects of physical activity volume on sleep by daylight hours. We estimated the effects of physical activity on sleep (RQ1) using mixed-effects models. We estimated the effect of physical activity volume on sleep by daylight hours, and the results are presented in Table 18 and Figure 48

The effects of physical activity intensity on sleep by daylight hours. We estimated how physical activity intensity affects sleep across daylight hours. We present the results in Table 18 and Figure 49.

The effects of sleep duration on physical activity. We estimated the effect of sleep duration on physical activity by daylight hours. Results, controlling for sex, SES, and BMI are presented in Table 19 and Figure 50.

The effects of sleep efficiency on physical activity. We estimated the effect of sleep efficiency on physical activity by daylight hours. Results, controlling for sex, SES, and BMI are presented in Table 19 and Figure 51.

The effects of sleep onset on physical activity. We estimated the effect of sleep onset on physical activity by daylight hours. Results, controlling for sex, SES, and BMI are presented in Table 19 and Figure 52.

The effects of sleep regularity on physical activity. We estimated the effect of sleep regularity on physical activity by daylight hours. Results are presented in Table 19 and Figure 53.

wear location

The effects of physical activity volume on sleep by wear location. We estimated the effects of physical activity on sleep (RQ1) using mixed-effects models. We estimated the effect of physical activity volume on sleep by wear location, and the results are presented in Table 20 and Figure 54

The effects of physical activity intensity on sleep by wear location. We estimated how physical activity intensity affects sleep across wear location. We present the results in Table 20 and Figure 55.

The effects of sleep duration on physical activity. We estimated the effect of sleep duration on physical activity by wear location. Results, controlling for sex, SES, and BMI are presented in Table 21 and Figure 56.

The effects of sleep efficiency on physical activity. We estimated the effect of sleep efficiency on physical activity by wear location. Results, controlling for sex, SES, and BMI are presented in Table 21 and Figure 57.

The effects of sleep onset on physical activity. We estimated the effect of sleep onset on physical activity by wear location. Results, controlling for sex, SES, and BMI are presented in Table 21 and Figure 58.

The effects of sleep regularity on physical activity. We estimated the effect of sleep regularity on physical activity by wear location. Results are presented in Table 21 and Figure 59.

most active hour

The effects of physical activity volume on sleep by most active hour. We estimated the effects of physical activity on sleep (RQ1) using mixed-effects models. We estimated the effect of physical activity volume on sleep by most active hour, and the results are presented in Table 22 and Figure 60

The effects of physical activity intensity on sleep by most active hour. We estimated how physical activity intensity affects sleep across most active hour. We present the results in Table 22 and Figure 61.

The effects of sleep duration on physical activity. We estimated the effect of sleep duration on physical activity by most active hour. Results, controlling for sex, SES, and BMI are presented in Table 23 and Figure 62.

The effects of sleep efficiency on physical activity. We estimated the effect of sleep efficiency on physical activity by most active hour. Results, controlling for sex, SES, and BMI are presented in Table 23 and Figure 63.

The effects of sleep onset on physical activity. We estimated the effect of sleep onset on physical activity by most active hour. Results, controlling for sex, SES, and BMI are presented in Table 23 and Figure 64.

The effects of sleep regularity on physical activity. We estimated the effect of sleep regularity on physical activity by most active hour. Results are presented in Table 23 and Figure 65.

ethnicity

The effects of physical activity volume on sleep by ethnicity. We estimated the effects of physical activity on sleep (RQ1) using mixed-effects models. We estimated the effect of physical activity volume on sleep by ethnicity, and the results are presented in Table 24 and Figure 66

The effects of physical activity intensity on sleep by ethnicity. We estimated how physical activity intensity affects sleep across ethnicity. We present the results in Table 24 and Figure 67.

The effects of sleep duration on physical activity. We estimated the effect of sleep duration on physical activity by ethnicity. Results, controlling for sex, SES, and BMI are presented in Table 25 and Figure 68.

The effects of sleep efficiency on physical activity. We estimated the effect of sleep efficiency on physical activity by ethnicity. Results, controlling for sex, SES, and BMI are presented in Table 25 and Figure 69.

The effects of sleep onset on physical activity. We estimated the effect of sleep onset on physical activity by ethnicity. Results, controlling for sex, SES, and BMI are presented in Table 25 and Figure 70.

The effects of sleep regularity on physical activity. We estimated the effect of sleep regularity on physical activity by ethnicity. Results are presented in Table 25 and Figure 71.

Table 1

Model diagnostics

Model name	Skewness	Kurtosis	Converged (%)
Models moderated by age			
Scale sleep duration by PA volume	-1.06	2.09	100.00%
Scale sleep efficiency by PA volume	-1.99	7.88	100.00%
Scale sleep onset by PA volume	0.42	3.98	100.00%
Scale sleep regularity by PA volume	-0.62	0.76	100.00%
Scale sleep duration by PA intensity	-1.06	2.09	100.00%
Scale sleep efficiency by PA intensity	-2.00	7.87	100.00%
Scale sleep onset by PA intensity	0.42	3.94	100.00%
Scale sleep regularity by PA intensity	-0.62	0.74	100.00%
Scale PA volume by sleep duration(lagged)	1.49	9.62	100.00%
Scale PA intensity by sleep duration(lagged)	0.12	1.73	100.00%
Scale PA volume by sleep efficiency(lagged)	1.49	9.63	100.00%
Scale PA intensity by sleep efficiency(lagged)	0.12	1.73	100.00%
Scale PA volume by sleep onset(lagged)	1.49	9.62	100.00%
Scale PA intensity by sleep onset(lagged)	0.12	1.72	100.00%
Scale PA volume by sleep regularity(lagged)	1.52	9.71	100.00%
Scale PA intensity by sleep regularity(lagged)	0.13	1.73	100.00%
Models moderated by age fixeddef			
Scale sleep duration by PA volume	-1.06	2.09	100.00%
Scale sleep efficiency by PA volume	-1.99	7.88	100.00%
Scale sleep onset by PA volume	0.42	3.98	100.00%
Scale sleep regularity by PA volume	-0.62	0.76	100.00%
Scale sleep duration by PA intensity	-1.06	2.09	100.00%
Scale sleep efficiency by PA intensity	-2.00	7.87	100.00%
Scale sleep onset by PA intensity	0.42	3.94	100.00%
Scale sleep regularity by PA intensity	-0.62	0.74	100.00%
Scale PA volume by sleep duration(lagged)	1.49	9.62	100.00%
Scale PA intensity by sleep duration(lagged)	0.12	1.73	100.00%
Scale PA volume by sleep efficiency(lagged)	1.49	9.63	100.00%
Scale PA intensity by sleep efficiency(lagged)	0.12	1.73	100.00%
Scale PA volume by sleep onset(lagged)	1.49	9.62	100.00%
Scale PA intensity by sleep onset(lagged)	0.12	1.72	100.00%
Scale PA volume by sleep regularity(lagged)	1.52	9.71	100.00%
Scale PA intensity by sleep regularity(lagged)	0.13	1.73	100.00%

Table 1 continued

Model name	Skewness	Kurtosis	Converged (%)
Models moderated by age log			
Scale sleep duration by log PA volume	-1.06	2.09	100.00%
Scale sleep efficiency by log PA volume	-1.99	7.89	100.00%
Scale sleep onset by log PA volume	0.42	3.98	100.00%
Scale sleep regularity by log PA volume	-0.61	0.77	100.00%
Scale sleep duration by PA intensity	-1.06	2.09	100.00%
Scale sleep efficiency by PA intensity	-2.00	7.87	100.00%
Scale sleep onset by PA intensity	0.42	3.94	100.00%
Scale sleep regularity by PA intensity	-0.62	0.74	100.00%
Log PA volume by sleep duration(lagged)	-0.23	2.11	100.00%
Scale PA intensity by sleep duration(lagged)	0.12	1.73	100.00%
Log PA volume by sleep efficiency(lagged)	-0.24	2.10	100.00%
Scale PA intensity by sleep efficiency(lagged)	0.12	1.73	100.00%
Log PA volume by sleep onset(lagged)	-0.24	2.10	100.00%
Scale PA intensity by sleep onset(lagged)	0.12	1.72	100.00%
Log PA volume by sleep regularity(lagged)	-0.21	2.08	100.00%
Scale PA intensity by sleep regularity(lagged)	0.13	1.73	100.00%
Models moderated by bmi			
Scale sleep duration by PA volume	-1.06	2.09	100.00%
Scale sleep efficiency by PA volume	-1.99	7.87	100.00%
Scale sleep onset by PA volume	0.42	3.97	100.00%
Scale sleep regularity by PA volume	-0.62	0.76	100.00%
Scale sleep duration by PA intensity	-1.07	2.09	100.00%
Scale sleep efficiency by PA intensity	-2.00	7.87	100.00%
Scale sleep onset by PA intensity	0.42	3.95	100.00%
Scale sleep regularity by PA intensity	-0.62	0.74	100.00%
Scale PA volume by sleep duration(lagged)	1.49	9.62	100.00%
Scale PA intensity by sleep duration(lagged)	0.12	1.73	100.00%
Scale PA volume by sleep efficiency(lagged)	1.49	9.63	100.00%
Scale PA intensity by sleep efficiency(lagged)	0.12	1.73	100.00%
Scale PA volume by sleep onset(lagged)	1.49	9.63	100.00%
Scale PA intensity by sleep onset(lagged)	0.12	1.72	100.00%
Scale PA volume by sleep regularity(lagged)	1.52	9.72	100.00%
Scale PA intensity by sleep regularity(lagged)	0.13	1.73	100.00%
Models moderated by ses			

Table 1 continued

Model name	Skewness	Kurtosis	Converged (%)
Scale sleep duration by PA volume	-1.06	2.09	100.00%
Scale sleep efficiency by PA volume	-1.99	7.87	100.00%
Scale sleep onset by PA volume	0.42	3.96	100.00%
Scale sleep regularity by PA volume	-0.62	0.76	100.00%
Scale sleep duration by PA intensity	-1.07	2.09	100.00%
Scale sleep efficiency by PA intensity	-2.00	7.87	100.00%
Scale sleep onset by PA intensity	0.42	3.94	100.00%
Scale sleep regularity by PA intensity	-0.62	0.74	100.00%
Scale PA volume by sleep duration(lagged)	1.49	9.63	100.00%
Scale PA intensity by sleep duration(lagged)	0.13	1.73	100.00%
Scale PA volume by sleep efficiency(lagged)	1.49	9.63	100.00%
Scale PA intensity by sleep efficiency(lagged)	0.12	1.73	100.00%
Scale PA volume by sleep onset(lagged)	1.49	9.63	100.00%
Scale PA intensity by sleep onset(lagged)	0.12	1.72	100.00%
Scale PA volume by sleep regularity(lagged)	1.52	9.71	100.00%
Scale PA intensity by sleep regularity(lagged)	0.13	1.73	100.00%
Models moderated by weekday			
Scale sleep duration by PA volume	-1.06	2.07	100.00%
Scale sleep efficiency by PA volume	-1.99	7.87	100.00%
Scale sleep onset by PA volume	0.42	4.01	100.00%
Scale sleep regularity by PA volume	-0.63	0.83	100.00%
Scale sleep duration by PA intensity	-1.06	2.07	100.00%
Scale sleep efficiency by PA intensity	-2.00	7.86	100.00%
Scale sleep onset by PA intensity	0.42	3.98	100.00%
Scale sleep regularity by PA intensity	-0.64	0.82	100.00%
Scale PA volume by sleep duration(lagged)	1.50	9.71	100.00%
Scale PA intensity by sleep duration(lagged)	0.13	1.77	100.00%
Scale PA volume by sleep efficiency(lagged)	1.50	9.71	100.00%
Scale PA intensity by sleep efficiency(lagged)	0.12	1.77	100.00%
Scale PA volume by sleep onset(lagged)	1.50	9.72	100.00%
Scale PA intensity by sleep onset(lagged)	0.13	1.77	100.00%
Scale PA volume by sleep regularity(lagged)	1.52	9.78	100.00%
Scale PA intensity by sleep regularity(lagged)	0.13	1.76	100.00%
Models moderated by season			
Scale sleep duration by PA volume	-1.06	2.09	100.00%

Table 1 continued

Model name	Skewness	Kurtosis	Converged (%)
Scale sleep efficiency by PA volume	-1.99	7.87	100.00%
Scale sleep onset by PA volume	0.42	3.96	100.00%
Scale sleep regularity by PA volume	-0.62	0.76	100.00%
Scale sleep duration by PA intensity	-1.07	2.09	100.00%
Scale sleep efficiency by PA intensity	-2.00	7.86	100.00%
Scale sleep onset by PA intensity	0.42	3.94	100.00%
Scale sleep regularity by PA intensity	-0.62	0.74	100.00%
Scale PA volume by sleep duration(lagged)	1.49	9.62	100.00%
Scale PA intensity by sleep duration(lagged)	0.13	1.73	100.00%
Scale PA volume by sleep efficiency(lagged)	1.49	9.63	100.00%
Scale PA intensity by sleep efficiency(lagged)	0.12	1.73	100.00%
Scale PA volume by sleep onset(lagged)	1.50	9.63	100.00%
Scale PA intensity by sleep onset(lagged)	0.12	1.73	100.00%
Scale PA volume by sleep regularity(lagged)	1.52	9.71	100.00%
Scale PA intensity by sleep regularity(lagged)	0.13	1.73	100.00%
Models moderated by region			
Scale sleep duration by PA volume	-1.06	2.10	100.00%
Scale sleep efficiency by PA volume	-1.99	7.89	100.00%
Scale sleep onset by PA volume	0.40	3.98	100.00%
Scale sleep regularity by PA volume	-0.62	0.76	100.00%
Scale sleep duration by PA intensity	-1.06	2.09	100.00%
Scale sleep efficiency by PA intensity	-2.00	7.87	100.00%
Scale sleep onset by PA intensity	0.41	3.95	100.00%
Scale sleep regularity by PA intensity	-0.62	0.74	100.00%
Scale PA volume by sleep duration(lagged)	1.50	9.62	100.00%
Scale PA intensity by sleep duration(lagged)	0.12	1.73	100.00%
Scale PA volume by sleep efficiency(lagged)	1.49	9.63	100.00%
Scale PA intensity by sleep efficiency(lagged)	0.12	1.73	100.00%
Scale PA volume by sleep onset(lagged)	1.49	9.63	100.00%
Scale PA intensity by sleep onset(lagged)	0.12	1.73	100.00%
Scale PA volume by sleep regularity(lagged)	1.53	9.73	100.00%
Scale PA intensity by sleep regularity(lagged)	0.13	1.73	100.00%
Models moderated by daylight			
Scale sleep duration by PA volume	-1.06	2.09	100.00%
Scale sleep efficiency by PA volume	-1.99	7.87	100.00%

Table 1 continued

Model name	Skewness	Kurtosis	Converged (%)
Scale sleep onset by PA volume	0.42	3.96	100.00%
Scale sleep regularity by PA volume	-0.62	0.76	100.00%
Scale sleep duration by PA intensity	-1.07	2.09	100.00%
Scale sleep efficiency by PA intensity	-2.00	7.87	100.00%
Scale sleep onset by PA intensity	0.42	3.95	100.00%
Scale sleep regularity by PA intensity	-0.62	0.74	100.00%
Scale PA volume by sleep duration(lagged)	1.49	9.63	100.00%
Scale PA intensity by sleep duration(lagged)	0.13	1.73	100.00%
Scale PA volume by sleep efficiency(lagged)	1.49	9.64	100.00%
Scale PA intensity by sleep efficiency(lagged)	0.12	1.73	100.00%
Scale PA volume by sleep onset(lagged)	1.50	9.64	100.00%
Scale PA intensity by sleep onset(lagged)	0.12	1.72	100.00%
Scale PA volume by sleep regularity(lagged)	1.52	9.71	100.00%
Scale PA intensity by sleep regularity(lagged)	0.13	1.73	100.00%
Models moderated by wear location			
Scale sleep duration by PA volume	-1.06	2.09	100.00%
Scale sleep efficiency by PA volume	-1.99	7.89	100.00%
Scale sleep onset by PA volume	0.41	3.97	100.00%
Scale sleep regularity by PA volume	-0.62	0.76	100.00%
Scale sleep duration by PA intensity	-1.06	2.08	100.00%
Scale sleep efficiency by PA intensity	-2.00	7.87	100.00%
Scale sleep onset by PA intensity	0.41	3.94	100.00%
Scale sleep regularity by PA intensity	-0.62	0.74	100.00%
Scale PA volume by sleep duration(lagged)	1.49	9.62	100.00%
Scale PA intensity by sleep duration(lagged)	0.13	1.73	100.00%
Scale PA volume by sleep efficiency(lagged)	1.49	9.63	100.00%
Scale PA intensity by sleep efficiency(lagged)	0.12	1.73	100.00%
Scale PA volume by sleep onset(lagged)	1.49	9.62	100.00%
Scale PA intensity by sleep onset(lagged)	0.12	1.72	100.00%
Scale PA volume by sleep regularity(lagged)	1.52	9.71	100.00%
Scale PA intensity by sleep regularity(lagged)	0.13	1.73	100.00%
Models moderated by PA mostactivehr			
Scale sleep duration by PA volume	-1.06	2.09	100.00%
Scale sleep efficiency by PA volume	-1.99	7.87	100.00%
Scale sleep onset by PA volume	0.42	3.96	100.00%

Table 1 continued

Model name	Skewness	Kurtosis	Converged (%)
Scale sleep regularity by PA volume	-0.62	0.76	100.00%
Scale sleep duration by PA intensity	-1.07	2.08	100.00%
Scale sleep efficiency by PA intensity	-2.00	7.87	100.00%
Scale sleep onset by PA intensity	0.42	3.94	100.00%
Scale sleep regularity by PA intensity	-0.62	0.74	100.00%
Scale PA volume by sleep duration(lagged)	1.49	9.61	100.00%
Scale PA intensity by sleep duration(lagged)	0.12	1.73	100.00%
Scale PA volume by sleep efficiency(lagged)	1.49	9.62	100.00%
Scale PA intensity by sleep efficiency(lagged)	0.12	1.73	100.00%
Scale PA volume by sleep onset(lagged)	1.50	9.62	100.00%
Scale PA intensity by sleep onset(lagged)	0.12	1.73	100.00%
Scale PA volume by sleep regularity(lagged)	1.52	9.70	100.00%
Scale PA intensity by sleep regularity(lagged)	0.13	1.73	100.00%

Table 2

Physical activity predicting sleep controlling for SES, sex, BMI, and the fixed effects of study IDs.

Term	Physical activity volume (z)			Physical activity intensity (z)				
	β [95% CI]	SE	t	p	β [95% CI]	SE	t	p
Sleep duration (z)								
(Intercept)	0.37 [0.11, 0.63]	0.13	2.79	.007	0.32 [0.04, 0.60]	0.14	2.23	.031
Physical activity	0.09 [-0.12, 0.29]	0.11	0.81	.422	0.09 [-0.01, 0.18]	0.05	1.76	.084
Age	0.00 [-0.01, 0.00]	0.00	-0.85	.400	0.00 [0.00, 0.00]	0.00	-0.93	.357
Physical activity ²	0.00 [-0.03, 0.02]	0.01	-0.36	.722	-0.01 [-0.04, 0.02]	0.02	-0.59	.560
Physical activity × age	0.00 [0.00, 0.00]	0.00	-0.44	.662	0.00 [0.00, 0.00]	0.00	-1.29	.201
Age × Physical activity ²	0.00 [0.00, 0.00]	0.00	-0.49	.626	0.00 [0.00, 0.00]	0.00	-0.43	.669
Sleep efficiency (z)								
(Intercept)	-0.24 [-0.39, -0.08]	0.08	-2.91	.005	-0.27 [-0.45, -0.09]	0.09	-2.95	.005
Physical activity	0.10 [-0.04, 0.25]	0.07	1.38	.173	0.01 [-0.03, 0.06]	0.02	0.54	.594
Age	0.00 [0.00, 0.00]	0.00	-0.10	.922	0.00 [0.00, 0.00]	0.00	-0.48	.635
Physical activity ²	-0.01 [-0.03, 0.00]	0.01	-1.59	.117	0.01 [-0.01, 0.03]	0.01	0.72	.473
Physical activity × age	0.00 [0.00, 0.00]	0.00	-1.24	.221	0.00 [0.00, 0.00]	0.00	-1.05	.298
Age × Physical activity ²	0.00 [0.00, 0.00]	0.00	0.55	.582	0.00 [0.00, 0.00]	0.00	-1.02	.311
Sleep onset (z)								
(Intercept)	-0.91 [-1.07, -0.74]	0.09	-10.54	< .001	-0.88 [-1.06, -0.70]	0.09	-9.54	< .001
Physical activity	0.04 [-0.05, 0.14]	0.05	0.86	.393	-0.05 [-0.11, 0.00]	0.03	-1.84	.072
Age	0.00 [0.00, 0.00]	0.00	1.07	.291	0.00 [0.00, 0.00]	0.00	0.64	.524
Physical activity ²	-0.01 [-0.02, 0.00]	0.01	-1.88	.066	-0.01 [-0.03, 0.02]	0.01	-0.58	.564
Physical activity × age	0.00 [0.00, 0.00]	0.00	-2.52	.015	0.00 [0.00, 0.00]	0.00	-0.36	.721
Age × Physical activity ²	0.00 [0.00, 0.00]	0.00	2.47	.016	0.00 [0.00, 0.00]	0.00	1.21	.233
Sleep regularity (z)								

Table 2 continued

Term	Physical activity volume (z)				Physical activity intensity (z)			
	β [95% CI]	SE	t	p	β [95% CI]	SE	t	p
(Intercept)	0.10 [-0.03, 0.22]	0.06	1.54	.130	0.06 [-0.08, 0.19]	0.07	0.83	.410
Physical activity	0.14 [0.08, 0.20]	0.03	4.33	< .001	0.11 [0.05, 0.17]	0.03	3.61	< .001
Age	0.00 [0.00, 0.00]	0.00	0.42	.678	0.00 [0.00, 0.00]	0.00	-0.86	.392
Physical activity ²	-0.02 [-0.03, -0.01]	0.01	-3.15	.003	-0.02 [-0.05, 0.01]	0.02	-1.44	.156
Physical activity × age	0.00 [0.00, 0.00]	0.00	1.90	.062	0.00 [0.00, 0.00]	0.00	-3.27	.002
Age × Physical activity ²	0.00 [0.00, 0.00]	0.00	-4.10	< .001	0.00 [0.00, 0.00]	0.00	-0.51	.610

Note. Adjusted for SES, sex, BMI, and the fixed effects of study IDs. Outcomes variables are listed in the column headers.

Table 3

Sleep predicting physical activity controlling for SES, sex, BMI, and the fixed effects of study IDs

Term	Physical activity volume (z)			Physical activity intensity (z)				
	β [95% CI]	SE	t	p	β [95% CI]	SE	t	p
Sleep duration (z)								
(Intercept)	0.13 [-0.02, 0.27]	0.07	1.69	.097	0.85 [0.67, 1.04]	0.09	9.04	< .001
Sleep duration	-0.01 [-0.12, 0.10]	0.06	-0.16	.874	0.02 [-0.01, 0.05]	0.01	1.22	.227
Age	-0.02 [-0.02, -0.01]	0.00	-7.47	< .001	-0.02 [-0.03, -0.01]	0.00	-6.54	< .001
Sleep duration ²	0.00 [-0.04, 0.03]	0.02	-0.30	.767	0.00 [-0.01, 0.01]	0.00	-0.17	.868
Sleep duration × age	0.00 [0.00, 0.00]	0.00	-0.08	.936	0.00 [0.00, 0.00]	0.00	0.59	.555
Age × Sleep duration ²	0.00 [0.00, 0.00]	0.00	-0.62	.539	0.00 [0.00, 0.00]	0.00	-0.19	.850
Sleep efficiency (z)								
(Intercept)	0.12 [-0.03, 0.26]	0.07	1.61	.113	0.86 [0.68, 1.05]	0.09	9.29	< .001
Sleep efficiency	0.05 [-0.03, 0.12]	0.04	1.17	.247	0.02 [0.00, 0.04]	0.01	2.10	.039
Age	-0.02 [-0.02, -0.01]	0.00	-7.26	< .001	-0.02 [-0.03, -0.01]	0.00	-6.53	< .001
Sleep efficiency ²	0.01 [-0.01, 0.02]	0.01	1.25	.215	0.00 [0.00, 0.01]	0.00	1.61	.111
Sleep efficiency × age	0.00 [0.00, 0.00]	0.00	-0.82	.417	0.00 [0.00, 0.00]	0.00	-1.72	.090
Age × Sleep efficiency ²	0.00 [0.00, 0.00]	0.00	-0.56	.579	0.00 [0.00, 0.00]	0.00	-0.44	.664
Sleep onset (z)								
(Intercept)	0.16 [0.01, 0.31]	0.08	2.04	.046	0.86 [0.67, 1.05]	0.10	8.90	< .001
Sleep onset	0.03 [-0.08, 0.13]	0.05	0.50	.623	-0.01 [-0.03, 0.02]	0.01	-0.52	.605
Age	-0.02 [-0.02, -0.01]	0.00	-7.33	< .001	-0.02 [-0.03, -0.01]	0.00	-6.54	< .001
Sleep onset ²	-0.02 [-0.04, -0.01]	0.01	-2.57	.013	-0.01 [-0.01, 0.00]	0.00	-2.03	.045
Sleep onset × age	0.00 [0.00, 0.00]	0.00	-0.64	.524	0.00 [0.00, 0.00]	0.00	-0.46	.650
Age × Sleep onset ²	0.00 [0.00, 0.00]	0.00	1.30	.200	0.00 [0.00, 0.00]	0.00	0.71	.481
Sleep regularity (z)								

Table 3 continued

Term	Physical activity volume (z)				Physical activity intensity (z)			
	β [95% CI]	SE	t	p	β [95% CI]	SE	t	p
(Intercept)	0.10 [-0.04, 0.24]	0.07	1.44	.156	0.87 [0.69, 1.05]	0.09	9.48	< .001
Sleep regularity	0.12 [0.04, 0.20]	0.04	3.07	.003	0.05 [0.04, 0.07]	0.01	7.41	< .001
Age	-0.02 [-0.02, -0.01]	0.00	-7.12	< .001	-0.02 [-0.03, -0.01]	0.00	-6.53	< .001
Sleep regularity ²	0.01 [0.00, 0.03]	0.01	1.54	.129	0.00 [-0.01, 0.01]	0.00	-0.58	.561
Sleep regularity × age	0.00 [0.00, 0.00]	0.00	-2.00	.051	0.00 [0.00, 0.00]	0.00	-4.51	< .001
Age × Sleep regularity ²	0.00 [0.00, 0.00]	0.00	-1.25	.215	0.00 [0.00, 0.00]	0.00	-0.07	.947

Note. Adjusted for SES, sex, BMI, and the fixed effects of study IDs. Outcomes variables are listed in the row headers.

Table 4

Physical activity predicting sleep controlling for SES, sex, and BMI.

Term	Physical activity volume (ln)			Physical activity intensity (z)					
	β	[95% CI]	SE	t	p	β [95% CI]	SE	t	p
<i>Sleep duration (z)</i>									
(Intercept)	0.18	[0.94, 1.31]	0.58	0.32	.750	0.01	[-0.35, 0.37]	0.18	0.05
Log pa volume	-0.26	[-1.15, 0.64]	0.45	-0.56	.578	0.09	[-0.01, 0.18]	0.05	1.76
Age	-0.01	[-0.03, 0.01]	0.01	-0.88	.382	0.00	[0.00, 0.00]	0.00	-0.87
Log pa volume ²	0.06	[-0.10, 0.22]	0.08	0.69	.491	-0.01	[-0.04, 0.02]	0.02	-0.58
Log pa volume × age	0.01	[-0.01, 0.02]	0.01	0.77	.446	0.00	[0.00, 0.00]	0.00	-1.29
Age × log pa volume ²	0.00	[0.00, 0.00]	0.00	-0.78	.440	0.00	[0.00, 0.00]	0.00	-0.43
<i>Sleep efficiency (z)</i>									
(Intercept)	-0.69	[-1.46, 0.07]	0.39	-1.77	.081	0.15	[-0.11, 0.40]	0.13	1.13
Log pa volume	0.29	[-0.15, 0.73]	0.22	1.30	.199	0.01	[-0.03, 0.06]	0.02	0.53
Age	0.00	[-0.01, 0.01]	0.01	0.22	.827	0.00	[0.00, 0.00]	0.00	-0.32
Log pa volume ²	-0.02	[-0.10, 0.06]	0.04	-0.45	.651	0.01	[-0.01, 0.03]	0.01	0.73
Log pa volume × age	0.00	[-0.01, 0.01]	0.00	0.42	.676	0.00	[0.00, 0.00]	0.00	-1.04
Age × log pa volume ²	0.00	[0.00, 0.00]	0.00	-0.84	.406	0.00	[0.00, 0.00]	0.00	-1.03
<i>Sleep onset (z)</i>									
(Intercept)	-0.82	[-1.67, 0.04]	0.44	-1.87	.067	-0.06	[-0.33, 0.21]	0.14	-0.44
Log pa volume	0.35	[-0.26, 0.95]	0.31	1.12	.269	-0.05	[-0.11, 0.00]	0.03	-1.84
Age	0.01	[-0.01, 0.03]	0.01	1.36	.180	0.00	[0.00, 0.00]	0.00	0.70
Log pa volume ²	-0.04	[-0.14, 0.06]	0.05	-0.78	.438	-0.01	[-0.03, 0.02]	0.01	-0.58
Log pa volume × age	0.00	[-0.01, 0.01]	0.01	-0.42	.678	0.00	[0.00, 0.00]	0.00	-0.36
Age × log pa volume ²	0.00	[0.00, 0.00]	0.00	-0.15	.878	0.00	[0.00, 0.00]	0.00	1.20
<i>Sleep regularity (z)</i>									

Term	Physical activity volume (ln)				Physical activity intensity (z)					
	β	[95% CI]	SE	t	p	β	[95% CI]	SE	t	p
(Intercept)	-1.00	[-1.99, 0.00]	0.51	-1.96	.055	0.42	[0.23, 0.61]	0.10	4.33	< .001
Log pa volume	0.52	[0.08, 1.11]	0.30	1.70	.096	0.11	[0.05, 0.17]	0.03	3.61	< .001
Age	-0.04	[-0.06, -0.02]	0.01	-3.42	.001	0.00	[0.00, 0.00]	0.00	-0.79	.432
Log pa volume ²	-0.04	[-0.13, 0.05]	0.04	-0.88	.382	-0.02	[-0.05, 0.01]	0.02	-1.43	.158
Log pa volume × age	0.02	[0.01, 0.04]	0.01	3.26	.002	0.00	[0.00, 0.00]	0.00	-3.27	.002
Age × log pa volume ²	0.00	[-0.01, 0.00]	0.00	-3.04	.004	0.00	[0.00, 0.00]	0.00	-0.52	.602

Note. Adjusted for SES, sex, and BMI. Outcomes variables are listed in the column headers.

Table 5

Sleep predicting physical activity controlling for SES, sex, and BMI

Term	Physical activity volume (ln)				Physical activity intensity (z)			
	β [95% CI]	SE	t	p	β [95% CI]	SE	t	p
Sleep duration (z)								
(Intercept)	4.12 [3.95, 4.30]	0.09	46.88	< .001	1.07 [0.82, 1.32]	0.13	8.38	< .001
Sleep duration	0.00 [-0.05, 0.05]	0.03	-0.10	.924	0.02 [-0.01, 0.05]	0.01	1.22	.226
Age	-0.01 [-0.01, -0.01]	0.00	-6.56	< .001	-0.02 [-0.03, -0.01]	0.00	-6.68	< .001
Sleep duration ²	0.00 [-0.02, 0.01]	0.01	-0.20	.839	0.00 [-0.01, 0.01]	0.00	-0.17	.866
Sleep duration × age	0.00 [0.00, 0.00]	0.00	-0.41	.686	0.00 [0.00, 0.00]	0.00	0.59	.556
Age × Sleep duration ²	0.00 [0.00, 0.00]	0.00	-1.51	.138	0.00 [0.00, 0.00]	0.00	-0.19	.851
Sleep efficiency (z)								
(Intercept)	4.12 [3.94, 4.29]	0.09	46.21	< .001	1.07 [0.82, 1.32]	0.13	8.39	< .001
Sleep efficiency	0.03 [-0.01, 0.06]	0.02	1.62	.111	0.02 [0.00, 0.04]	0.01	2.10	.039
Age	-0.01 [-0.01, -0.01]	0.00	-6.45	< .001	-0.02 [-0.03, -0.01]	0.00	-6.67	< .001
Sleep efficiency ²	0.01 [0.00, 0.01]	0.00	1.79	.080	0.00 [0.00, 0.01]	0.00	1.61	.111
Sleep efficiency × age	0.00 [0.00, 0.00]	0.00	-1.01	.318	0.00 [0.00, 0.00]	0.00	-1.72	.090
Age × Sleep efficiency ²	0.00 [0.00, 0.00]	0.00	-0.73	.469	0.00 [0.00, 0.00]	0.00	-0.44	.664
Sleep onset (z)								
(Intercept)	4.13 [3.96, 4.31]	0.09	46.46	< .001	1.08 [0.83, 1.33]	0.13	8.40	< .001
Sleep onset	0.02 [-0.03, 0.06]	0.02	0.68	.501	-0.01 [-0.03, 0.02]	0.01	-0.52	.608
Age	-0.01 [-0.01, -0.01]	0.00	-6.49	< .001	-0.02 [-0.03, -0.01]	0.00	-6.68	< .001
Sleep onset ²	-0.01 [-0.02, 0.00]	0.00	-2.96	.005	-0.01 [-0.01, 0.00]	0.00	-2.04	.044
Sleep onset × age	0.00 [0.00, 0.00]	0.00	-0.67	.505	0.00 [0.00, 0.00]	0.00	-0.46	.649
Age × Sleep onset ²	0.00 [0.00, 0.00]	0.00	0.85	.398	0.00 [0.00, 0.00]	0.00	0.71	.479
Sleep regularity (z)								

Table 5 continued

Term	Physical activity volume (ln)				Physical activity intensity (z)					
	β	[95% CI]	SE	t	p	β	[95% CI]	SE	t	p
(Intercept)	4.10	[3.93, 4.27]	0.09	46.33	< .001	1.06	[0.81, 1.31]	0.13	8.40	< .001
Sleep regularity	0.06	[0.03, 0.10]	0.02	3.57	< .001	0.05	[0.04, 0.07]	0.01	7.41	< .001
Age	-0.01	[-0.01, -0.01]	0.00	-6.42	< .001	-0.02	[-0.03, -0.01]	0.00	-6.67	< .001
Sleep regularity ²	0.00	[-0.01, 0.01]	0.00	0.24	.812	0.00	[-0.01, 0.01]	0.00	-0.58	.563
Sleep regularity × age	0.00	[0.00, 0.00]	0.00	-1.84	.072	0.00	[0.00, 0.00]	0.00	-4.52	< .001
Age × Sleep regularity ²	0.00	[0.00, 0.00]	0.00	-0.44	.663	0.00	[0.00, 0.00]	0.00	-0.07	.945

Note. Adjusted for SES, sex, and BMI. Outcomes variables are listed in the row headers.

Table 6

Physical activity predicting sleep controlling for SES, age, and sex.

Term	Physical activity volume (z)				Physical activity intensity (z)			
	β [95% CI]	SE	t	p	β [95% CI]	SE	t	p
<i>Sleep duration (z)</i>								
(Intercept)	0.00 [-0.39, 0.39]	0.20	0.02	.985	0.01 [-0.35, 0.37]	0.19	0.05	.960
Physical activity	0.09 [-0.14, 0.32]	0.12	0.74	.465	0.08 [-0.02, 0.18]	0.05	1.60	.116
Physical activity ²	-0.01 [-0.04, 0.02]	0.02	-0.46	.646	0.00 [-0.03, 0.03]	0.02	-0.15	.882
Age	0.00 [-0.01, 0.00]	0.00	-0.71	.478	0.00 [0.00, 0.00]	0.00	-0.79	.435
Physical activity × bmi	0.00 [-0.01, 0.00]	0.00	-0.29	.770	0.00 [0.00, 0.00]	0.00	-0.68	.501
<i>Sleep efficiency (z)</i>								
(Intercept)	0.12 [-0.15, 0.38]	0.14	0.85	.397	0.15 [-0.11, 0.41]	0.13	1.13	.259
Physical activity	0.09 [-0.08, 0.25]	0.08	1.03	.306	0.01 [-0.04, 0.06]	0.03	0.43	.667
Physical activity ²	-0.01 [-0.03, 0.01]	0.01	-1.05	.298	0.01 [-0.02, 0.04]	0.01	0.53	.595
Age	0.00 [0.00, 0.00]	0.00	0.40	.687	0.00 [0.00, 0.00]	0.00	-0.33	.739
Physical activity × bmi	0.00 [0.00, 0.00]	0.00	-0.55	.585	0.00 [0.00, 0.00]	0.00	-0.50	.620
<i>Sleep onset (z)</i>								
(Intercept)	-0.10 [-0.39, 0.18]	0.15	-0.71	.478	-0.06 [-0.33, 0.21]	0.14	-0.43	.668
Physical activity	0.04 [-0.08, 0.15]	0.06	0.61	.544	-0.06 [-0.12, 0.00]	0.03	-1.93	.059
Physical activity ²	-0.01 [-0.03, 0.01]	0.01	-1.22	.227	-0.01 [-0.04, 0.03]	0.02	-0.40	.691
Age	0.00 [0.00, 0.01]	0.00	1.65	.105	0.00 [0.00, 0.00]	0.00	0.98	.329
Physical activity × bmi	0.00 [-0.01, 0.00]	0.00	-1.20	.236	0.00 [0.00, 0.00]	0.00	-0.10	.918
<i>Sleep regularity (z)</i>								
(Intercept)	0.32 [0.15, 0.49]	0.09	3.71	<.001	0.42 [0.24, 0.60]	0.09	4.58	< .001
Physical activity	0.06 [-0.22, 0.34]	0.14	0.41	.683	0.07 [0.00, 0.14]	0.04	2.07	.043
Physical activity ²	0.00 [-0.06, 0.06]	0.03	0.07	.942	-0.01 [-0.05, 0.03]	0.02	-0.47	.637

Term	Physical activity volume (z)				Physical activity intensity (z)					
	β	[95% CI]	SE	t	p	β	[95% CI]	SE	t	p
Age	0.00	[0.00, 0.00]	0.00	-0.08	.936	0.00	[0.00, 0.00]	0.00	-0.58	.566
Physical activity \times bmi	0.01	[-0.01, 0.02]	0.01	0.78	.440	0.00	[0.00, 0.00]	0.00	-0.38	.703

Note. Adjusted for SES, age, and sex. Outcomes variables are listed in the column headers.

Sleep predicting physical activity controlling for SES, age, and sex

Term	Physical activity volume (z)				Physical activity intensity (z)					
	β	[95% CI]	SE	t	p	β	[95% CI]	SE	t	p
Sleep duration (z)										
(Intercept)	1.16	[0.81, 1.50]	0.18	6.48	< .001	1.07	[0.83, 1.32]	0.13	8.46	< .001
Sleep duration	-0.01	[-0.13, 0.11]	0.06	-0.11	.912	0.02	[-0.02, 0.06]	0.02	0.98	.332
Sleep duration ²	-0.01	[-0.05, 0.03]	0.02	-0.37	.710	0.00	[-0.02, 0.02]	0.01	-0.07	.941
Age	-0.02	[-0.02, -0.01]	0.00	-7.49	< .001	-0.02	[-0.03, -0.01]	0.00	-6.64	< .001
Sleep duration × bmi	0.00	[0.00, 0.00]	0.00	-0.13	.901	0.00	[0.00, 0.00]	0.00	0.01	.990
Sleep efficiency (z)										
(Intercept)	1.14	[0.79, 1.48]	0.18	6.45	< .001	1.08	[0.82, 1.33]	0.13	8.36	< .001
Sleep efficiency	0.05	[-0.03, 0.14]	0.04	1.21	.232	0.02	[-0.02, 0.05]	0.02	0.89	.378
Sleep efficiency ²	0.01	[-0.01, 0.03]	0.01	0.80	.428	0.00	[-0.01, 0.01]	0.00	0.12	.902
Age	-0.02	[-0.02, -0.01]	0.00	-7.37	< .001	-0.02	[-0.03, -0.01]	0.00	-6.67	< .001
Sleep efficiency × bmi	0.00	[0.00, 0.00]	0.00	-0.86	.393	0.00	[0.00, 0.00]	0.00	-0.40	.691
Sleep onset (z)										
(Intercept)	1.17	[0.82, 1.52]	0.18	6.58	< .001	1.08	[0.83, 1.33]	0.13	8.49	< .001
Sleep onset	0.04	[-0.07, 0.15]	0.06	0.70	.489	-0.01	[-0.05, 0.04]	0.02	-0.25	.805
Sleep onset ²	-0.03	[-0.05, -0.01]	0.01	-2.42	.019	-0.01	[-0.02, 0.01]	0.01	-0.82	.417
Age	-0.02	[-0.02, -0.01]	0.00	-7.28	< .001	-0.02	[-0.03, -0.01]	0.00	-6.64	< .001
Sleep onset × bmi	0.00	[0.00, 0.00]	0.00	-0.81	.422	0.00	[0.00, 0.00]	0.00	-0.29	.772
Sleep regularity (z)										
(Intercept)	1.09	[0.75, 1.44]	0.18	6.22	< .001	1.06	[0.82, 1.31]	0.13	8.49	< .001
Sleep regularity	0.10	[-0.04, 0.24]	0.07	1.35	.183	0.04	[0.00, 0.09]	0.02	1.75	.085
Sleep regularity ²	0.01	[-0.01, 0.03]	0.01	0.97	.334	0.00	[-0.02, 0.01]	0.01	-0.69	.491

Term	Physical activity volume (z)				Physical activity intensity (z)					
	β	[95% CI]	SE	t	p	β	[95% CI]	SE	t	p
Age	-0.02	[-0.02, -0.01]	0.00	-7.35	< .001	-0.02	[-0.03, -0.01]	0.00	-6.68	< .001
Sleep regularity × bmi	0.00	[-0.01, 0.00]	0.00	-0.08	.935	0.00	[0.00, 0.00]	0.00	-0.18	.856

Note. Adjusted for SES, age, and sex. Outcomes variables are listed in the row headers.

Physical activity predicting sleep controlling for age, sex, and BMI.

Term	Physical activity volume (z)			Physical activity intensity (z)				
	β [95% CI]	SE	t	p	β [95% CI]	SE	t	p
Sleep duration (z)								
(Intercept)	0.00 [-0.39, 0.39]	0.20	0.01	.990	0.02 [-0.34, 0.37]	0.18	0.09	.925
Physical activity	0.07 [-0.06, 0.20]	0.06	1.10	.276	0.05 [-0.01, 0.11]	0.03	1.69	.098
Physical activity ²	-0.01 [-0.02, 0.01]	0.01	-0.92	.362	-0.01 [-0.02, 0.00]	0.01	-1.26	.212
Age	0.00 [-0.01, 0.00]	0.00	-0.65	.521	0.00 [0.00, 0.00]	0.00	-0.75	.456
Physical activity × sesmedium	-0.01 [-0.06, 0.04]	0.03	-0.37	.712	0.00 [-0.02, 0.03]	0.01	0.19	.847
Physical activity × sesshigh	0.01 [-0.03, 0.04]	0.02	0.31	.760	0.00 [-0.02, 0.03]	0.01	0.40	.694
Sleep efficiency (z)								
(Intercept)	0.11 [-0.16, 0.38]	0.14	0.83	.407	0.16 [-0.10, 0.41]	0.13	1.19	.235
Physical activity	0.06 [-0.02, 0.14]	0.04	1.47	.147	0.00 [-0.03, 0.04]	0.02	0.24	.811
Physical activity ²	-0.01 [-0.02, 0.00]	0.00	-2.37	.020	0.00 [-0.01, 0.01]	0.00	0.55	.581
Age	0.00 [0.00, 0.00]	0.00	0.40	.688	0.00 [0.00, 0.00]	0.00	-0.36	.719
Physical activity × sesmedium	-0.01 [-0.05, 0.02]	0.02	-0.65	.519	0.00 [-0.02, 0.02]	0.01	-0.06	.955
Physical activity × sesshigh	0.03 [0.01, 0.06]	0.01	2.51	.013	0.00 [-0.02, 0.02]	0.01	-0.26	.796
Sleep onset (z)								
(Intercept)	-0.12 [-0.40, 0.17]	0.14	-0.82	.415	-0.07 [-0.34, 0.20]	0.14	-0.53	.599
Physical activity	-0.03 [-0.09, 0.03]	0.03	-1.03	.308	-0.06 [-0.11, -0.02]	0.02	-2.95	.005
Physical activity ²	0.00 [-0.01, 0.01]	0.00	0.49	.625	0.01 [0.00, 0.02]	0.01	1.20	.233
Age	0.00 [0.00, 0.01]	0.00	1.69	.096	0.00 [0.00, 0.00]	0.00	0.97	.334
Physical activity × sesmedium	0.01 [-0.02, 0.04]	0.02	0.42	.675	0.00 [-0.02, 0.02]	0.01	-0.03	.978
Physical activity × sesshigh	0.04 [0.01, 0.07]	0.01	2.68	.009	0.00 [-0.02, 0.02]	0.01	0.13	.897
Sleep regularity (z)								

Table 8 continued

Term	Physical activity volume (z)				Physical activity intensity (z)			
	β [95% CI]	SE	t	p	β [95% CI]	SE	t	p
(Intercept)	0.36 [0.19, 0.54]	0.09	4.05	< .001	0.43 [0.24, 0.62]	0.10	4.48	< .001
Physical activity	0.15 [0.10, 0.21]	0.03	5.58	< .001	0.06 [0.04, 0.08]	0.01	5.03	< .001
Physical activity ²	-0.02 [-0.03, -0.02]	0.00	-6.03	< .001	-0.01 [-0.02, -0.01]	0.00	-3.05	.003
Age	0.00 [0.00, 0.00]	0.00	0.08	.935	0.00 [0.00, 0.00]	0.00	-0.52	.603
Physical activity × sesmedium	0.01 [-0.01, 0.03]	0.01	0.73	.464	-0.01 [-0.02, 0.01]	0.01	-0.61	.540
Physical activity × seshigh	0.01 [-0.01, 0.04]	0.01	0.84	.401	0.01 [-0.01, 0.02]	0.01	0.70	.482

Note. Adjusted for age, sex, and BMI. Outcomes variables are listed in the column headers.

Table 9

Sleep predicting physical activity controlling for age, sex, and BMI

Term	Physical activity volume (z)				Physical activity intensity (z)			
	β [95% CI]	SE	t	p	β [95% CI]	SE	t	p
Sleep duration (z)								
(Intercept)	1.17 [0.82, 1.51]	0.18	6.64	< .001	1.08 [0.82, 1.33]	0.13	8.36	< .001
Sleep duration	-0.02 [-0.08, 0.04]	0.03	-0.64	.524	0.02 [0.00, 0.05]	0.01	1.73	.089
Sleep duration ²	-0.02 [-0.04, 0.00]	0.01	-2.00	.051	0.00 [-0.01, 0.00]	0.00	-0.81	.418
Age	-0.02 [-0.02, -0.01]	0.00	-7.49	< .001	-0.02 [-0.03, -0.01]	0.00	-6.65	< .001
Sleep duration × sesmedium	0.01 [-0.02, 0.03]	0.01	0.55	.583	0.00 [-0.02, 0.02]	0.01	0.08	.938
Sleep duration × seshigh	0.01 [0.00, 0.03]	0.01	1.44	.151	0.00 [-0.01, 0.02]	0.01	0.27	.784
Sleep efficiency (z)								
(Intercept)	1.14 [0.79, 1.48]	0.18	6.43	< .001	1.07 [0.82, 1.33]	0.13	8.38	< .001
Sleep efficiency	0.04 [-0.01, 0.08]	0.02	1.68	.098	0.01 [-0.02, 0.03]	0.01	0.62	.538
Sleep efficiency ²	0.01 [0.00, 0.02]	0.01	1.30	.199	0.00 [0.00, 0.01]	0.00	0.59	.559
Age	-0.02 [-0.02, -0.01]	0.00	-7.37	< .001	-0.02 [-0.03, -0.01]	0.00	-6.67	< .001
Sleep efficiency × sesmedium	-0.01 [-0.03, 0.02]	0.01	-0.65	.516	0.00 [-0.02, 0.02]	0.01	-0.18	.855
Sleep efficiency × seshigh	0.00 [-0.02, 0.02]	0.01	-0.29	.775	0.01 [-0.01, 0.02]	0.01	0.57	.571
Sleep onset (z)								
(Intercept)	1.16 [0.82, 1.51]	0.18	6.58	< .001	1.08 [0.82, 1.33]	0.13	8.30	< .001
Sleep onset	0.01 [-0.04, 0.07]	0.03	0.40	.693	-0.01 [-0.04, 0.02]	0.01	-0.67	.503
Sleep onset ²	-0.02 [-0.03, -0.01]	0.01	-3.96	< .001	0.00 [0.01, 0.00]	0.00	-1.25	.215
Age	-0.02 [-0.02, -0.01]	0.00	-7.27	< .001	-0.02 [-0.03, -0.01]	0.00	-6.64	< .001
Sleep onset × sesmedium	0.00 [-0.03, 0.02]	0.01	-0.05	.963	0.00 [-0.02, 0.01]	0.01	-0.26	.793
Sleep onset × seshigh	0.01 [-0.01, 0.03]	0.01	0.83	.407	0.00 [-0.02, 0.02]	0.01	-0.29	.776
Sleep regularity (z)								

Table 9 continued

Term	Physical activity volume (z)				Physical activity intensity (z)			
	β [95% CI]	SE	t	p	β [95% CI]	SE	t	p
(Intercept)	1.10 [0.76, 1.44]	0.17	6.29	< .001	1.06 [0.81, 1.31]	0.13	8.37	< .001
Sleep regularity	0.08 [0.03, 0.12]	0.02	3.33	.002	0.03 [0.02, 0.05]	0.01	4.68	< .001
Sleep regularity ²	0.01 [0.00, 0.02]	0.01	1.19	.237	0.00 [-0.01, 0.01]	0.00	-0.23	.817
Age	-0.02 [-0.02, -0.01]	0.00	-7.41	< .001	-0.02 [-0.03, -0.01]	0.00	-6.69	< .001
Sleep regularity × sesmedium	0.01 [-0.01, 0.03]	0.01	0.81	.420	-0.01 [-0.02, 0.01]	0.01	-1.05	.297
Sleep regularity × seshigh	0.01 [0.00, 0.03]	0.01	1.51	.134	0.00 [-0.01, 0.02]	0.01	0.67	.506

Note. Adjusted for age, sex, and BMI. Outcomes variables are listed in the row headers.

Table 10

Physical activity predicting sleep controlling for SES, age, and BMI.

Term	Physical activity volume (z)			Physical activity intensity (z)				
	β [95% CI]	SE	t	p	β [95% CI]	SE	t	p
<i>Sleep duration (z)</i>								
(Intercept)	0.00 [-0.39, 0.40]	0.20	0.01	.993	0.02 [-0.34, 0.37]	0.18	0.09	.932
Physical activity	0.07 [-0.07, 0.21]	0.07	0.94	.354	0.05 [0.00, 0.10]	0.03	1.94	.058
Physical activity ²	-0.01 [-0.02, 0.01]	0.01	-0.75	.458	-0.01 [-0.02, 0.00]	0.01	-1.27	.207
Age	0.00 [-0.01, 0.00]	0.00	-0.64	.527	0.00 [0.00, 0.00]	0.00	-0.75	.453
Physical activity × sexmale	0.00 [-0.03, 0.04]	0.02	0.20	.841	0.01 [-0.01, 0.03]	0.01	0.83	.408
<i>Sleep efficiency (z)</i>								
(Intercept)	0.12 [-0.16, 0.39]	0.14	0.83	.406	0.15 [-0.10, 0.41]	0.13	1.17	.243
Physical activity	0.08 [-0.02, 0.17]	0.05	1.62	.112	0.00 [-0.03, 0.03]	0.02	-0.19	.851
Physical activity ²	-0.01 [-0.02, 0.00]	0.00	-2.53	.014	0.01 [0.00, 0.01]	0.00	1.71	.090
Age	0.00 [0.00, 0.00]	0.00	0.43	.669	0.00 [0.00, 0.00]	0.00	-0.39	.696
Physical activity × sexmale	-0.02 [-0.04, 0.00]	0.01	-2.07	.040	0.01 [0.00, 0.03]	0.01	2.11	.036
<i>Sleep onset (z)</i>								
(Intercept)	-0.12 [-1.27, 1.04]	0.59	-0.20	.843	-0.08 [-0.34, 0.19]	0.14	-0.56	.576
Physical activity	0.00 [-0.07, 0.06]	0.03	-0.11	.916	-0.06 [-0.10, -0.03]	0.02	-3.27	.002
Physical activity ²	0.00 [-0.01, 0.01]	0.00	-0.21	.834	0.01 [0.00, 0.02]	0.00	2.59	.012
Age	0.00 [0.00, 0.01]	0.00	1.71	.093	0.00 [0.00, 0.00]	0.00	0.98	.330
Physical activity × sexmale	-0.02 [-0.05, 0.00]	0.01	-1.84	.070	0.00 [-0.02, 0.01]	0.01	-0.24	.810
<i>Sleep regularity (z)</i>								
(Intercept)	0.37 [0.19, 0.54]	0.09	4.08	< .001	0.43 [0.24, 0.62]	0.10	4.46	< .001
Physical activity	0.16 [0.11, 0.22]	0.03	5.91	< .001	0.05 [0.03, 0.07]	0.01	4.50	< .001
Physical activity ²	-0.03 [-0.04, -0.02]	0.00	-6.95	< .001	-0.01 [-0.02, -0.01]	0.00	-3.26	.001

Term	Physical activity volume (z)				Physical activity intensity (z)			
	β [95% CI]	SE	t	p	β [95% CI]	SE	t	p
Age	0.00 [0.00, 0.00]	0.00	0.09	.926	0.00 [0.00, 0.00]	0.00	-0.52	.607
Physical activity \times sexmale	0.00 [-0.02, 0.02]	0.01	-0.08	.936	0.02 [0.01, 0.03]	0.01	3.06	.002

Note. Adjusted for SES, age, and BMI. Outcomes variables are listed in the column headers.

Table 11

Sleep predicting physical activity controlling for SES, age, and BMI

Term	Physical activity volume (z)			Physical activity intensity (z)				
	β [95% CI]	SE	t	p	β [95% CI]	SE	t	p
Sleep duration (z)								
(Intercept)	1.16 [0.81, 1.50]	0.18	6.60	< .001	1.07 [0.82, 1.32]	0.13	8.29	< .001
Sleep duration	-0.02 [-0.09, 0.04]	0.03	-0.78	.439	0.02 [0.00, 0.04]	0.01	1.59	.117
Sleep duration ²	-0.01 [-0.03, 0.01]	0.01	-1.08	.285	0.00 [0.00, 0.01]	0.00	0.66	.514
Age	-0.02 [-0.02, -0.01]	0.00	-7.49	< .001	-0.02 [-0.03, -0.01]	0.00	-6.65	< .001
Sleep duration × sexmale	0.03 [0.01, 0.04]	0.01	3.29	.001	0.01 [-0.01, 0.02]	0.01	1.03	.307
Sleep efficiency (z)								
(Intercept)	1.13 [0.79, 1.48]	0.18	6.42	< .001	1.07 [0.82, 1.32]	0.13	8.39	< .001
Sleep efficiency	0.04 [0.00, 0.09]	0.02	2.00	.051	0.01 [-0.01, 0.03]	0.01	0.89	.376
Sleep efficiency ²	0.01 [0.00, 0.02]	0.00	2.09	.041	0.00 [0.00, 0.01]	0.00	1.20	.234
Age	-0.02 [-0.02, -0.01]	0.00	-7.36	< .001	-0.02 [-0.03, -0.01]	0.00	-6.67	< .001
Sleep efficiency × sexmale	-0.03 [-0.04, -0.01]	0.01	-3.35	< .001	0.00 [-0.02, 0.01]	0.01	-0.52	.601
Sleep onset (z)								
(Intercept)	1.17 [0.82, 1.51]	0.18	6.58	< .001	1.08 [0.82, 1.33]	0.13	8.29	< .001
Sleep onset	0.03 [-0.03, 0.10]	0.03	1.11	.271	-0.01 [-0.03, 0.01]	0.01	-0.95	.348
Sleep onset ²	-0.02 [-0.03, -0.01]	0.01	-3.22	.002	0.00 [-0.01, 0.00]	0.00	-1.05	.298
Age	-0.02 [-0.02, -0.01]	0.00	-7.27	< .001	-0.02 [-0.03, -0.01]	0.00	-6.65	< .001
Sleep onset × sexmale	-0.04 [-0.05, -0.03]	0.01	-6.45	< .001	0.00 [-0.01, 0.01]	0.01	0.05	.964
Sleep regularity (z)								
(Intercept)	1.10 [0.76, 1.44]	0.17	6.31	< .001	1.06 [0.82, 1.31]	0.13	8.40	< .001
Sleep regularity	0.08 [0.03, 0.12]	0.02	3.53	< .001	0.03 [0.02, 0.04]	0.01	5.90	< .001
Sleep regularity ²	0.01 [0.00, 0.02]	0.01	1.12	.269	0.00 [-0.01, 0.00]	0.00	-1.56	.120

Table 11 continued

Term	Physical activity volume (z)				Physical activity intensity (z)					
	β	[95% CI]	SE	t	p	β	[95% CI]	SE	t	p
Age	-0.02	[-0.02, -0.01]	0.00	-7.42	< .001	-0.02	[-0.03, -0.01]	0.00	-6.69	< .001
Sleep regularity \times sexmale	0.02	[0.00, 0.03]	0.01	2.66	.009	0.00	[0.01, 0.01]	0.01	0.51	.609

Note. Adjusted for SES, age, and BMI. Outcomes variables are listed in the row headers.

Table 12

Physical activity predicting sleep controlling for SES, age, sex, and BMI.

TITLE

Term	Physical activity volume (z)			Physical activity intensity (z)				
	β [95% CI]	SE	t	p	β [95% CI]	SE	t	p
Sleep duration (z)								
(Intercept)	0.00 [-0.40, 0.39]	0.20	-0.02	.981	0.00 [-0.36, 0.36]	0.18	-0.01	.991
Physical activity	0.10 [-0.05, 0.24]	0.07	1.35	.184	0.08 [0.02, 0.13]	0.03	2.60	.012
Weekdaymonday	-0.02 [-0.05, 0.02]	0.02	-0.84	.403	0.00 [-0.03, 0.03]	0.02	-0.12	.903
Weekdaysaturday	0.08 [0.06, 0.10]	0.01	7.32	< .001	0.10 [0.07, 0.13]	0.01	7.17	< .001
Weekdaysunday	0.08 [0.05, 0.11]	0.02	5.13	< .001	0.09 [0.06, 0.12]	0.02	5.75	< .001
Weekdaythursday	-0.05 [-0.07, -0.03]	0.01	-4.54	< .001	-0.06 [-0.08, -0.03]	0.01	-4.34	< .001
Weekdaytuesday	-0.03 [-0.05, 0.00]	0.01	-2.22	.028	-0.02 [-0.04, 0.01]	0.01	-1.50	.136
Weekdaywednesday	-0.05 [-0.08, -0.03]	0.01	-4.81	< .001	-0.06 [-0.08, -0.03]	0.01	-4.44	< .001
Physical activity ²	-0.01 [-0.02, 0.01]	0.01	-1.12	.266	0.00 [-0.01, 0.01]	0.01	-0.02	.985
Age	0.00 [-0.01, 0.00]	0.00	-0.62	.540	0.00 [0.00, 0.00]	0.00	-0.70	.489
Physical activity × weekdaymonday	-0.03 [-0.07, 0.00]	0.02	-1.94	.055	-0.01 [-0.04, 0.02]	0.01	-0.87	.388
Physical activity × weekdaysaturday	-0.03 [-0.06, 0.00]	0.01	-2.02	.044	-0.02 [-0.05, 0.00]	0.01	-2.26	.025
Physical activity × weekdaysunday	-0.04 [-0.08, 0.00]	0.02	-1.90	.061	-0.03 [-0.06, 0.00]	0.02	-1.71	.090
Physical activity × weekdaythursday	-0.01 [-0.04, 0.02]	0.02	-0.52	.604	-0.02 [-0.04, 0.00]	0.01	-2.08	.039
Physical activity × weekdaytuesday	-0.04 [-0.06, -0.01]	0.01	-2.78	.006	0.00 [-0.02, 0.01]	0.01	-0.43	.670
Physical activity × weekdaywednesday	-0.04 [-0.07, -0.01]	0.02	-2.40	.018	-0.02 [-0.04, 0.00]	0.01	-1.65	.101
Weekdaymonday × Physical activity ²	0.00 [-0.01, 0.01]	0.00	0.90	.367	-0.01 [-0.03, 0.00]	0.01	-1.58	.116
Weekdaysaturday × Physical activity ²	0.00 [-0.01, 0.01]	0.00	0.60	.552	-0.02 [-0.03, 0.00]	0.01	-2.26	.025
Weekdaysunday × Physical activity ²	0.01 [-0.01, 0.02]	0.01	0.99	.325	-0.01 [-0.03, 0.00]	0.01	-1.42	.156
Weekdaytuesday × Physical activity ²	0.00 [-0.01, 0.01]	0.00	0.00	.997	0.00 [-0.01, 0.02]	0.01	0.66	.508
Weekdaywednesday × Physical activity ²	0.01 [0.00, 0.02]	0.00	2.04	.042	0.00 [-0.02, 0.01]	0.01	-0.37	.712

Table 12 continued

TITLE

Term	Physical activity volume (z)				Physical activity intensity (z)			
	β [95% CI]	SE	t	p	β [95% CI]	SE	t	p
Weekdaywednesday \times Physical activity ²	0.01 [0.00, 0.01]	0.00	1.36	.174	0.01 [-0.01, 0.02]	0.01	0.77	.441
Sleep efficiency (z)								
(Intercept)	0.13 [-0.14, 0.40]	0.14	0.92	.359	0.18 [-0.08, 0.44]	0.13	1.37	.172
Physical activity	0.06 [-0.03, 0.15]	0.05	1.27	.211	0.01 [-0.02, 0.04]	0.02	0.43	.671
Weekdaymonday	-0.02 [-0.05, 0.01]	0.02	-1.24	.219	-0.03 [-0.06, 0.00]	0.02	-2.19	.030
Weekdaysaturday	-0.01 [-0.03, 0.01]	0.01	-1.11	.267	-0.03 [-0.05, 0.00]	0.01	-2.28	.023
Weekdaysunday	-0.02 [-0.05, 0.01]	0.01	-1.53	.129	-0.04 [-0.07, -0.01]	0.01	-2.89	.004
Weekdaythursday	-0.03 [-0.05, -0.01]	0.01	-2.58	.010	-0.03 [-0.05, -0.01]	0.01	-2.61	.009
Weekdaytuesday	-0.02 [-0.04, 0.00]	0.01	-1.57	.117	-0.02 [-0.05, 0.00]	0.01	-1.73	.085
Weekdaywednesday	-0.02 [-0.04, 0.00]	0.01	-1.87	.063	-0.02 [-0.05, 0.00]	0.01	-1.99	.048
Physical activity ²	-0.01 [-0.02, 0.00]	0.01	-1.19	.238	0.00 [-0.01, 0.01]	0.01	0.01	.996
Age	0.00 [0.00, 0.00]	0.00	0.44	.662	0.00 [0.00, 0.00]	0.00	-0.39	.698
Physical activity \times weekdaymonday	0.01 [-0.02, 0.04]	0.01	0.80	.425	0.00 [-0.02, 0.02]	0.01	-0.35	.726
Physical activity \times weekdaysaturday	0.02 [-0.01, 0.05]	0.02	1.11	.269	0.00 [-0.02, 0.02]	0.01	0.12	.907
Physical activity \times weekdaysunday	0.02 [-0.02, 0.05]	0.02	0.94	.349	0.00 [-0.02, 0.02]	0.01	0.09	.931
Physical activity \times weekdaythursday	-0.01 [-0.04, 0.02]	0.02	-0.49	.627	-0.01 [-0.03, 0.01]	0.01	-1.25	.211
Physical activity \times weekdaytuesday	-0.01 [-0.03, 0.02]	0.01	-0.48	.630	0.00 [-0.02, 0.01]	0.01	-0.44	.662
Physical activity \times weekdaywednesday	0.00 [-0.03, 0.03]	0.01	-0.15	.881	-0.01 [-0.03, 0.01]	0.01	-0.70	.482
Weekdaymonday \times Physical activity ²	0.00 [-0.01, 0.00]	0.00	-1.14	.253	0.00 [-0.01, 0.02]	0.01	0.29	.770
Weekdaysaturday \times Physical activity ²	0.00 [-0.01, 0.01]	0.00	-0.81	.419	0.01 [0.00, 0.03]	0.01	1.65	.101
Weekdaysunday \times Physical activity ²	0.00 [-0.01, 0.00]	0.00	-0.86	.393	0.01 [-0.01, 0.03]	0.01	1.21	.228
Weekdaythursday \times Physical activity ²	0.00 [-0.01, 0.01]	0.00	-0.18	.860	0.00 [-0.01, 0.02]	0.01	0.56	.575
Weekdaytuesday \times Physical activity ²	0.00 [-0.01, 0.01]	0.00	-0.15	.881	0.00 [-0.01, 0.01]	0.01	0.08	.938

Table 12 continued

TITLE

Term	Physical activity volume (z)				Physical activity intensity (z)			
	β [95% CI]	SE	t	p	β [95% CI]	SE	t	p
Weekdaywednesday \times Physical activity ²	0.00 [-0.01, 0.01]	0.00	-0.58	.565	0.00 [-0.01, 0.01]	0.01	-0.05	.959
Sleep onset (z)								
(Intercept)	-0.13 [-0.41, 0.15]	0.14	-0.91	.363	-0.08 [-1.90, 1.74]	0.93	-0.09	.931
Physical activity	0.01 [-0.06, 0.07]	0.03	0.22	.828	-0.05 [-0.09, -0.01]	0.02	-2.48	.016
Weekdaymonday	-0.01 [-0.05, 0.02]	0.02	-0.74	.463	-0.02 [-0.05, 0.02]	0.02	-1.04	.303
Weekdaysaturday	0.07 [0.05, 0.09]	0.01	7.42	< .001	0.06 [0.04, 0.08]	0.01	5.12	< .001
Weekdaysunday	0.09 [0.06, 0.11]	0.01	7.65	< .001	0.06 [0.04, 0.09]	0.01	4.74	< .001
Weekdaythursday	-0.03 [-0.05, -0.01]	0.01	-3.69	< .001	-0.02 [-0.04, 0.00]	0.01	-2.31	.022
Weekdaytuesday	-0.03 [-0.05, -0.02]	0.01	-4.37	< .001	-0.03 [-0.05, -0.01]	0.01	-3.04	.003
Weekdaywednesday	-0.02 [-0.03, 0.00]	0.01	-2.09	.037	-0.01 [-0.03, 0.01]	0.01	-1.00	.318
Physical activity ²	0.00 [-0.01, 0.01]	0.00	-0.46	.650	0.00 [-0.01, 0.01]	0.01	0.49	.623
Age	0.00 [0.00, 0.01]	0.00	1.77	.083	0.00 [0.00, 0.00]	0.00	1.01	.315
Physical activity \times weekdaymonday	-0.05 [-0.08, -0.03]	0.01	-3.92	< .001	-0.03 [-0.05, -0.01]	0.01	-2.46	.016
Physical activity \times weekdaysaturday	0.03 [0.01, 0.05]	0.01	2.49	.013	0.00 [-0.01, 0.02]	0.01	0.31	.753
Physical activity \times weekdaysunday	0.00 [-0.03, 0.03]	0.01	0.08	.936	-0.04 [-0.07, -0.02]	0.01	-3.15	.002
Physical activity \times weekdaythursday	-0.04 [-0.06, -0.02]	0.01	-3.77	< .001	-0.01 [-0.03, 0.00]	0.01	-1.65	.100
Physical activity \times weekdaytuesday	-0.04 [-0.07, -0.02]	0.01	-3.68	< .001	-0.01 [-0.02, 0.01]	0.01	-1.14	.255
Physical activity \times weekdaywednesday	-0.04 [-0.06, -0.01]	0.01	-3.02	.003	0.00 [-0.02, 0.02]	0.01	0.04	.966
Weekdaymonday \times Physical activity ²	0.00 [0.00, 0.01]	0.00	1.03	.306	0.01 [-0.01, 0.02]	0.01	0.91	.362
Weekdaysaturday \times Physical activity ²	0.00 [-0.01, 0.00]	0.00	-0.67	.504	0.01 [-0.01, 0.02]	0.01	1.05	.296
Weekdaysunday \times Physical activity ²	-0.01 [-0.01, 0.00]	0.00	-1.45	.149	0.01 [0.00, 0.02]	0.01	1.44	.152
Weekdaythursday \times Physical activity ²	0.01 [0.00, 0.01]	0.00	1.52	.130	0.00 [-0.01, 0.01]	0.01	-0.54	.591
Weekdaytuesday \times Physical activity ²	0.00 [0.00, 0.01]	0.00	1.25	.214	0.00 [-0.01, 0.01]	0.01	-0.51	.607

Table 12 continued

TITLE

Term	Physical activity volume (z)				Physical activity intensity (z)			
	β [95% CI]	SE	t	p	β [95% CI]	SE	t	p
Weekdaywednesday \times Physical activity ²	0.00 [0.00, 0.01]	0.00	1.17	.242	0.00 [-0.02, 0.01]	0.01	-0.82	.414
Sleep regularity (z)								
(Intercept)	0.34 [0.16, 0.52]	0.09	3.73	< .001	0.41 [0.22, 0.60]	0.10	4.24	< .001
Physical activity	0.13 [0.08, 0.19]	0.03	4.69	< .001	0.01 [-0.01, 0.04]	0.01	0.97	.333
Weekdaymonday	0.03 [0.00, 0.05]	0.01	2.39	.018	0.03 [0.00, 0.05]	0.01	2.31	.022
Weekdaysaturday	-0.09 [-0.11, -0.07]	0.01	-8.58	< .001	-0.10 [-0.12, -0.07]	0.01	-7.76	< .001
Weekdaysunday	-0.11 [-0.13, -0.09]	0.01	-9.28	< .001	-0.14 [-0.16, -0.11]	0.01	-10.44	< .001
Weekdaythursday	0.13 [0.10, 0.15]	0.01	10.92	< .001	0.13 [0.11, 0.16]	0.01	10.05	< .001
Weekdaytuesday	0.13 [0.12, 0.15]	0.01	13.65	< .001	0.14 [0.12, 0.16]	0.01	11.93	< .001
Weekdaywednesday	0.13 [0.11, 0.15]	0.01	11.74	< .001	0.15 [0.12, 0.17]	0.01	11.81	< .001
Physical activity ²	-0.02 [-0.03, -0.01]	0.00	-3.93	< .001	0.00 [-0.01, 0.01]	0.01	-0.03	.977
Age	0.00 [0.00, 0.00]	0.00	0.04	.965	0.00 [0.00, 0.00]	0.00	-0.63	.532
Physical activity \times weekdaymonday	0.05 [0.02, 0.08]	0.01	3.70	< .001	0.08 [0.07, 0.10]	0.01	8.95	< .001
Physical activity \times weekdaysaturday	0.02 [-0.01, 0.05]	0.01	1.56	.120	-0.01 [-0.03, 0.00]	0.01	-1.47	.144
Physical activity \times weekdaysunday	0.08 [0.05, 0.10]	0.01	5.66	< .001	0.01 [-0.01, 0.03]	0.01	0.92	.361
Physical activity \times weekdaythursday	0.01 [-0.02, 0.04]	0.01	0.64	.526	0.05 [0.03, 0.07]	0.01	5.80	< .001
Physical activity \times weekdaytuesday	0.00 [-0.03, 0.02]	0.01	-0.31	.758	0.08 [0.06, 0.10]	0.01	8.89	< .001
Physical activity \times weekdaywednesday	-0.02 [-0.05, 0.01]	0.01	-1.23	.220	0.05 [0.03, 0.07]	0.01	5.53	< .001
Weekdaymonday \times Physical activity ²	-0.01 [-0.02, -0.01]	0.00	-3.45	< .001	-0.03 [-0.05, -0.02]	0.01	-4.89	< .001
Weekdaysaturday \times Physical activity ²	-0.01 [-0.02, 0.00]	0.00	-1.66	.098	-0.01 [-0.02, 0.01]	0.01	-1.01	.314
Weekdaysunday \times Physical activity ²	-0.01 [-0.02, -0.01]	0.00	-3.69	< .001	0.00 [-0.02, 0.01]	0.01	-0.61	.545
Weekdaythursday \times Physical activity ²	-0.01 [-0.01, 0.00]	0.00	-1.38	.168	-0.02 [-0.03, -0.01]	0.01	-2.87	.004
Weekdaytuesday \times Physical activity ²	0.00 [-0.01, 0.01]	0.00	0.13	.898	-0.02 [-0.03, 0.00]	0.01	-2.23	.026

Table 12 continued

Term	Physical activity volume (z)			Physical activity intensity (z)				
	β [95% CI]	SE	t	p	β [95% CI]	SE	t	p
Weekdaywednesday \times Physical activity ²	0.00 [-0.01, 0.00]	0.00	-0.66	.506	-0.03 [-0.04, -0.02]	0.01	-4.33	< .001

Note. Adjusted for SES, age, sex, and BMI. Outcomes variables are listed in the column headers.

Table 13

Sleep predicting physical activity controlling for SES, age, sex, and BMI

TITLE

Term	Physical activity volume (z)				Physical activity intensity (z)			
	β [95% CI]	SE	t	p	β [95% CI]	SE	t	p
Sleep duration (z)								
(Intercept)	1.23 [0.88, 1.57]	0.18	6.97	< .001	1.12 [0.86, 1.37]	0.13	8.65	< .001
Sleep duration	0.01 [-0.06, 0.08]	0.04	0.23	.821	0.05 [0.02, 0.07]	0.01	3.41	.001
Weekdaymonday	-0.14 [-0.17, -0.12]	0.01	-10.74	< .001	-0.08 [-0.12, -0.05]	0.02	-4.48	< .001
Weekdaysaturday	-0.07 [-0.09, -0.05]	0.01	-7.24	< .001	-0.07 [-0.08, -0.05]	0.01	-7.23	< .001
Weekdaysunday	-0.15 [-0.17, -0.12]	0.01	-13.45	< .001	-0.13 [-0.15, -0.11]	0.01	-13.43	< .001
Weekdaythursday	-0.03 [-0.05, -0.01]	0.01	-3.13	.002	0.01 [-0.01, 0.02]	0.01	0.63	.532
Weekdaytuesday	-0.06 [-0.08, -0.04]	0.01	-6.53	< .001	-0.02 [-0.04, -0.01]	0.01	-2.64	.009
Weekdaywednesday	-0.05 [-0.06, -0.03]	0.01	-5.18	< .001	0.00 [-0.02, 0.02]	0.01	0.15	.883
Sleep duration ²	-0.01 [-0.03, 0.01]	0.01	-0.66	.509	0.01 [0.00, 0.02]	0.00	1.46	.148
Age	-0.02 [-0.02, -0.01]	0.00	-7.48	< .001	-0.02 [-0.03, -0.01]	0.00	-6.64	< .001
Sleep duration × weekdaymonday	-0.02 [-0.04, 0.01]	0.01	-1.22	.225	-0.03 [0.05, -0.01]	0.01	-3.00	.003
Sleep duration × weekdaysaturday	-0.04 [-0.06, -0.01]	0.01	-3.11	.002	-0.04 [-0.06, -0.02]	0.01	-3.75	< .001
Sleep duration × weekdaysunday	-0.04 [-0.07, -0.02]	0.01	-3.12	.002	-0.05 [-0.08, -0.03]	0.01	-4.98	< .001
Sleep duration × weekdaythursday	0.00 [-0.03, 0.02]	0.01	-0.45	.651	0.00 [-0.02, 0.02]	0.01	-0.18	.856
Sleep duration × weekdaytuesday	-0.01 [-0.03, 0.02]	0.01	-0.70	.484	-0.01 [-0.03, 0.01]	0.01	-1.17	.244
Sleep duration × weekdaywednesday	-0.01 [-0.03, 0.01]	0.01	-1.07	.288	-0.01 [-0.03, 0.01]	0.01	-1.39	.166
Weekdaymonday × Sleep duration ²	0.00 [-0.01, 0.01]	0.01	-0.03	.975	-0.01 [-0.02, 0.00]	0.01	-2.03	.044
Weekdaysaturday × Sleep duration ²	0.00 [-0.02, 0.01]	0.01	-0.67	.507	-0.01 [-0.02, 0.00]	0.01	-2.30	.023
Weekdaysunday × Sleep duration ²	0.00 [-0.02, 0.01]	0.01	-0.77	.442	-0.02 [-0.03, -0.01]	0.01	-3.00	.003
Weekdaythursday × Sleep duration ²	0.00 [-0.01, 0.01]	0.01	0.02	.983	0.00 [-0.01, 0.01]	0.01	0.13	.893
Weekdaytuesday × Sleep duration ²	0.00 [-0.01, 0.01]	0.01	0.02	.980	0.00 [-0.01, 0.01]	0.00	0.13	.895

Table 13 continued

TITLE

Term	Physical activity volume (z)				Physical activity intensity (z)			
	β [95% CI]	SE	t	p	β [95% CI]	SE	t	p
Weekdaywednesday \times Sleep duration ²	0.00 [-0.01, 0.01]	0.01	0.17	.864	0.00 [-0.01, 0.01]	0.00	-0.76	.450
Sleep efficiency (z)								
(Intercept)	1.21 [0.87, 1.56]	0.18	6.86	< .001	1.13 [0.88, 1.38]	0.13	8.86	< .001
Sleep efficiency	0.01 [-0.04, 0.07]	0.03	0.57	.569	-0.02 [-0.04, 0.00]	0.01	-1.88	.064
Weekdaymonday	-0.15 [-0.17, -0.12]	0.01	-11.92	< .001	-0.10 [-0.13, -0.07]	0.02	-6.38	< .001
Weekdaysaturday	-0.08 [-0.10, -0.06]	0.01	-8.78	< .001	-0.09 [-0.10, -0.07]	0.01	-10.78	< .001
Weekdaysunday	-0.16 [-0.18, -0.14]	0.01	-15.56	< .001	-0.16 [-0.18, -0.14]	0.01	-17.94	< .001
Weekdaythursday	-0.03 [-0.05, -0.02]	0.01	-3.90	< .001	0.00 [-0.02, 0.02]	0.01	0.05	.962
Weekdaytuesday	-0.07 [-0.09, -0.05]	0.01	-7.08	< .001	-0.03 [-0.05, -0.01]	0.01	-3.59	< .001
Weekdaywednesday	-0.05 [-0.06, -0.03]	0.01	-5.71	< .001	-0.01 [-0.02, 0.01]	0.01	-0.69	.488
Sleep efficiency ²	0.00 [-0.01, 0.01]	0.01	0.16	.874	0.00 [-0.01, 0.00]	0.00	-2.01	.046
Age	-0.02 [-0.02, -0.01]	0.00	-7.37	< .001	-0.02 [-0.03, -0.01]	0.00	-6.68	< .001
Sleep efficiency \times weekdaymonday	0.02 [-0.01, 0.05]	0.01	1.49	.137	0.05 [0.02, 0.08]	0.01	3.48	< .001
Sleep efficiency \times weekdaysaturday	0.00 [-0.02, 0.03]	0.01	0.26	.797	0.03 [0.01, 0.05]	0.01	2.42	.016
Sleep efficiency \times weekdaysunday	0.05 [0.02, 0.07]	0.01	3.22	.002	0.07 [0.04, 0.10]	0.01	5.32	< .001
Sleep efficiency \times weekdaythursday	0.01 [-0.01, 0.04]	0.01	0.85	.397	0.01 [-0.01, 0.04]	0.01	1.36	.174
Sleep efficiency \times weekdaytuesday	0.01 [-0.02, 0.04]	0.01	0.94	.351	0.02 [0.00, 0.04]	0.01	1.61	.109
Sleep efficiency \times weekdaywednesday	0.00 [-0.02, 0.03]	0.01	0.17	.867	0.01 [-0.01, 0.04]	0.01	1.35	.179
Weekdaymonday \times Sleep efficiency ²	0.01 [0.00, 0.02]	0.00	1.48	.141	0.01 [0.00, 0.02]	0.00	2.06	.041
Weekdaysaturday \times Sleep efficiency ²	0.01 [0.00, 0.02]	0.00	1.43	.156	0.01 [0.00, 0.01]	0.00	1.80	.073
Weekdaysunday \times Sleep efficiency ²	0.01 [0.00, 0.03]	0.01	2.69	.008	0.01 [0.00, 0.02]	0.00	2.82	.006
Weekdaythursday \times Sleep efficiency ²	0.00 [0.00, 0.01]	0.00	1.10	.274	0.00 [0.00, 0.01]	0.00	1.64	.102
Weekdaytuesday \times Sleep efficiency ²	0.00 [0.00, 0.01]	0.00	0.97	.335	0.01 [0.00, 0.01]	0.00	2.12	.034

Table 13 continued

TITLE

Term	Physical activity volume (z)				Physical activity intensity (z)					
	β	[95% CI]	SE	t	p	β	[95% CI]	SE	t	p
Weekdaywednesday × Sleep efficiency ²	0.00	[0.01, 0.01]	0.00	0.39	.696	0.00	[0.00, 0.01]	0.00	0.96	.337
Sleep onset (z)										
(Intercept)	1.23	[0.88, 1.58]	0.18	6.96	< .001	1.12	[0.87, 1.37]	0.13	8.65	< .001
Sleep onset	0.00	[-0.06, 0.07]	0.03	0.06	.953	-0.04	[-0.07, -0.01]	0.01	-2.50	.015
Weekdaymonday	-0.14	[-0.17, -0.12]	0.01	-10.79	< .001	-0.08	[-0.11, -0.05]	0.02	-4.77	< .001
Weekdaysaturday	-0.07	[-0.10, -0.05]	0.01	-7.27	< .001	-0.07	[-0.09, -0.05]	0.01	-8.07	< .001
Weekdaysunday	-0.14	[-0.17, -0.12]	0.01	-13.08	< .001	-0.14	[-0.16, -0.11]	0.01	-12.14	< .001
Weekdaythursday	-0.03	[-0.05, -0.01]	0.01	-3.37	< .001	0.01	[-0.01, 0.03]	0.01	0.94	.350
Weekdaytuesday	-0.06	[-0.08, -0.04]	0.01	-6.19	< .001	-0.02	[-0.04, 0.00]	0.01	-1.90	.059
Weekdaywednesday	-0.05	[-0.07, -0.03]	0.01	-5.16	< .001	0.00	[-0.02, 0.02]	0.01	0.31	.760
Sleep onset ²	-0.02	[-0.03, 0.00]	0.01	-2.71	.008	0.00	[-0.01, 0.01]	0.00	0.44	.663
Age	-0.02	[-0.02, -0.01]	0.00	-7.28	< .001	-0.02	[-0.03, -0.01]	0.00	-6.65	< .001
Sleep onset × weekdaymonday	0.01	[-0.01, 0.03]	0.01	1.19	.237	0.05	[0.03, 0.07]	0.01	4.29	< .001
Sleep onset × weekdaysaturday	0.02	[0.00, 0.04]	0.01	2.30	.022	0.04	[0.02, 0.05]	0.01	4.26	< .001
Sleep onset × weekdaysunday	0.04	[0.02, 0.07]	0.01	4.04	< .001	0.08	[0.06, 0.10]	0.01	7.09	< .001
Sleep onset × weekdaythursday	0.01	[-0.01, 0.02]	0.01	0.89	.374	0.01	[-0.01, 0.03]	0.01	1.07	.284
Sleep onset × weekdaytuesday	0.01	[-0.01, 0.03]	0.01	1.45	.150	0.02	[0.00, 0.04]	0.01	2.48	.014
Sleep onset × weekdaywednesday	0.01	[-0.01, 0.03]	0.01	1.42	.158	0.02	[0.00, 0.04]	0.01	2.13	.035
Weekdaymonday × Sleep onset ²	0.00	[-0.01, 0.01]	0.01	0.34	.736	-0.01	[-0.02, 0.00]	0.01	-1.75	.082
Weekdaysaturday × Sleep onset ²	0.00	[-0.01, 0.01]	0.01	0.42	.676	0.00	[-0.02, 0.01]	0.01	-0.80	.422
Weekdaysunday × Sleep onset ²	-0.01	[-0.02, 0.00]	0.01	-1.28	.202	-0.01	[-0.02, 0.00]	0.01	-2.35	.020
Weekdaythursday × Sleep onset ²	0.00	[-0.01, 0.02]	0.01	0.64	.524	0.00	[-0.01, 0.01]	0.01	-0.46	.647
Weekdaytuesday × Sleep onset ²	0.00	[-0.02, 0.01]	0.01	-0.52	.605	0.00	[-0.01, 0.01]	0.01	-0.63	.530

Table 13 continued

TITLE

Term	Physical activity volume (z)				Physical activity intensity (z)					
	β	[95% CI]	SE	t	p	β	[95% CI]	SE	t	p
Weekdaywednesday × Sleep onset ²	0.00	[−0.01, 0.02]	0.01	0.69	.490	0.00	[−0.02, 0.01]	0.01	−0.80	.422
Sleep regularity (z)										
(Intercept)	1.16	[0.82, 1.51]	0.18	6.63	< .001	1.11	[0.87, 1.36]	0.13	8.82	< .001
Sleep regularity	0.08	[0.04, 0.13]	0.02	3.56	< .001	0.02	[0.00, 0.04]	0.01	2.53	.013
Weekdaymonday	−0.11	[−0.14, −0.09]	0.01	−8.71	< .001	−0.09	[−0.12, −0.05]	0.02	−4.81	< .001
Weekdaysaturday	−0.05	[−0.07, −0.03]	0.01	−5.33	< .001	−0.07	[−0.09, −0.06]	0.01	−7.91	< .001
Weekdaysunday	−0.12	[−0.14, −0.10]	0.01	−10.24	< .001	−0.14	[−0.17, −0.12]	0.01	−12.71	< .001
Weekdaythursday	−0.02	[−0.04, 0.00]	0.01	−2.45	.015	0.01	[−0.01, 0.03]	0.01	0.78	.435
Weekdaytuesday	−0.06	[−0.08, −0.04]	0.01	−5.58	< .001	−0.02	[−0.04, −0.01]	0.01	−2.52	.012
Weekdaywednesday	−0.04	[−0.06, −0.02]	0.01	−4.10	< .001	0.00	[−0.02, 0.01]	0.01	−0.51	.613
Sleep regularity ²	0.01	[0.00, 0.03]	0.01	1.77	.080	0.00	[−0.01, 0.00]	0.00	−0.94	.348
Age	−0.02	[−0.02, −0.01]	0.00	−7.42	< .001	−0.02	[−0.03, −0.01]	0.00	−6.70	< .001
Sleep regularity × weekdaymonday	−0.01	[−0.03, 0.01]	0.01	−0.87	.386	0.01	[−0.01, 0.03]	0.01	0.63	.528
Sleep regularity × weekdaysaturday	0.00	[−0.02, 0.02]	0.01	−0.17	.862	0.01	[−0.01, 0.03]	0.01	1.29	.197
Sleep regularity × weekendsumday	0.02	[0.00, 0.04]	0.01	1.52	.131	0.02	[0.00, 0.04]	0.01	2.25	.026
Sleep regularity × weekdaythursday	−0.02	[−0.03, 0.00]	0.01	−2.27	.024	0.00	[−0.02, 0.02]	0.01	0.06	.949
Sleep regularity × weekendtuesday	−0.01	[−0.03, 0.01]	0.01	−0.73	.464	0.00	[−0.02, 0.02]	0.01	0.01	.992
Sleep regularity × weekendwednesday	−0.02	[−0.04, 0.00]	0.01	−2.24	.026	0.00	[−0.01, 0.02]	0.01	0.48	.630
Weekdaymonday × Sleep regularity ²	−0.01	[−0.02, 0.00]	0.01	−1.50	.136	0.00	[−0.01, 0.01]	0.01	−0.13	.897
Weekdaysaturday × Sleep regularity ²	−0.01	[−0.02, 0.00]	0.01	−2.15	.033	0.00	[−0.01, 0.01]	0.01	−0.16	.870
Weekdaysunday × Sleep regularity ²	−0.01	[−0.02, 0.00]	0.01	−1.70	.092	0.00	[−0.01, 0.01]	0.01	0.49	.623
Weekdaythursday × Sleep regularity ²	0.00	[−0.01, 0.01]	0.01	−0.79	.430	0.00	[−0.01, 0.01]	0.01	−0.45	.653
Weekdaytuesday × Sleep regularity ²	0.00	[−0.01, 0.01]	0.01	0.06	.952	0.00	[−0.01, 0.01]	0.01	0.25	.803

Table 13 continued

TITLE

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Term	Physical activity volume (z)			Physical activity intensity (z)				
	β [95% CI]	SE	t	p	β [95% CI]	SE	t	p
Weekdaywednesday \times Sleep regularity ²	-0.01 [-0.02, 0.01]	0.01	-0.93	.353	0.00 [-0.01, 0.01]	0.01	0.27	.790

Note. Adjusted for SES, age, sex, and BMI. Outcomes variables are listed in the row headers.

Table 14

Physical activity predicting sleep controlling for SES, age, sex, and BMI.

Term	Physical activity volume (z)				Physical activity intensity (z)			
	β [95% CI]	SE	t	p	β [95% CI]	SE	t	p
Sleep duration (z)								
(Intercept)	0.01 [-0.38, 0.40]	0.20	0.06	.954	0.03 [-0.33, 0.38]	0.18	0.15	.884
Physical activity	0.06 [-0.11, 0.23]	0.09	0.73	.470	0.06 [0.00, 0.11]	0.03	1.97	.054
Seasonspring	-0.05 [-0.08, -0.02]	0.02	-3.58	< .001	-0.06 [-0.09, -0.02]	0.02	-3.48	< .001
Seasonsummer	-0.06 [-0.09, -0.03]	0.01	-4.50	< .001	-0.05 [-0.07, -0.02]	0.01	-3.50	< .001
Seasonwinter	0.03 [0.01, 0.05]	0.01	2.51	.013	0.02 [0.00, 0.05]	0.01	1.79	.075
Physical activity ²	-0.01 [-0.02, 0.01]	0.01	-0.86	.393	-0.01 [-0.02, 0.00]	0.01	-1.32	.191
Age	0.00 [-0.01, 0.00]	0.00	-0.47	.643	0.00 [0.00, 0.00]	0.00	-0.55	.583
Physical activity × seasonspring	0.03 [-0.04, 0.11]	0.04	0.82	.414	-0.01 [-0.03, 0.02]	0.01	-0.57	.568
Physical activity × seasonsummer	-0.02 [-0.05, 0.01]	0.02	-1.12	.265	-0.01 [-0.04, 0.01]	0.01	-1.01	.314
Physical activity × seasonwinter	0.01 [-0.03, 0.05]	0.02	0.48	.631	0.01 [-0.01, 0.04]	0.01	1.08	.281
Seasonspring × Physical activity ²	0.00 [-0.01, 0.01]	0.01	0.18	.854	0.00 [-0.01, 0.02]	0.01	0.42	.678
Seasonsummer × Physical activity ²	0.01 [0.00, 0.01]	0.00	1.31	.191	-0.01 [-0.02, 0.01]	0.01	-0.88	.381
Seasonwinter × Physical activity ²	0.00 [-0.01, 0.01]	0.01	0.61	.545	0.01 [-0.01, 0.02]	0.01	1.07	.285
Sleep efficiency (z)								
(Intercept)	0.11 [-0.16, 0.38]	0.14	0.79	.434	0.15 [-0.10, 0.41]	0.13	1.17	.246
Physical activity	0.06 [-0.05, 0.17]	0.06	1.09	.280	0.01 [-0.02, 0.04]	0.02	0.49	.623
Seasonspring	-0.02 [-0.04, 0.01]	0.01	-1.41	.160	-0.02 [-0.04, 0.00]	0.01	-1.76	.079
Seasonsummer	0.00 [-0.02, 0.02]	0.01	-0.29	.775	0.00 [-0.02, 0.03]	0.01	0.12	.906
Seasonwinter	0.03 [0.01, 0.05]	0.01	2.72	.007	0.02 [0.00, 0.04]	0.01	2.02	.044
Physical activity ²	-0.01 [-0.02, 0.00]	0.01	-1.77	.081	0.00 [-0.01, 0.01]	0.01	0.23	.821
Age	0.00 [0.00, 0.00]	0.00	0.56	.578	0.00 [0.00, 0.00]	0.00	-0.28	.778

Table 14 continued

TITLE

Term	Physical activity volume (z)				Physical activity intensity (z)			
	β [95% CI]	SE	t	p	β [95% CI]	SE	t	p
Physical activity × seasonspring	0.00 [-0.05, 0.06]	0.03	0.08	.937	-0.02 [-0.04, -0.01]	0.01	-2.54	.012
Physical activity × seasonsummer	0.00 [-0.03, 0.03]	0.01	-0.04	.968	0.00 [-0.02, 0.02]	0.01	-0.16	.871
Physical activity × seasonwinter	0.01 [-0.02, 0.04]	0.02	0.65	.516	0.01 [-0.01, 0.03]	0.01	0.99	.323
Seasonspring × Physical activity ²	0.00 [-0.01, 0.01]	0.00	-0.04	.971	0.00 [-0.01, 0.02]	0.01	0.74	.462
Seasonsummer × Physical activity ²	0.00 [-0.01, 0.01]	0.00	0.63	.531	0.00 [-0.01, 0.01]	0.01	0.04	.966
Seasonwinter × Physical activity ²	0.00 [-0.01, 0.01]	0.00	-0.05	.962	0.00 [-0.01, 0.01]	0.01	0.48	.635
Sleep onset (z)								
(Intercept)	-0.13 [-0.41, 0.15]	0.14	-0.90	.371	-0.08 [-1.23, 1.07]	0.59	-0.14	.891
Physical activity	-0.01 [-0.08, 0.07]	0.04	-0.16	.873	-0.06 [-0.09, -0.02]	0.02	-3.09	.003
Seasonspring	0.02 [0.00, 0.04]	0.01	2.09	.038	0.02 [0.00, 0.05]	0.01	2.10	.037
Seasonsummer	0.05 [0.03, 0.07]	0.01	4.97	< .001	0.04 [0.02, 0.06]	0.01	3.62	< .001
Seasonwinter	0.00 [-0.01, 0.02]	0.01	0.35	.727	0.00 [-0.02, 0.02]	0.01	0.22	.826
Physical activity ²	0.00 [-0.01, 0.01]	0.00	-0.38	.708	0.00 [-0.01, 0.01]	0.01	0.24	.808
Age	0.00 [0.00, 0.01]	0.00	1.61	.114	0.00 [0.00, 0.00]	0.00	0.86	.393
Physical activity × seasonspring	-0.03 [-0.07, 0.01]	0.02	-1.44	.155	-0.02 [-0.03, 0.00]	0.01	-2.52	.013
Physical activity × seasonsummer	0.00 [-0.02, 0.03]	0.01	0.32	.747	0.01 [-0.01, 0.02]	0.01	0.81	.419
Physical activity × seasonwinter	-0.01 [-0.04, 0.02]	0.01	-0.65	.516	-0.01 [-0.03, 0.00]	0.01	-1.56	.120
Seasonspring × Physical activity ²	0.01 [0.00, 0.01]	0.00	1.41	.163	0.00 [-0.01, 0.01]	0.01	0.37	.712
Seasonsummer × Physical activity ²	0.00 [0.00, 0.01]	0.00	0.52	.606	0.01 [0.00, 0.02]	0.01	2.35	.020
Seasonwinter × Physical activity ²	0.00 [-0.01, 0.01]	0.00	-0.07	.948	0.00 [-0.01, 0.01]	0.01	0.15	.883
Sleep regularity (z)								
(Intercept)	0.37 [0.19, 0.55]	0.09	4.11	< .001	0.45 [0.26, 0.63]	0.10	4.60	< .001
Physical activity	0.13 [0.07, 0.19]	0.03	4.35	< .001	0.06 [0.03, 0.08]	0.01	4.08	< .001

Table 14 continued

Term	Physical activity volume (z)				Physical activity intensity (z)					
	β	[95% CI]	SE	t	p	β	[95% CI]	SE	t	p
Seasonspring	-0.04	[-0.06, -0.01]	0.01	-3.16	.002	-0.05	[-0.08, -0.03]	0.01	-4.32	< .001
Seasonsummer	0.01	[-0.01, 0.03]	0.01	0.96	.340	0.00	[-0.02, 0.03]	0.01	0.31	.758
Seasonwinter	-0.02	[-0.04, 0.00]	0.01	-2.07	.039	-0.03	[-0.05, -0.01]	0.01	-2.68	.008
Physical activity ²	-0.02	[-0.03, -0.01]	0.00	-4.66	< .001	-0.02	[-0.03, -0.01]	0.01	-2.93	.004
Age	0.00	[0.00, 0.00]	0.00	0.20	.840	0.00	[0.00, 0.00]	0.00	-0.44	.661
Physical activity × seasonspring	0.06	[0.03, 0.09]	0.02	3.71	< .001	-0.01	[-0.03, 0.01]	0.01	-0.61	.542
Physical activity × seasonsummer	0.02	[0.00, 0.05]	0.01	1.80	.073	-0.01	[-0.03, 0.01]	0.01	-0.82	.413
Physical activity × seasonwinter	0.04	[0.02, 0.07]	0.01	3.46	< .001	0.02	[0.00, 0.03]	0.01	1.95	.052
Seasonspring × Physical activity ²	-0.01	[-0.02, 0.00]	0.00	-2.87	.005	0.00	[-0.01, 0.02]	0.01	0.54	.587
Seasonsummer × Physical activity ²	0.00	[-0.01, 0.00]	0.00	-0.89	.375	0.01	[-0.01, 0.02]	0.01	1.10	.273
Seasonwinter × Physical activity ²	0.00	[-0.01, 0.00]	0.00	-1.25	.211	0.00	[-0.01, 0.01]	0.01	-0.31	.757

Note. Adjusted for SES, age, sex, and BMI. Outcomes variables are listed in the column headers.

Table 15

Sleep predicting physical activity controlling for SES, age, sex, and BMI

Term	Physical activity volume (z)				Physical activity intensity (z)			
	β [95% CI]	SE	t	p	β [95% CI]	SE	t	p
Sleep duration (z)								
(Intercept)	1.16 [0.81, 1.51]	0.18	6.57	< .001	1.09 [0.83, 1.34]	0.13	8.36	< .001
Sleep duration	-0.01 [-0.10, 0.07]	0.04	-0.33	.744	0.03 [0.00, 0.05]	0.01	1.94	.057
Seasonspring	0.00 [-0.03, 0.02]	0.01	-0.32	.753	-0.01 [-0.03, 0.00]	0.01	-1.49	.136
Seasonsummer	0.02 [0.00, 0.05]	0.01	2.11	.036	-0.03 [-0.05, -0.01]	0.01	-3.41	< .001
Seasonwinter	-0.03 [-0.05, -0.01]	0.01	-2.88	.004	-0.01 [-0.03, 0.00]	0.01	-1.60	.111
Sleep duration ²	-0.01 [-0.03, 0.02]	0.01	-0.41	.684	0.00 [0.00, 0.01]	0.00	0.91	.366
Age	-0.02 [-0.02, -0.01]	0.00	-7.46	< .001	-0.02 [-0.03, -0.01]	0.00	-6.61	< .001
Sleep duration × seasonspring	-0.01 [-0.05, 0.04]	0.03	-0.20	.844	-0.01 [-0.03, 0.01]	0.01	-1.36	.176
Sleep duration × seasonsummer	-0.01 [-0.03, 0.01]	0.01	-0.83	.406	-0.02 [-0.03, 0.00]	0.01	-1.59	.113
Sleep duration × seasonwinter	0.02 [-0.01, 0.05]	0.01	1.41	.163	0.00 [-0.01, 0.02]	0.01	0.48	.634
Seasonspring × Sleep duration ²	-0.01 [-0.03, 0.01]	0.01	-0.98	.331	-0.01 [-0.01, 0.00]	0.00	-1.83	.069
Seasonsummer × Sleep duration ²	-0.01 [-0.02, 0.00]	0.01	-2.35	.020	-0.01 [-0.02, 0.00]	0.00	-1.93	.055
Seasonwinter × Sleep duration ²	0.00 [-0.01, 0.01]	0.01	0.40	.687	0.00 [-0.01, 0.01]	0.00	-0.69	.489
Sleep efficiency (z)								
(Intercept)	1.14 [0.79, 1.49]	0.18	6.43	< .001	1.09 [0.84, 1.34]	0.13	8.49	< .001
Sleep efficiency	0.04 [-0.02, 0.09]	0.03	1.23	.224	0.01 [-0.01, 0.03]	0.01	0.89	.375
Seasonspring	-0.01 [-0.03, 0.01]	0.01	-0.76	.447	-0.02 [-0.04, 0.00]	0.01	-2.22	.027
Seasonsummer	0.01 [-0.01, 0.03]	0.01	1.32	.186	-0.04 [-0.06, -0.02]	0.01	-4.60	< .001
Seasonwinter	-0.03 [-0.05, -0.01]	0.01	-2.99	.003	-0.02 [-0.03, 0.00]	0.01	-2.16	.032
Sleep efficiency ²	0.01 [0.00, 0.02]	0.01	1.39	.170	0.00 [0.00, 0.01]	0.00	0.70	.489
Age	-0.02 [-0.02, -0.01]	0.00	-7.34	< .001	-0.02 [-0.03, -0.01]	0.00	-6.62	< .001

Table 15 continued

TITLE

Term	Physical activity volume (z)					Physical activity intensity (z)				
	β [95% CI]	SE	t	p	β [95% CI]	SE	t	p		
Sleep efficiency × seasonspring	-0.02 [-0.05, 0.02]	0.02	-0.91	.368	-0.01 [-0.03, 0.01]	0.01	-0.97	.332		
Sleep efficiency × seasonsummer	0.00 [-0.03, 0.02]	0.01	-0.22	.823	0.00 [-0.02, 0.02]	0.01	-0.33	.742		
Sleep efficiency × seasonwinter	0.00 [-0.02, 0.03]	0.01	0.24	.815	0.01 [-0.01, 0.02]	0.01	0.55	.585		
Seasonspring × Sleep efficiency ²	-0.01 [-0.01, 0.00]	0.00	-1.18	.241	0.00 [-0.01, 0.00]	0.00	-0.19	.852		
Seasonsummer × Sleep efficiency ²	0.00 [-0.01, 0.01]	0.00	-0.31	.755	0.00 [-0.01, 0.01]	0.00	0.33	.740		
Seasonwinter × Sleep efficiency ²	0.00 [-0.01, 0.01]	0.00	0.05	.957	0.00 [0.00, 0.01]	0.00	0.56	.579		
Sleep onset (z)										
(Intercept)	1.16 [0.82, 1.51]	0.18	6.55	< .001	1.09 [0.84, 1.35]	0.13	8.38	< .001		
Sleep onset	0.02 [-0.06, 0.09]	0.04	0.42	.674	-0.01 [-0.04, 0.01]	0.01	-0.92	.363		
Seasonspring	-0.01 [-0.03, 0.02]	0.01	-0.60	.552	-0.02 [-0.04, 0.00]	0.01	-1.85	.065		
Seasonsummer	0.02 [0.00, 0.04]	0.01	1.63	.104	-0.03 [-0.05, -0.02]	0.01	-3.60	< .001		
Seasonwinter	-0.02 [-0.04, 0.00]	0.01	-1.96	.051	-0.01 [-0.03, 0.01]	0.01	-1.31	.189		
Sleep onset ²	-0.01 [-0.03, 0.00]	0.01	-1.75	.085	0.00 [-0.01, 0.01]	0.00	-0.08	.934		
Age	-0.02 [-0.02, -0.01]	0.00	-7.26	< .001	-0.02 [-0.03, -0.01]	0.00	-6.60	< .001		
Sleep onset × seasonspring	0.00 [-0.05, 0.04]	0.02	-0.16	.875	0.00 [-0.01, 0.01]	0.01	-0.02	.980		
Sleep onset × seasonsummer	0.01 [-0.01, 0.02]	0.01	0.61	.541	0.00 [-0.01, 0.02]	0.01	0.64	.520		
Sleep onset × seasonwinter	-0.01 [-0.03, 0.01]	0.01	-0.74	.462	0.00 [-0.01, 0.01]	0.01	0.06	.953		
Seasonspring × Sleep onset ²	-0.01 [-0.02, 0.01]	0.01	-0.96	.342	0.00 [-0.01, 0.00]	0.00	-1.00	.318		
Seasonsummer × Sleep onset ²	-0.01 [-0.02, 0.00]	0.01	-1.26	.210	-0.01 [-0.01, 0.00]	0.00	-1.32	.189		
Seasonwinter × Sleep onset ²	-0.01 [-0.02, 0.00]	0.01	-1.17	.244	0.00 [-0.01, 0.00]	0.00	-1.05	.296		
Sleep regularity (z)										
(Intercept)	1.11 [0.76, 1.45]	0.18	6.28	< .001	1.08 [0.83, 1.33]	0.13	8.50	< .001		
Sleep regularity	0.07 [0.02, 0.13]	0.03	2.63	.011	0.03 [0.02, 0.05]	0.01	4.38	< .001		

Table 15 continued

Term	Physical activity volume (z)				Physical activity intensity (z)			
	β [95% CI]	SE	t	p	β [95% CI]	SE	t	p
Seasonspring	-0.01 [-0.03, 0.02]	0.01	-0.48	.634	-0.02 [-0.04, 0.00]	0.01	-1.99	.048
Seasonsummer	0.01 [-0.01, 0.03]	0.01	0.87	.385	-0.04 [-0.06, -0.02]	0.01	-4.11	< .001
Seasonwinter	-0.03 [-0.05, -0.01]	0.01	-2.77	.006	-0.02 [-0.04, 0.00]	0.01	-2.29	.022
Sleep regularity ²	0.01 [-0.01, 0.02]	0.01	0.74	.465	0.00 [-0.01, 0.00]	0.00	-1.12	.266
Age	-0.02 [-0.02, -0.01]	0.00	-7.40	< .001	-0.02 [-0.03, -0.01]	0.00	-6.65	< .001
Sleep regularity × seasonspring	0.01 [-0.02, 0.04]	0.02	0.63	.531	0.00 [-0.01, 0.01]	0.01	0.16	.871
Sleep regularity × seasonsummer	0.00 [-0.02, 0.02]	0.01	0.32	.747	-0.01 [-0.02, 0.01]	0.01	-1.05	.296
Sleep regularity × seasonwinter	0.03 [0.01, 0.04]	0.01	2.58	.011	0.01 [0.00, 0.03]	0.01	2.08	.039
Seasonspring × Sleep regularity ²	0.00 [-0.01, 0.01]	0.01	-0.44	.660	0.00 [-0.01, 0.01]	0.00	-0.12	.903
Seasonsummer × Sleep regularity ²	0.00 [-0.01, 0.01]	0.01	0.39	.696	0.00 [-0.01, 0.01]	0.00	-0.44	.660
Seasonwinter × Sleep regularity ²	0.01 [0.00, 0.01]	0.00	1.07	.287	0.00 [0.00, 0.01]	0.00	1.23	.220

Note. Adjusted for SES, age, sex, and BMI. Outcomes variables are listed in the row headers.

Table 16

Physical activity predicting sleep controlling for SES, age, sex, and BMI.

Term	Physical activity volume (z)			Physical activity intensity (z)				
	β [95% CI]	SE	t	p	β [95% CI]	SE	t	p
Sleep duration (z)								
(Intercept)	0.08 [-0.30, 0.46]	0.19	0.42	.677	0.04 [-0.37, 0.44]	0.21	0.17	.866
Physical activity	0.12 [-0.08, 0.32]	0.10	1.18	.244	0.08 [-0.05, 0.21]	0.07	1.17	.247
Regioneurope	-0.07 [-0.14, 0.00]	0.04	-1.98	.049	-0.02 [-0.14, 0.11]	0.06	-0.28	.779
Regionafrica	-0.06 [-0.16, 0.04]	0.05	-1.14	.258	0.00 [-0.13, 0.13]	0.07	0.01	.992
Regionasia	-0.29 [-0.42, -0.15]	0.07	-4.22	<.001	-0.12 [-0.25, 0.02]	0.07	-1.70	.093
Regionnorth america	-0.11 [-0.19, -0.04]	0.04	-3.01	.003	0.03 [-0.12, 0.18]	0.08	0.43	.666
Regionsouth america	-0.20 [-0.35, -0.06]	0.07	-2.71	.009	-0.14 [-0.31, 0.03]	0.09	-1.62	.109
Physical activity ²	-0.01 [-0.03, 0.02]	0.01	-0.60	.548	0.04 [0.00, 0.07]	0.02	1.78	.080
Age	0.00 [0.00, 0.00]	0.00	-0.60	.549	0.00 [0.00, 0.00]	0.00	-0.56	.578
Physical activity × regioneurope	-0.05 [-0.20, 0.10]	0.08	-0.62	.536	-0.02 [-0.13, 0.08]	0.05	-0.46	.648
Physical activity × regionafrica	-0.12 [-0.29, 0.05]	0.09	-1.42	.162	0.06 [-0.07, 0.18]	0.06	0.91	.365
Physical activity × regionasia	-0.18 [-0.45, 0.08]	0.13	-1.37	.176	-0.08 [-0.22, 0.05]	0.07	-1.20	.235
Physical activity × regionnorth america	-0.16 [-0.38, 0.06]	0.11	-1.44	.156	0.02 [-0.09, 0.13]	0.06	0.41	.683
Physical activity × regionsouth america	-0.04 [-0.25, 0.16]	0.10	-0.41	.682	-0.04 [-0.15, 0.07]	0.06	-0.68	.497
Regioneurope × Physical activity ²	0.00 [-0.02, 0.02]	0.01	0.03	.974	-0.04 [-0.08, 0.00]	0.02	-2.14	.036
Regionafrica × Physical activity ²	-0.03 [-0.09, 0.03]	0.03	-1.01	.316	-0.10 [-0.17, -0.03]	0.04	-2.71	.009
Regionasia × Physical activity ²	0.00 [0.08, 0.08]	0.04	0.00	.997	-0.11 [-0.20, -0.03]	0.04	-2.70	.009
Regionnorth america × Physical activity ²	0.01 [-0.02, 0.05]	0.02	0.58	.567	-0.14 [-0.21, -0.07]	0.04	-3.89	< .001
Regionsouth america × Physical activity ²	0.00 [-0.04, 0.04]	0.02	-0.10	.922	-0.05 [-0.10, 0.00]	0.02	-2.03	.047
Sleep efficiency (z)								
(Intercept)	0.19 [-0.07, 0.45]	0.13	1.40	.164	0.21 [-0.05, 0.48]	0.14	1.56	.122

Table 16 continued

TITLE

Term	Physical activity volume (z)				Physical activity intensity (z)					
	β	[95% CI]	SE	t	p	β	[95% CI]	SE	t	p
Physical activity	0.06	[0.03, 0.15]	0.05	1.23	.224	0.01	[-0.04, 0.05]	0.02	0.21	.834
Regioneurope	-0.06	[-0.12, 0.00]	0.03	-2.06	.040	-0.05	[-0.12, 0.02]	0.03	-1.47	.144
Regionafrica	-0.04	[-0.10, 0.03]	0.03	-1.09	.277	0.00	[-0.07, 0.08]	0.04	0.05	.963
Regionasia	-0.11	[-0.20, -0.03]	0.04	-2.56	.011	-0.18	[-0.26, -0.09]	0.04	-4.20	< .001
Regionnorth america	0.01	[-0.06, 0.07]	0.03	0.16	.872	-0.03	[-0.11, 0.05]	0.04	-0.76	.450
Regionsouth america	-0.13	[-0.22, -0.04]	0.05	-2.74	.007	-0.16	[-0.24, -0.07]	0.04	-3.63	< .001
Physical activity ²	-0.01	[-0.02, 0.00]	0.01	-1.20	.236	0.01	[-0.01, 0.04]	0.01	1.16	.251
Age	0.00	[0.00, 0.00]	0.00	0.19	.852	0.00	[0.00, 0.00]	0.00	-0.31	.760
Physical activity × regioneurope	-0.02	[-0.09, 0.05]	0.04	-0.57	.572	0.00	[-0.05, 0.04]	0.02	-0.17	.867
Physical activity × regionafrica	-0.02	[-0.09, 0.06]	0.04	-0.39	.698	-0.06	[-0.13, 0.02]	0.04	-1.53	.128
Physical activity × regionasia	0.09	[-0.02, 0.21]	0.06	1.56	.124	0.02	[-0.08, 0.13]	0.05	0.46	.648
Physical activity × regionnorth america	0.06	[-0.04, 0.16]	0.05	1.22	.228	0.01	[-0.07, 0.09]	0.04	0.17	.867
Physical activity × regionsouth america	0.04	[-0.09, 0.18]	0.07	0.60	.552	-0.01	[-0.10, 0.08]	0.04	-0.19	.847
Regioneurope × Physical activity ²	0.00	[-0.01, 0.01]	0.01	-0.06	.950	-0.01	[-0.04, 0.01]	0.01	-1.25	.213
Regionafrica × Physical activity ²	0.01	[-0.02, 0.04]	0.02	0.74	.463	0.00	[-0.05, 0.05]	0.02	-0.06	.953
Regionasia × Physical activity ²	-0.01	[-0.06, 0.03]	0.02	-0.53	.601	-0.02	[-0.08, 0.05]	0.03	-0.59	.559
Regionnorth america × Physical activity ²	-0.02	[-0.03, 0.00]	0.01	-1.83	.070	-0.02	[-0.07, 0.03]	0.03	-0.74	.461
Regionsouth america × Physical activity ²	0.00	[-0.03, 0.02]	0.01	-0.37	.715	0.00	[-0.04, 0.04]	0.02	0.05	.963
Sleep onset (z)										
(Intercept)	-0.11	[-0.40, 0.18]	0.15	-0.75	.455	-0.04	[-0.34, 0.26]	0.15	-0.23	.816
Physical activity	-0.05	[-0.13, 0.04]	0.05	-1.01	.318	-0.08	[-0.15, -0.01]	0.03	-2.41	.019
Regioneurope	0.01	[-0.04, 0.06]	0.03	0.50	.616	-0.01	[-0.08, 0.06]	0.04	-0.30	.762
Regionafrica	0.04	[-0.02, 0.10]	0.03	1.22	.222	-0.01	[-0.09, 0.07]	0.04	-0.21	.834

Table 16 continued

TITLE

Term	Physical activity volume (z)			Physical activity intensity (z)				
	β [95% CI]	SE	t	p	β [95% CI]	SE	t	p
Regionasia	0.21 [0.13, 0.29]	0.04	5.06	< .001	0.06 [-0.03, 0.14]	0.04	1.30	.197
Regionnorth america	0.04 [-0.02, 0.10]	0.03	1.35	.180	-0.10 [-0.19, -0.01]	0.05	-2.21	.030
Regionsouth america	0.01 [-0.06, 0.09]	0.04	0.36	.718	-0.06 [-0.16, 0.03]	0.05	-1.30	.196
Physical activity ²	0.00 [-0.01, 0.01]	0.00	-0.29	.775	-0.02 [-0.04, 0.00]	0.01	-2.04	.046
Age	0.00 [0.00, 0.00]	0.00	1.30	.200	0.00 [0.00, 0.00]	0.00	0.71	.480
Physical activity × regioneurope	-0.01 [-0.09, 0.07]	0.04	-0.25	.801	0.01 [-0.05, 0.07]	0.03	0.31	.754
Physical activity × regionafrica	0.11 [0.00, 0.22]	0.05	1.99	.051	-0.03 [-0.14, 0.08]	0.06	-0.55	.587
Physical activity × regionasia	0.17 [0.02, 0.32]	0.08	2.18	.034	0.06 [-0.05, 0.18]	0.06	1.06	.293
Physical activity × regionnorth america	0.20 [0.07, 0.33]	0.07	2.94	.005	0.05 [-0.08, 0.18]	0.07	0.71	.483
Physical activity × regionsouth america	0.07 [-0.05, 0.18]	0.06	1.15	.254	0.04 [-0.03, 0.12]	0.04	1.23	.222
Regioneurope × Physical activity ²	0.01 [0.00, 0.02]	0.01	1.30	.199	0.03 [0.00, 0.05]	0.01	2.32	.024
Regionafrica × Physical activity ²	0.03 [-0.01, 0.06]	0.02	1.65	.103	0.06 [0.01, 0.11]	0.03	2.30	.024
Regionasia × Physical activity ²	0.00 [-0.04, 0.04]	0.02	-0.01	.989	0.06 [-0.01, 0.12]	0.03	1.73	.088
Regionnorth america × Physical activity ²	-0.01 [-0.03, 0.01]	0.01	-1.37	.174	0.03 [-0.03, 0.10]	0.03	1.07	.289
Regionsouth america × Physical activity ²	0.00 [-0.02, 0.03]	0.01	0.26	.798	0.03 [-0.01, 0.07]	0.02	1.65	.104
Sleep regularity (z)								
(Intercept)	0.23 [0.06, 0.41]	0.09	2.65	.009	0.33 [0.14, 0.53]	0.10	3.33	.001
Physical activity	0.20 [0.15, 0.25]	0.02	7.99	< .001	0.11 [0.06, 0.15]	0.02	4.83	< .001
Regioneurope	0.16 [0.11, 0.22]	0.03	5.79	< .001	0.14 [0.08, 0.20]	0.03	4.39	< .001
Regionafrica	0.29 [0.21, 0.36]	0.04	7.79	< .001	0.28 [0.21, 0.36]	0.04	7.55	< .001
Regionasia	0.31 [0.23, 0.38]	0.04	7.87	< .001	0.30 [0.22, 0.37]	0.04	7.80	< .001
Regionnorth america	0.11 [0.04, 0.17]	0.03	3.24	.001	0.06 [-0.01, 0.13]	0.04	1.67	.095
Regionsouth america	-0.02 [-0.08, 0.05]	0.03	-0.53	.595	-0.01 [-0.08, 0.06]	0.03	-0.32	.753

Table 16 continued

TITLE

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Term	Physical activity volume (z)				Physical activity intensity (z)			
	β [95% CI]	SE	t	p	β [95% CI]	SE	t	p
Physical activity ²	-0.03 [-0.03, -0.02]	0.00	-7.39	< .001	-0.03 [-0.05, -0.02]	0.01	-3.62	< .001
Age	0.00 [0.00, 0.00]	0.00	0.38	.702	0.00 [0.00, 0.00]	0.00	-0.48	.631
Physical activity × regioneurope	-0.01 [-0.05, 0.03]	0.02	-0.43	.671	-0.06 [-0.10, -0.02]	0.02	-2.93	.004
Physical activity × regionafrica	-0.10 [-0.16, -0.03]	0.03	-2.76	.007	0.01 [-0.06, 0.09]	0.04	0.37	.714
Physical activity × regionasia	-0.11 [-0.18, -0.03]	0.04	-2.71	.008	0.03 [-0.04, 0.10]	0.04	0.78	.434
Physical activity × regionnorth america	0.00 [-0.06, 0.07]	0.03	0.13	.897	-0.01 [-0.10, 0.08]	0.05	-0.22	.825
Physical activity × regionsouth america	-0.09 [-0.17, -0.01]	0.04	-2.32	.024	-0.05 [-0.11, 0.00]	0.03	-1.90	.061
Regioneurope × Physical activity ²	-0.01 [-0.02, 0.00]	0.00	-2.59	.010	0.02 [0.00, 0.04]	0.01	2.01	.047
Regionafrica × Physical activity ²	-0.01 [-0.06, 0.03]	0.02	-0.64	.522	-0.02 [-0.07, 0.03]	0.03	-0.78	.438
Regionasia × Physical activity ²	-0.01 [-0.05, 0.03]	0.02	-0.43	.669	-0.01 [-0.06, 0.05]	0.03	-0.27	.784
Regionnorth america × Physical activity ²	-0.01 [-0.03, 0.01]	0.01	-1.40	.166	-0.01 [-0.06, 0.05]	0.03	-0.20	.839
Regionsouth america × Physical activity ²	0.00 [-0.01, 0.02]	0.01	0.42	.674	0.02 [-0.01, 0.05]	0.01	1.42	.160

Note. Adjusted for SES, age, sex, and BMI. Outcomes variables are listed in the column headers.

Table 17

Sleep predicting physical activity controlling for SES, age, sex, and BMI

TITLE

Term	Physical activity volume (z)				Physical activity intensity (z)			
	β [95% CI]	SE	t	p	β [95% CI]	SE	t	p
Sleep duration (z)								
(Intercept)	1.33 [1.00, 1.66]	0.17	7.85	< .001	1.21 [0.96, 1.46]	0.13	9.39	< .001
Sleep duration	0.04 [-0.05, 0.12]	0.04	0.85	.402	0.05 [0.01, 0.09]	0.02	2.52	.014
Regioneurope	-0.19 [-0.27, -0.11]	0.04	-4.59	< .001	-0.14 [-0.19, -0.09]	0.03	-5.64	< .001
Regionafrica	-0.13 [-0.22, -0.04]	0.04	-2.85	.005	-0.08 [-0.15, -0.01]	0.04	-2.24	.026
Regionasia	-0.39 [-0.48, -0.29]	0.05	-8.03	< .001	-0.38 [-0.44, -0.32]	0.03	-12.02	< .001
Regionnorth america	-0.30 [-0.38, -0.22]	0.04	-7.65	< .001	-0.19 [-0.25, -0.13]	0.03	-6.38	< .001
Regionsouth america	-0.26 [-0.35, -0.17]	0.05	-5.63	< .001	-0.24 [-0.30, -0.19]	0.03	-8.20	< .001
Sleep duration ²	-0.01 [-0.04, 0.01]	0.01	-0.98	.331	0.00 [-0.01, 0.01]	0.01	0.28	.778
Age	-0.02 [-0.02, -0.01]	0.00	-7.52	< .001	-0.02 [-0.03, -0.01]	0.00	-6.67	< .001
Sleep duration × regioneurope	-0.05 [-0.11, 0.02]	0.03	-1.49	.143	-0.02 [-0.05, 0.01]	0.02	-1.06	.291
Sleep duration × regionafrica	-0.07 [-0.15, 0.01]	0.04	-1.82	.073	-0.04 [-0.09, 0.00]	0.02	-1.90	.060
Sleep duration × regionasia	-0.07 [-0.16, 0.02]	0.05	-1.50	.139	-0.03 [-0.09, 0.02]	0.03	-1.20	.234
Sleep duration × regionnorth america	-0.04 [-0.11, 0.03]	0.04	-1.23	.225	-0.04 [-0.09, 0.00]	0.02	-2.05	.043
Sleep duration × regionsouth america	-0.06 [-0.19, 0.07]	0.07	-0.96	.344	-0.06 [-0.09, -0.02]	0.02	-2.96	.004
Regioneurope × Sleep duration ²	0.00 [-0.03, 0.02]	0.01	-0.38	.705	0.00 [-0.02, 0.01]	0.01	-0.58	.565
Regionafrica × Sleep duration ²	0.01 [-0.02, 0.04]	0.01	0.64	.527	-0.01 [-0.03, 0.01]	0.01	-1.31	.190
Regionasia × Sleep duration ²	0.03 [-0.01, 0.06]	0.02	1.41	.163	0.01 [-0.02, 0.03]	0.01	0.56	.579
Regionnorth america × Sleep duration ²	0.01 [-0.01, 0.04]	0.01	1.32	.190	-0.01 [-0.03, 0.01]	0.01	-0.74	.458
Regionsouth america × Sleep duration ²	0.01 [-0.03, 0.05]	0.02	0.51	.613	-0.01 [-0.02, 0.01]	0.01	-1.09	.280
Sleep efficiency (z)								
(Intercept)	1.33 [0.98, 1.67]	0.17	7.62	< .001	1.23 [0.98, 1.48]	0.13	9.71	< .001

Table 17 continued

TITLE

Term	Physical activity volume (z)				Physical activity intensity (z)			
	β [95% CI]	SE	t	p	β [95% CI]	SE	t	p
Sleep efficiency	0.05 [-0.04, 0.13]	0.04	1.03	.309	0.02 [-0.01, 0.06]	0.02	1.31	.192
Regioneurope	-0.22 [-0.27, -0.16]	0.03	-8.11	< .001	-0.16 [-0.20, -0.11]	0.02	-6.97	< .001
Regionafrica	-0.15 [-0.21, -0.09]	0.03	-4.64	< .001	-0.11 [-0.17, -0.05]	0.03	-3.76	< .001
Regionasia	-0.38 [-0.44, -0.31]	0.03	-11.61	< .001	-0.39 [-0.45, -0.34]	0.03	-13.73	< .001
Regionnorth america	-0.30 [-0.36, -0.25]	0.03	-10.47	< .001	-0.22 [-0.27, -0.17]	0.03	-8.79	< .001
Regionsouth america	-0.27 [-0.34, -0.21]	0.03	-8.60	< .001	-0.28 [-0.33, -0.23]	0.03	-10.54	< .001
Sleep efficiency ²	0.01 [-0.01, 0.03]	0.01	0.88	.383	0.01 [0.00, 0.01]	0.00	1.27	.208
Age	-0.02 [-0.02, -0.01]	0.00	-7.34	< .001	-0.02 [-0.03, -0.02]	0.00	-6.70	< .001
Sleep efficiency × regioneurope	-0.02 [-0.10, 0.06]	0.04	-0.53	.595	-0.02 [-0.06, 0.02]	0.02	-1.08	.285
Sleep efficiency × regionafrica	0.00 [-0.09, 0.10]	0.05	0.05	.957	-0.05 [-0.11, 0.01]	0.03	-1.53	.128
Sleep efficiency × regionasia	0.05 [-0.06, 0.16]	0.06	0.87	.387	0.03 [-0.05, 0.11]	0.04	0.76	.449
Sleep efficiency × regionnorth america	-0.02 [-0.11, 0.07]	0.04	-0.43	.666	-0.01 [-0.06, 0.04]	0.03	-0.53	.600
Sleep efficiency × regionsouth america	-0.02 [-0.12, 0.09]	0.05	-0.29	.774	-0.02 [-0.06, 0.02]	0.02	-0.85	.399
Regioneurope × Sleep efficiency ²	0.00 [-0.02, 0.01]	0.01	-0.42	.674	-0.01 [-0.01, 0.00]	0.00	-1.30	.196
Regionafrica × Sleep efficiency ²	0.00 [-0.02, 0.02]	0.01	0.09	.925	-0.01 [-0.02, 0.00]	0.01	-1.57	.118
Regionasia × Sleep efficiency ²	0.01 [-0.01, 0.04]	0.01	1.13	.264	0.01 [-0.01, 0.03]	0.01	0.85	.395
Regionnorth america × Sleep efficiency ²	0.00 [-0.02, 0.02]	0.01	-0.41	.681	0.00 [-0.02, 0.01]	0.01	-0.83	.405
Regionsouth america × Sleep efficiency ²	0.00 [-0.02, 0.02]	0.01	-0.16	.876	0.00 [-0.01, 0.01]	0.01	-0.53	.599
Sleep onset (z)								
(Intercept)	1.34 [0.99, 1.69]	0.18	7.51	< .001	1.22 [0.96, 1.47]	0.13	9.42	< .001
Sleep onset	-0.02 [-0.14, 0.10]	0.06	-0.34	.737	-0.04 [-0.07, 0.00]	0.02	-1.90	.062
Regioneurope	-0.21 [-0.31, -0.11]	0.05	-4.10	< .001	-0.14 [-0.20, -0.09]	0.03	-4.78	< .001
Regionafrica	-0.09 [-0.21, 0.02]	0.06	-1.60	.113	-0.12 [-0.22, -0.02]	0.05	-2.45	.016

Table 17 continued

TITLE

Term	Physical activity volume (z)			Physical activity intensity (z)				
	β [95% CI]	SE	t	p	β [95% CI]	SE	t	p
Regionasia	-0.35 [-0.46, -0.24]	0.06	-6.00	< .001	-0.36 [-0.44, -0.28]	0.04	-9.11	< .001
Regionnorth america	-0.28 [-0.38, -0.18]	0.05	-5.44	< .001	-0.18 [-0.24, -0.11]	0.03	-5.46	< .001
Regionsouth america	-0.27 [-0.41, -0.12]	0.07	-3.62	< .001	-0.25 [-0.32, -0.19]	0.03	-7.98	< .001
Sleep onset ²	-0.03 [-0.05, -0.01]	0.01	-2.97	.004	-0.01 [-0.02, 0.01]	0.01	-1.05	.295
Age	-0.02 [-0.02, -0.01]	0.00	-7.20	< .001	-0.02 [-0.03, -0.01]	0.00	-6.66	< .001
Sleep onset × regioneurope	0.03 [-0.07, 0.12]	0.05	0.61	.546	0.02 [-0.02, 0.07]	0.02	1.07	.290
Sleep onset × regionafrica	0.10 [0.00, 0.21]	0.05	2.04	.046	-0.01 [-0.09, 0.08]	0.04	-0.12	.902
Sleep onset × regionasia	0.13 [0.02, 0.23]	0.05	2.31	.024	0.06 [-0.02, 0.14]	0.04	1.46	.148
Sleep onset × regionnorth america	0.06 [-0.03, 0.15]	0.05	1.36	.180	0.06 [0.01, 0.10]	0.02	2.50	.014
Sleep onset × regionsouth america	0.04 [-0.10, 0.18]	0.07	0.54	.593	0.04 [0.00, 0.08]	0.02	1.81	.075
Regioneurope × Sleep onset ²	0.01 [-0.01, 0.03]	0.01	1.25	.216	0.00 [-0.01, 0.02]	0.01	0.38	.706
Regionafrica × Sleep onset ²	0.02 [-0.02, 0.06]	0.02	1.05	.295	0.00 [-0.02, 0.03]	0.01	0.26	.798
Regionasia × Sleep onset ²	0.05 [0.00, 0.10]	0.03	1.93	.056	0.01 [-0.03, 0.05]	0.02	0.45	.652
Regionnorth america × Sleep onset ²	0.02 [-0.01, 0.06]	0.02	1.41	.161	0.00 [-0.02, 0.02]	0.01	0.05	.957
Regionsouth america × Sleep onset ²	0.02 [-0.01, 0.05]	0.02	1.07	.287	0.01 [-0.01, 0.02]	0.01	0.66	.511
Sleep regularity (z)								
(Intercept)	1.30 [0.96, 1.63]	0.17	7.50	< .001	1.22 [0.97, 1.47]	0.13	9.65	< .001
Sleep regularity	0.19 [0.13, 0.25]	0.03	6.11	< .001	0.06 [0.04, 0.09]	0.01	4.52	< .001
Regioneurope	-0.24 [-0.29, -0.18]	0.03	-8.57	< .001	-0.17 [-0.21, -0.12]	0.02	-7.34	< .001
Regionafrica	-0.17 [-0.23, -0.10]	0.03	-4.89	< .001	-0.12 [-0.18, -0.06]	0.03	-4.12	< .001
Regionasia	-0.41 [-0.48, -0.35]	0.03	-12.22	< .001	-0.41 [-0.47, -0.36]	0.03	-14.41	< .001
Regionnorth america	-0.31 [-0.37, -0.25]	0.03	-10.20	< .001	-0.20 [-0.25, -0.15]	0.03	-7.94	< .001
Regionsouth america	-0.28 [-0.35, -0.22]	0.03	-8.67	< .001	-0.28 [-0.33, -0.22]	0.03	-10.33	< .001 ⁶⁴

Table 17 continued

TITLE

Term	Physical activity volume (z)				Physical activity intensity (z)			
	β [95% CI]	SE	t	p	β [95% CI]	SE	t	p
Sleep regularity ²	0.03 [0.01, 0.04]	0.01	2.96	.004	0.00 [-0.01, 0.01]	0.01	0.78	.435
Age	-0.02 [-0.02, -0.01]	0.00	-7.39	< .001	-0.02 [-0.03, -0.01]	0.00	-6.71	< .001
Sleep regularity × regioneurope	-0.12 [-0.16, -0.08]	0.02	-5.33	< .001	-0.04 [-0.06, -0.01]	0.01	-2.85	.006
Sleep regularity × regionafrica	-0.12 [-0.17, -0.07]	0.02	-4.94	< .001	-0.01 [-0.04, 0.02]	0.02	-0.71	.476
Sleep regularity × regionasia	-0.13 [-0.19, -0.07]	0.03	-4.50	< .001	0.01 [-0.03, 0.05]	0.02	0.66	.508
Sleep regularity × regionnorth america	-0.09 [-0.15, -0.04]	0.03	-3.60	< .001	-0.02 [-0.07, 0.03]	0.03	-0.95	.343
Sleep regularity × regionsouth america	-0.11 [-0.19, -0.03]	0.04	-2.77	.008	-0.03 [-0.06, -0.01]	0.01	-2.41	.018
Regioneurope × Sleep regularity ²	-0.02 [-0.04, -0.01]	0.01	-2.87	.005	-0.01 [-0.02, 0.00]	0.01	-1.21	.228
Regionafrica × Sleep regularity ²	-0.03 [-0.06, -0.01]	0.01	-2.72	.007	-0.01 [-0.03, 0.01]	0.01	-0.93	.352
Regionasia × Sleep regularity ²	-0.02 [-0.05, 0.01]	0.01	-1.50	.135	0.00 [-0.02, 0.02]	0.01	0.15	.882
Regionnorth america × Sleep regularity ²	-0.03 [-0.05, 0.00]	0.01	-2.11	.037	-0.02 [-0.05, 0.00]	0.01	-2.25	.027
Regionsouth america × Sleep regularity ²	-0.02 [-0.04, 0.00]	0.01	-1.83	.072	-0.01 [-0.02, 0.00]	0.01	-1.27	.206

Note. Adjusted for SES, age, sex, and BMI. Outcomes variables are listed in the row headers.

Table 18

Physical activity predicting sleep controlling for SES, age, sex, and BMI.

Term	Physical activity volume (z)				Physical activity intensity (z)			
	β [95% CI]	SE	t	p	β [95% CI]	SE	t	p
Sleep duration (z)								
(Intercept)	0.21 [-0.17, 0.58]	0.19	1.08	.281	0.21 [-0.15, 0.57]	0.18	1.15	.252
Physical activity	0.06 [-0.12, 0.25]	0.09	0.68	.497	0.12 [0.03, 0.20]	0.04	2.76	.008
Daylight hours	-0.02 [-0.02, -0.01]	0.00	-5.98	< .001	-0.02 [-0.02, -0.01]	0.00	-6.15	< .001
Physical activity ²	0.00 [-0.02, 0.02]	0.01	0.11	.917	0.01 [-0.02, 0.03]	0.01	0.65	.516
Age	0.00 [-0.01, 0.00]	0.00	-0.46	.649	0.00 [0.00, 0.00]	0.00	-0.53	.598
Physical activity × daylight hours	0.00 [-0.01, 0.01]	0.00	0.18	.860	-0.01 [-0.01, 0.00]	0.00	-2.69	.008
Daylight hours × Physical activity ²	0.00 [0.00, 0.00]	0.00	-0.57	.569	0.00 [0.00, 0.00]	0.00	-1.23	.222
Sleep efficiency (z)								
(Intercept)	0.17 [-0.09, 0.43]	0.13	1.27	.207	0.20 [-0.06, 0.46]	0.13	1.49	.138
Physical activity	0.11 [-0.02, 0.23]	0.06	1.70	.095	0.04 [0.00, 0.08]	0.02	2.01	.047
Daylight hours	0.00 [-0.01, 0.00]	0.00	-2.77	.006	0.00 [-0.01, 0.00]	0.00	-2.16	.031
Physical activity ²	-0.02 [-0.03, 0.00]	0.01	-1.85	.066	0.00 [-0.02, 0.03]	0.01	0.41	.681
Age	0.00 [0.00, 0.00]	0.00	0.51	.614	0.00 [0.00, 0.00]	0.00	-0.30	.764
Physical activity × daylight hours	0.00 [-0.01, 0.00]	0.00	-1.56	.120	0.00 [-0.01, 0.00]	0.00	-2.45	.015
Daylight hours × Physical activity ²	0.00 [0.00, 0.00]	0.00	1.00	.318	0.00 [0.00, 0.00]	0.00	-0.13	.900
Sleep onset (z)								
(Intercept)	-0.22 [-0.49, 0.06]	0.14	-1.54	.125	-0.17 [-1.32, 0.99]	0.59	-0.28	.778
Physical activity	-0.01 [-0.11, 0.10]	0.05	-0.11	.910	-0.08 [-0.14, -0.03]	0.03	-3.14	.003
Daylight hours	0.01 [0.01, 0.01]	0.00	5.53	< .001	0.01 [0.01, 0.01]	0.00	5.38	< .001
Physical activity ²	-0.01 [-0.03, 0.00]	0.01	-1.65	.102	-0.01 [-0.03, 0.01]	0.01	-0.97	.332
Age	0.00 [0.00, 0.01]	0.00	1.57	.122	0.00 [0.00, 0.00]	0.00	0.85	.397

Term	Physical activity volume (z)				Physical activity intensity (z)			
	β [95% CI]	SE	t	p	β [95% CI]	SE	t	p
Physical activity \times daylight hours	0.00 [-0.01, 0.00]	0.00	-0.38	.702	0.00 [0.00, 0.00]	0.00	1.20	.233
Daylight hours \times Physical activity ²	0.00 [0.00, 0.00]	0.00	1.77	.079	0.00 [0.00, 0.00]	0.00	1.55	.122
Sleep regularity (z)								
(Intercept)	0.29 [0.11, 0.47]	0.09	3.22	.002	0.36 [0.16, 0.55]	0.10	3.64	< .001
Physical activity	0.17 [0.09, 0.25]	0.04	4.39	< .001	0.12 [0.07, 0.16]	0.02	5.49	< .001
Daylight hours	0.01 [0.00, 0.01]	0.00	3.51	< .001	0.01 [0.00, 0.01]	0.00	2.95	.003
Physical activity ²	-0.01 [-0.03, 0.00]	0.01	-1.75	.083	-0.02 [-0.05, 0.00]	0.01	-1.72	.087
Age	0.00 [0.00, 0.00]	0.00	0.03	.975	0.00 [0.00, 0.00]	0.00	-0.57	.569
Physical activity \times daylight hours	0.00 [-0.01, 0.00]	0.00	-0.36	.717	0.00 [-0.01, 0.00]	0.00	-3.26	.001
Daylight hours \times Physical activity ²	0.00 [0.00, 0.00]	0.00	-1.48	.140	0.00 [0.00, 0.00]	0.00	0.56	.577

Note. Adjusted for SES, age, sex, and BMI. Outcomes variables are listed in the column headers.

Table 19

Sleep predicting physical activity controlling for SES, age, sex, and BMI

Term	Physical activity volume (z)				Physical activity intensity (z)			
	β [95% CI]	SE	t	p	β [95% CI]	SE	t	p
Sleep duration (z)								
(Intercept)	1.00 [0.65, 1.35]	0.18	5.65	< .001	1.08 [0.83, 1.33]	0.13	8.47	< .001
Sleep duration	0.03 [-0.07, 0.13]	0.05	0.56	.581	0.05 [0.02, 0.09]	0.02	2.76	.007
Daylight hours	0.01 [0.01, 0.02]	0.00	7.67	< .001	0.00 [0.00, 0.00]	0.00	-0.62	.538
Sleep duration ²	0.02 [-0.02, 0.06]	0.02	1.20	.234	0.02 [0.00, 0.04]	0.01	1.99	.049
Age	-0.02 [-0.02, -0.01]	0.00	-7.56	< .001	-0.02 [-0.03, -0.01]	0.00	-6.63	< .001
Sleep duration × daylight hours	0.00 [-0.01, 0.00]	0.00	-1.68	.095	0.00 [-0.01, 0.00]	0.00	-1.86	.065
Daylight hours × Sleep duration ²	0.00 [0.00, 0.00]	0.00	-2.56	.012	0.00 [0.00, 0.00]	0.00	-2.15	.033
Sleep efficiency (z)								
(Intercept)	0.99 [0.64, 1.34]	0.18	5.53	< .001	1.09 [0.85, 1.34]	0.13	8.66	< .001
Sleep efficiency	0.08 [0.01, 0.16]	0.04	2.27	.026	0.04 [0.00, 0.09]	0.02	1.79	.076
Daylight hours	0.01 [0.01, 0.02]	0.00	7.85	< .001	0.00 [0.00, 0.00]	0.00	-1.16	.247
Sleep efficiency ²	0.02 [0.00, 0.04]	0.01	1.79	.078	0.01 [-0.01, 0.02]	0.01	1.03	.307
Age	-0.02 [-0.02, -0.01]	0.00	-7.44	< .001	-0.02 [-0.03, -0.01]	0.00	-6.65	< .001
Sleep efficiency × daylight hours	0.00 [-0.01, 0.00]	0.00	-2.33	.021	0.00 [-0.01, 0.00]	0.00	-1.75	.082
Daylight hours × Sleep efficiency ²	0.00 [0.00, 0.00]	0.00	-1.59	.114	0.00 [0.00, 0.00]	0.00	-0.82	.416
Sleep onset (z)								
(Intercept)	1.03 [0.68, 1.38]	0.18	5.81	< .001	1.10 [0.85, 1.35]	0.13	8.62	< .001
Sleep onset	0.01 [-0.08, 0.11]	0.05	0.27	.788	-0.01 [-0.05, 0.04]	0.02	-0.29	.774
Daylight hours	0.01 [0.01, 0.01]	0.00	6.35	< .001	0.00 [0.00, 0.00]	0.00	-1.41	.158
Sleep onset ²	-0.02 [-0.05, 0.01]	0.01	-1.41	.163	0.00 [-0.02, 0.02]	0.01	-0.05	.960
Age	-0.02 [-0.02, -0.01]	0.00	-7.35	< .001	-0.02 [-0.03, -0.01]	0.00	-6.62	< .001

Table 19 continued

Term	Physical activity volume (z)				Physical activity intensity (z)			
	β [95% CI]	SE	t	p	β [95% CI]	SE	t	p
Sleep onset × daylight hours	0.00 [0.00, 0.00]	0.00	0.00	> .999	0.00 [0.00, 0.00]	0.00	-0.29	.770
Daylight hours × Sleep onset ²	0.00 [0.00, 0.00]	0.00	0.10	.922	0.00 [0.00, 0.00]	0.00	-0.39	.700
Sleep regularity (z)								
(Intercept)	0.97 [0.62, 1.32]	0.18	5.45	< .001	1.09 [0.84, 1.34]	0.13	8.54	< .001
Sleep regularity	0.11 [0.04, 0.18]	0.04	3.19	.002	0.07 [0.04, 0.10]	0.01	4.97	< .001
Daylight hours	0.01 [0.01, 0.01]	0.00	6.86	< .001	0.00 [-0.01, 0.00]	0.00	-1.37	.171
Sleep regularity ²	0.01 [-0.01, 0.04]	0.01	1.08	.282	0.00 [-0.01, 0.02]	0.01	0.36	.717
Age	-0.02 [-0.02, -0.01]	0.00	-7.49	< .001	-0.02 [-0.03, -0.01]	0.00	-6.67	< .001
Sleep regularity × daylight hours	0.00 [-0.01, 0.00]	0.00	-1.60	.112	0.00 [-0.01, 0.00]	0.00	-2.94	.004
Daylight hours × Sleep regularity ²	0.00 [0.00, 0.00]	0.00	-0.71	.476	0.00 [0.00, 0.00]	0.00	-0.72	.472

Note. Adjusted for SES, age, sex, and BMI. Outcomes variables are listed in the row headers.

Table 20

Physical activity predicting sleep controlling for SES, age, sex, and BMI.

Term	Physical activity volume (z)				Physical activity intensity (z)			
	β [95% CI]	SE	t	p	β [95% CI]	SE	t	p
Sleep duration (z)								
(Intercept)	-0.03 [-0.53, 0.48]	0.26	-0.10	.920	-0.05 [-0.55, 0.45]	0.26	-0.19	.852
Physical activity	0.04 [0.09, 0.16]	0.06	0.61	.548	0.09 [0.00, 0.19]	0.05	1.97	.055
Acc wear locwrst	0.02 [-0.48, 0.51]	0.25	0.06	.949	0.08 [-0.41, 0.56]	0.25	0.31	.757
Physical activity ²	-0.02 [-0.05, 0.01]	0.02	-1.44	.157	-0.05 [-0.09, 0.00]	0.02	-2.13	.038
Age	0.00 [-0.01, 0.00]	0.00	-0.47	.644	0.00 [0.00, 0.00]	0.00	-0.86	.391
Physical activity × acc wear locwrst	0.05 [-0.09, 0.18]	0.07	0.68	.498	-0.04 [-0.11, 0.03]	0.04	-1.19	.238
Acc wear locwrst × Physical activity ²	0.02 [-0.02, 0.06]	0.02	0.81	.420	0.05 [0.00, 0.10]	0.02	1.90	.063
Sleep efficiency (z)								
(Intercept)	-0.37 [-0.68, -0.05]	0.16	-2.30	.022	-0.40 [-0.72, -0.09]	0.16	-2.50	.013
Physical activity	0.13 [0.04, 0.22]	0.04	2.94	.005	0.00 [-0.08, 0.08]	0.04	0.02	.985
Acc wear locwrst	0.63 [0.32, 0.94]	0.16	3.96	< .001	0.70 [0.40, 1.00]	0.15	4.52	< .001
Physical activity ²	-0.02 [-0.03, 0.00]	0.01	-1.77	.082	0.01 [-0.02, 0.05]	0.02	0.72	.476
Age	0.00 [0.00, 0.00]	0.00	0.06	.956	0.00 [0.00, 0.00]	0.00	-0.36	.716
Physical activity × acc wear locwrst	-0.10 [-0.16, -0.03]	0.03	-2.92	.005	0.00 [-0.07, 0.07]	0.04	0.06	.949
Acc wear locwrst × Physical activity ²	0.01 [-0.01, 0.03]	0.01	1.01	.315	-0.01 [-0.05, 0.03]	0.02	-0.59	.559
Sleep onset (z)								
(Intercept)	-0.75 [-1.12, -0.39]	0.19	-4.03	< .001	-0.74 [-3.28, 1.80]	1.29	-0.57	.568
Physical activity	0.07 [0.00, 0.15]	0.04	1.87	.068	-0.07 [-0.16, 0.02]	0.05	-1.51	.137
Acc wear locwrst	0.84 [0.47, 1.21]	0.19	4.46	< .001	0.84 [-1.99, 3.67]	1.44	0.58	.561
Physical activity ²	0.01 [0.00, 0.03]	0.01	1.45	.152	0.02 [-0.01, 0.06]	0.02	1.17	.248
Age	0.00 [0.00, 0.00]	0.00	1.18	.244	0.00 [0.00, 0.00]	0.00	0.98	.331

Table 20 continued

Term	Physical activity volume (z)				Physical activity intensity (z)			
	β [95% CI]	SE	t	p	β [95% CI]	SE	t	p
Physical activity \times acc wear locwrist	-0.13 [-0.20, -0.05]	0.04	-3.33	.002	0.01 [-0.09, 0.10]	0.05	0.12	.903
Acc wear locwrist \times Physical activity ²	-0.01 [-0.03, 0.01]	0.01	-0.93	.358	-0.02 [-0.06, 0.02]	0.02	-1.04	.303
Sleep regularity (z)								
(Intercept)	0.18 [-0.08, 0.44]	0.13	1.38	.167	0.12 [-0.15, 0.39]	0.14	0.86	.390
Physical activity	0.18 [0.13, 0.22]	0.02	7.40	< .001	0.13 [0.05, 0.20]	0.04	3.42	.001
Acc wear locwrist	0.23 [-0.01, 0.48]	0.13	1.86	.062	0.40 [0.14, 0.66]	0.13	3.05	.002
Physical activity ²	-0.05 [-0.07, -0.03]	0.01	-4.84	< .001	-0.04 [-0.09, 0.00]	0.02	-2.01	.050
Age	0.00 [0.00, 0.00]	0.00	0.01	.995	0.00 [0.00, 0.00]	0.00	-0.82	.415
Physical activity \times acc wear locwrist	-0.02 [-0.07, 0.02]	0.02	-0.94	.353	-0.09 [-0.16, -0.02]	0.04	-2.46	.017
Acc wear locwrist \times Physical activity ²	0.02 [0.00, 0.04]	0.01	2.44	.018	0.03 [-0.01, 0.07]	0.02	1.37	.177

Note. Adjusted for SES, age, sex, and BMI. Outcomes variables are listed in the column headers.

Table 21

Sleep predicting physical activity controlling for SES, age, sex, and BMI

Term	Physical activity volume (z)				Physical activity intensity (z)			
	β [95% CI]	SE	t	p	β [95% CI]	SE	t	p
Sleep duration (z)								
(Intercept)	0.18 [-0.27, 0.62]	0.23	0.78	.435	0.84 [0.51, 1.17]	0.17	5.04	< .001
Sleep duration	-0.01 [-0.06, 0.04]	0.03	-0.55	.583	0.02 [-0.01, 0.06]	0.02	1.47	.147
Acc wear locwrst	1.23 [0.74, 1.72]	0.25	4.90	< .001	0.29 [-0.03, 0.61]	0.16	1.77	.077
Sleep duration ²	0.00 [-0.01, 0.02]	0.01	0.53	.601	0.00 [0.00, 0.01]	0.00	0.91	.363
Age	-0.02 [-0.02, -0.01]	0.00	-7.52	< .001	-0.02 [-0.03, -0.01]	0.00	-6.63	< .001
Sleep duration × acc wear locwrst	0.01 [-0.05, 0.06]	0.03	0.20	.839	0.00 [-0.03, 0.02]	0.01	-0.12	.905
Acc wear locwrst × Sleep duration ²	-0.02 [-0.05, 0.00]	0.01	-1.73	.090	-0.01 [-0.02, 0.01]	0.01	-1.06	.293
Sleep efficiency (z)								
(Intercept)	0.18 [-0.27, 0.63]	0.23	0.80	.425	0.85 [0.52, 1.18]	0.17	5.02	< .001
Sleep efficiency	0.05 [0.01, 0.09]	0.02	2.75	.008	0.03 [0.00, 0.05]	0.01	1.98	.053
Acc wear locwrst	1.20 [0.70, 1.69]	0.25	4.76	< .001	0.29 [-0.04, 0.61]	0.17	1.71	.088
Sleep efficiency ²	0.01 [0.00, 0.02]	0.00	2.95	.004	0.01 [0.00, 0.01]	0.00	1.98	.052
Age	-0.02 [-0.02, -0.01]	0.00	-7.42	< .001	-0.02 [-0.03, -0.01]	0.00	-6.66	< .001
Sleep efficiency × acc wear locwrst	-0.03 [-0.07, 0.01]	0.02	-1.58	.119	-0.03 [-0.05, 0.00]	0.01	-2.15	.035
Acc wear locwrst × Sleep efficiency ²	-0.01 [-0.02, 0.01]	0.01	-0.64	.522	0.00 [-0.01, 0.00]	0.00	-1.23	.222
Sleep onset (z)								
(Intercept)	0.22 [-0.23, 0.66]	0.23	0.97	.333	0.85 [0.51, 1.19]	0.17	4.93	< .001
Sleep onset	0.05 [-0.02, 0.12]	0.03	1.41	.165	-0.01 [-0.05, 0.03]	0.02	-0.37	.714
Acc wear locwrst	1.18 [0.69, 1.67]	0.25	4.68	< .001	0.29 [-0.04, 0.62]	0.17	1.71	.087
Sleep onset ²	-0.01 [-0.02, 0.01]	0.01	-0.84	.407	0.00 [-0.01, 0.00]	0.00	-1.15	.253
Age	-0.02 [-0.02, -0.01]	0.00	-7.31	< .001	-0.02 [-0.03, -0.01]	0.00	-6.63	< .001

Table 21 continued

Term	Physical activity volume (z)				Physical activity intensity (z)					
	β	[95% CI]	SE	t	p	β	[95% CI]	SE	t	p
Sleep onset × acc wear locwrist	-0.05	[-0.11, 0.02]	0.03	-1.46	.151	-0.01	[-0.05, 0.03]	0.02	-0.30	.768
Acc wear locwrist × Sleep onset ²	-0.01	[-0.04, 0.01]	0.01	-0.83	.408	0.00	[-0.01, 0.01]	0.01	0.37	.715
Sleep regularity (z)										
(Intercept)	0.17	[-0.27, 0.61]	0.22	0.76	.446	0.86	[0.53, 1.18]	0.17	5.13	< .001
Sleep regularity	0.08	[0.05, 0.12]	0.02	4.30	< .001	0.06	[0.04, 0.08]	0.01	6.00	< .001
Acc wear locwrist	1.16	[0.68, 1.65]	0.25	4.72	< .001	0.26	[-0.06, 0.59]	0.17	1.57	.116
Sleep regularity ²	0.00	[-0.01, 0.01]	0.01	0.04	.964	-0.01	[-0.02, 0.00]	0.00	-2.43	.017
Age	-0.02	[-0.02, -0.01]	0.00	-7.45	< .001	-0.02	[-0.03, -0.01]	0.00	-6.67	< .001
Sleep regularity × acc wear locwrist	0.00	[-0.03, 0.03]	0.02	-0.08	.940	-0.04	[-0.06, -0.01]	0.01	-3.26	.002
Acc wear locwrist × Sleep regularity ²	0.01	[0.00, 0.02]	0.01	1.40	.167	0.01	[0.00, 0.02]	0.00	2.45	.016

Note. Adjusted for SES, age, sex, and BMI. Outcomes variables are listed in the row headers.

Table 22

Physical activity predicting sleep controlling for SES, age, sex, and BMI.

Term	Physical activity volume (z)				Physical activity intensity (z)			
	β [95% CI]	SE	t	p	β [95% CI]	SE	t	p
Sleep duration (z)								
(Intercept)	0.02 [-0.39, 0.42]	0.21	0.07	.941	0.02 [-0.36, 0.40]	0.19	0.09	.927
Physical activity	0.08 [-0.08, 0.24]	0.08	0.99	.326	0.06 [0.00, 0.12]	0.03	1.84	.071
Pa mostactivehr	0.00 [0.00, 0.00]	0.00	-0.80	.427	0.00 [0.00, 0.00]	0.00	-0.17	.864
Physical activity ²	0.00 [-0.02, 0.01]	0.01	-0.64	.524	0.01 [-0.01, 0.02]	0.01	0.63	.528
Age	0.00 [-0.01, 0.00]	0.00	-0.63	.532	0.00 [0.00, 0.00]	0.00	-0.74	.460
Physical activity × pa mostactivehr	0.00 [0.00, 0.00]	0.00	-0.60	.548	0.00 [0.00, 0.00]	0.00	-0.24	.814
Pa mostactivehr × Physical activity ²	0.00 [0.00, 0.00]	0.00	0.14	.885	0.00 [0.00, 0.00]	0.00	-1.55	.125
Sleep efficiency (z)								
(Intercept)	0.13 [-0.14, 0.41]	0.14	0.97	.336	0.18 [-0.09, 0.44]	0.13	1.31	.193
Physical activity	0.06 [-0.04, 0.15]	0.05	1.19	.239	0.01 [-0.03, 0.04]	0.02	0.32	.748
Pa mostactivehr	0.00 [0.00, 0.00]	0.00	-1.88	.063	0.00 [0.00, 0.00]	0.00	-1.45	.150
Physical activity ²	-0.01 [-0.02, 0.00]	0.01	-1.66	.101	0.00 [-0.01, 0.02]	0.01	0.72	.476
Age	0.00 [0.00, 0.00]	0.00	0.40	.692	0.00 [0.00, 0.00]	0.00	-0.39	.694
Physical activity × pa mostactivehr	0.00 [0.00, 0.00]	0.00	0.71	.480	0.00 [0.00, 0.00]	0.00	-0.26	.795
Pa mostactivehr × Physical activity ²	0.00 [0.00, 0.00]	0.00	-0.05	.964	0.00 [0.00, 0.00]	0.00	-0.11	.911
Sleep onset (z)								
(Intercept)	-0.14 [-0.43, 0.15]	0.15	-0.94	.346	-0.09 [-0.37, 0.20]	0.14	-0.60	.548
Physical activity	-0.04 [-0.11, 0.03]	0.04	-1.13	.265	-0.04 [-0.08, 0.01]	0.02	-1.66	.102
Pa mostactivehr	0.00 [0.00, 0.00]	0.00	1.75	.085	0.00 [0.00, 0.00]	0.00	0.98	.330
Physical activity ²	0.00 [-0.01, 0.01]	0.00	0.52	.605	-0.01 [-0.02, 0.01]	0.01	-1.27	.207
Age	0.00 [0.00, 0.01]	0.00	1.68	.098	0.00 [0.00, 0.00]	0.00	1.04	.301

Table 22 continued

Term	Physical activity volume (z)				Physical activity intensity (z)			
	β [95% CI]	SE	t	p	β [95% CI]	SE	t	p
Physical activity × pa mostactivehr	0.00 [0.00, 0.00]	0.00	2.14	.036	0.00 [0.00, 0.00]	0.00	-3.22	.002
Pa mostactivehr × Physical activity ²	0.00 [0.00, 0.00]	0.00	-0.68	.500	0.00 [0.00, 0.00]	0.00	2.47	.016
Sleep regularity (z)								
(Intercept)	0.38 [0.21, 0.56]	0.09	4.26	< .001	0.47 [0.28, 0.65]	0.10	4.87	< .001
Physical activity	0.13 [0.07, 0.19]	0.03	4.51	< .001	0.04 [0.02, 0.06]	0.01	3.28	.002
Pa mostactivehr	0.00 [0.00, 0.00]	0.00	-2.53	.012	0.00 [0.00, 0.00]	0.00	-4.48	< .001
Physical activity ²	-0.02 [-0.03, -0.01]	0.00	-4.57	< .001	-0.02 [-0.03, -0.01]	0.01	-3.59	< .001
Age	0.00 [0.00, 0.00]	0.00	0.04	.968	0.00 [0.00, 0.00]	0.00	-0.56	.581
Physical activity × pa mostactivehr	0.00 [0.00, 0.00]	0.00	2.79	.006	0.00 [0.00, 0.00]	0.00	2.66	.008
Pa mostactivehr × Physical activity ²	0.00 [0.00, 0.00]	0.00	-2.50	.014	0.00 [0.00, 0.00]	0.00	1.35	.179

Note. Adjusted for SES, age, sex, and BMI. Outcomes variables are listed in the column headers.

Table 23

Sleep predicting physical activity controlling for SES, age, sex, and BMI

Term	Physical activity volume (z)			Physical activity intensity (z)				
	β [95% CI]	SE	t	p	β [95% CI]	SE	t	p
Sleep duration (z)								
(Intercept)	1.18 [0.82, 1.53]	0.18	6.47	< .001	1.06 [0.80, 1.33]	0.14	7.86	< .001
Sleep duration	0.02 [-0.04, 0.09]	0.03	0.66	.512	0.05 [0.02, 0.09]	0.02	3.29	.002
Pa mostactivehr	0.00 [-0.01, 0.00]	0.00	-0.84	.403	0.00 [0.00, 0.00]	0.00	0.96	.340
Sleep duration ²	0.00 [-0.02, 0.03]	0.01	0.32	.751	0.01 [0.00, 0.02]	0.00	1.60	.113
Age	-0.02 [-0.02, -0.01]	0.00	-7.48	< .001	-0.02 [-0.03, -0.01]	0.00	-6.64	< .001
Sleep duration × pa mostactivehr	0.00 [0.00, 0.00]	0.00	-3.61	< .001	0.00 [0.00, 0.00]	0.00	-4.42	< .001
Pa mostactivehr × Sleep duration ²	0.00 [0.00, 0.00]	0.00	-3.03	.003	0.00 [0.00, 0.00]	0.00	-2.27	.025
Sleep efficiency (z)								
(Intercept)	1.17 [0.82, 1.53]	0.18	6.42	< .001	1.07 [0.81, 1.34]	0.13	8.07	< .001
Sleep efficiency	0.02 [-0.03, 0.07]	0.03	0.68	.498	-0.01 [-0.04, 0.01]	0.01	-0.91	.367
Pa mostactivehr	0.00 [-0.01, 0.00]	0.00	-1.55	.127	0.00 [0.00, 0.00]	0.00	-0.08	.938
Sleep efficiency ²	0.00 [-0.01, 0.02]	0.01	0.60	.549	0.00 [-0.01, 0.00]	0.00	-1.00	.318
Age	-0.02 [-0.02, -0.01]	0.00	-7.35	< .001	-0.02 [-0.03, -0.01]	0.00	-6.66	< .001
Sleep efficiency × pa mostactivehr	0.00 [0.00, 0.00]	0.00	1.22	.225	0.00 [0.00, 0.00]	0.00	2.70	.007
Pa mostactivehr × Sleep efficiency ²	0.00 [0.00, 0.00]	0.00	0.63	.528	0.00 [0.00, 0.00]	0.00	2.48	.014
Sleep onset (z)								
(Intercept)	1.19 [0.83, 1.55]	0.18	6.47	< .001	1.07 [0.80, 1.34]	0.14	7.85	< .001
Sleep onset	-0.02 [-0.08, 0.05]	0.03	-0.55	.586	-0.03 [-0.06, 0.00]	0.01	-2.18	.034
Pa mostactivehr	0.00 [-0.01, 0.00]	0.00	-1.05	.299	0.00 [0.00, 0.00]	0.00	0.59	.559
Sleep onset ²	-0.02 [-0.03, 0.00]	0.01	-2.07	.043	0.00 [-0.01, 0.01]	0.01	-0.56	.578
Age	-0.02 [-0.02, -0.01]	0.00	-7.27	< .001	-0.02 [-0.03, -0.01]	0.00	-6.64	< .001

Table 23 continued

Term	Physical activity volume (z)				Physical activity intensity (z)			
	β [95% CI]	SE	t	p	β [95% CI]	SE	t	p
Sleep onset × pa mostactivehr	0.00 [0.00, 0.00]	0.00	3.23	.002	0.00 [0.00, 0.00]	0.00	3.36	.001
Pa mostactivehr × Sleep onset ²	0.00 [0.00, 0.00]	0.00	-0.50	.619	0.00 [0.00, 0.00]	0.00	-0.21	.833
Sleep regularity (z)								
(Intercept)	1.13 [0.77, 1.48]	0.18	6.21	< .001	1.06 [0.80, 1.32]	0.13	7.96	< .001
Sleep regularity	0.09 [0.04, 0.14]	0.02	3.55	< .001	0.02 [0.01, 0.04]	0.01	3.23	.002
Pa mostactivehr	0.00 [-0.01, 0.00]	0.00	-1.07	.290	0.00 [0.00, 0.00]	0.00	0.35	.728
Sleep regularity ²	0.01 [0.00, 0.03]	0.01	1.87	.066	0.00 [-0.01, 0.00]	0.00	-0.90	.371
Age	-0.02 [-0.02, -0.01]	0.00	-7.40	< .001	-0.02 [-0.03, -0.01]	0.00	-6.69	< .001
Sleep regularity × pa mostactivehr	0.00 [0.00, 0.00]	0.00	-0.39	.699	0.00 [0.00, 0.00]	0.00	1.59	.114
Pa mostactivehr × Sleep regularity ²	0.00 [0.00, 0.00]	0.00	-1.50	.137	0.00 [0.00, 0.00]	0.00	0.01	.994

Note. Adjusted for SES, age, sex, and BMI. Outcomes variables are listed in the row headers.

Table 24

Physical activity predicting sleep controlling for SES, age, sex, and BMI.

Term	Physical activity volume (z)			Physical activity intensity (z)				
	β [95% CI]	SE	t	p	β [95% CI]	SE	t	p
<i>Sleep duration (z)</i>								
(Intercept)	0.03 [-0.37, 0.42]	0.20	0.13	.897	0.04 [-0.32, 0.40]	0.18	0.23	.815
Physical activity	0.05 [-0.09, 0.19]	0.07	0.68	.503	0.05 [0.00, 0.10]	0.03	1.95	.056
Ethnicitynon-white	-0.09 [-0.14, -0.03]	0.03	-3.16	.002	-0.07 [-0.10, -0.03]	0.02	-3.80	< .001
Ethnicityunclear	-0.02 [-0.06, 0.02]	0.02	-1.16	.250	-0.04 [-0.08, -0.01]	0.02	-2.40	.017
Physical activity ²	0.00 [-0.02, 0.01]	0.01	-0.46	.649	-0.01 [-0.02, 0.01]	0.01	-1.06	.292
Age	0.00 [-0.01, 0.00]	0.00	-0.73	.470	0.00 [0.00, 0.00]	0.00	-0.86	.393
Physical activity × ethnicitynon-white	-0.01 [-0.08, 0.06]	0.04	-0.32	.750	0.02 [-0.02, 0.07]	0.02	0.92	.362
Physical activity × ethnicityunclear	0.06 [0.00, 0.12]	0.03	2.11	.039	0.02 [-0.02, 0.05]	0.02	0.86	.394
Ethnicitynon-white × Physical activity ²	0.00 [-0.03, 0.02]	0.01	-0.28	.781	-0.03 [-0.05, 0.00]	0.01	-2.19	.031
Ethnicityunclear × Physical activity ²	0.00 [-0.02, 0.01]	0.01	-0.76	.452	0.01 [-0.01, 0.02]	0.01	1.04	.300
<i>Sleep efficiency (z)</i>								
(Intercept)	0.12 [-0.16, 0.39]	0.14	0.83	.409	0.16 [-0.10, 0.41]	0.13	1.21	.230
Physical activity	0.05 [-0.04, 0.14]	0.05	1.13	.266	0.01 [-0.02, 0.03]	0.01	0.54	.590
Ethnicitynon-white	-0.05 [-0.08, -0.01]	0.02	-2.43	.017	-0.07 [-0.10, -0.04]	0.02	-4.32	< .001
Ethnicityunclear	0.01 [-0.02, 0.04]	0.01	0.77	.439	0.00 [-0.02, 0.03]	0.01	0.21	.836
Physical activity ²	-0.01 [-0.02, 0.00]	0.00	-1.73	.090	0.00 [-0.01, 0.01]	0.00	-0.31	.755
Age	0.00 [0.00, 0.00]	0.00	0.35	.725	0.00 [0.00, 0.00]	0.00	-0.32	.749
Physical activity × ethnicitynon-white	0.05 [0.00, 0.10]	0.03	1.88	.064	0.01 [-0.03, 0.04]	0.02	0.37	.710
Physical activity × ethnicityunclear	0.02 [-0.01, 0.05]	0.02	1.19	.237	-0.01 [-0.04, 0.02]	0.01	-0.75	.455
Ethnicitynon-white × Physical activity ²	0.00 [-0.02, 0.01]	0.01	-0.70	.487	0.00 [-0.02, 0.02]	0.01	0.20	.843
Ethnicityunclear × Physical activity ²	0.00 [-0.01, 0.01]	0.00	-0.41	.686	0.01 [0.00, 0.02]	0.01	2.17	.031

Table 24 continued

TITLE

Term	Physical activity volume (z)			Physical activity intensity (z)				
	β [95% CI]	SE	t	p	β [95% CI]	SE	t	p
<i>Sleep onset (z)</i>								
(Intercept)	-0.14 [-1.30, 1.01]	0.59	-0.24	.809	-0.10 [-1.92, 1.72]	0.93	-0.11	.915
Physical activity	-0.02 [-0.08, 0.04]	0.03	-0.81	.424	-0.06 [-0.09, -0.02]	0.02	-3.07	.003
Ethnicitynon-white	0.08 [0.05, 0.11]	0.02	4.82	< .001	0.05 [0.03, 0.07]	0.01	4.22	< .001
Ethnicityunclear	0.04 [0.01, 0.06]	0.01	2.77	.006	0.04 [0.01, 0.06]	0.01	2.84	.005
Physical activity ²	0.00 [-0.01, 0.01]	0.00	0.44	.658	0.00 [-0.01, 0.01]	0.01	0.43	.669
Age	0.00 [0.00, 0.01]	0.00	1.73	.090	0.00 [0.00, 0.00]	0.00	1.15	.257
Physical activity × ethnicitynon-white	0.07 [0.02, 0.12]	0.02	2.95	.004	0.00 [-0.04, 0.03]	0.02	-0.10	.923
Physical activity × ethnicityunclear	0.00 [-0.03, 0.04]	0.02	0.20	.843	-0.02 [-0.05, 0.00]	0.01	-1.66	.101
Ethnicitynon-white × Physical activity ²	-0.01 [-0.02, 0.01]	0.01	-0.91	.365	0.01 [-0.01, 0.03]	0.01	0.76	.447
Ethnicityunclear × Physical activity ²	0.00 [-0.01, 0.01]	0.00	-0.59	.560	0.00 [-0.01, 0.02]	0.01	0.39	.701
<i>Sleep regularity (z)</i>								
(Intercept)	0.39 [0.21, 0.57]	0.09	4.29	< .001	0.45 [0.26, 0.65]	0.10	4.64	< .001
Physical activity	0.15 [0.09, 0.21]	0.03	5.22	< .001	0.05 [0.02, 0.07]	0.01	3.64	< .001
Ethnicitynon-white	0.02 [-0.01, 0.05]	0.02	1.43	.153	0.03 [0.00, 0.06]	0.02	2.09	.037
Ethnicityunclear	-0.05 [-0.08, -0.02]	0.01	-3.62	< .001	-0.04 [-0.07, -0.02]	0.01	-2.99	.003
Physical activity ²	-0.03 [-0.03, -0.02]	0.00	-5.92	< .001	-0.01 [-0.01, 0.00]	0.00	-1.31	.192
Age	0.00 [0.00, 0.00]	0.00	0.00	.997	0.00 [0.00, 0.00]	0.00	-0.65	.519
Physical activity × ethnicitynon-white	-0.01 [-0.05, 0.02]	0.02	-0.83	.406	0.07 [0.04, 0.11]	0.02	3.94	< .001
Physical activity × ethnicityunclear	0.03 [0.00, 0.06]	0.01	2.20	.031	0.01 [-0.01, 0.04]	0.01	1.14	.256
Ethnicitynon-white × Physical activity ²	0.00 [-0.02, 0.01]	0.01	-0.45	.653	-0.04 [-0.07, -0.01]	0.02	-2.67	.009
Ethnicityunclear × Physical activity ²	0.00 [-0.01, 0.00]	0.00	-0.64	.527	-0.02 [-0.03, -0.01]	0.01	-3.14	.002

Note. Adjusted for SES, age, sex, and BMI. Outcomes variables are listed in the column headers.

Table 25

Sleep predicting physical activity controlling for SES, age, sex, and BMI

Term	Physical activity volume (z)				Physical activity intensity (z)			
	β [95% CI]	SE	t	p	β [95% CI]	SE	t	p
Sleep duration (z)								
(Intercept)	1.17 [0.82, 1.51]	0.18	6.61	< .001	1.10 [0.84, 1.36]	0.13	8.34	< .001
Sleep duration	-0.01 [-0.08, 0.06]	0.04	-0.34	.736	0.03 [0.00, 0.05]	0.01	2.35	.022
Ethnicitynon-white	-0.08 [-0.10, -0.05]	0.01	-5.23	< .001	-0.05 [-0.07, -0.02]	0.01	-3.89	< .001
Ethnicityunclear	0.00 [-0.04, 0.03]	0.02	-0.26	.794	-0.03 [-0.06, 0.00]	0.01	-2.11	.036
Sleep duration ²	-0.01 [-0.03, 0.02]	0.01	-0.71	.479	0.00 [-0.01, 0.01]	0.00	0.57	.574
Age	-0.02 [-0.02, -0.01]	0.00	-7.48	< .001	-0.02 [-0.03, -0.01]	0.00	-6.63	< .001
Sleep duration × ethnicitynon-white	-0.01 [-0.04, 0.02]	0.02	-0.78	.440	-0.02 [-0.05, 0.00]	0.01	-2.11	.037
Sleep duration × ethnicityunclear	0.00 [-0.03, 0.04]	0.02	0.24	.811	-0.01 [-0.03, 0.00]	0.01	-1.46	.148
Ethnicitynon-white × Sleep duration ²	0.01 [0.00, 0.02]	0.01	1.49	.139	-0.01 [-0.02, 0.01]	0.01	-0.83	.408
Ethnicityunclear × Sleep duration ²	0.00 [-0.02, 0.01]	0.01	-0.39	.697	-0.01 [-0.02, 0.00]	0.00	-1.49	.140
Sleep efficiency (z)								
(Intercept)	1.15 [0.80, 1.50]	0.18	6.45	< .001	1.10 [0.85, 1.36]	0.13	8.50	< .001
Sleep efficiency	0.03 [-0.02, 0.08]	0.02	1.27	.210	0.01 [-0.01, 0.03]	0.01	0.90	.370
Ethnicitynon-white	-0.07 [-0.09, -0.04]	0.01	-5.31	< .001	-0.06 [-0.08, -0.04]	0.01	-4.93	< .001
Ethnicityunclear	-0.01 [-0.04, 0.02]	0.02	-0.42	.673	-0.04 [-0.07, -0.02]	0.01	-3.49	< .001
Sleep efficiency ²	0.01 [-0.01, 0.02]	0.01	0.98	.331	0.00 [0.00, 0.01]	0.00	0.45	.651
Age	-0.02 [-0.02, -0.01]	0.00	-7.35	< .001	-0.02 [-0.03, -0.01]	0.00	-6.65	< .001
Sleep efficiency × ethnicitynon-white	0.03 [-0.01, 0.06]	0.02	1.43	.157	0.01 [-0.02, 0.03]	0.01	0.50	.615
Sleep efficiency × ethnicityunclear	-0.01 [-0.04, 0.02]	0.02	-0.55	.586	-0.01 [-0.02, 0.01]	0.01	-0.59	.555
Ethnicitynon-white × Sleep efficiency ²	0.01 [0.00, 0.02]	0.01	1.24	.219	0.00 [-0.01, 0.01]	0.00	0.52	.607
Ethnicityunclear × Sleep efficiency ²	0.00 [-0.01, 0.01]	0.01	-0.45	.653	0.00 [0.00, 0.01]	0.00	0.64	.524

Table 25 continued

TITLE

Term	Physical activity volume (z)				Physical activity intensity (z)			
	β [95% CI]	SE	t	p	β [95% CI]	SE	t	p
Sleep onset (z)								
(Intercept)	1.17 [0.82, 1.52]	0.18	6.58	< .001	1.10 [0.84, 1.36]	0.13	8.31	< .001
Sleep onset	0.01 [-0.06, 0.08]	0.04	0.35	.728	-0.01 [-0.04, 0.02]	0.01	-0.74	.463
Ethnicitynon-white	-0.06 [-0.09, -0.03]	0.02	-3.67	< .001	-0.05 [-0.08, -0.02]	0.01	-3.36	< .001
Ethnicityunclear	-0.01 [-0.05, 0.03]	0.02	-0.62	.536	-0.04 [-0.07, 0.00]	0.02	-2.24	.027
Sleep onset ²	-0.02 [-0.04, 0.00]	0.01	-2.14	.037	0.00 [-0.01, 0.01]	0.00	-0.11	.914
Age	-0.02 [-0.02, -0.01]	0.00	-7.25	< .001	-0.02 [-0.03, -0.01]	0.00	-6.62	< .001
Sleep onset × ethnicitynon-white	0.03 [0.00, 0.06]	0.02	1.80	.077	0.01 [-0.01, 0.03]	0.01	0.99	.325
Sleep onset × ethnicityunclear	-0.01 [-0.04, 0.03]	0.02	-0.26	.793	0.00 [-0.02, 0.02]	0.01	-0.44	.661
Ethnicitynon-white × Sleep onset ²	0.00 [-0.01, 0.02]	0.01	0.64	.524	0.00 [-0.02, 0.01]	0.01	-0.52	.601
Ethnicityunclear × Sleep onset ²	0.00 [-0.02, 0.01]	0.01	-0.05	.959	-0.01 [-0.02, 0.00]	0.01	-1.25	.215
Sleep regularity (z)								
(Intercept)	1.11 [0.76, 1.45]	0.18	6.28	< .001	1.09 [0.84, 1.34]	0.13	8.47	< .001
Sleep regularity	0.07 [0.02, 0.12]	0.02	2.94	.005	0.03 [0.01, 0.04]	0.01	3.79	< .001
Ethnicitynon-white	-0.06 [-0.09, -0.04]	0.01	-4.57	< .001	-0.05 [-0.08, -0.03]	0.01	-4.15	< .001
Ethnicityunclear	-0.01 [-0.03, 0.02]	0.01	-0.40	.692	-0.04 [-0.07, -0.01]	0.01	-3.11	.002
Sleep regularity ²	0.00 [-0.01, 0.02]	0.01	0.77	.442	0.00 [-0.01, 0.00]	0.00	-1.47	.144
Age	-0.02 [-0.02, -0.01]	0.00	-7.38	< .001	-0.02 [-0.03, -0.01]	0.00	-6.67	< .001
Sleep regularity × ethnicitynon-white	0.01 [-0.02, 0.04]	0.01	0.58	.562	0.02 [0.00, 0.04]	0.01	2.31	.022
Sleep regularity × ethnicityunclear	0.04 [0.02, 0.06]	0.01	3.74	< .001	0.02 [0.00, 0.03]	0.01	1.95	.055
Ethnicitynon-white × Sleep regularity ²	0.00 [-0.02, 0.01]	0.01	-0.45	.653	0.00 [-0.01, 0.01]	0.01	-0.63	.526
Ethnicityunclear × Sleep regularity ²	0.01 [0.00, 0.02]	0.00	1.41	.163	0.00 [0.00, 0.01]	0.00	0.88	.380

Note. Adjusted for SES, age, sex, and BMI. Outcomes variables are listed in the row headers.

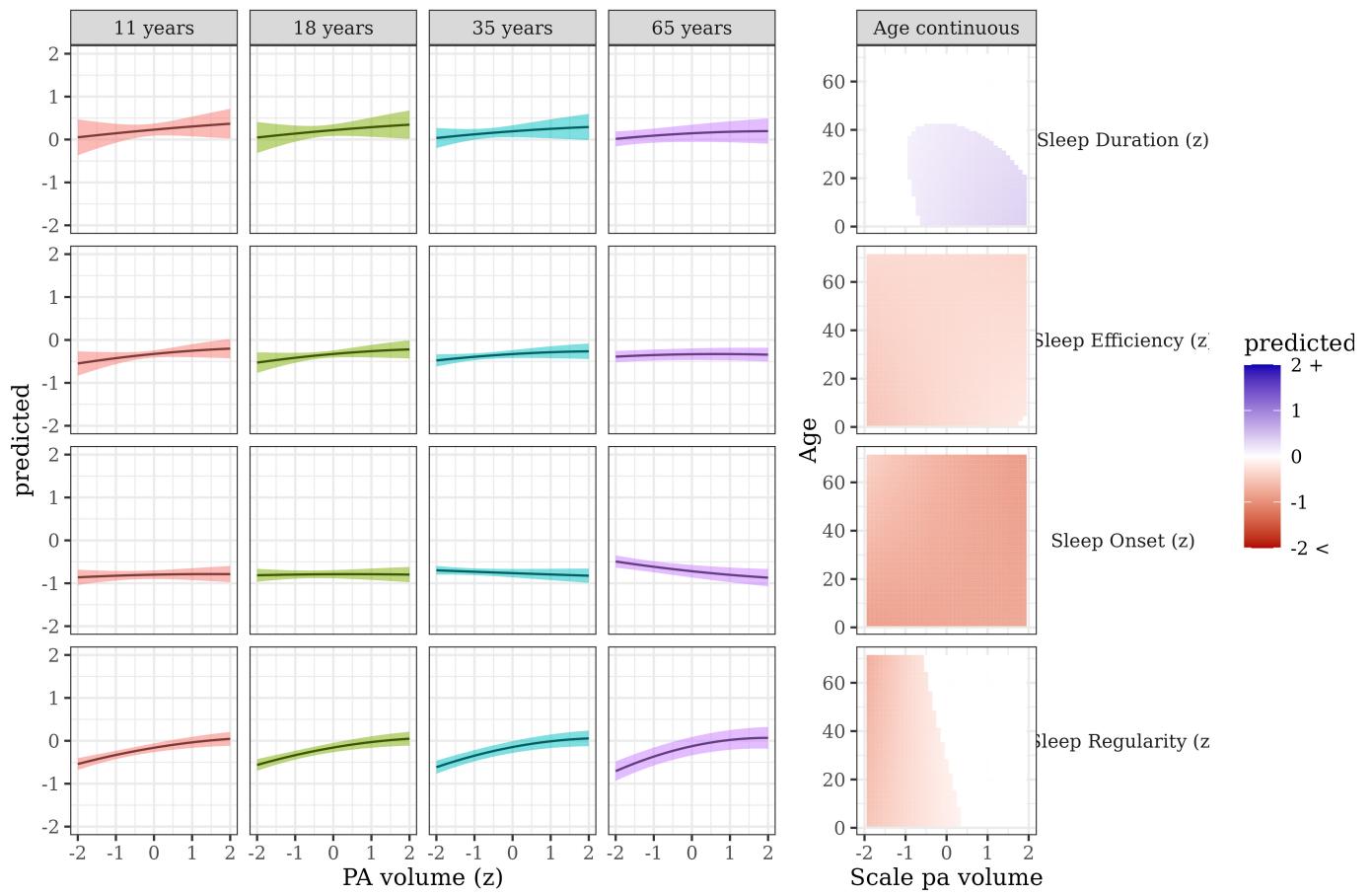


Figure 1. Sleep metrics on Physical activity volume

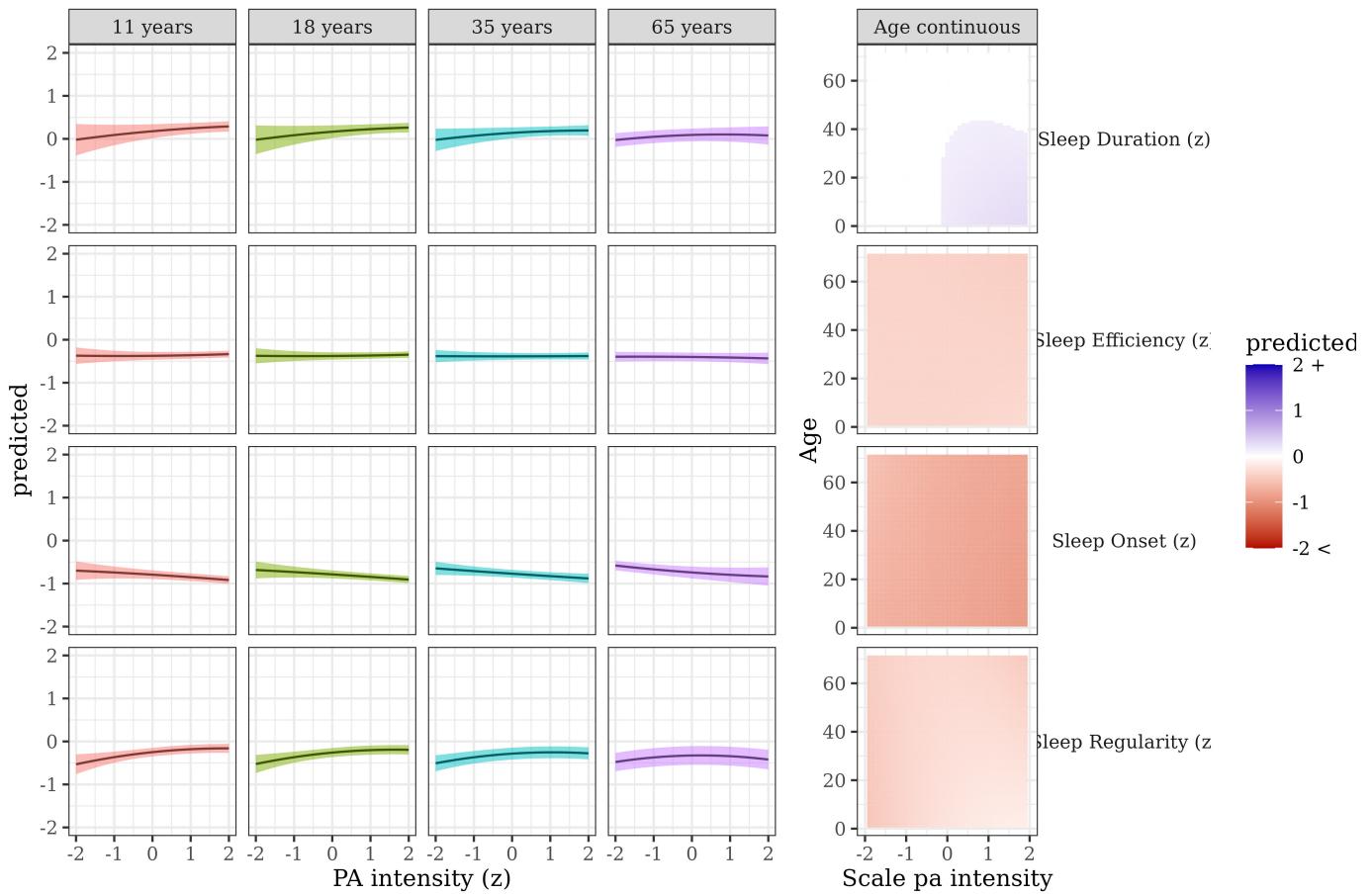


Figure 2. Sleep metrics on Physical activity intensity

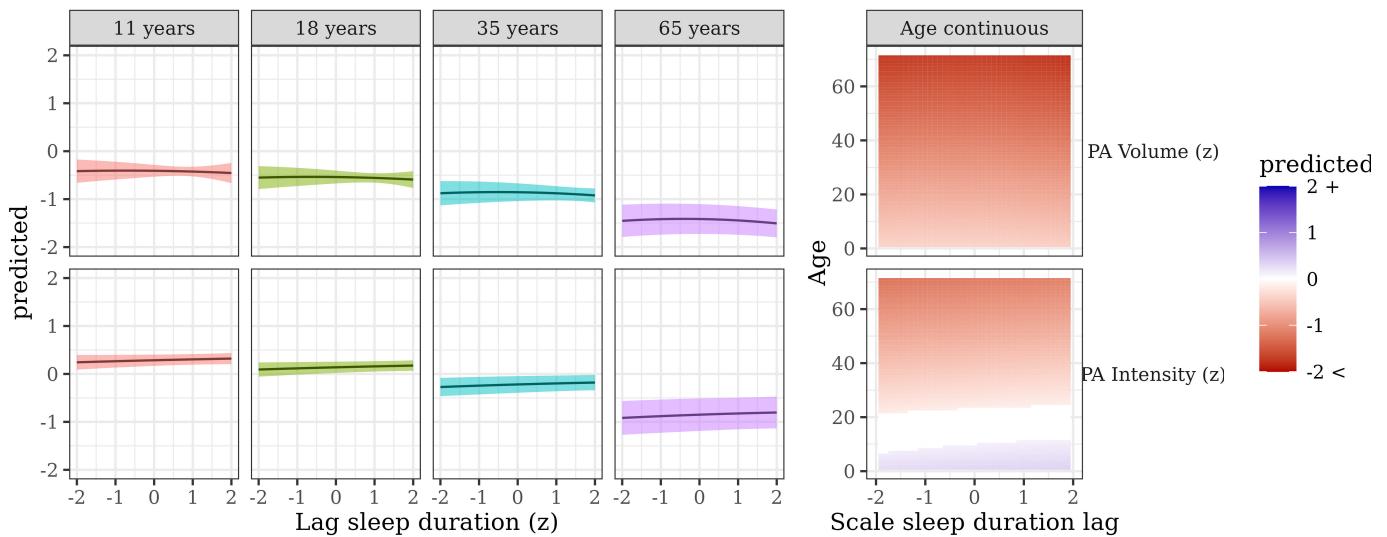


Figure 3. Physical activity by sleep duration

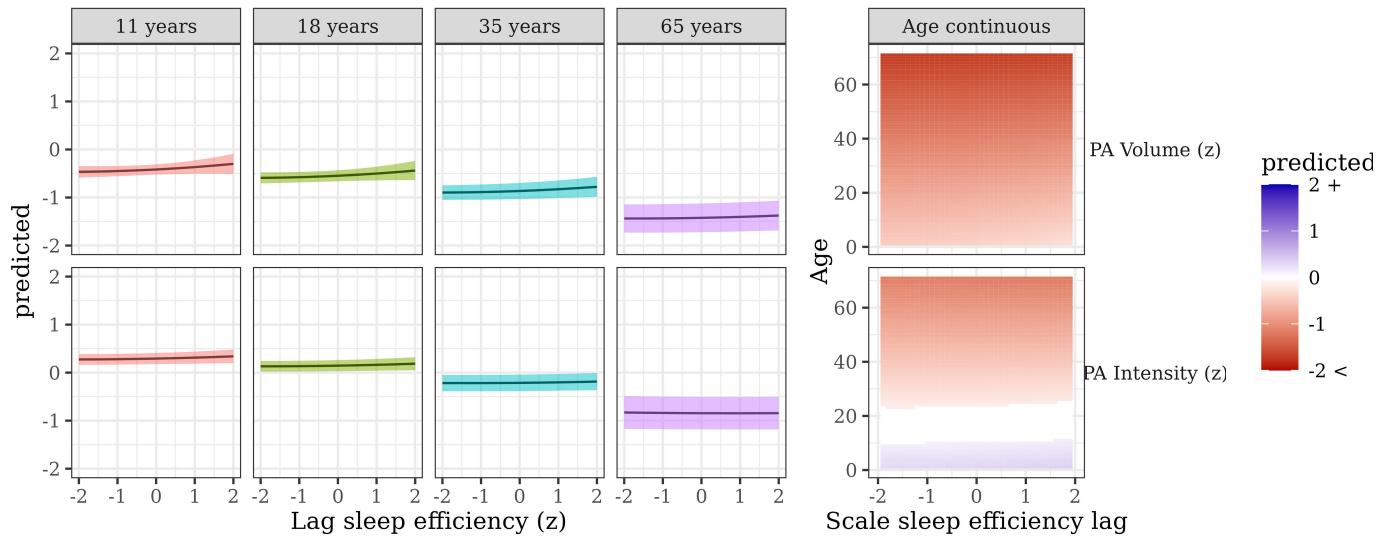


Figure 4. Physical activity by sleep efficiency

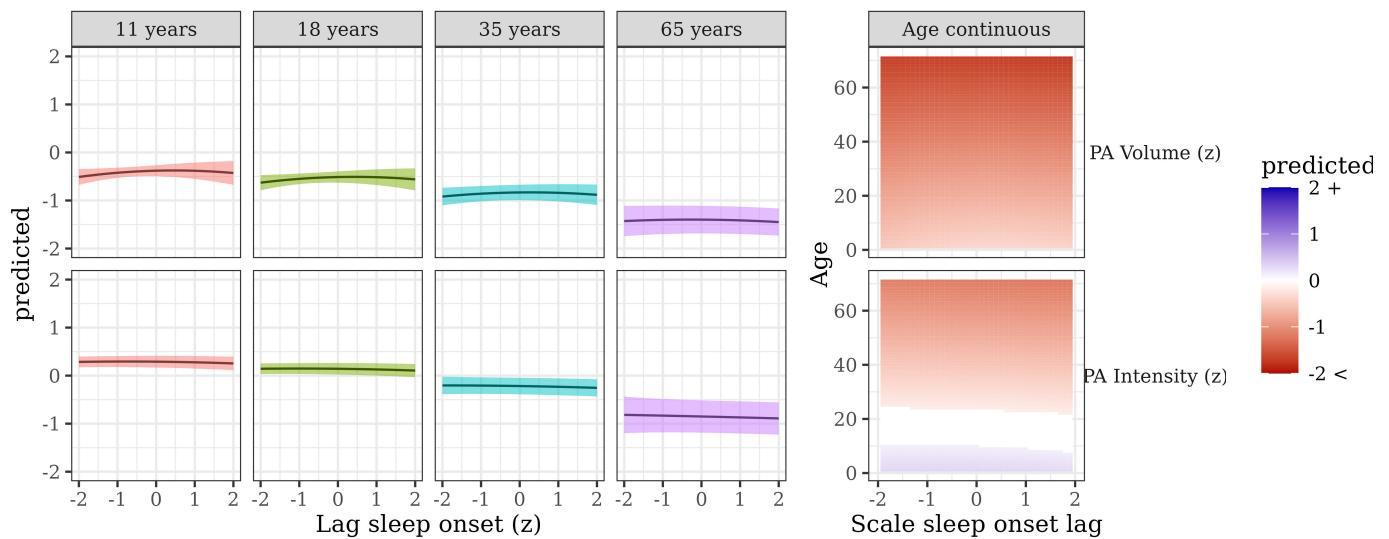


Figure 5. Physical activity by sleep onset

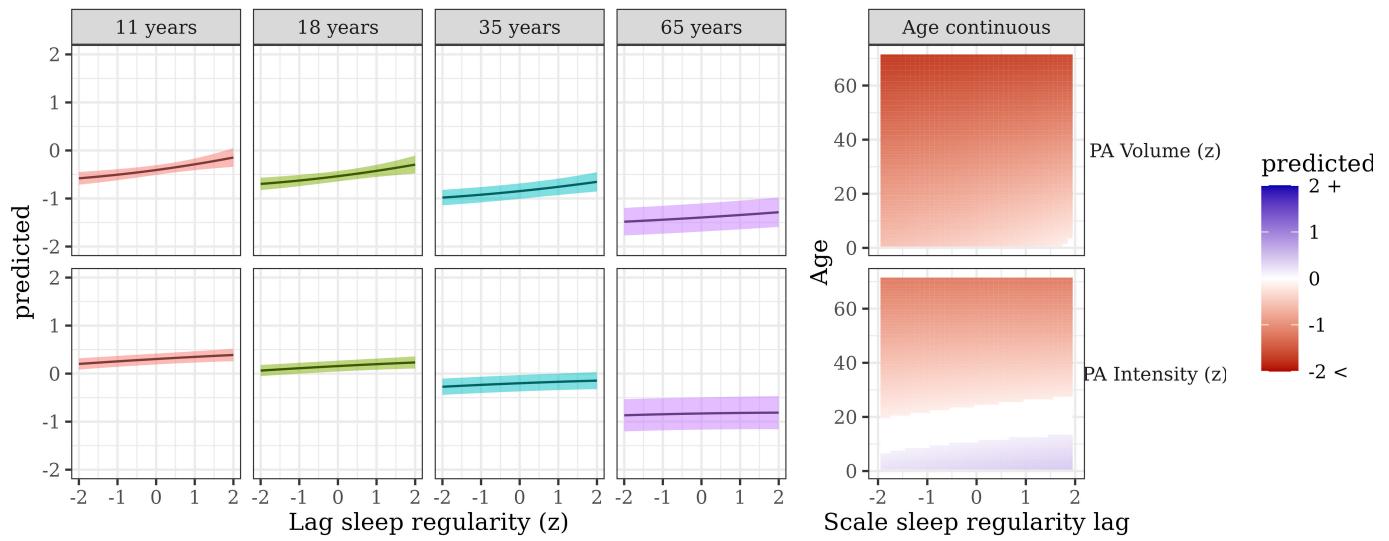


Figure 6. Physical activity by sleep regularity

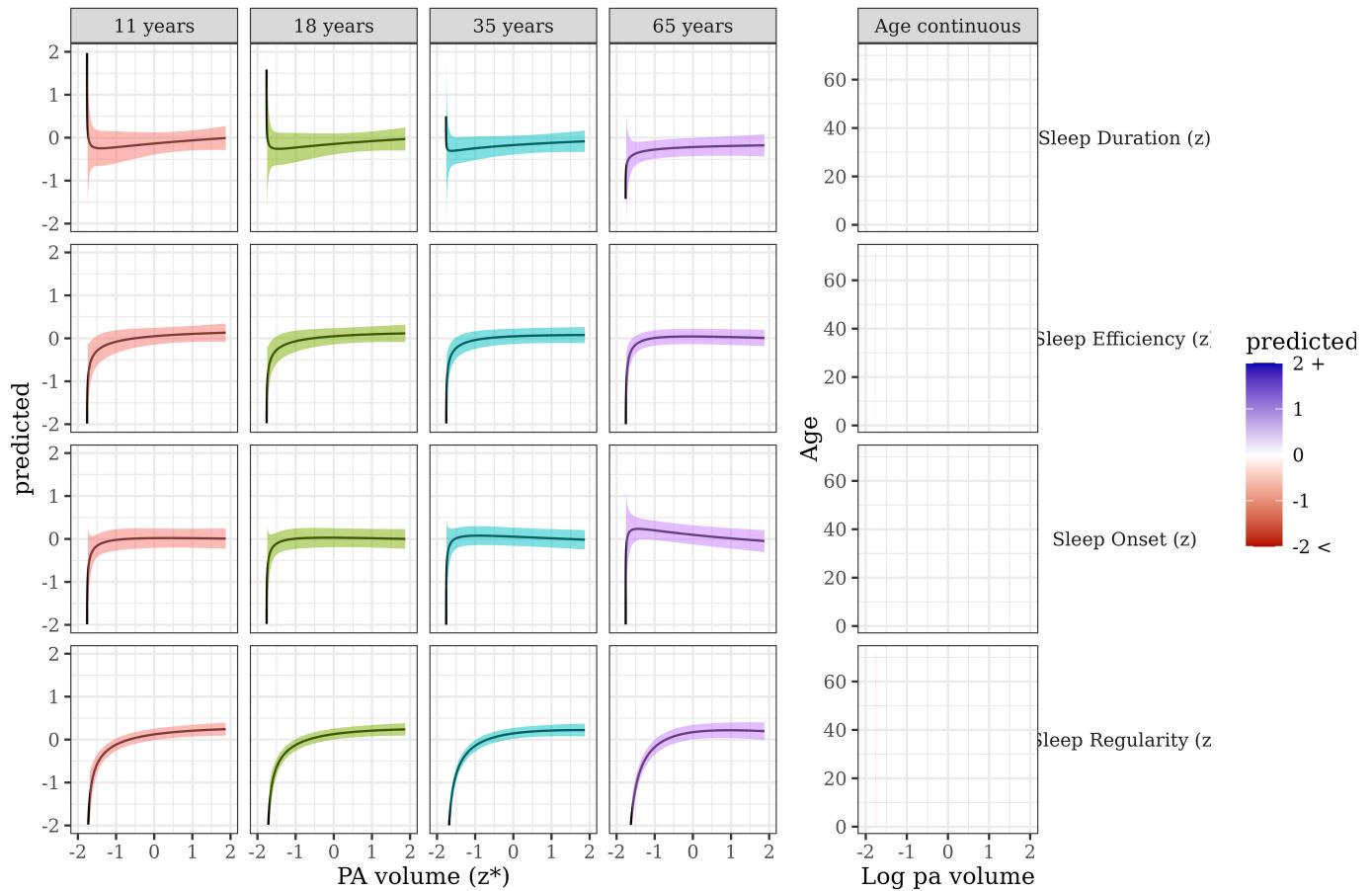


Figure 7. Sleep metrics on Physical activity volume

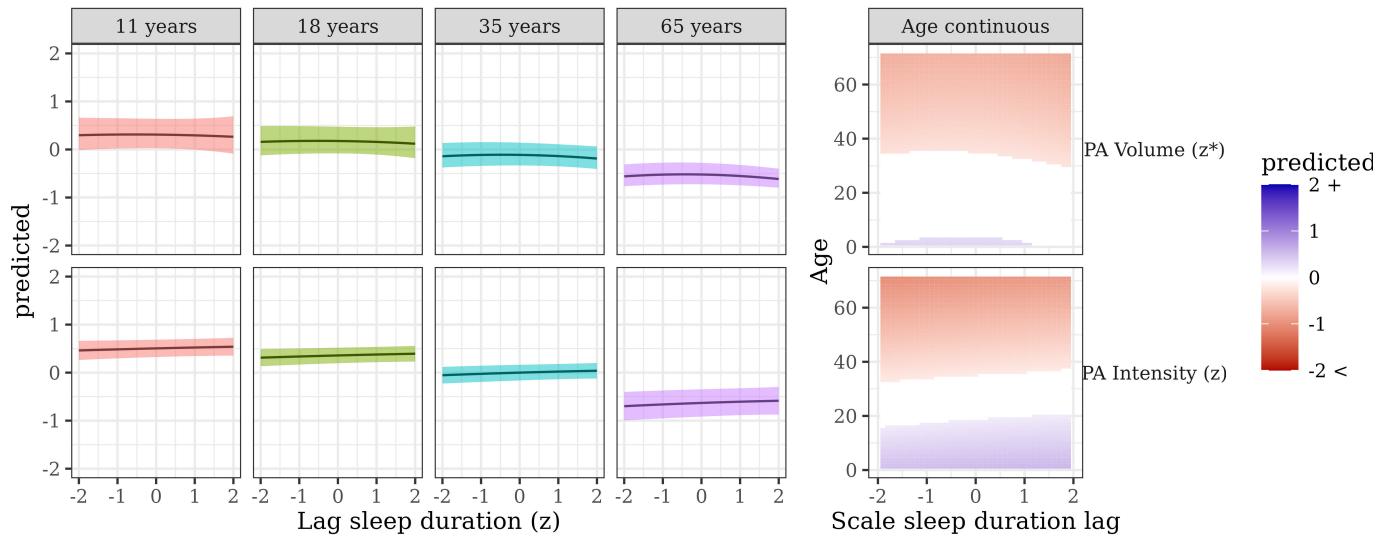


Figure 8. Physical activity by sleep duration

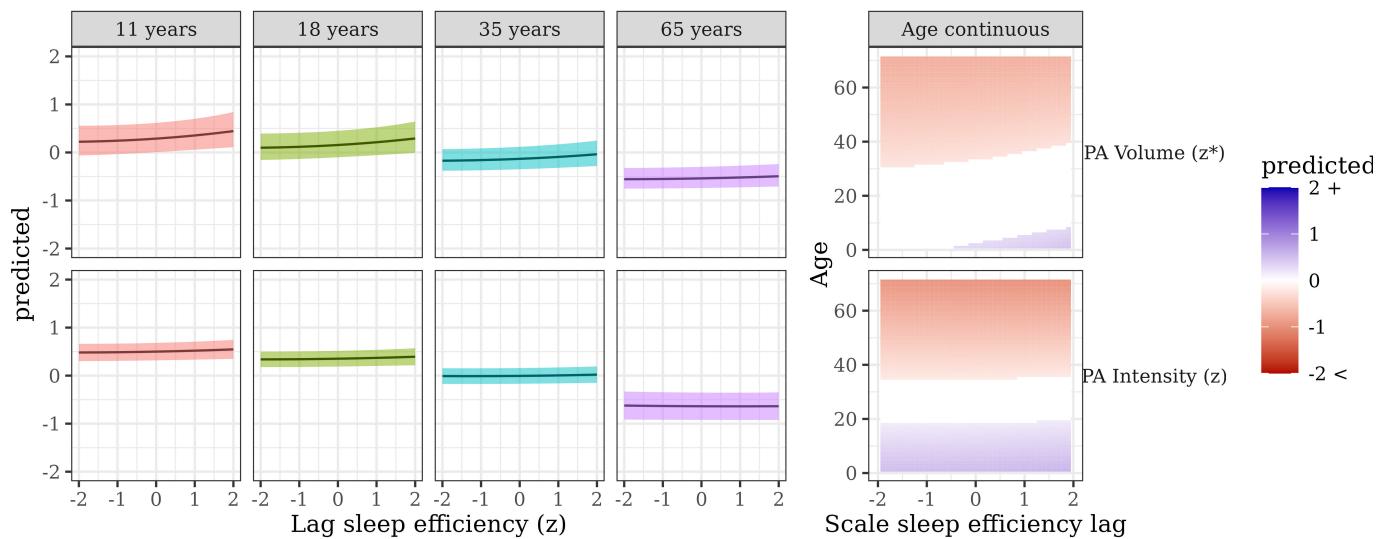


Figure 9. Physical activity by sleep efficiency

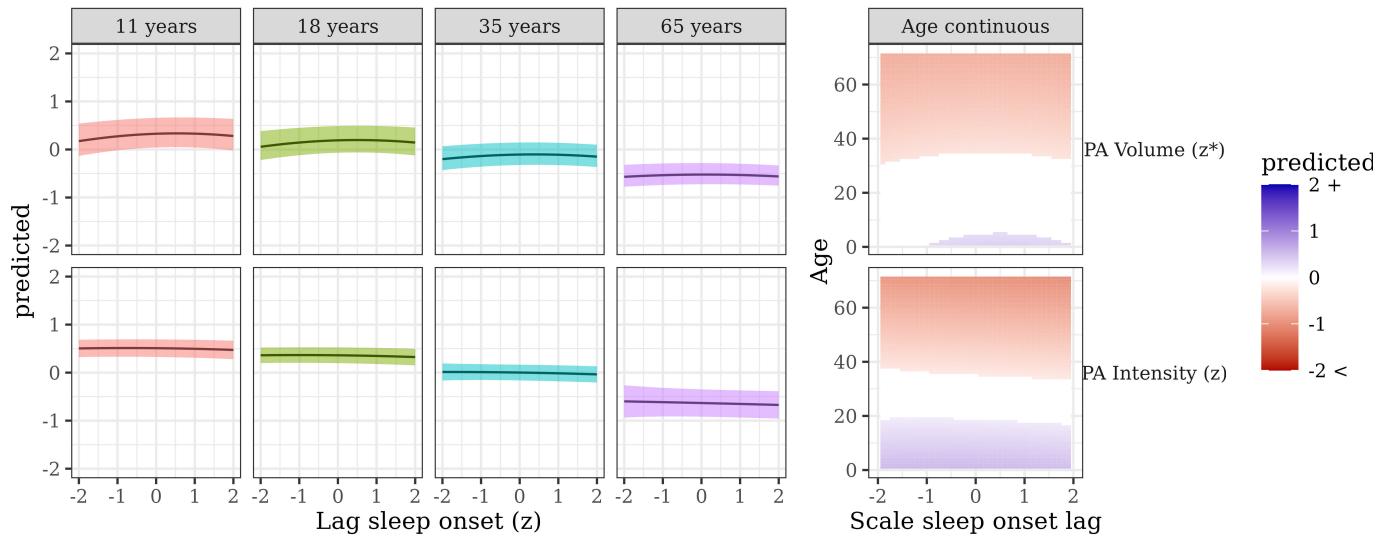


Figure 10. Physical activity by sleep onset

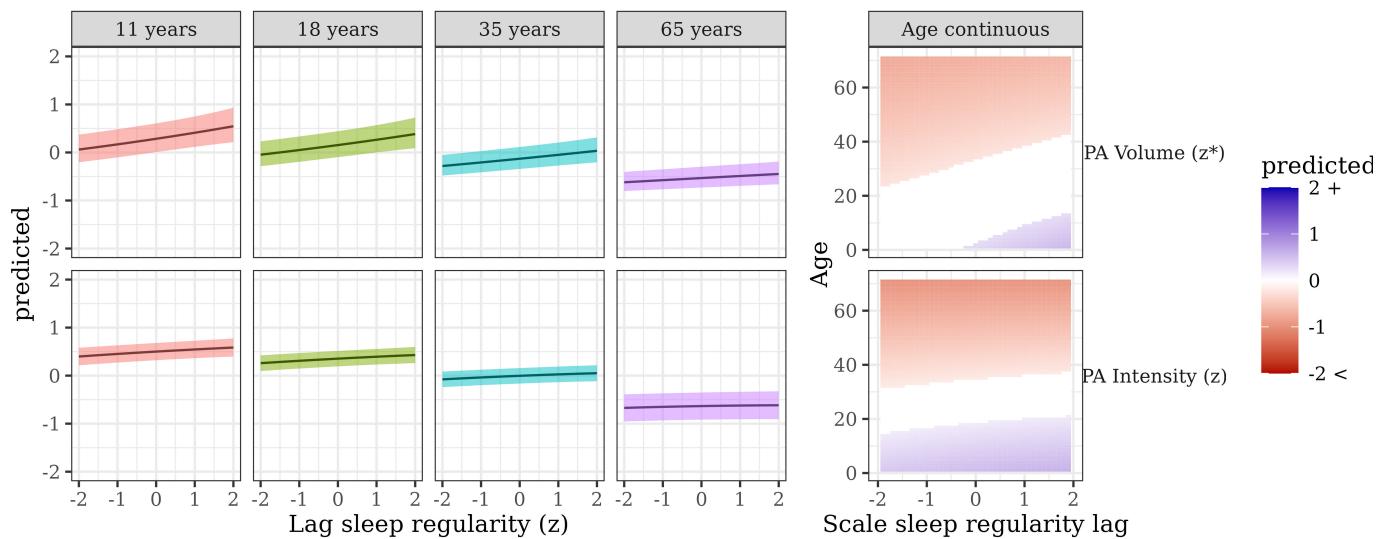


Figure 11. Physical activity by sleep regularity

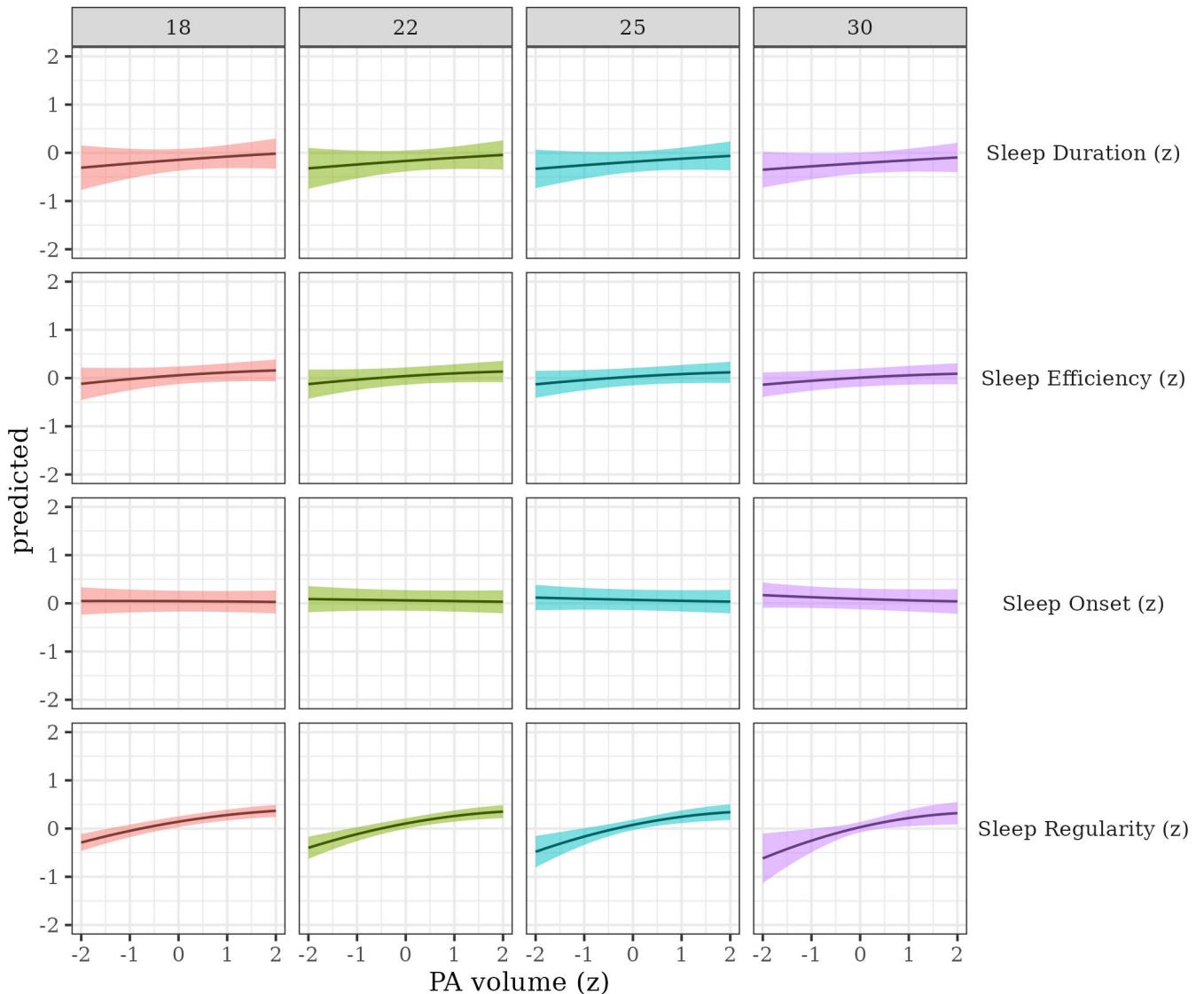


Figure 12. Sleep metrics on Physical activity volume by BMI

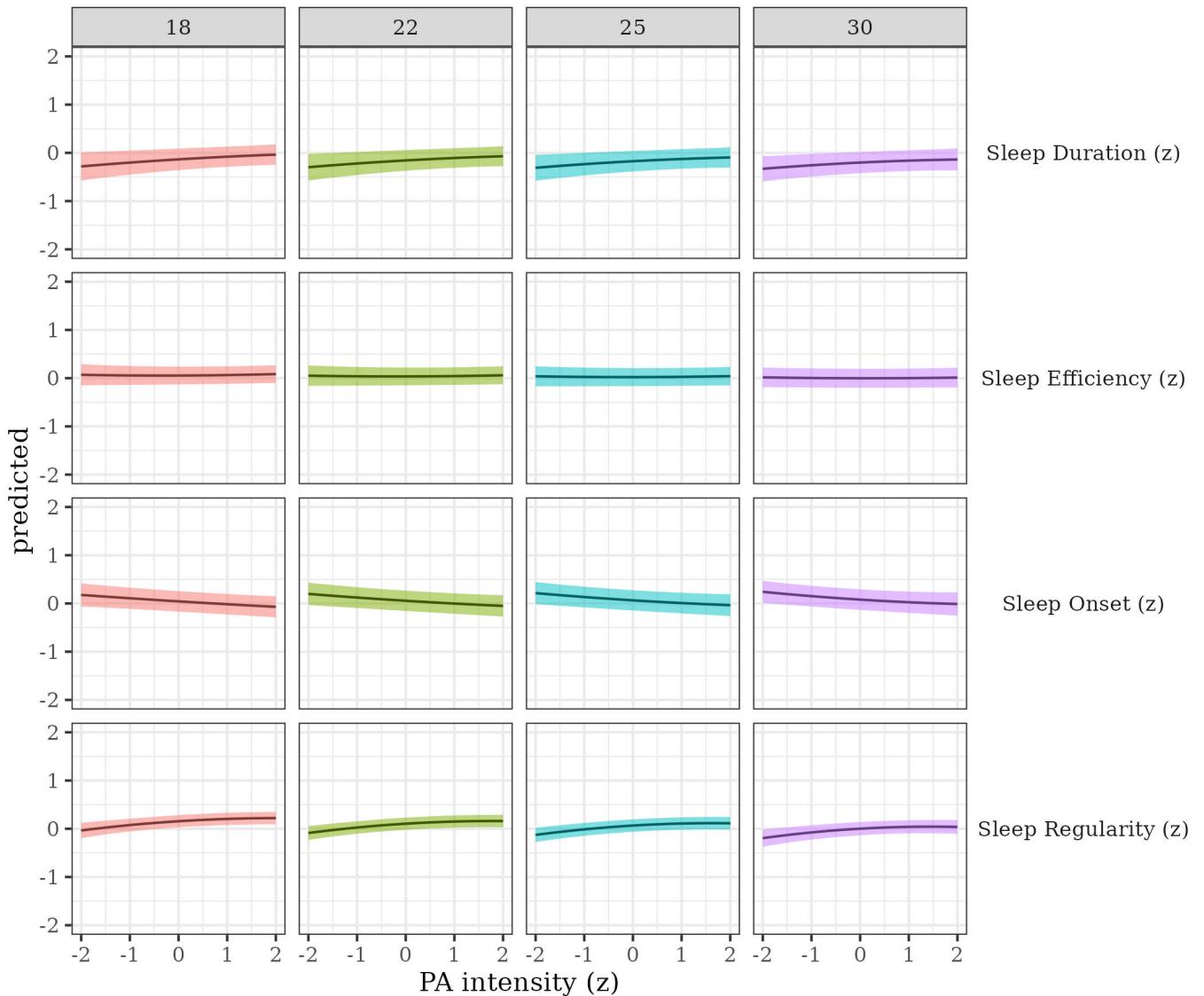


Figure 13. Sleep metrics on Physical activity intensity moderated by BMI

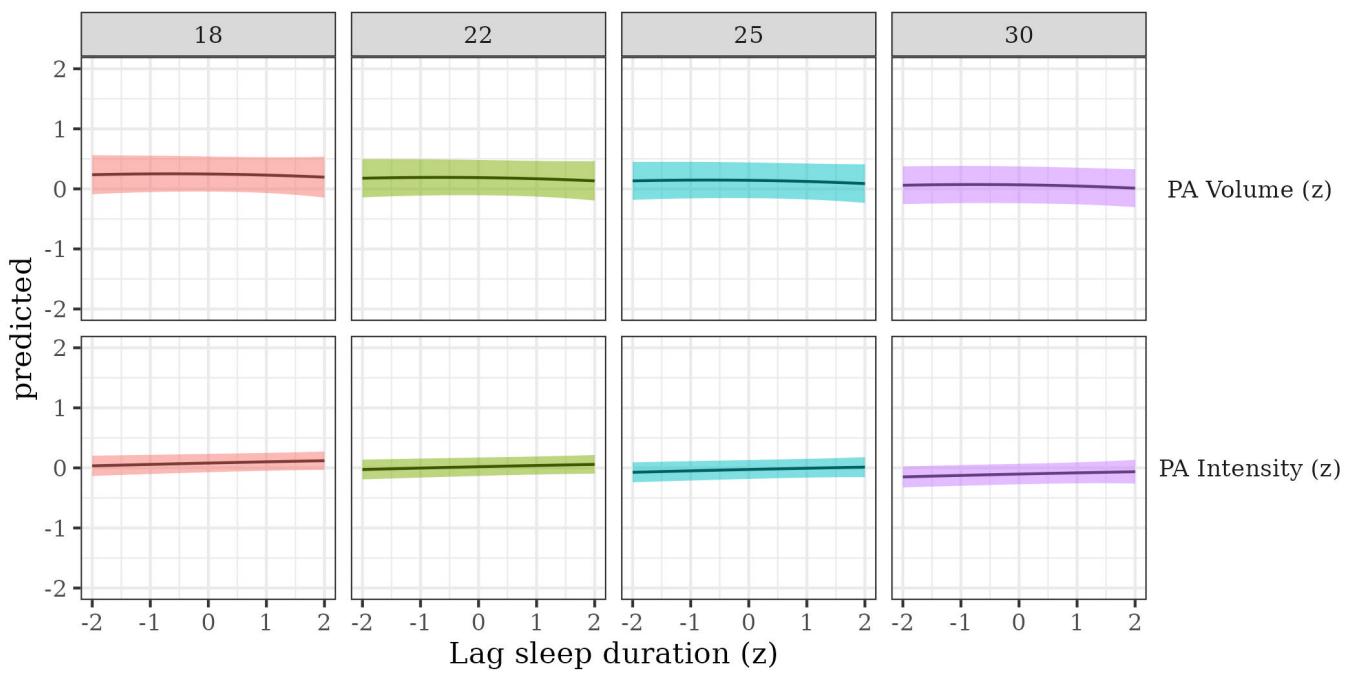


Figure 14. Physical activity by sleep duration moderated by BMI

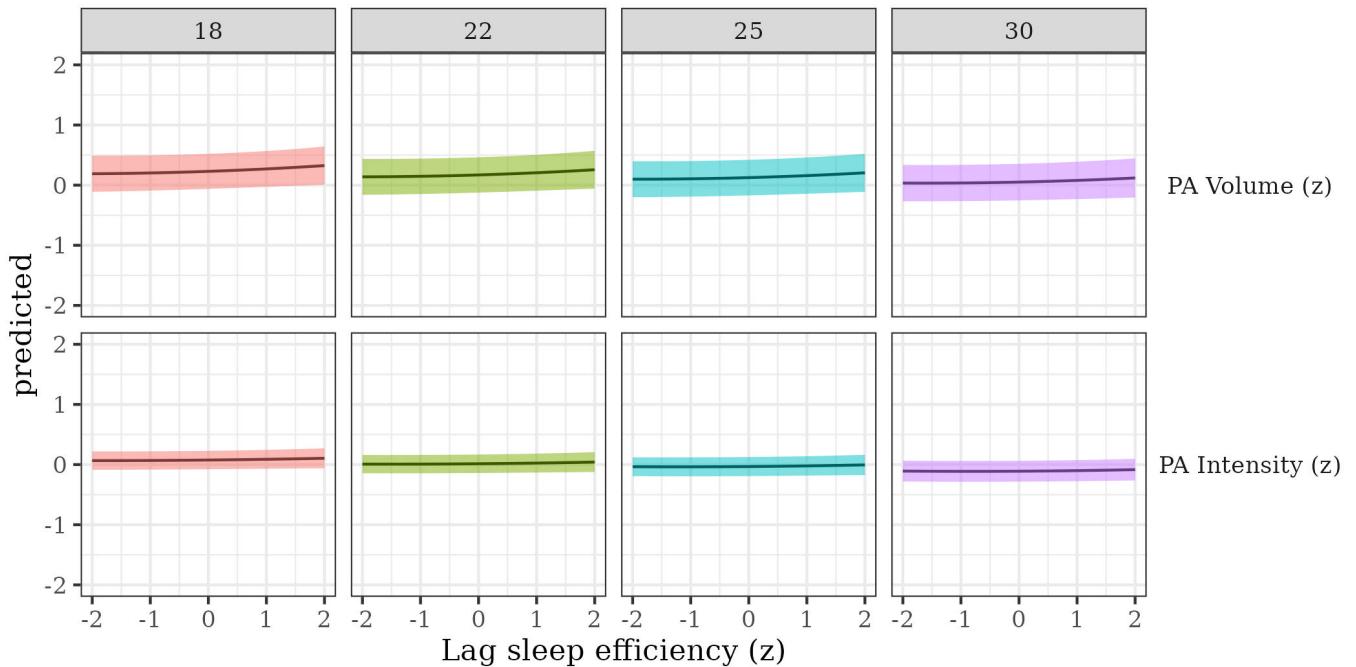


Figure 15. Physical activity by sleep efficiency moderated by BMI

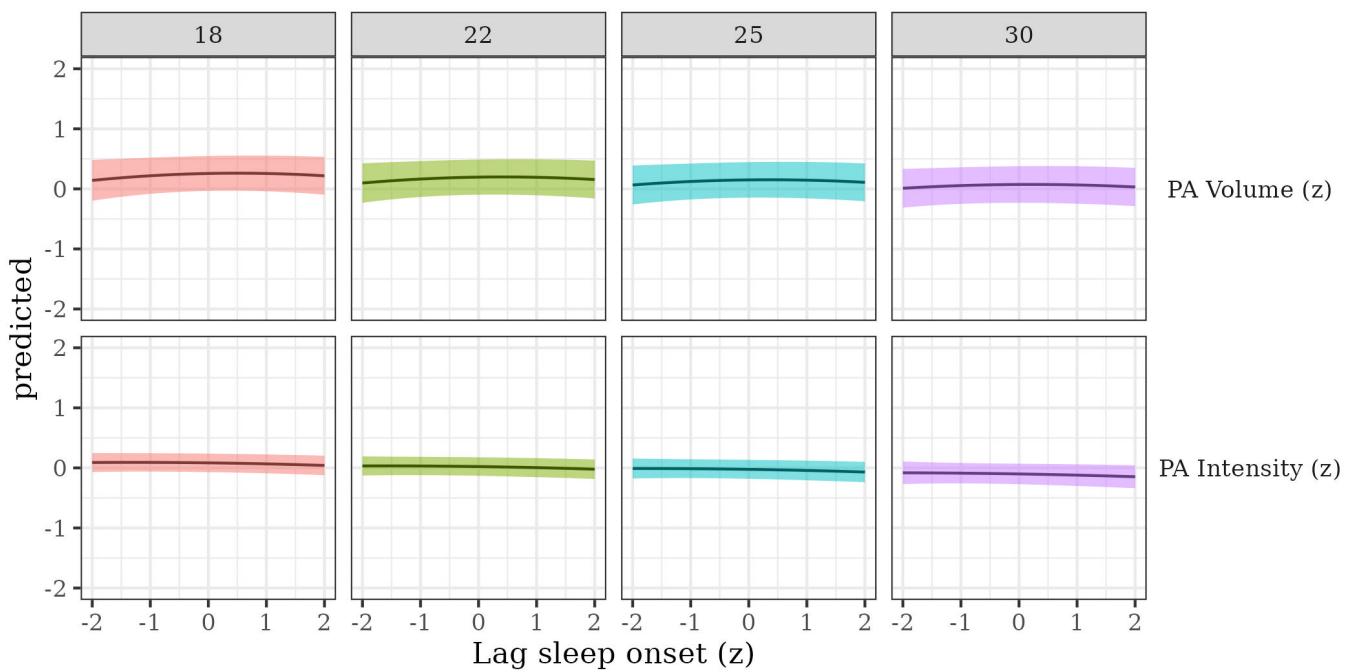


Figure 16. Physical activity by sleep onset moderated by BMI

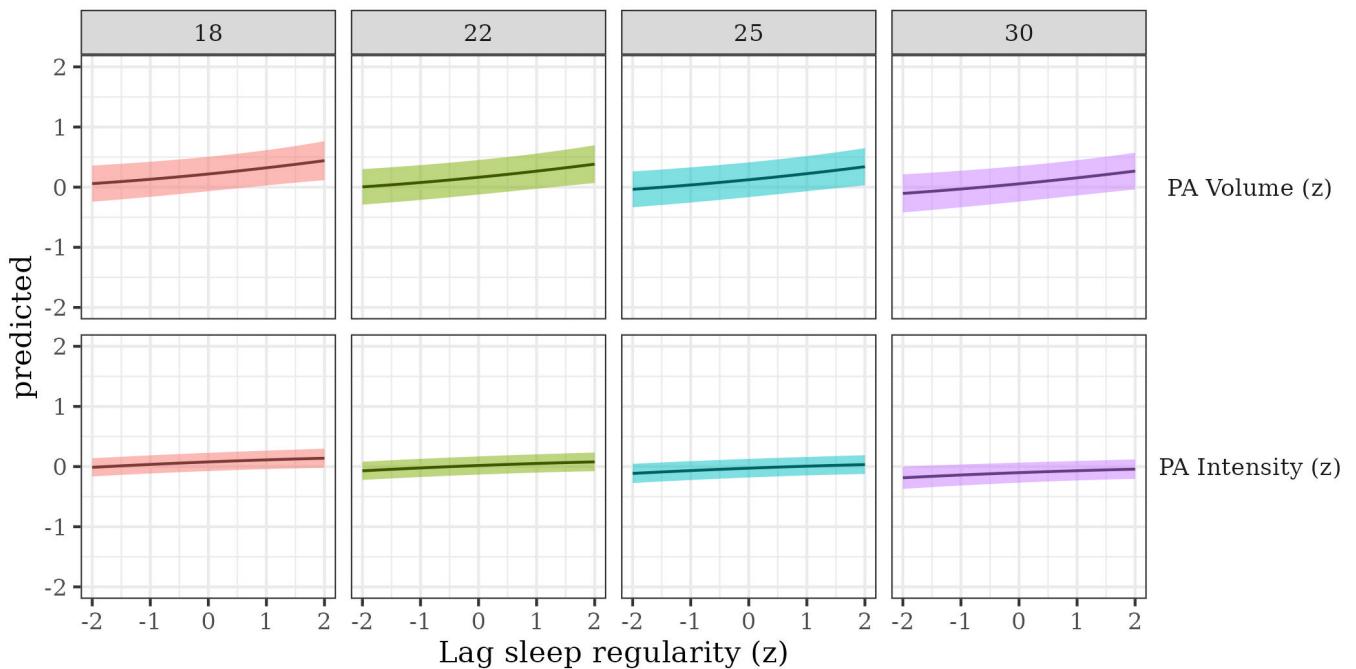


Figure 17. Physical activity by sleep regularity moderated by BMI

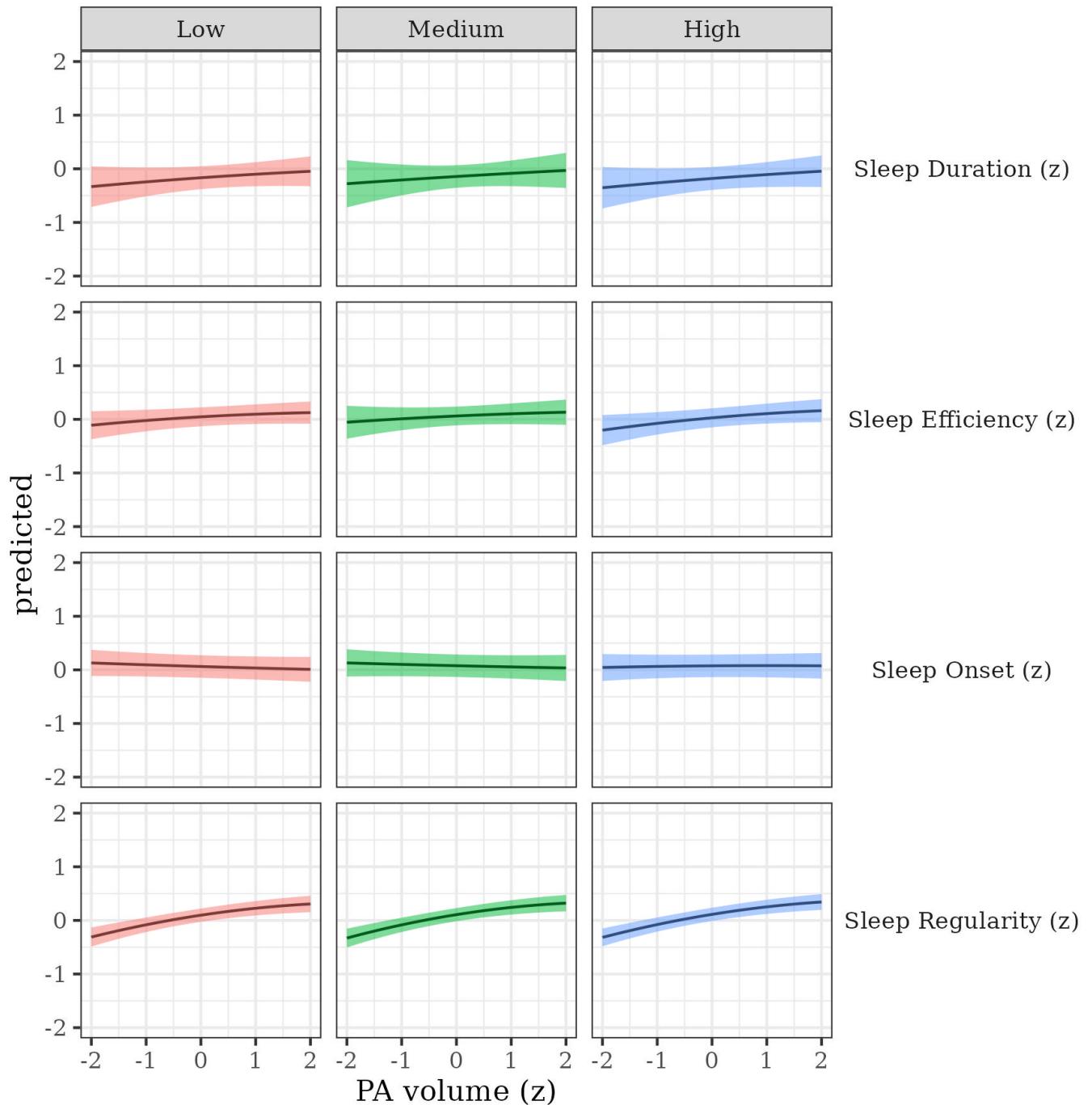


Figure 18. Sleep metrics on Physical activity volume by SES

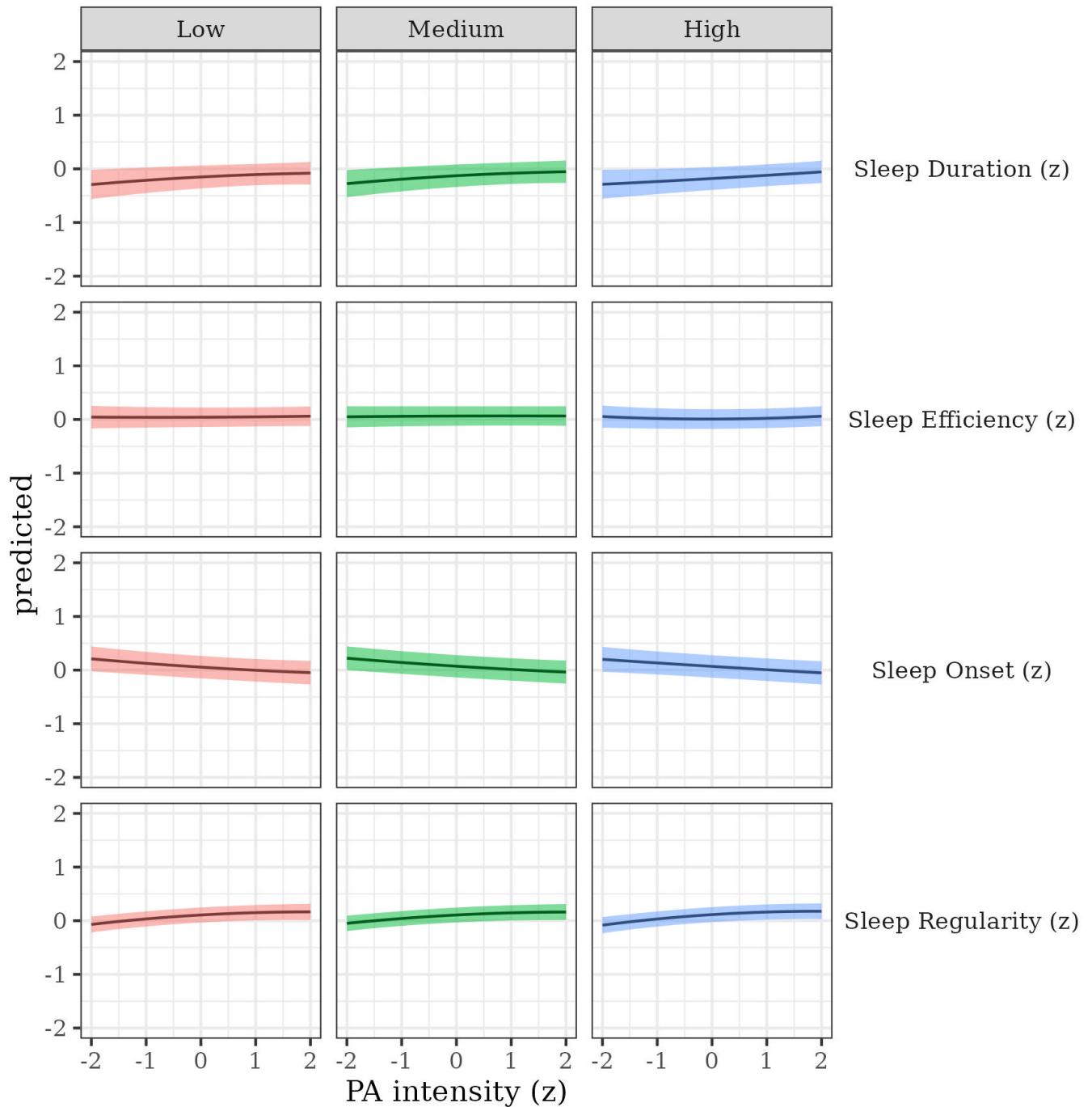


Figure 19. Sleep metrics on Physical activity intensity moderated by SES

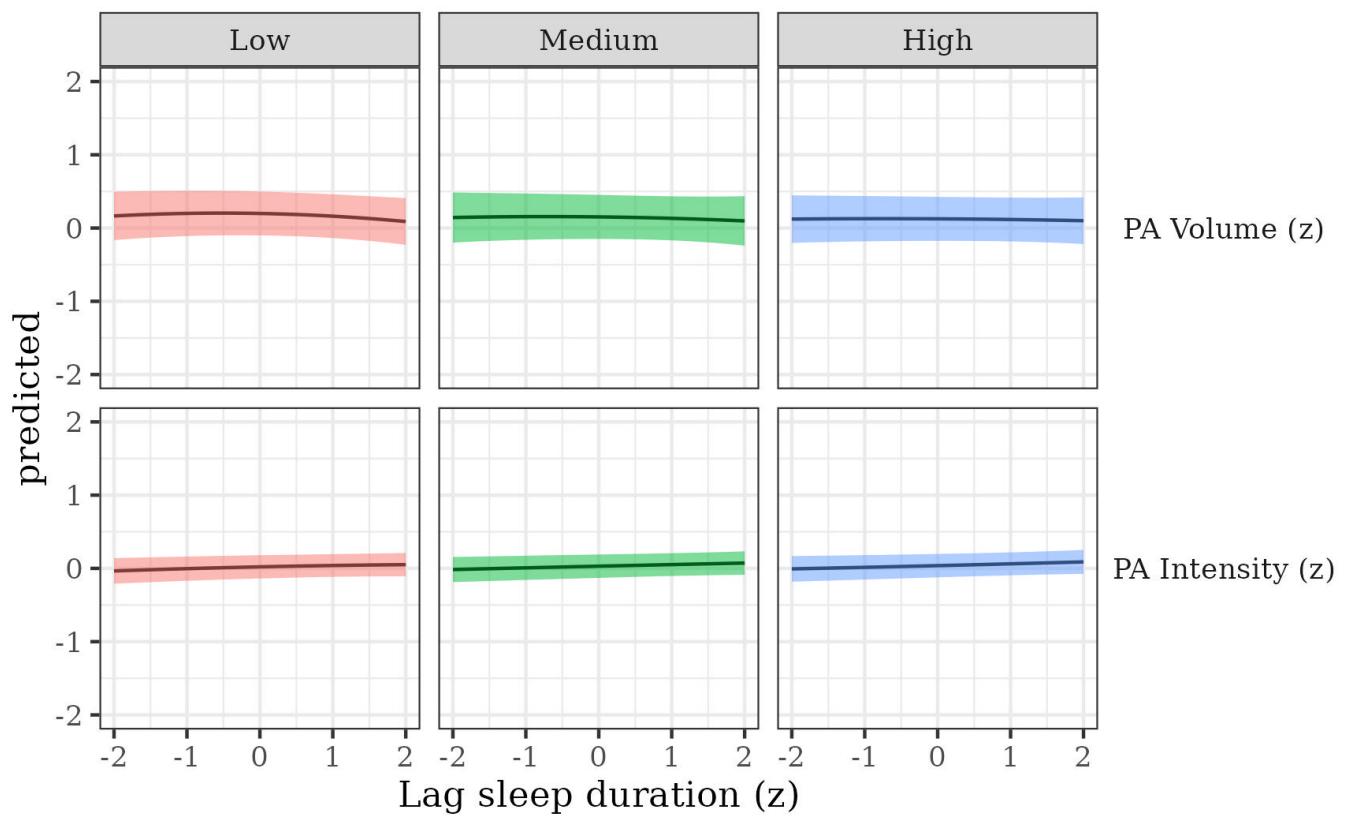


Figure 20. Physical activity by sleep duration moderated by SES

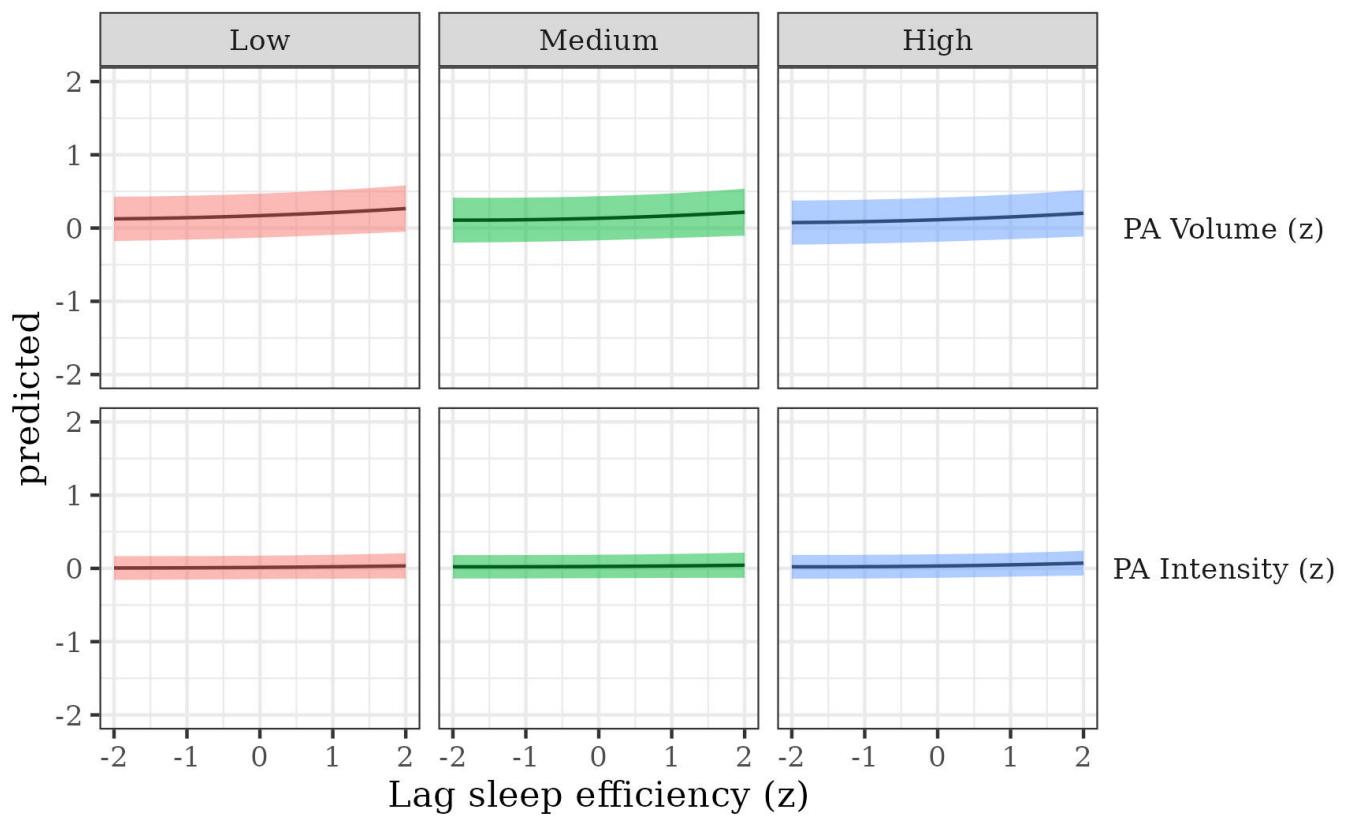


Figure 21. Physical activity by sleep efficiency moderated by SES

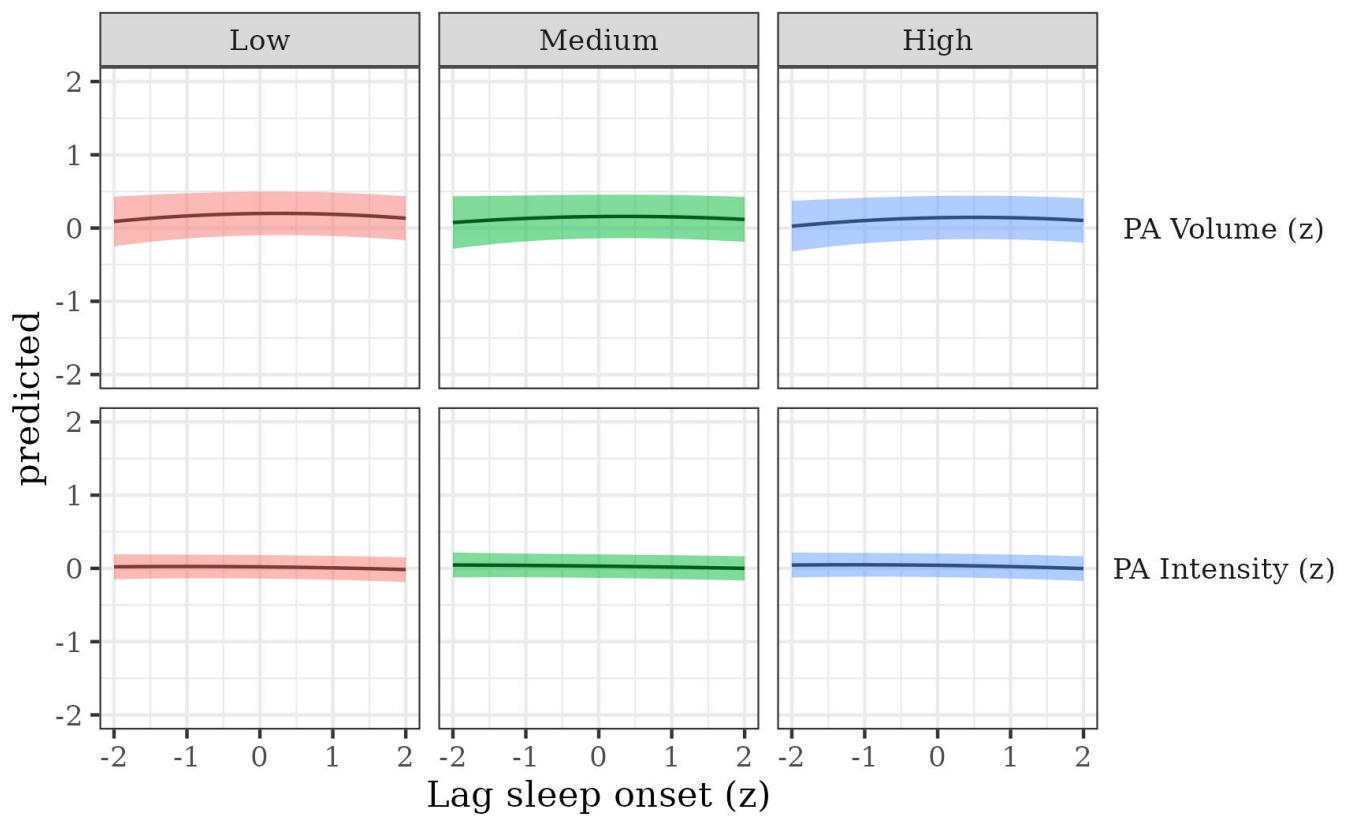


Figure 22. Physical activity by sleep onset moderated by SES

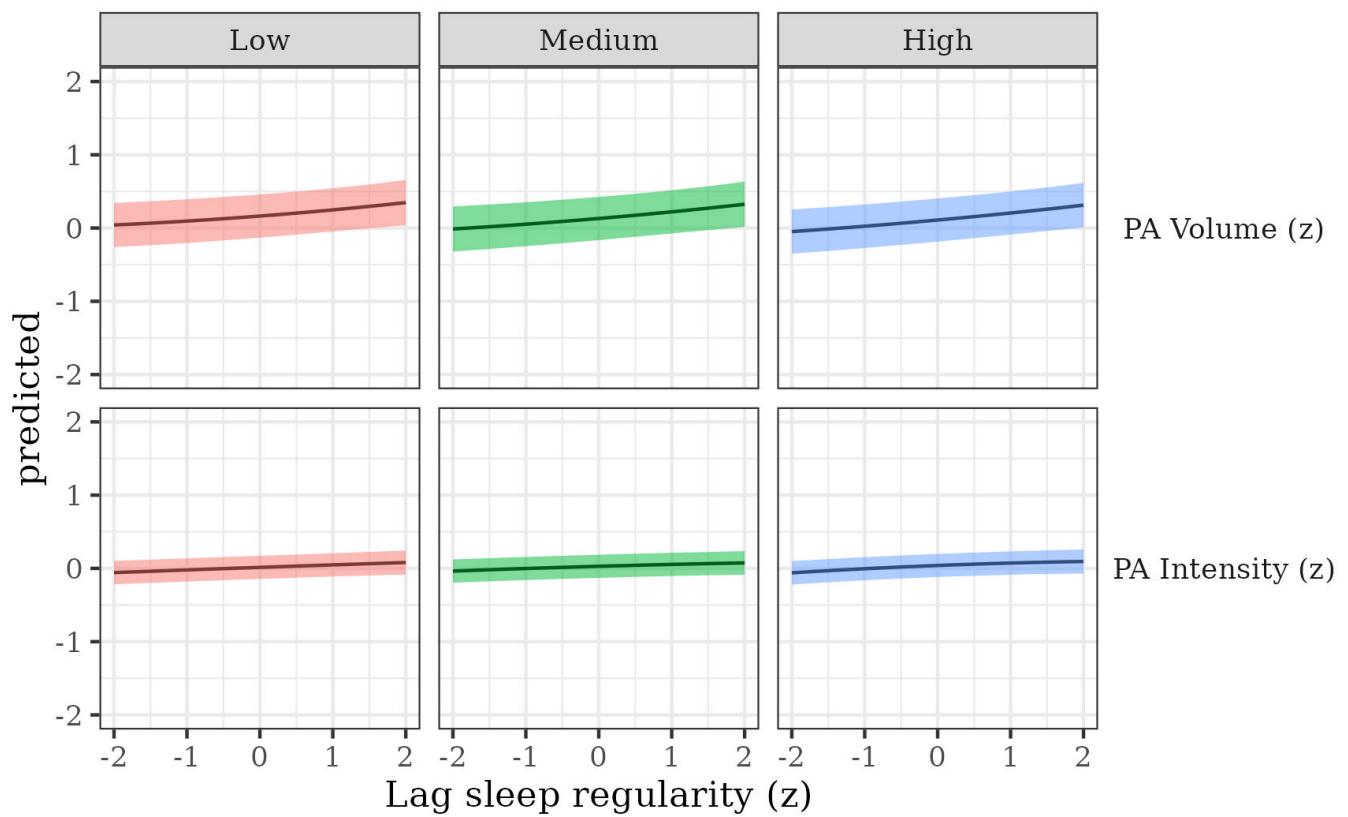


Figure 23. Physical activity by sleep regularity moderated by SES

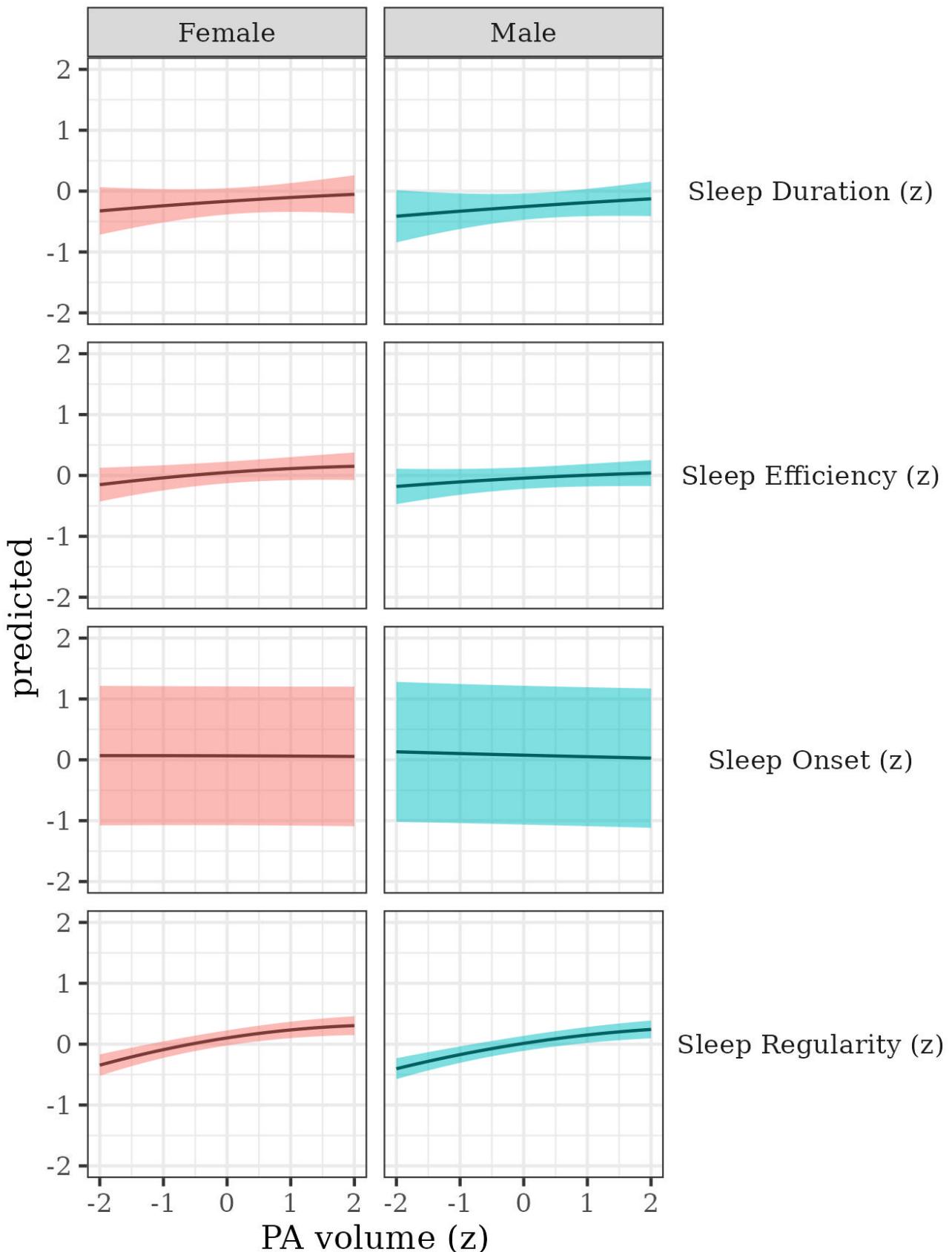


Figure 24. Sleep metrics on Physical activity volume by sex

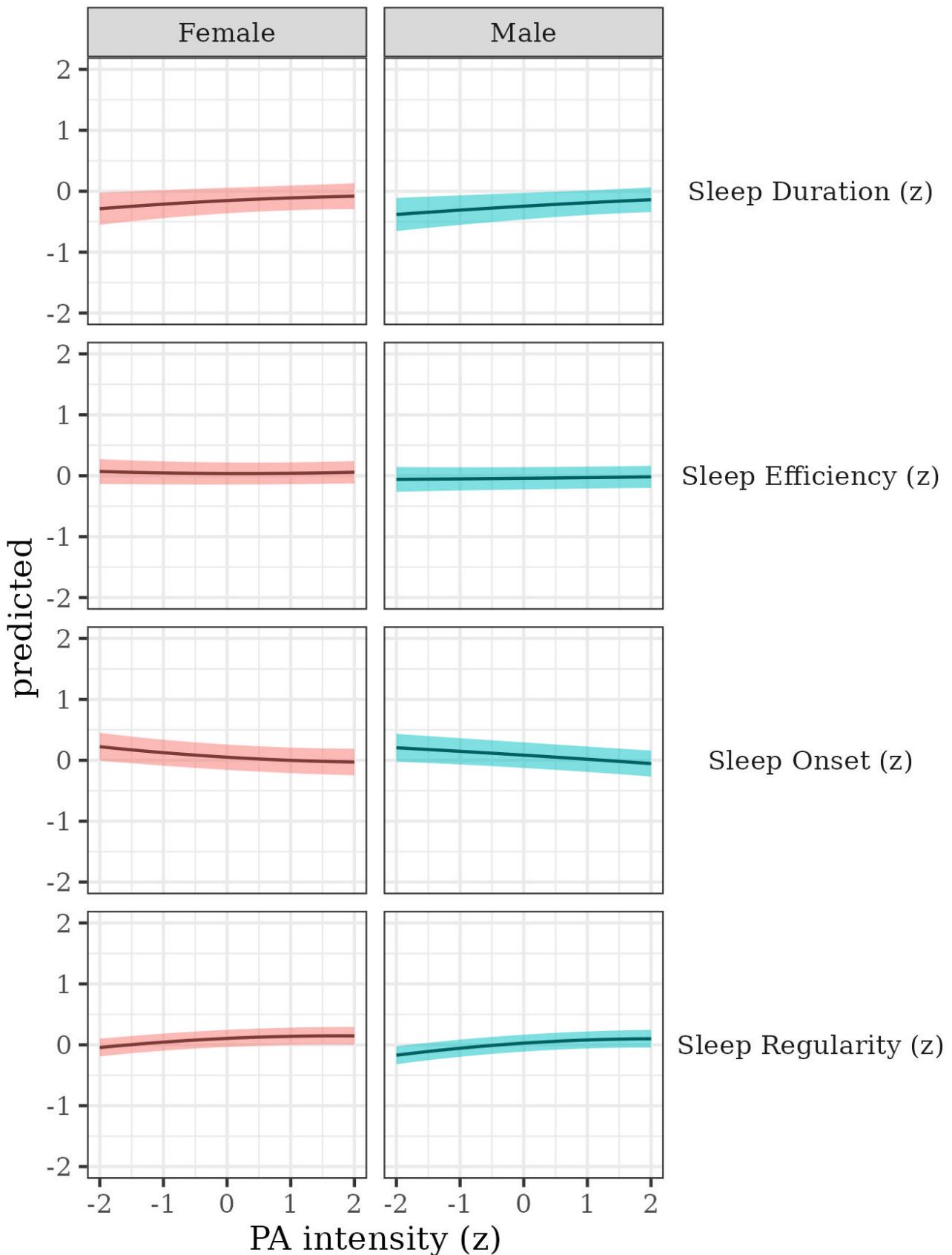


Figure 25. Sleep metrics on Physical activity intensity moderated by sex

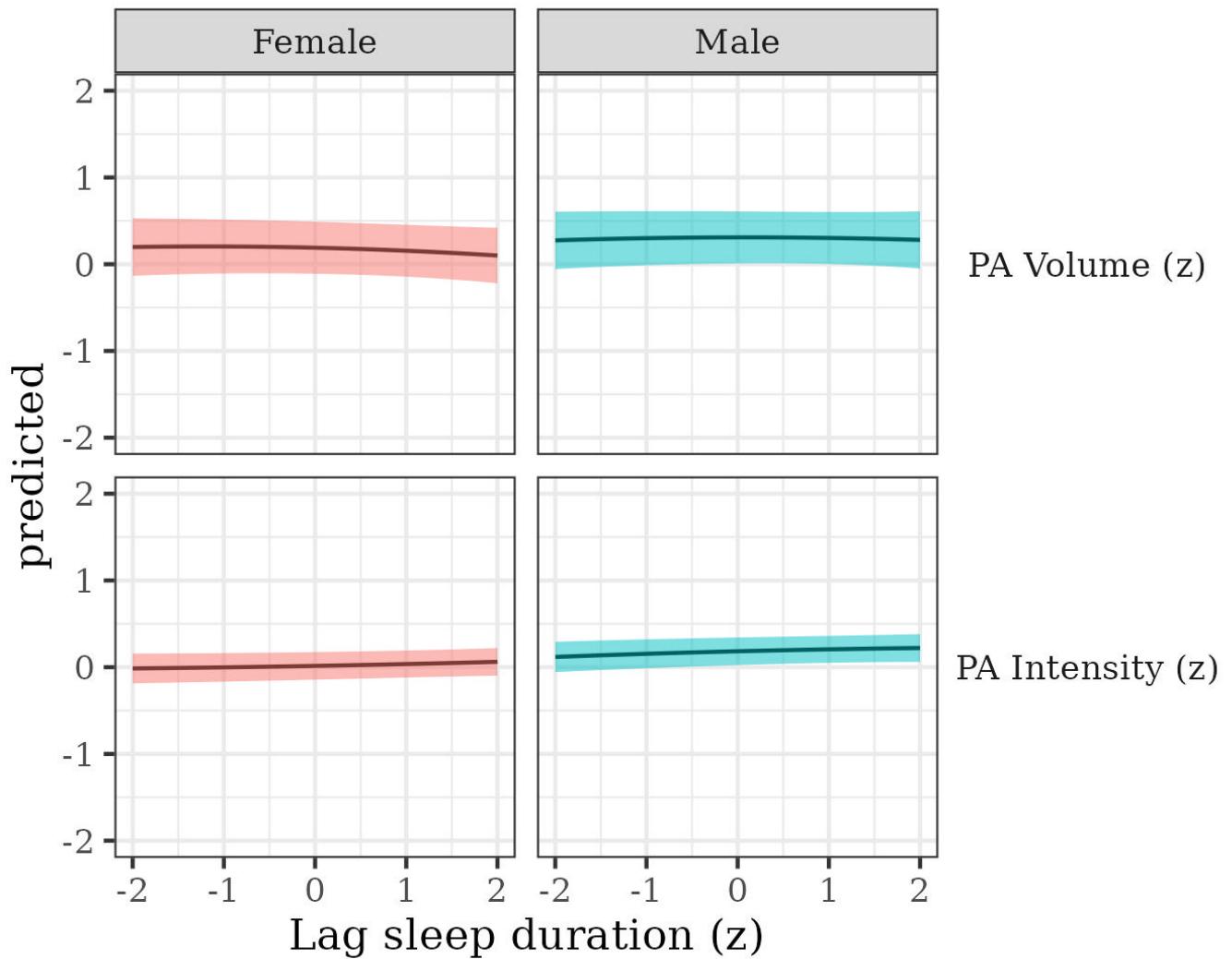


Figure 26. Physical activity by sleep duration moderated by sex

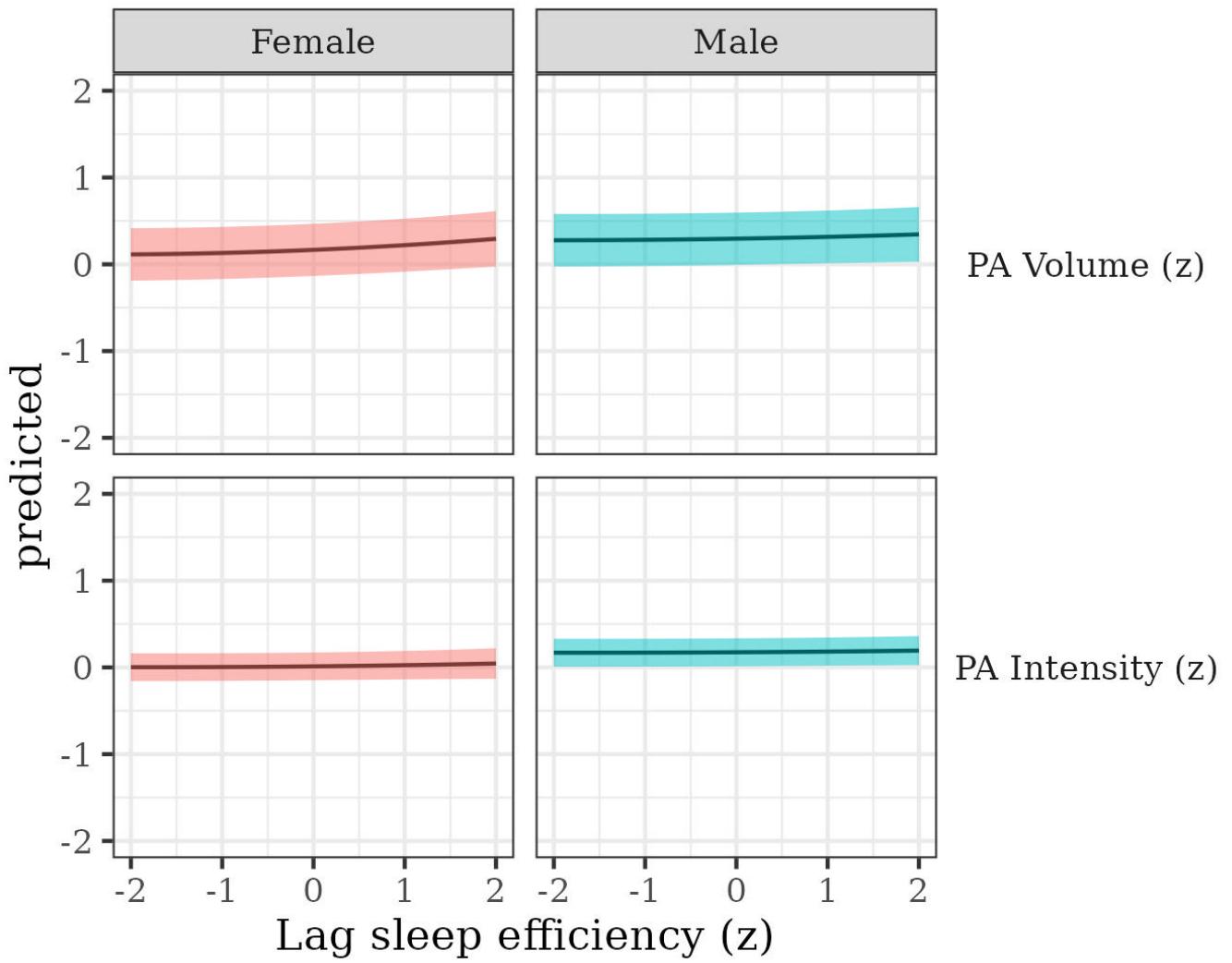


Figure 27. Physical activity by sleep efficiency moderated by sex

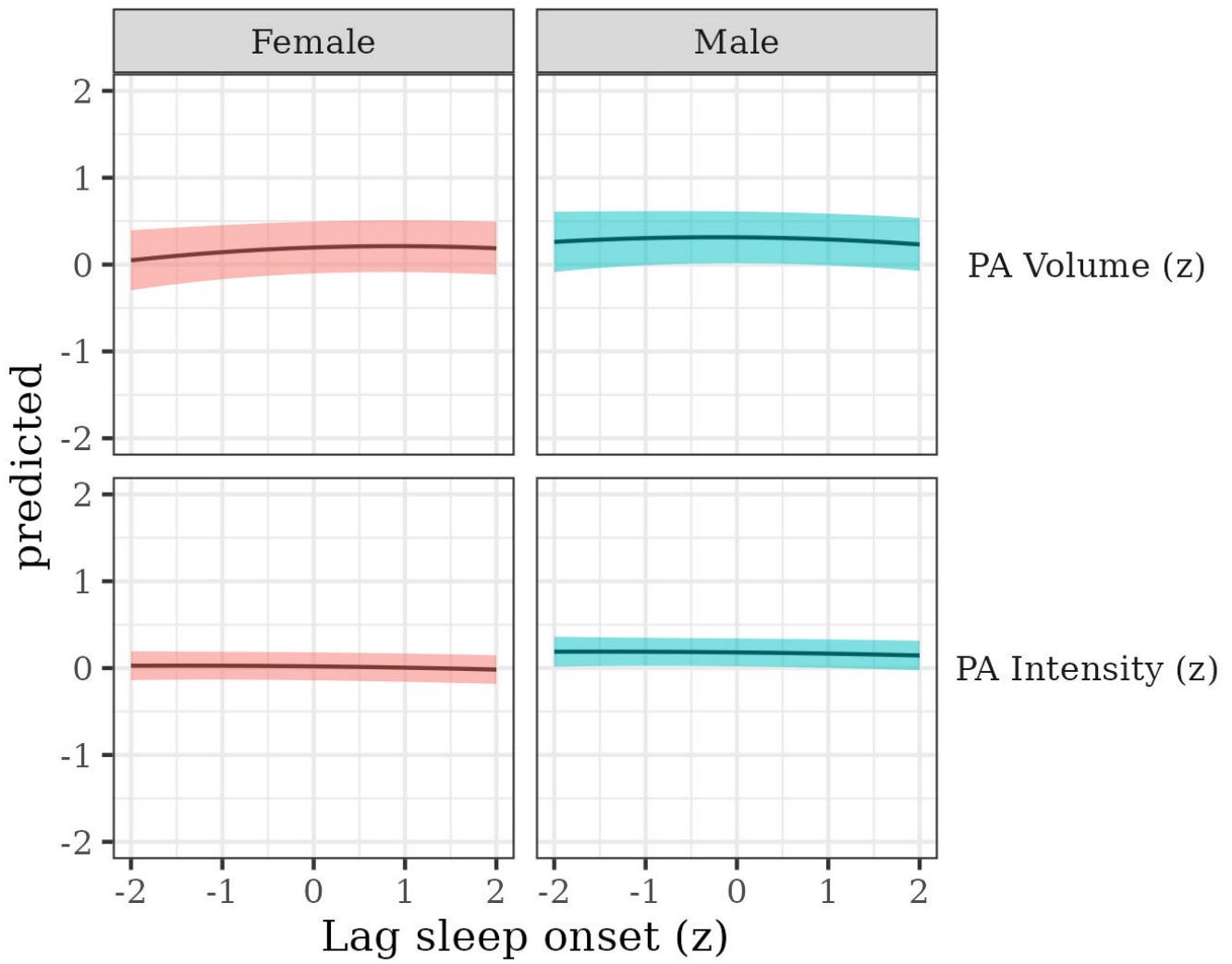


Figure 28. Physical activity by sleep onset moderated by sex

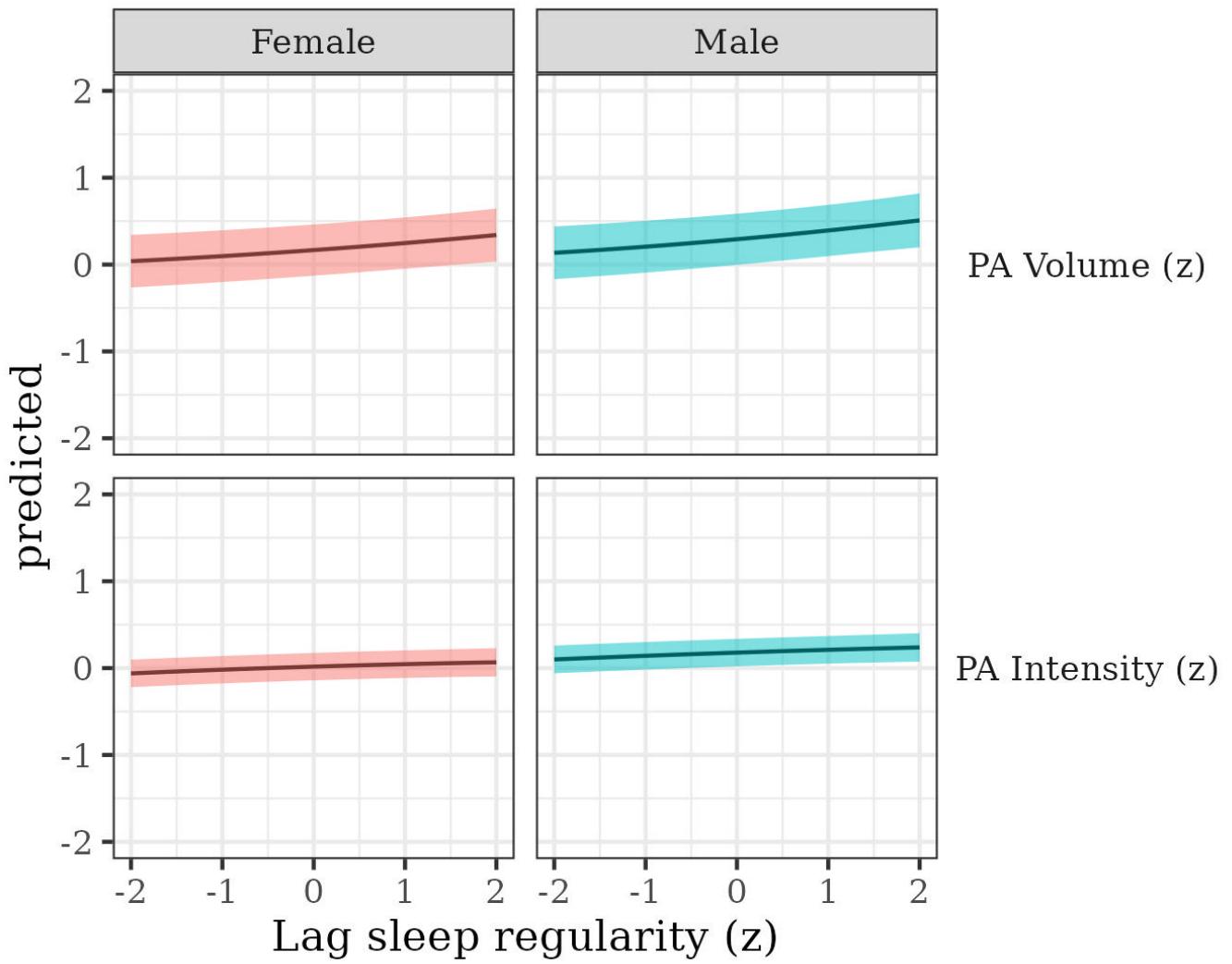


Figure 29. Physical activity by sleep regularity moderated by sex

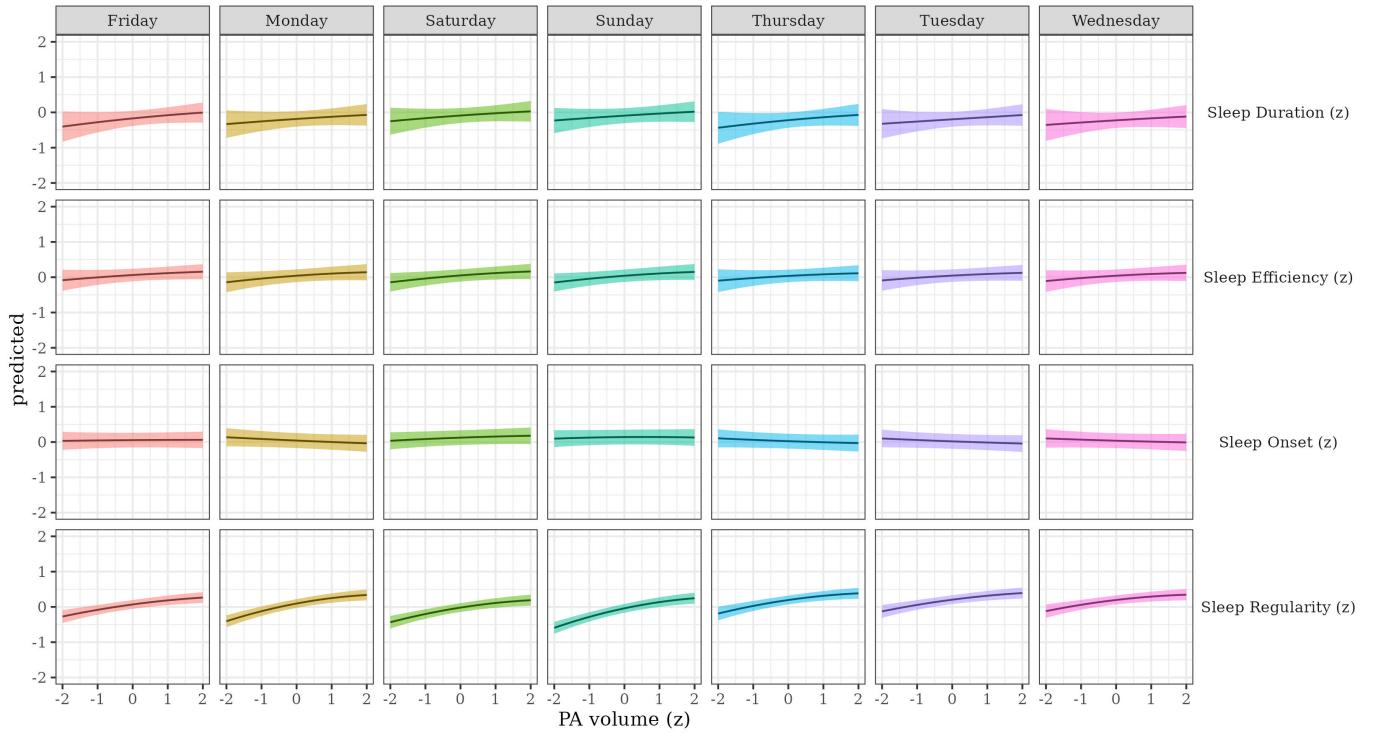


Figure 30. Sleep metrics on Physical activity volume by weekday

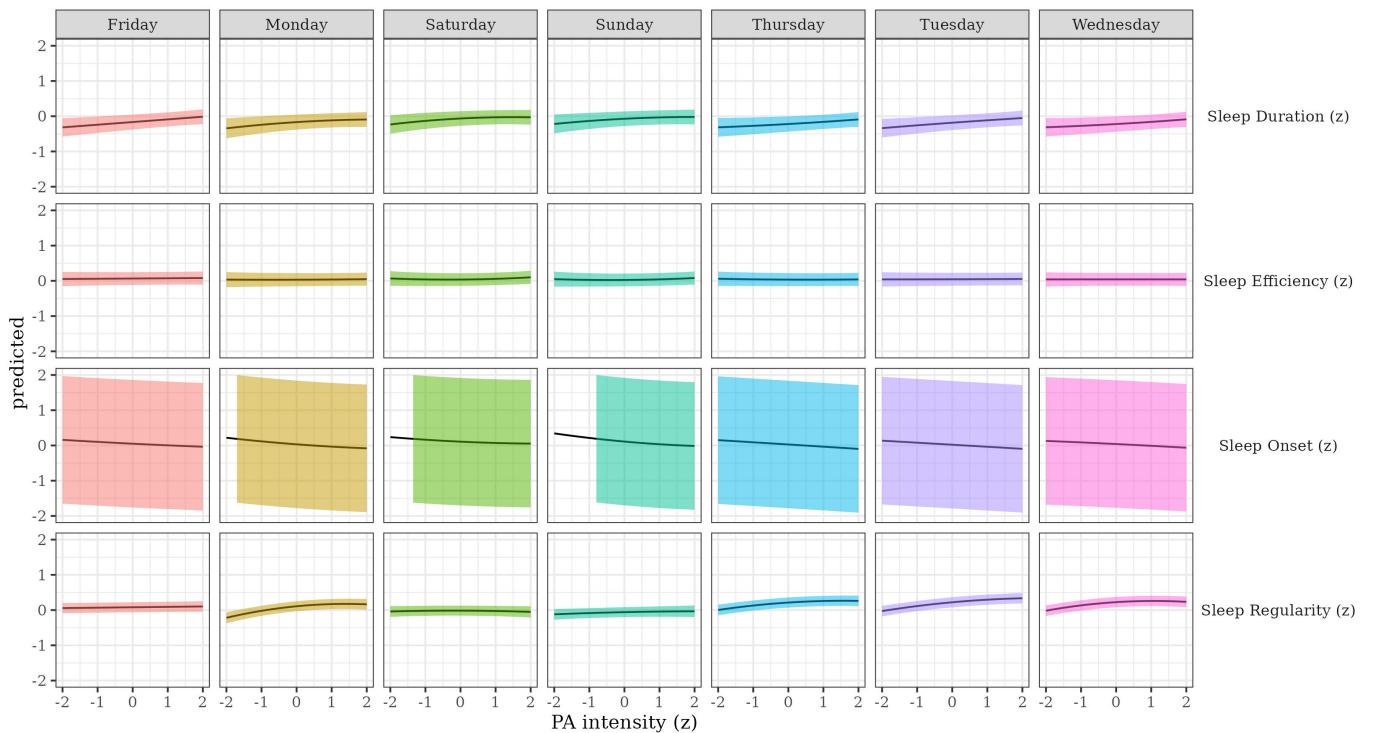


Figure 31. Sleep metrics on Physical activity intensity moderated by weekday

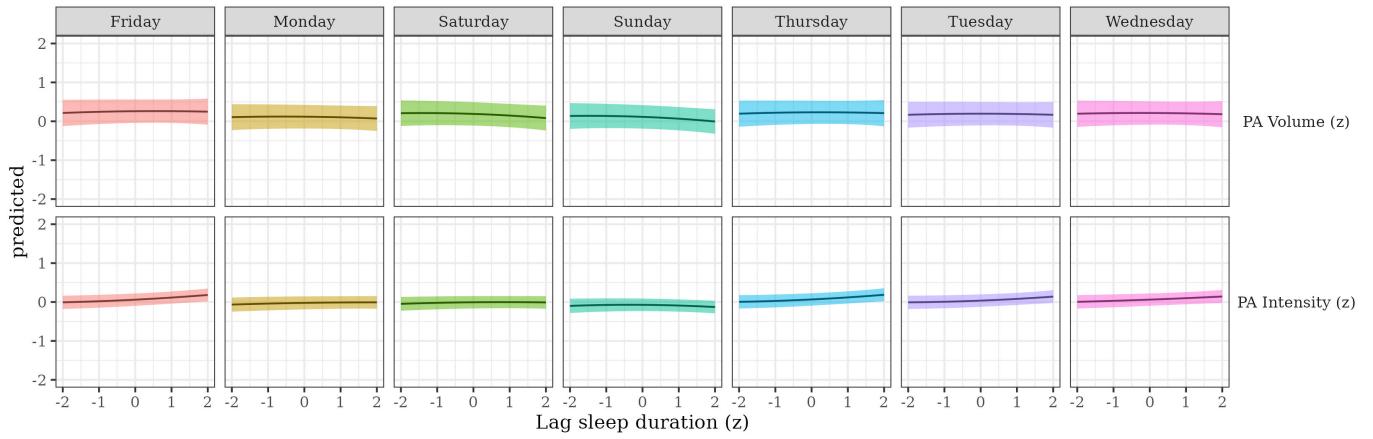


Figure 32. Physical activity by sleep duration moderated by weekday

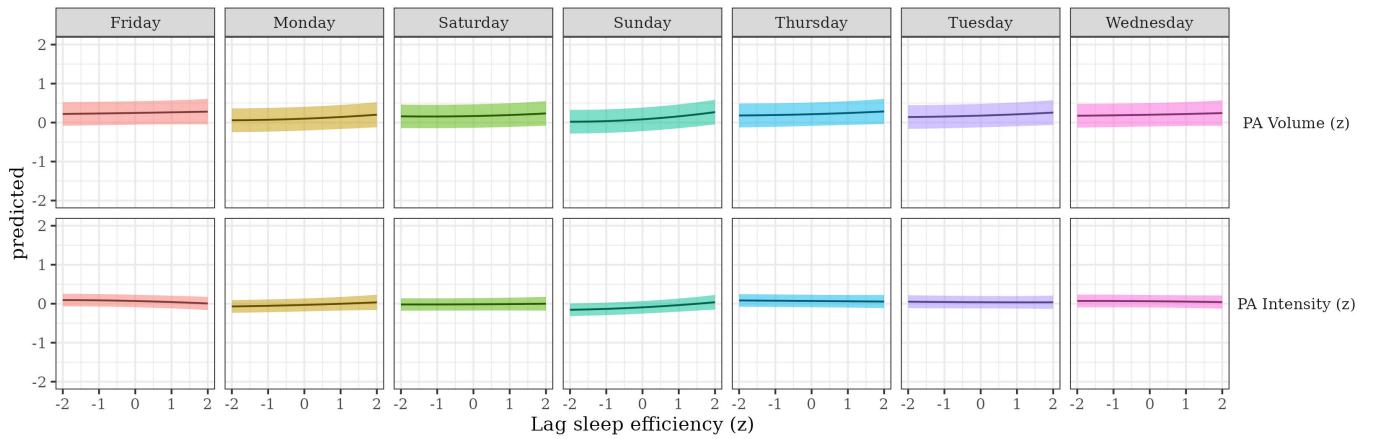


Figure 33. Physical activity by sleep efficiency moderated by weekday

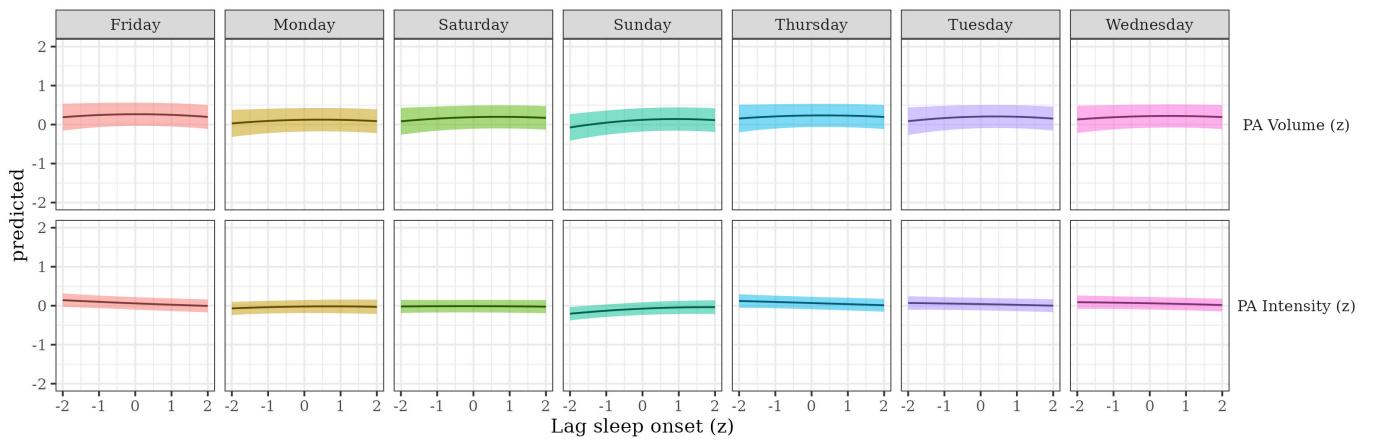


Figure 34. Physical activity by sleep onset moderated by weekday

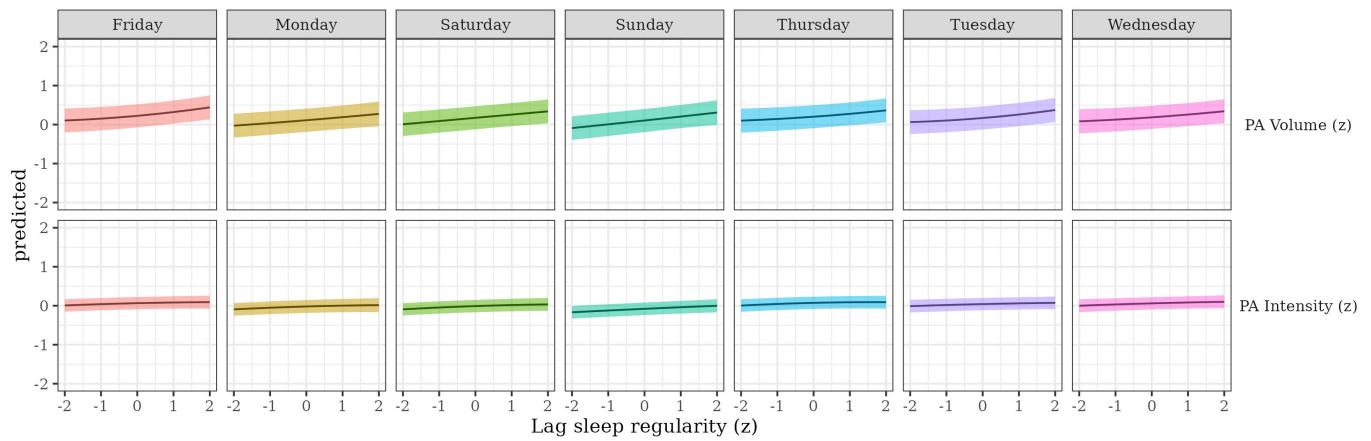


Figure 35. Physical activity by sleep regularity moderated by weekday

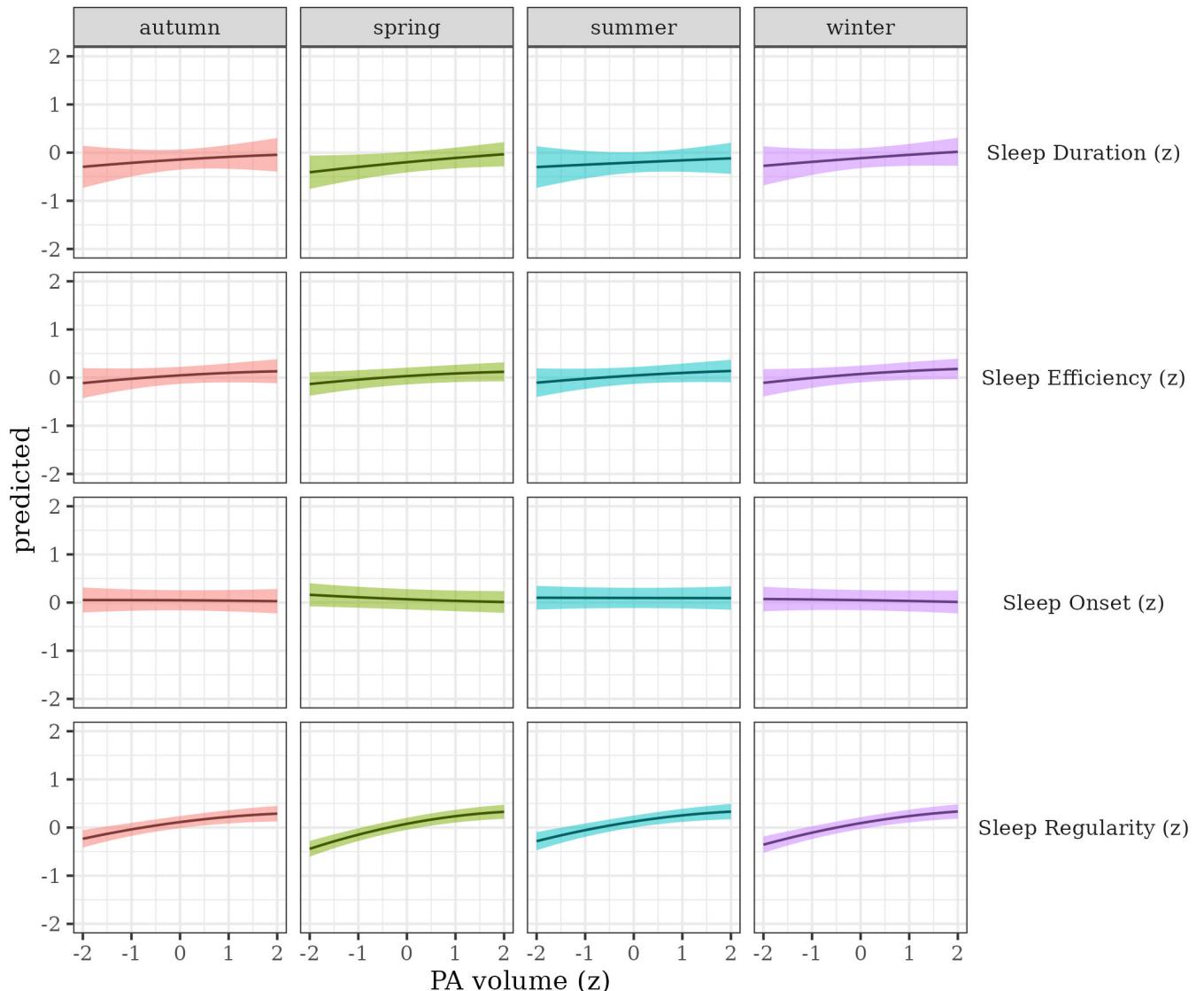


Figure 36. Sleep metrics on Physical activity volume by season

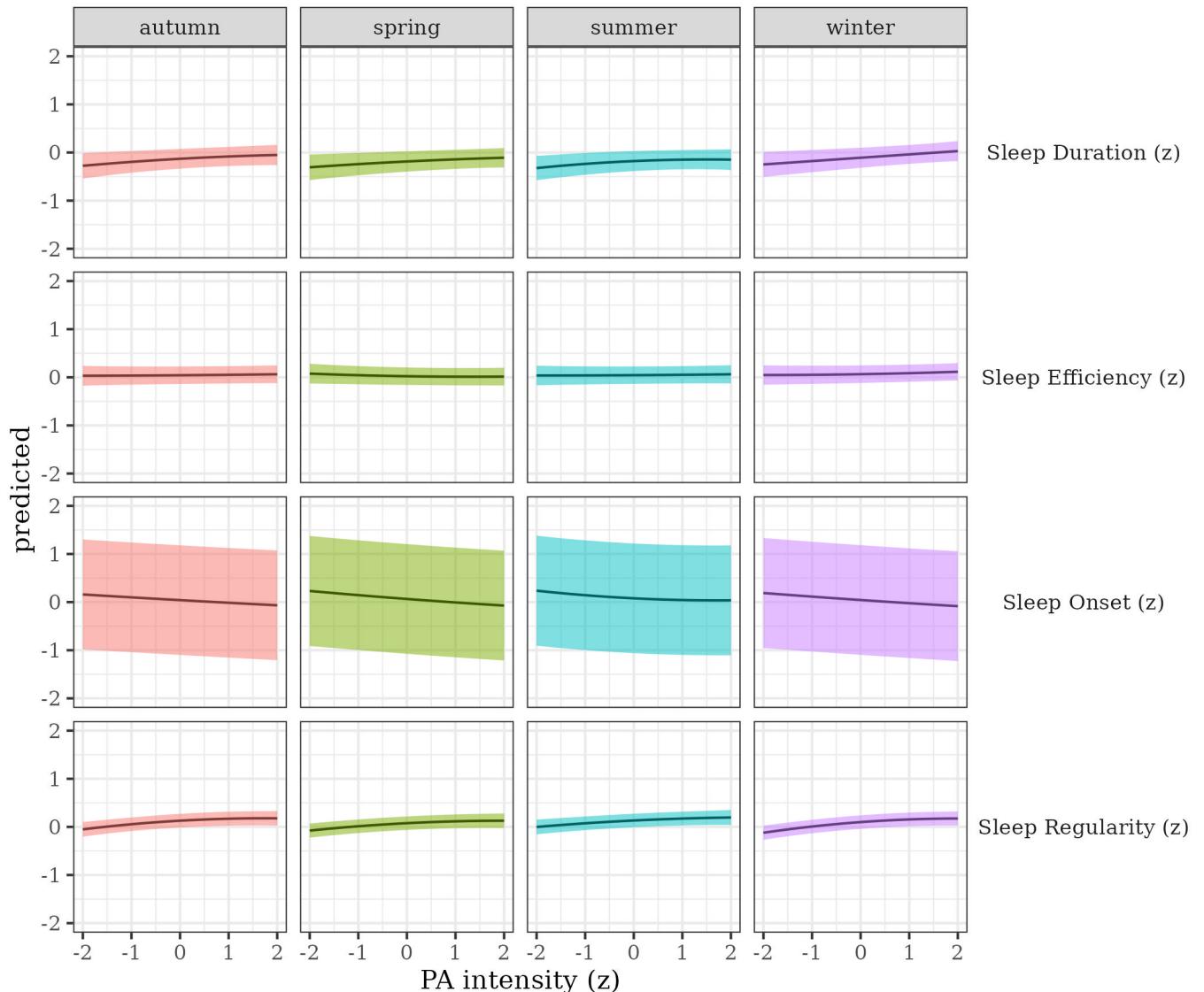


Figure 37. Sleep metrics on Physical activity intensity moderated by season

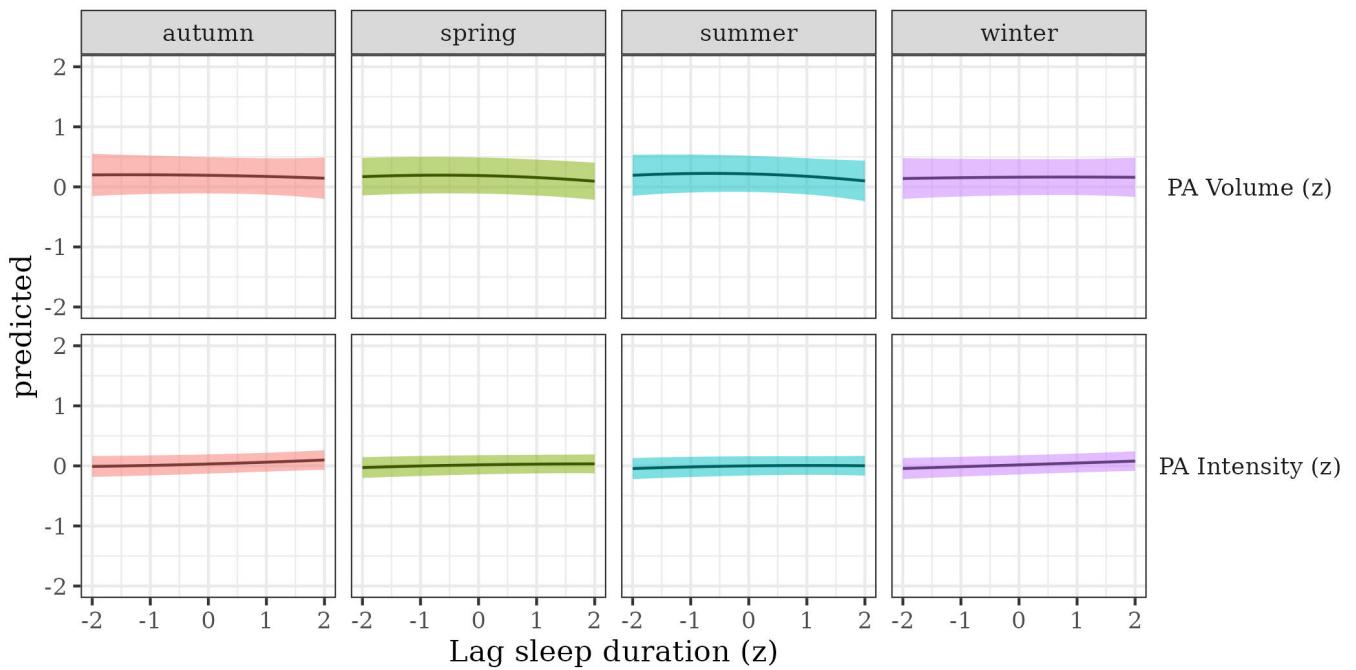


Figure 38. Physical activity by sleep duration moderated by season

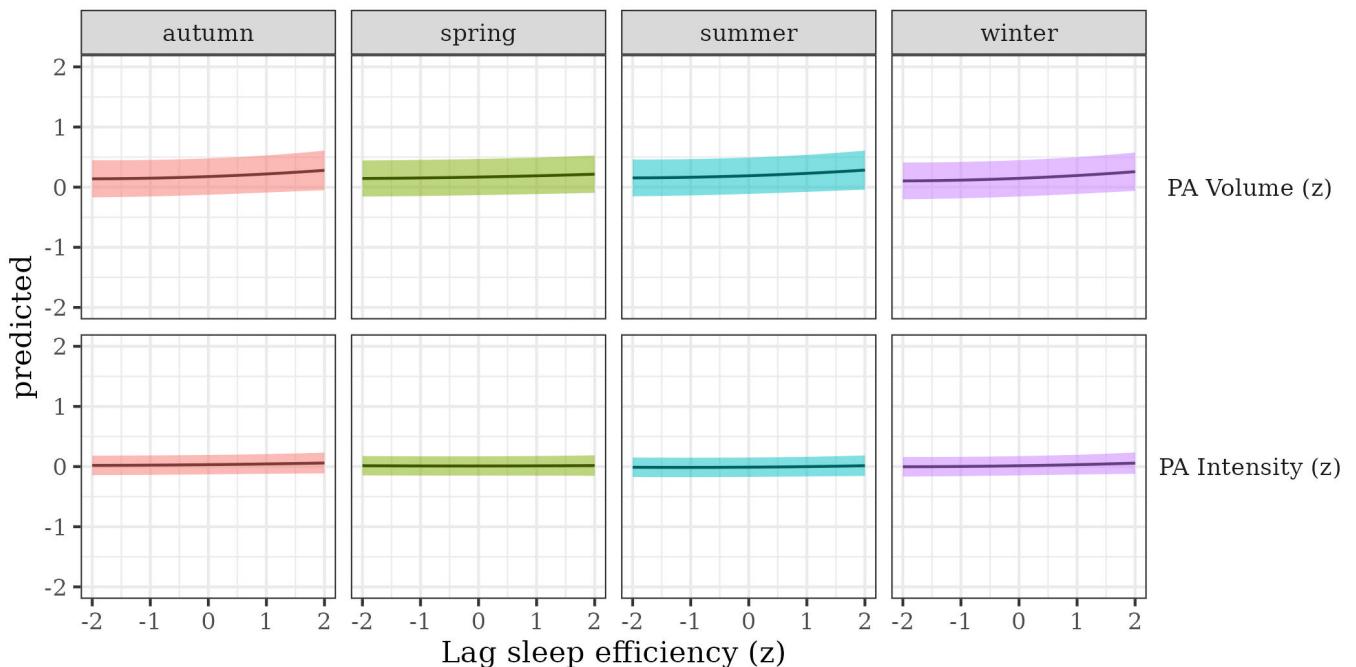


Figure 39. Physical activity by sleep efficiency moderated by season

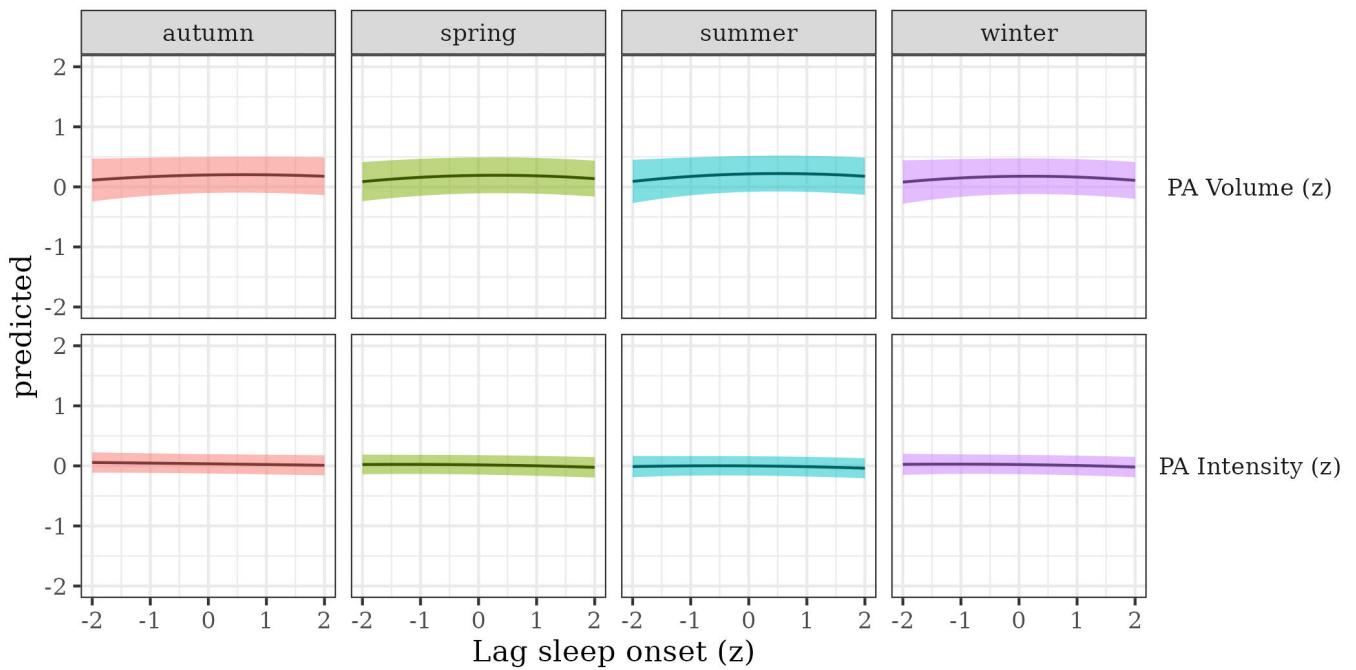


Figure 40. Physical activity by sleep onset moderated by season

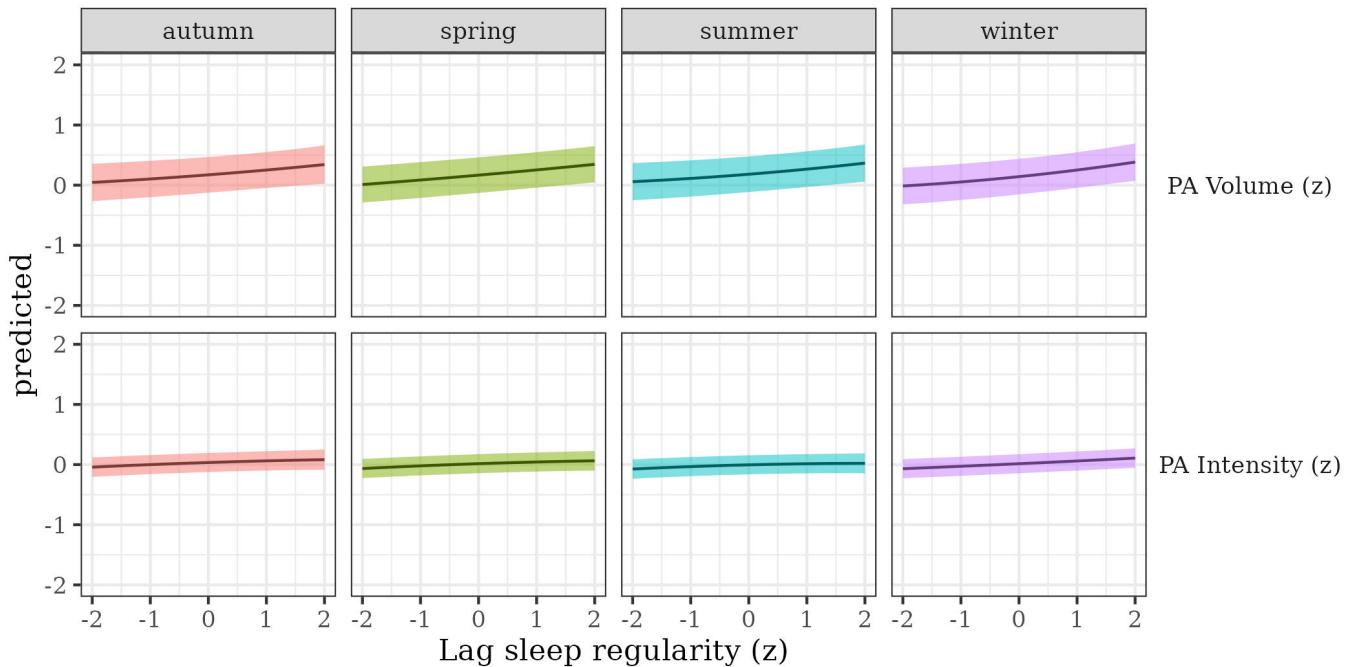


Figure 41. Physical activity by sleep regularity moderated by season

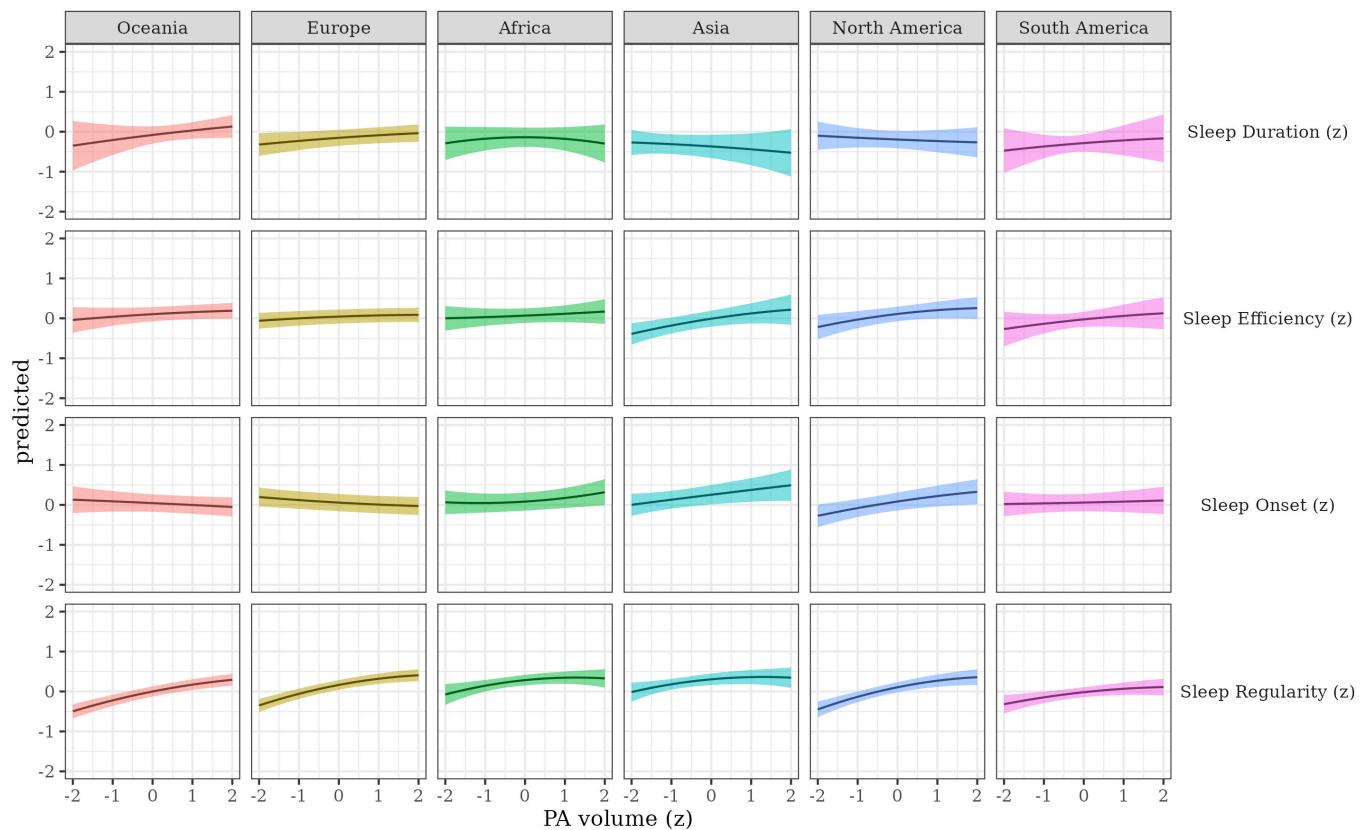


Figure 42. Sleep metrics on Physical activity volume by region

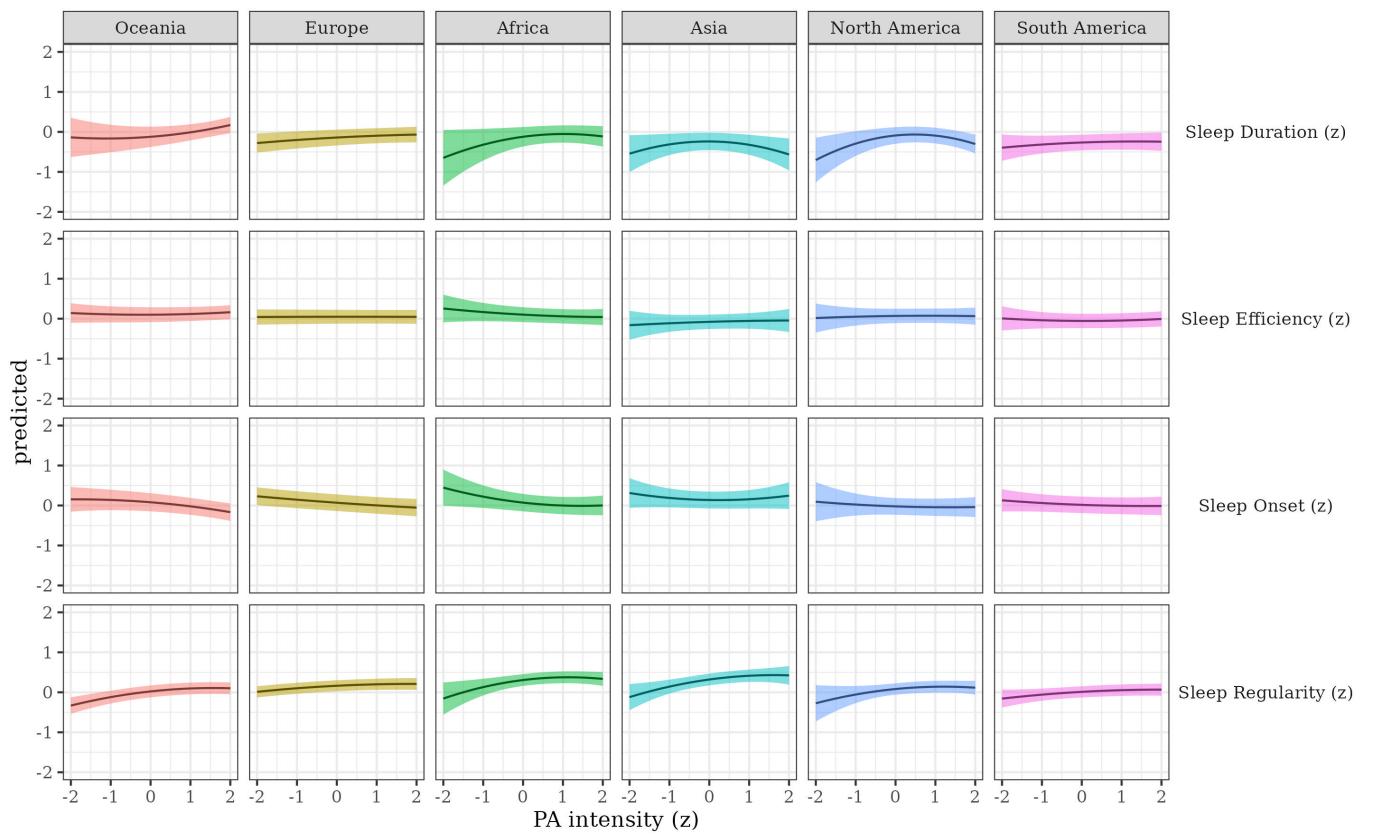


Figure 43. Sleep metrics on Physical activity intensity moderated by region

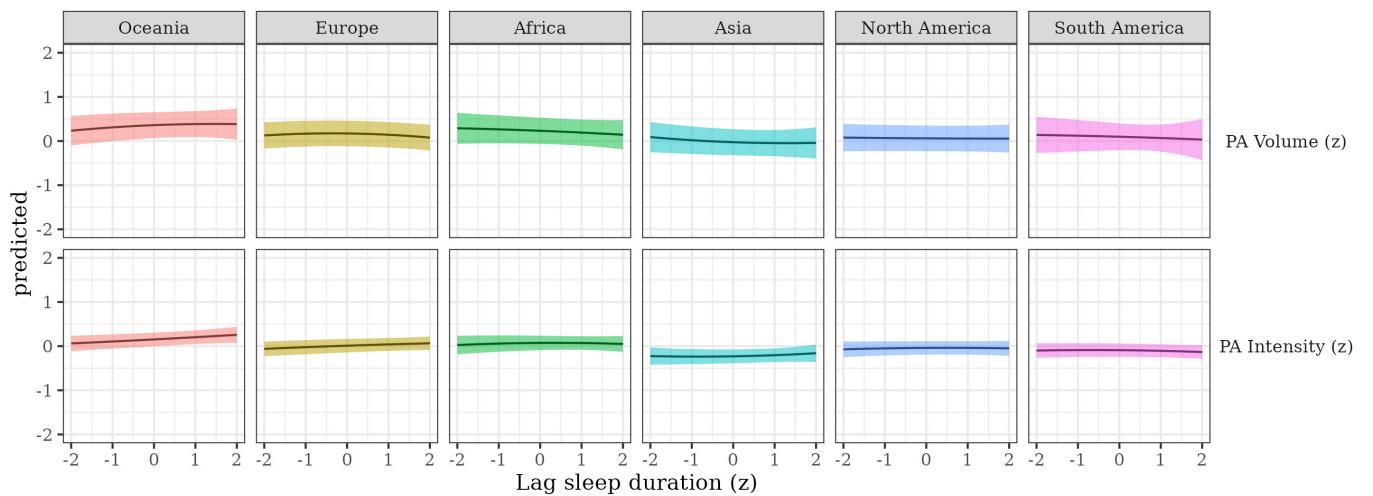


Figure 44. Physical activity by sleep duration moderated by region

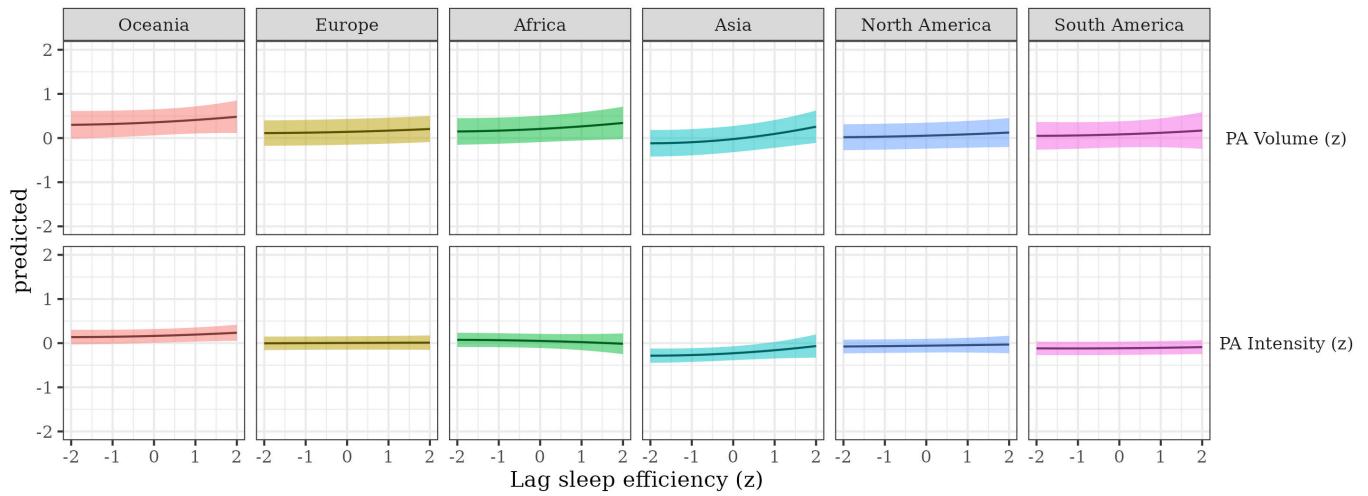


Figure 45. Physical activity by sleep efficiency moderated by region

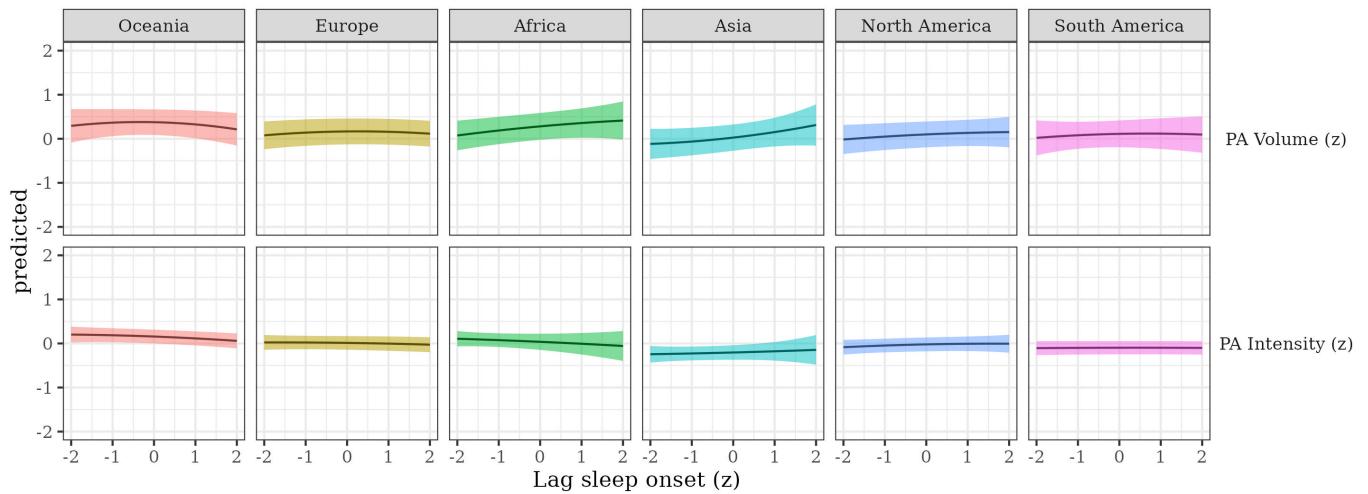


Figure 46. Physical activity by sleep onset moderated by region

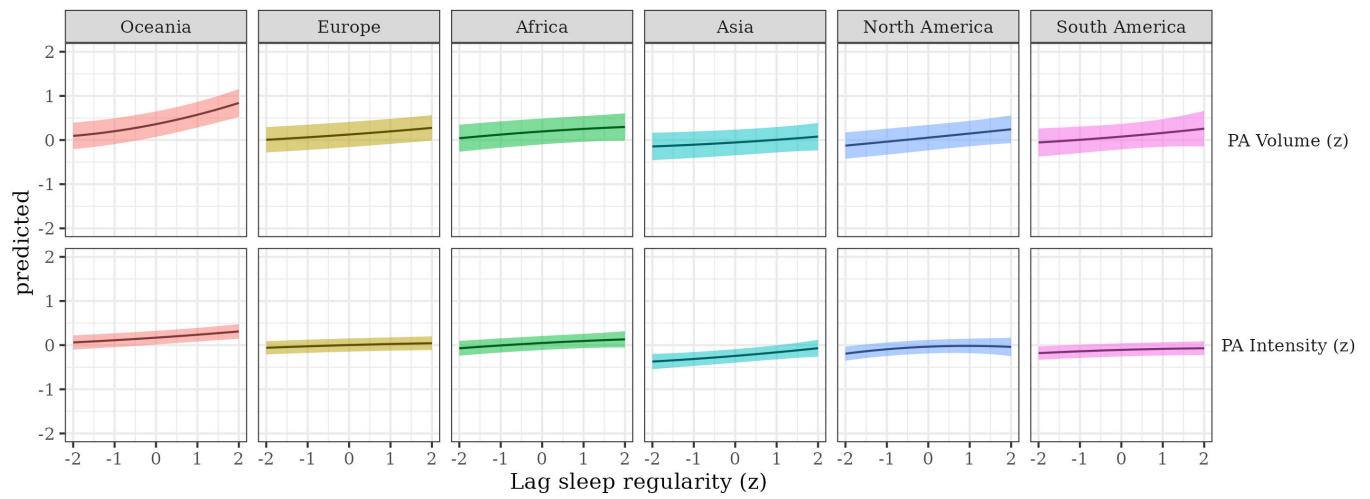


Figure 47. Physical activity by sleep regularity moderated by region

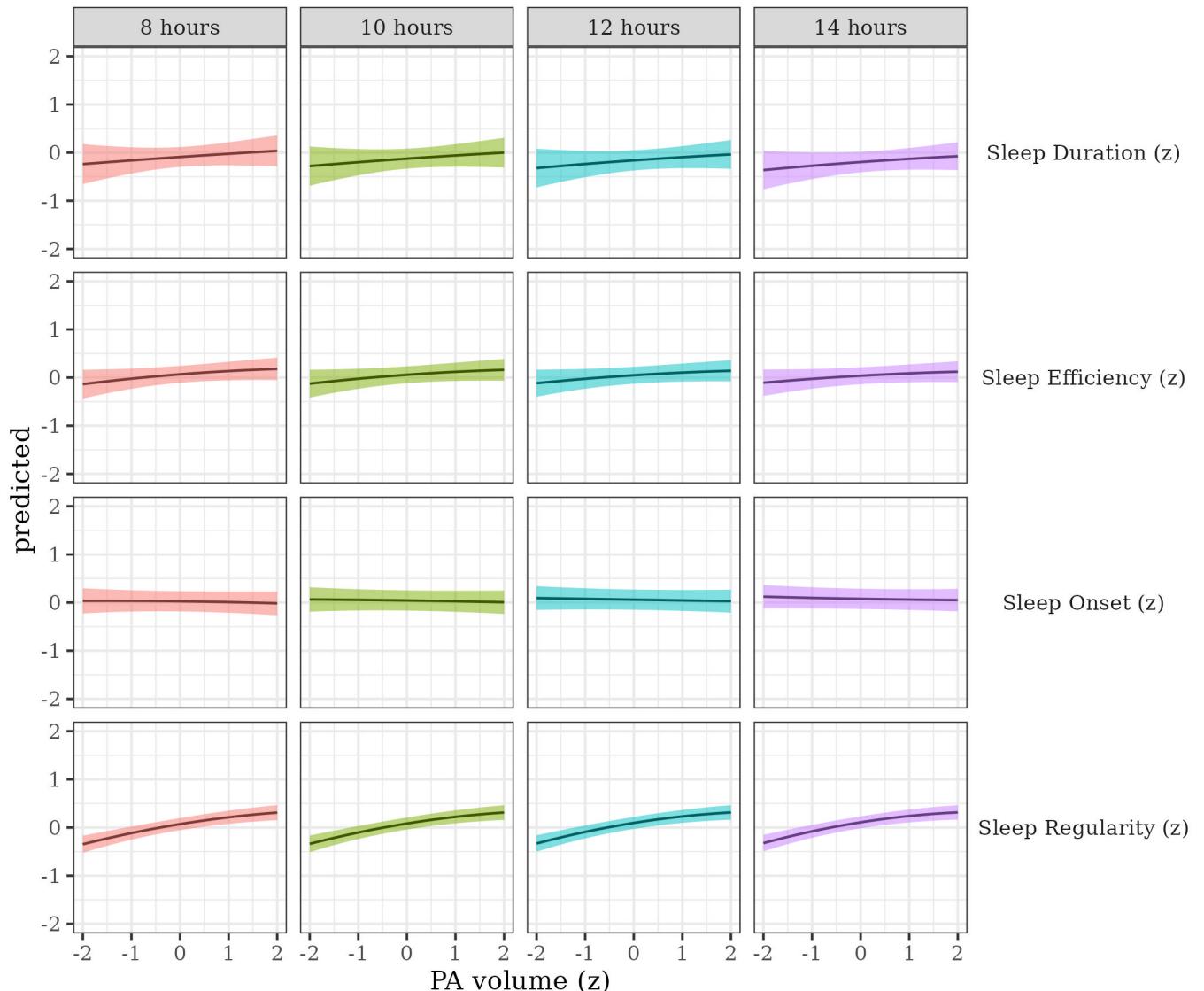


Figure 48. Sleep metrics on Physical activity volume by daylight hours

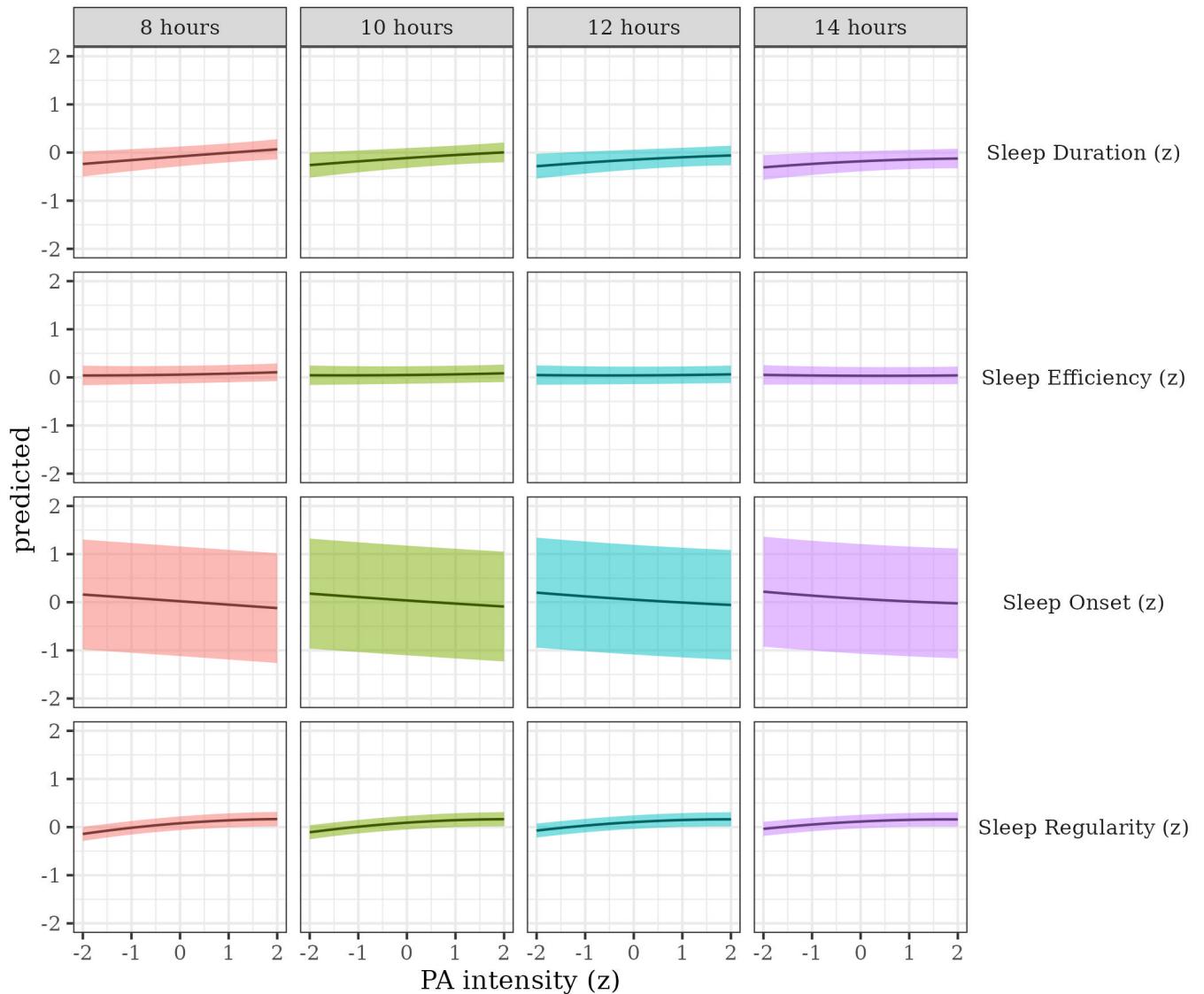


Figure 49. Sleep metrics on Physical activity intensity moderated by daylight hours

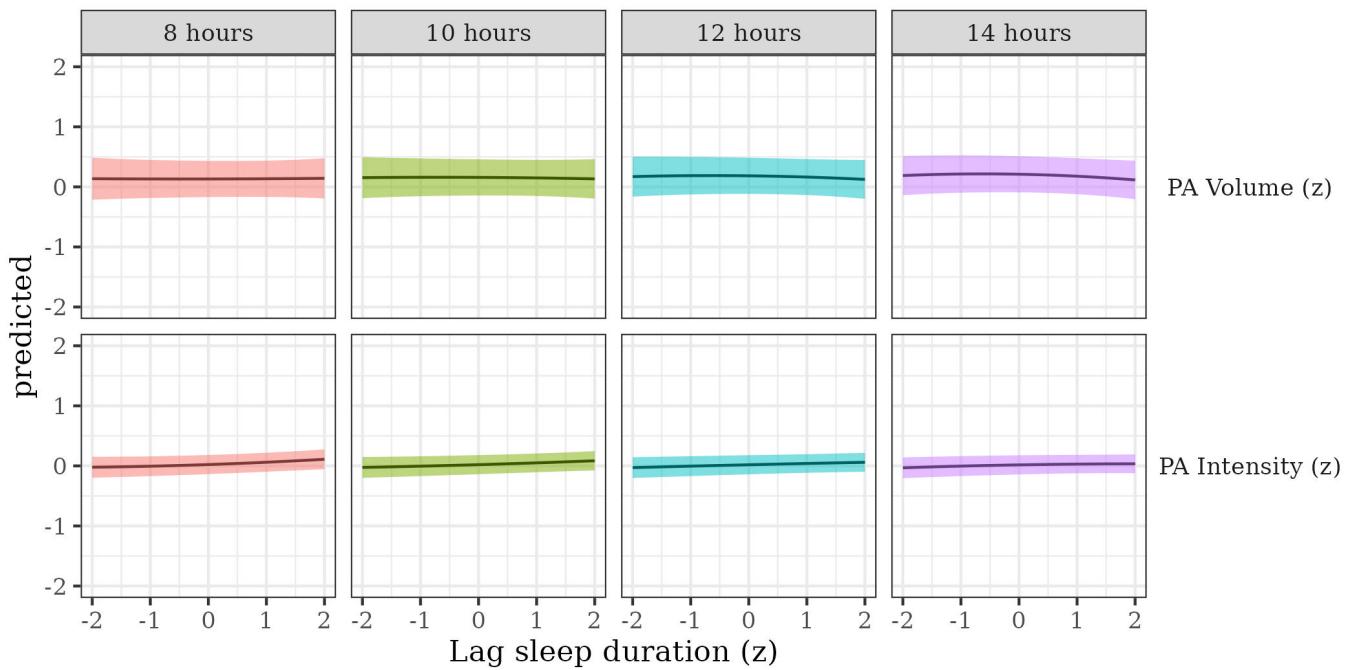


Figure 50. Physical activity by sleep duration moderated by daylight hours

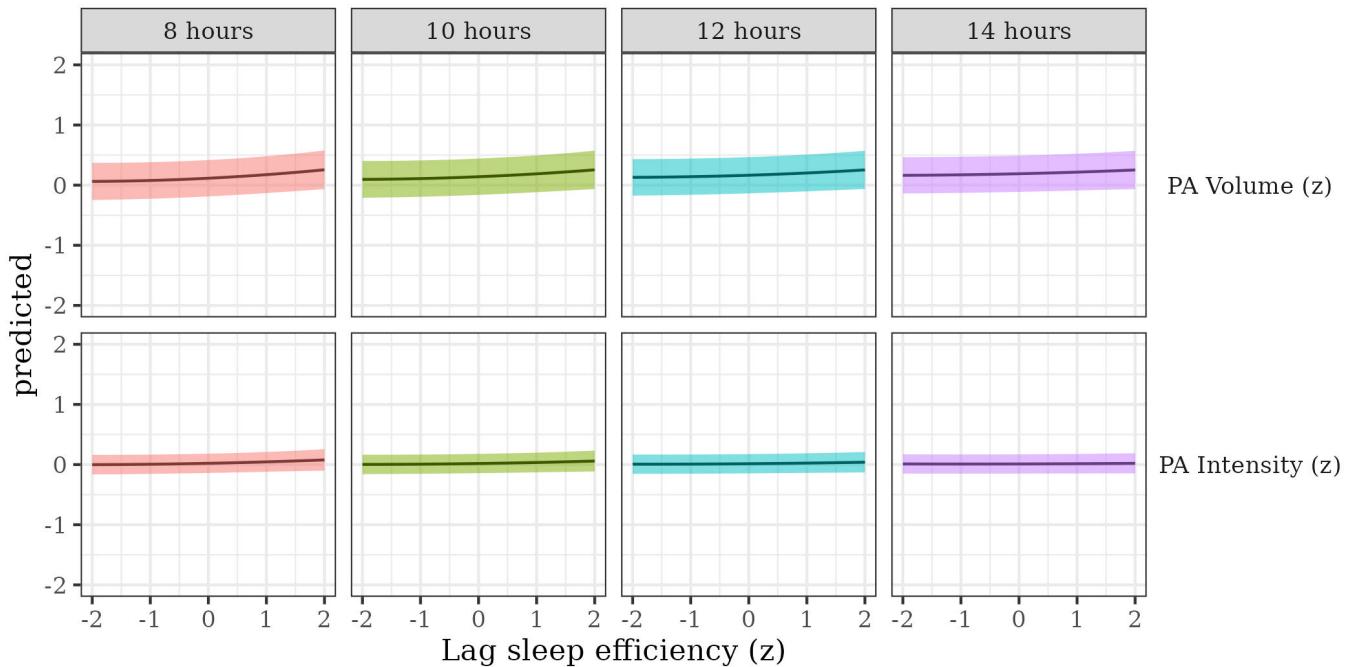


Figure 51. Physical activity by sleep efficiency moderated by daylight hours

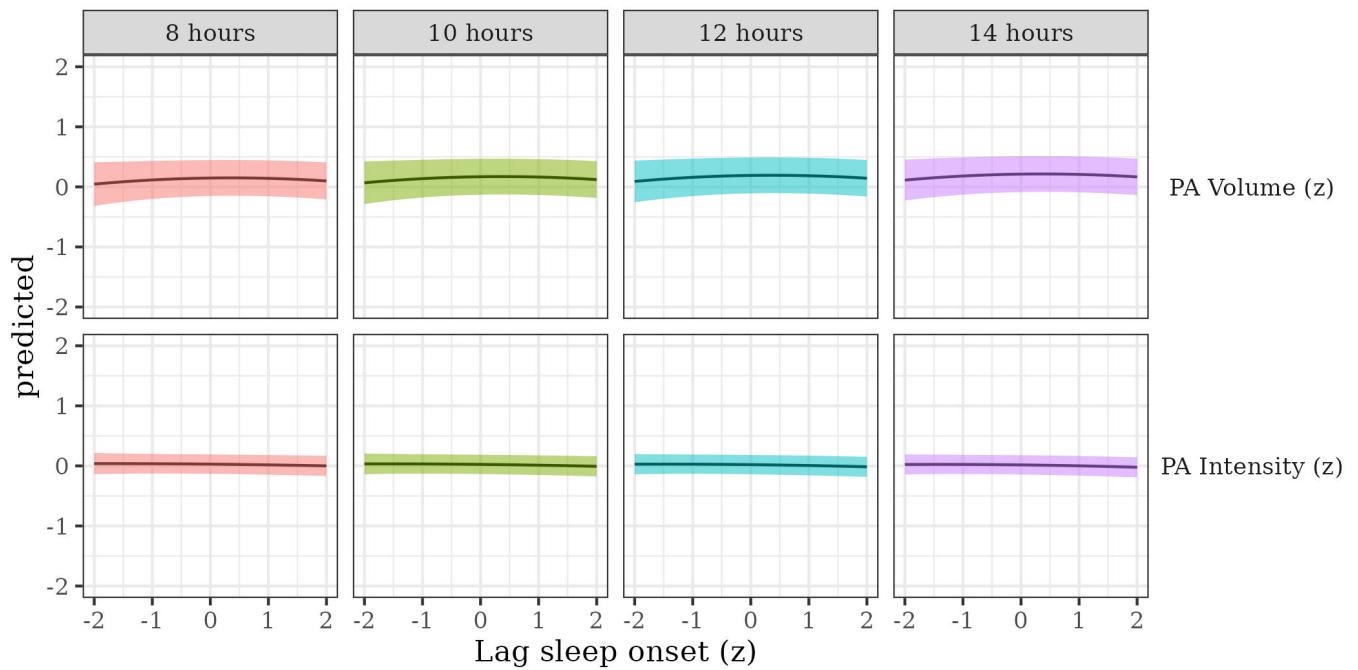


Figure 52. Physical activity by sleep onset moderated by daylight hours

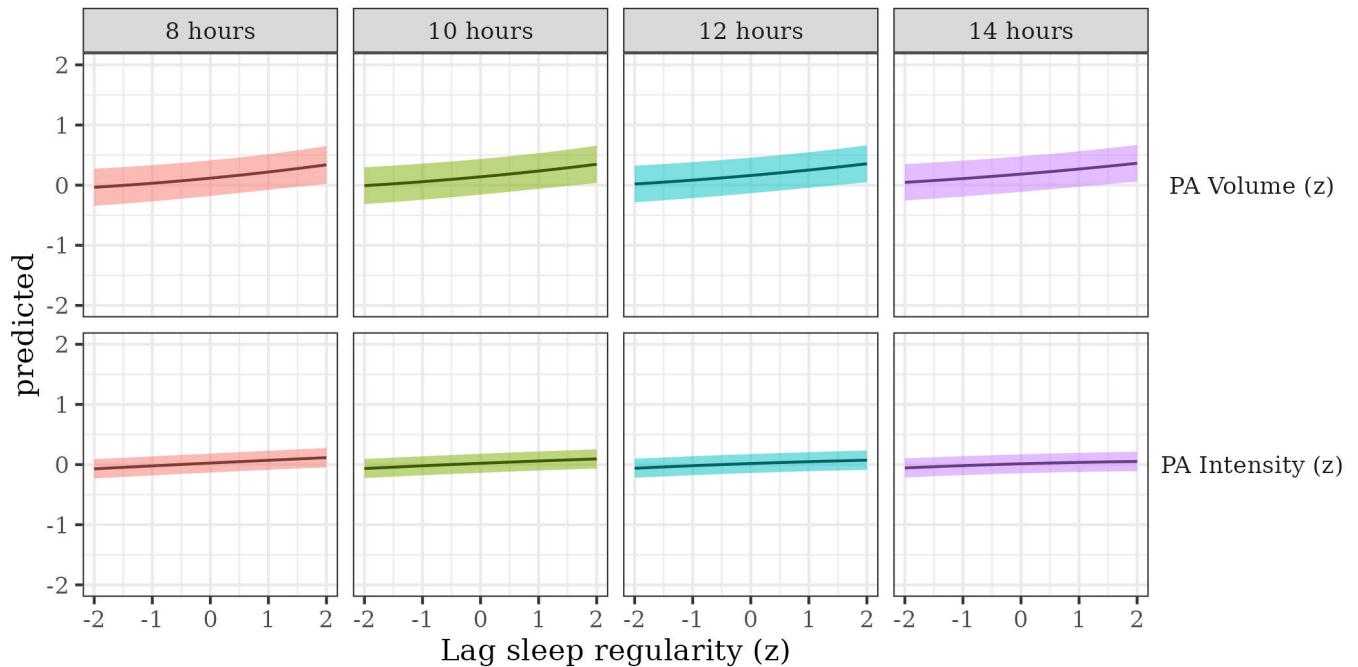


Figure 53. Physical activity by sleep regularity moderated by daylight hours

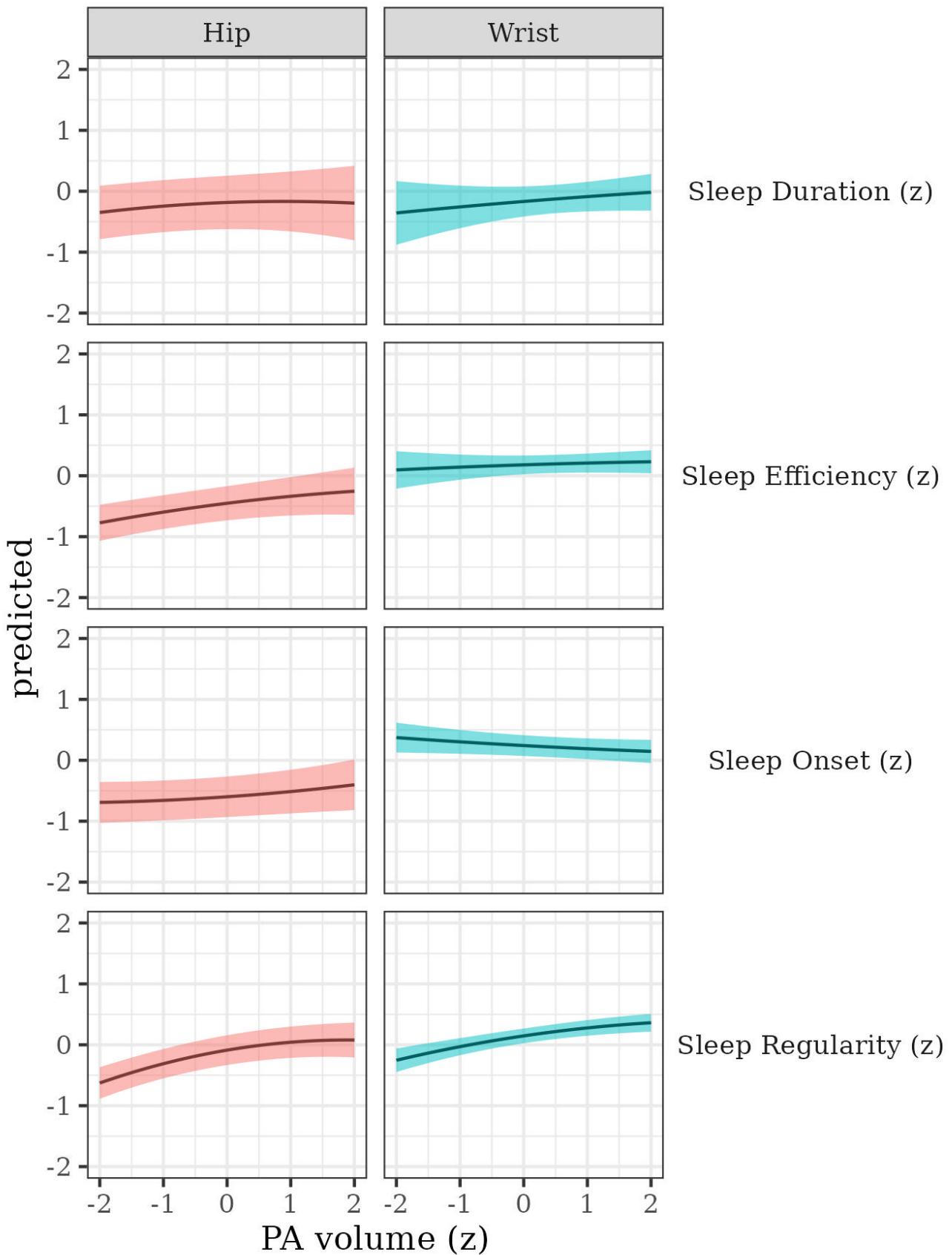


Figure 54. Sleep metrics on Physical activity volume by wear location

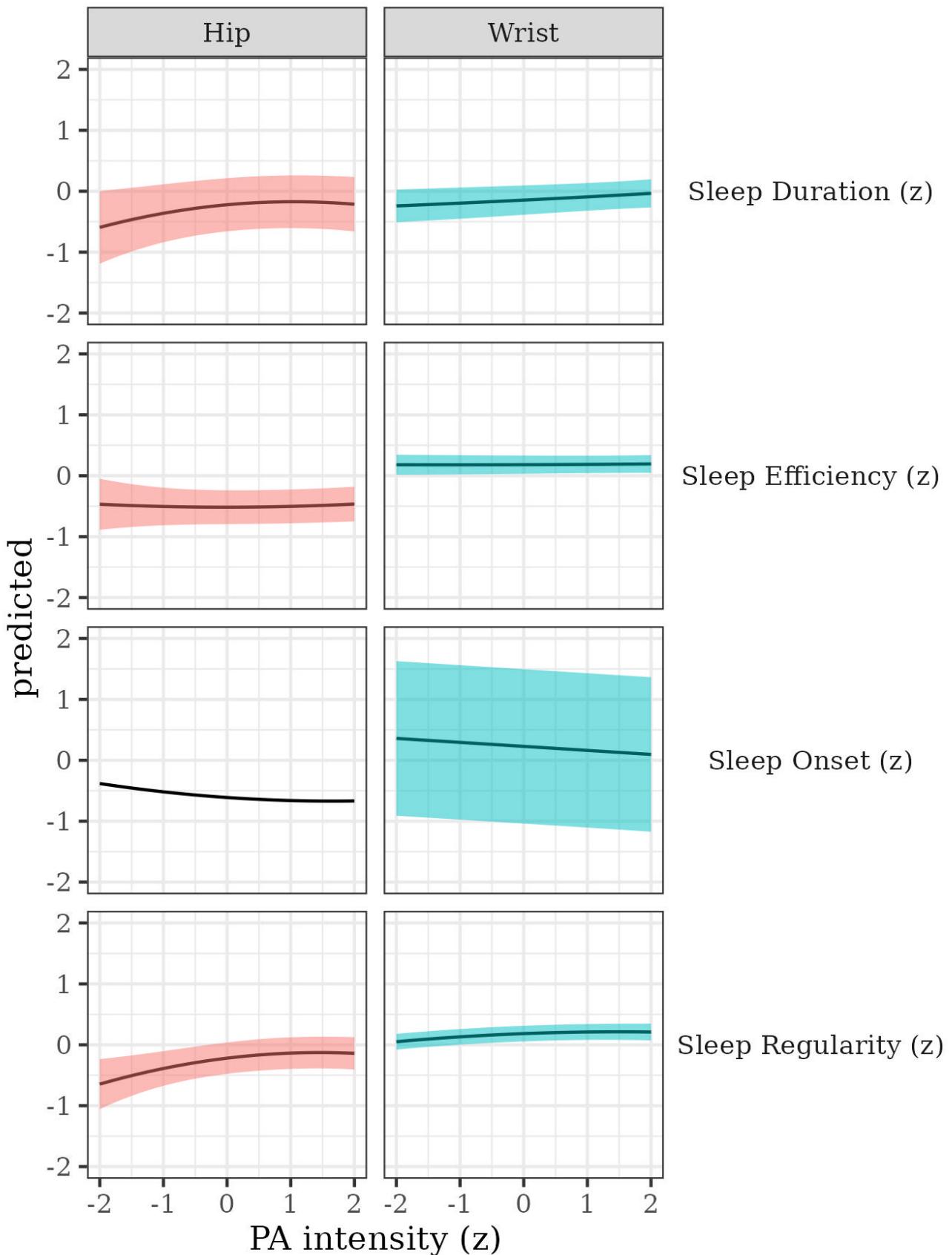


Figure 55. Sleep metrics on Physical activity intensity moderated by wear location

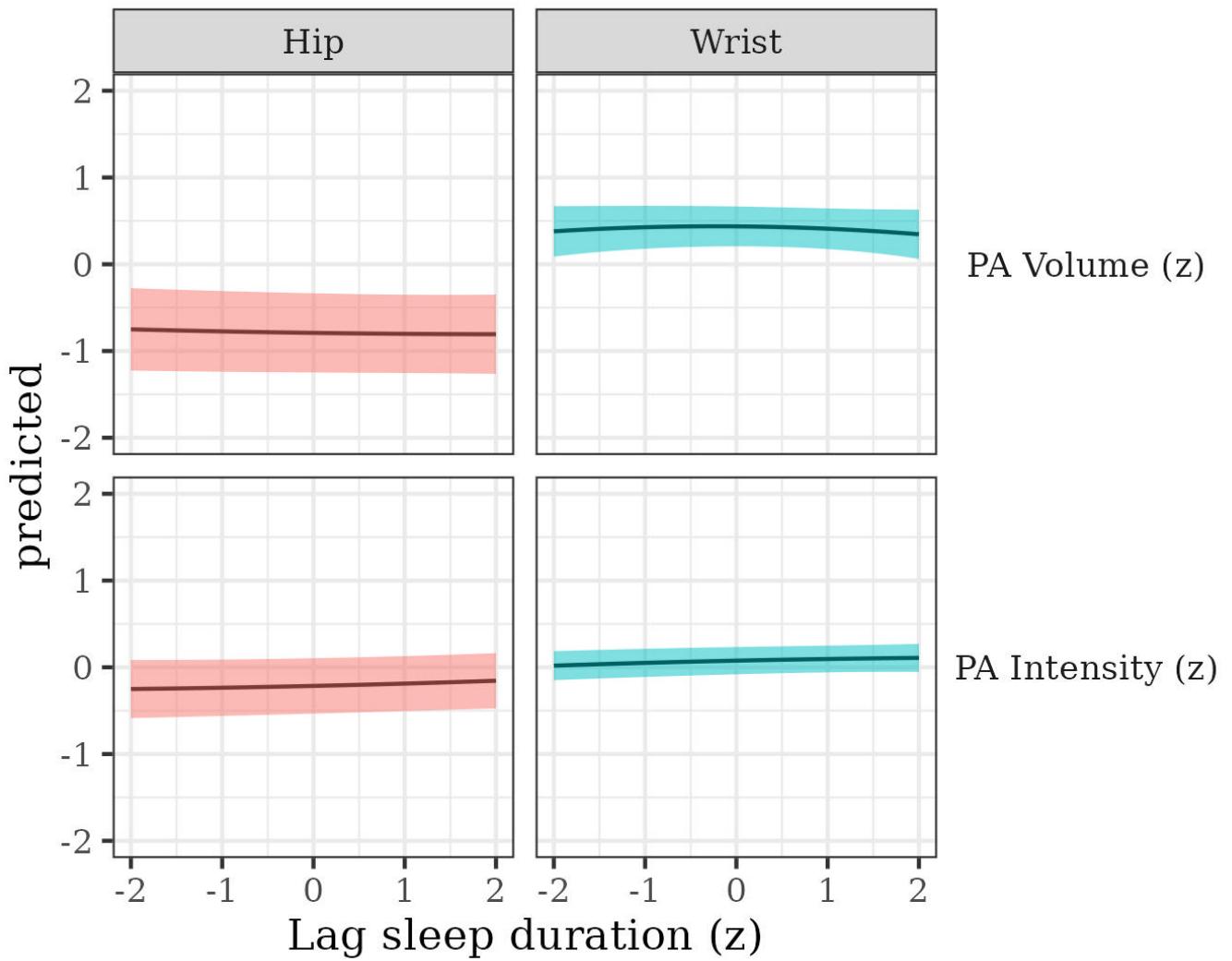


Figure 56. Physical activity by sleep duration moderated by wear location

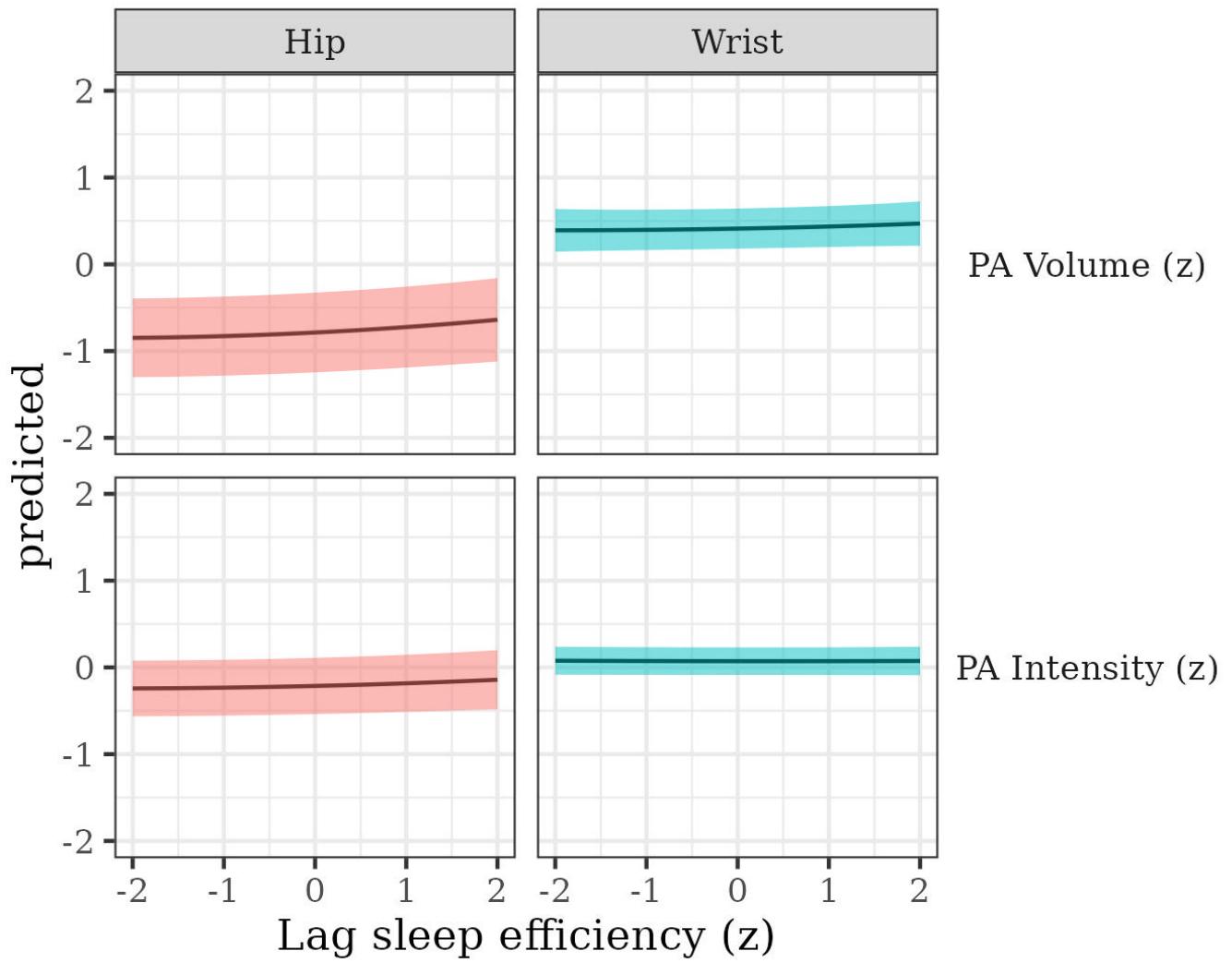


Figure 57. Physical activity by sleep efficiency moderated by wear location

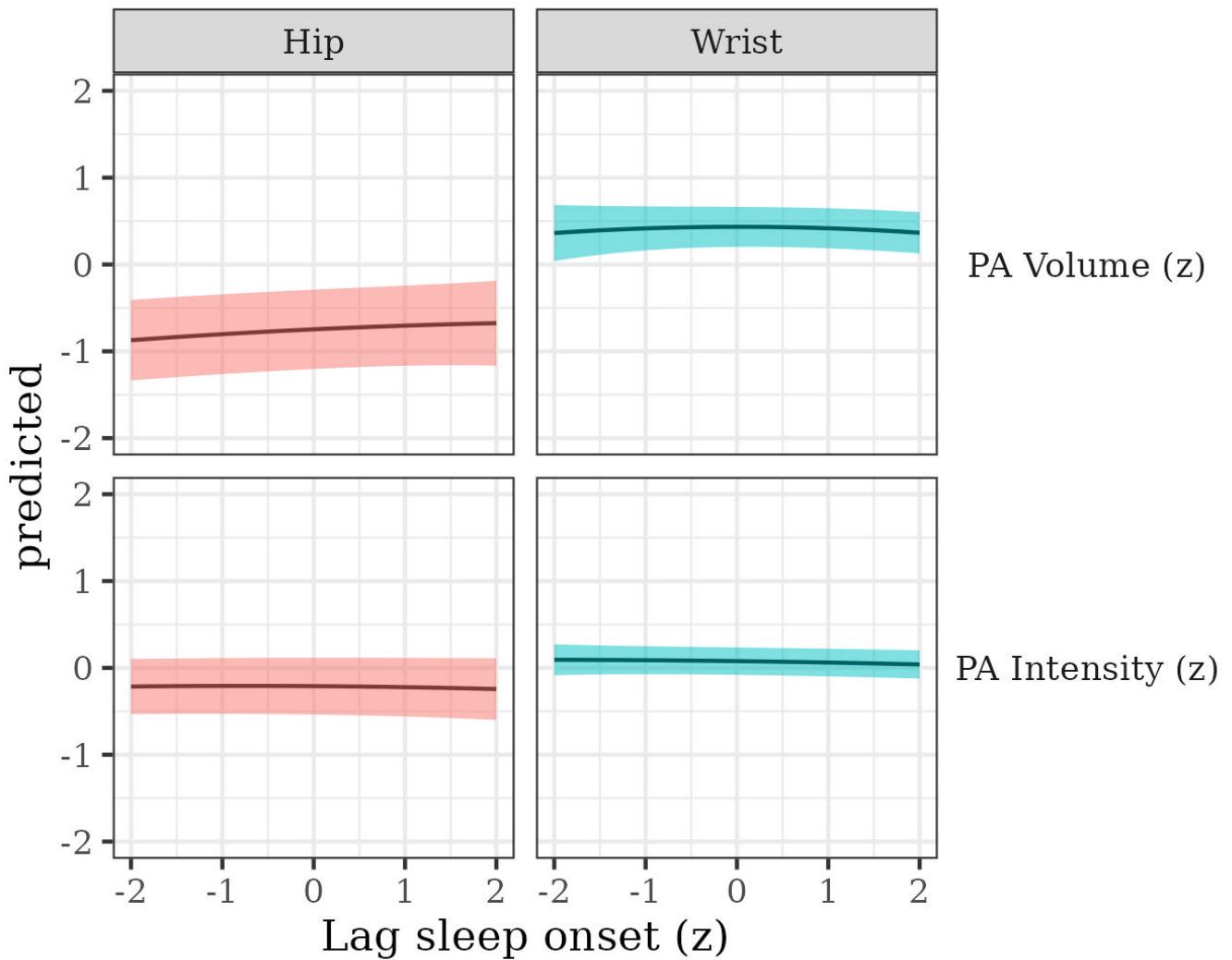


Figure 58. Physical activity by sleep onset moderated by wear location

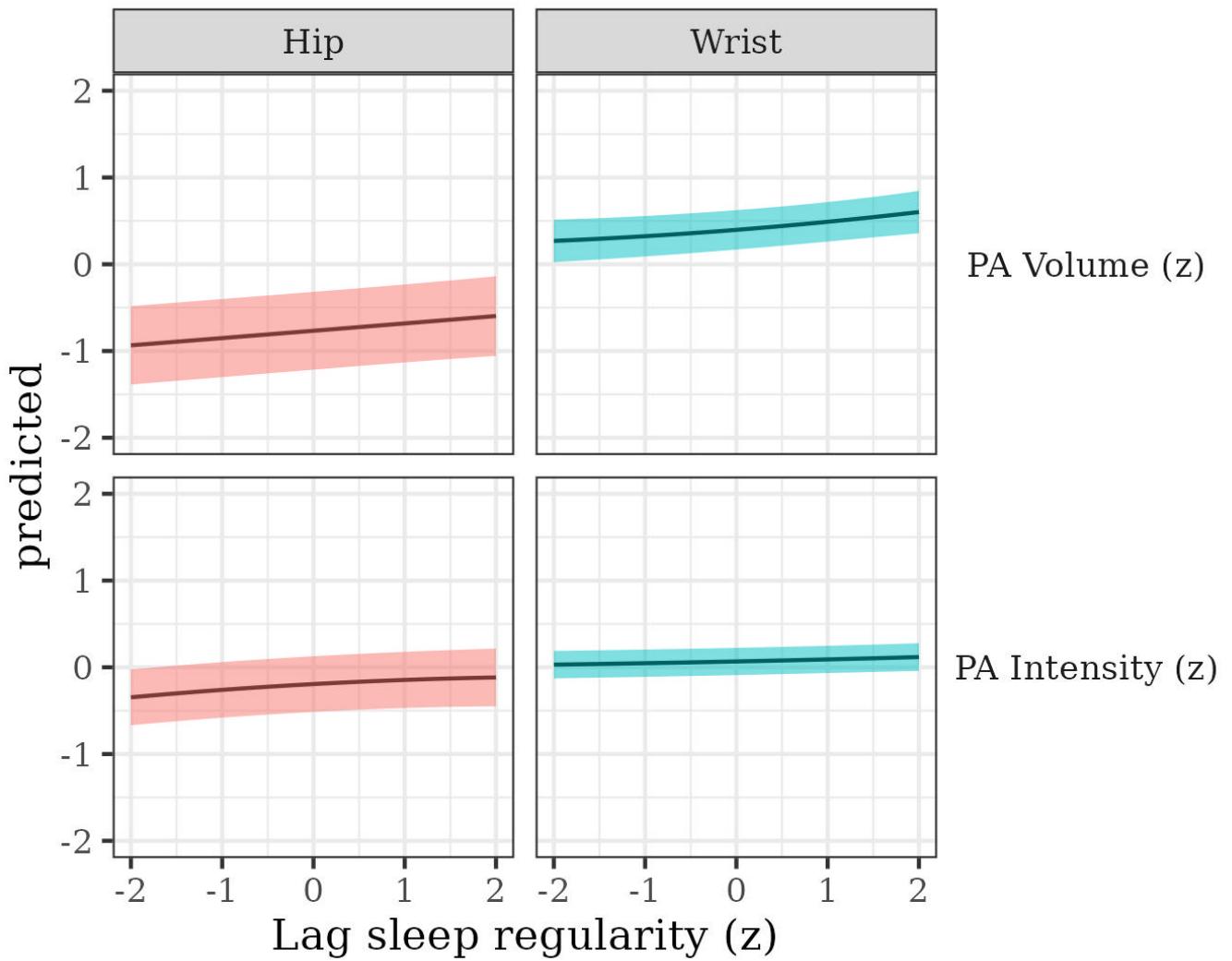


Figure 59. Physical activity by sleep regularity moderated by wear location

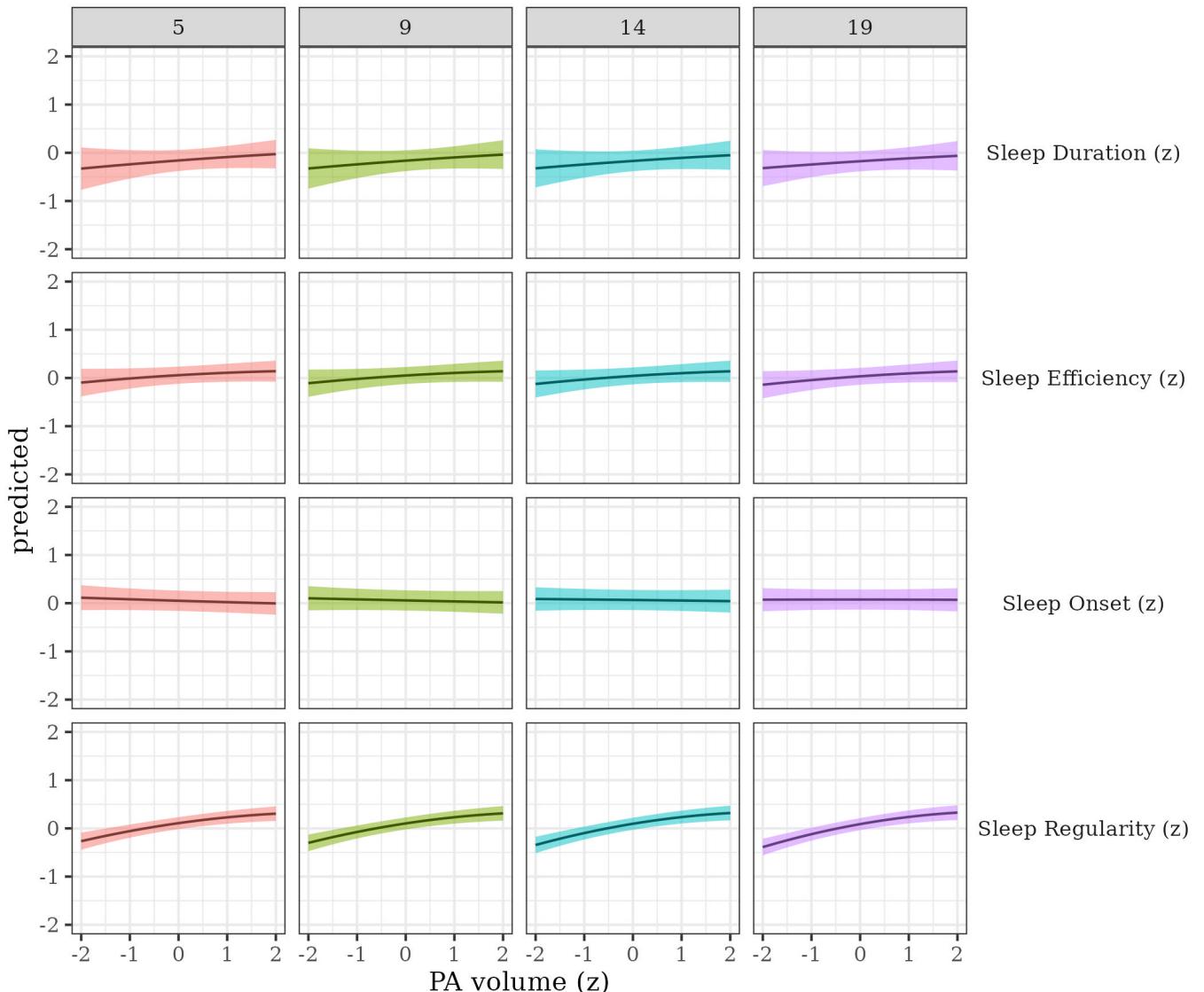


Figure 60. Sleep metrics on Physical activity volume by most active hour

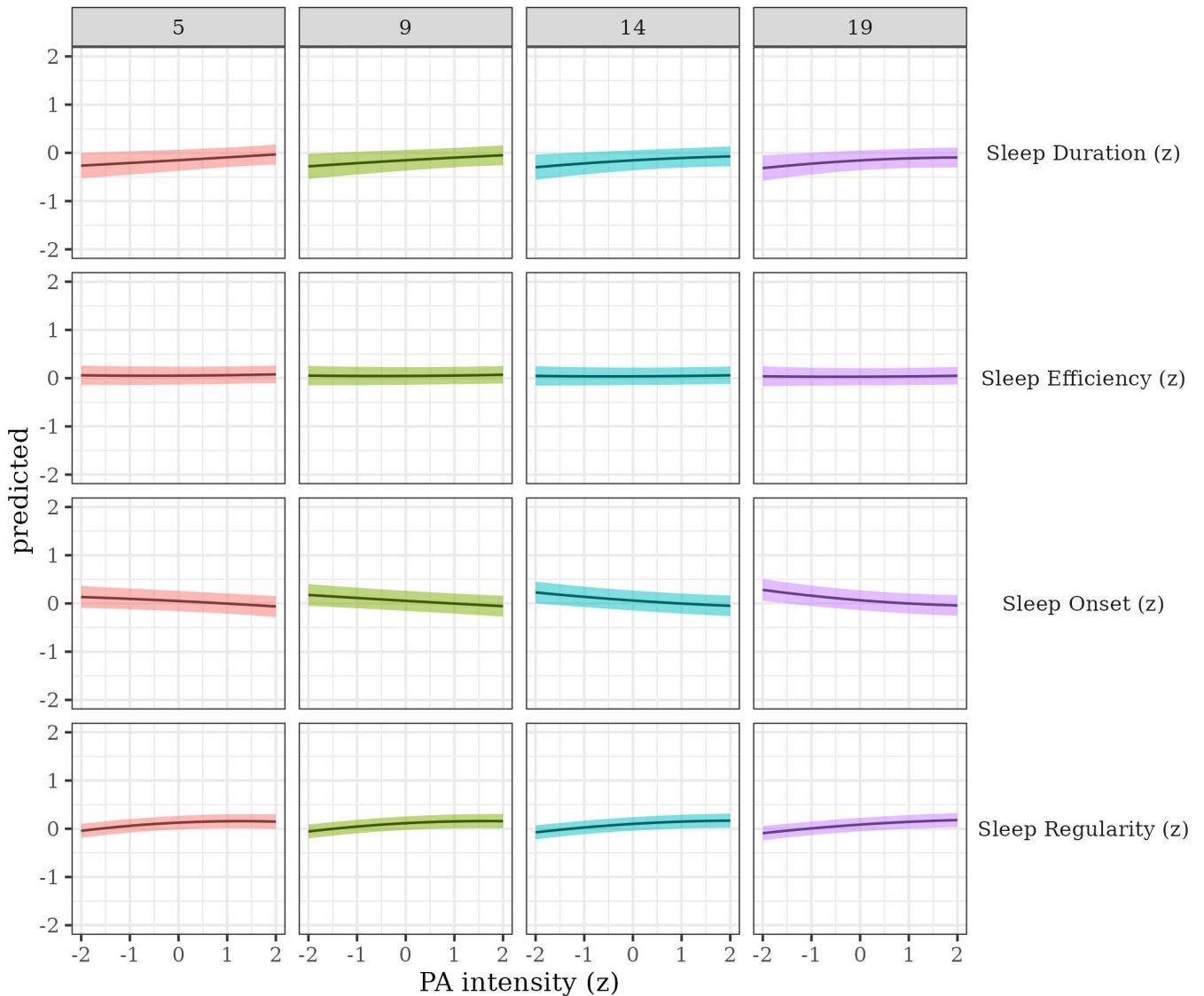


Figure 61. Sleep metrics on Physical activity intensity moderated by most active hour

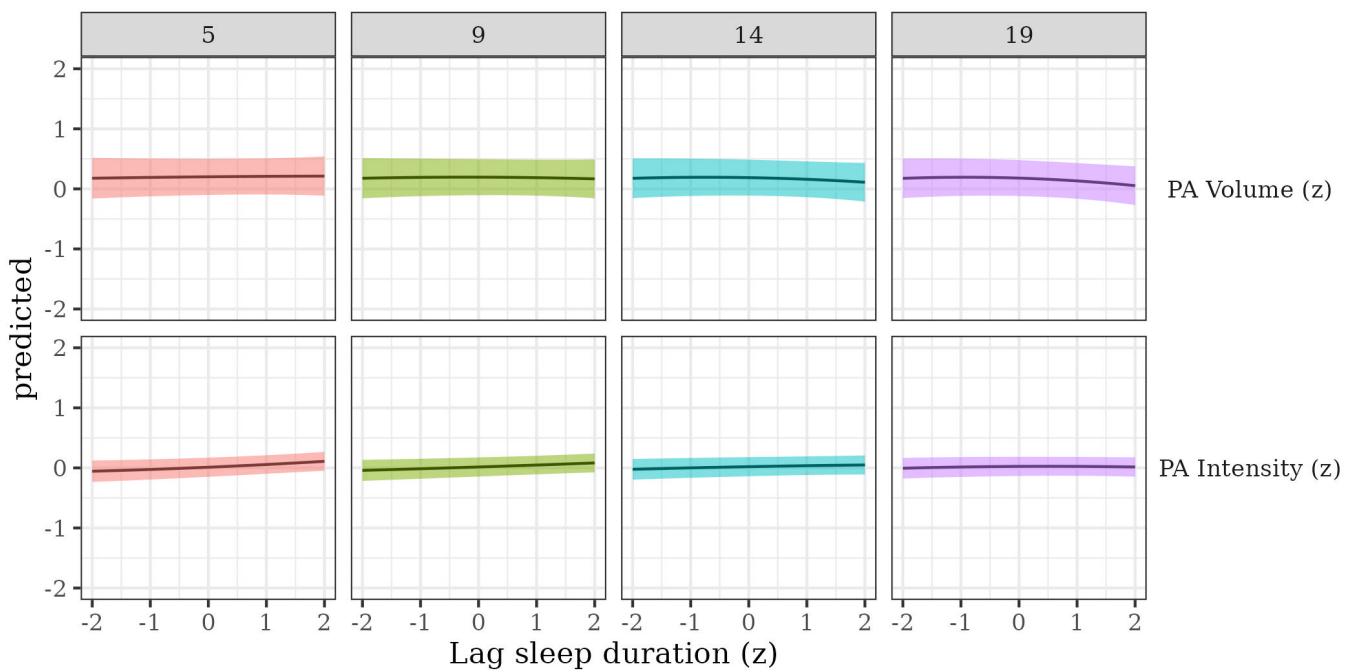


Figure 62. Physical activity by sleep duration moderated by most active hour

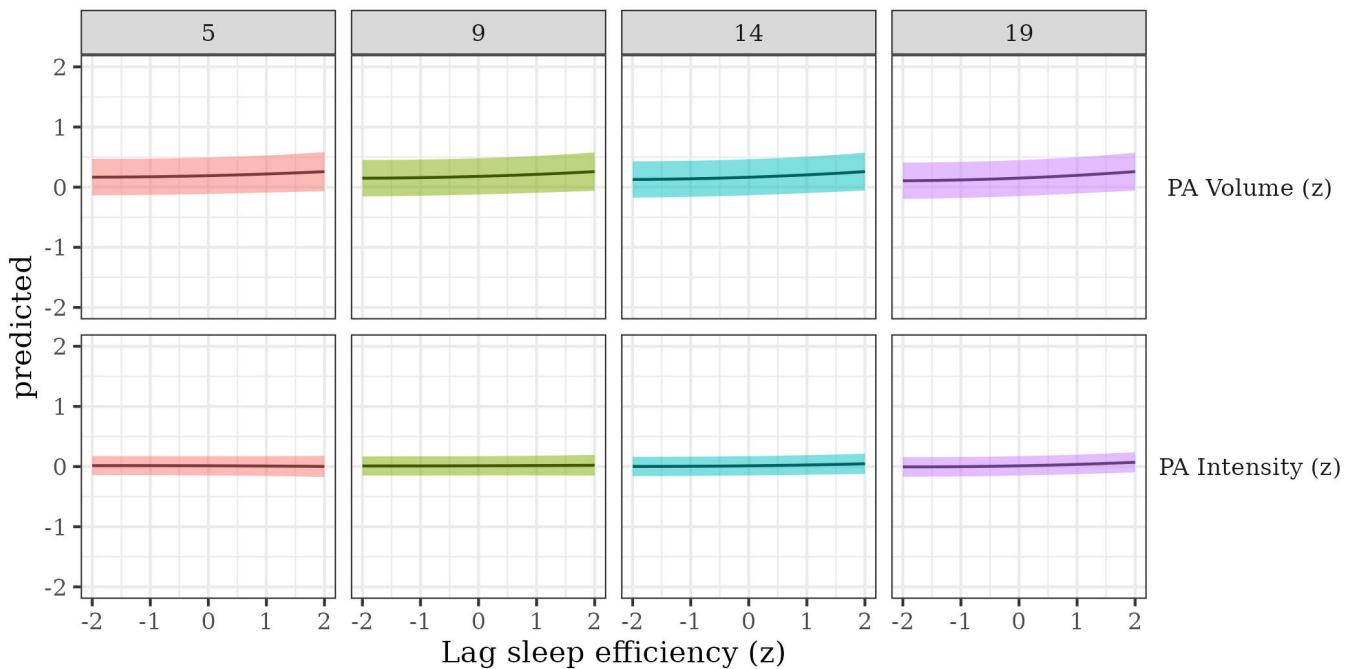


Figure 63. Physical activity by sleep efficiency moderated by most active hour

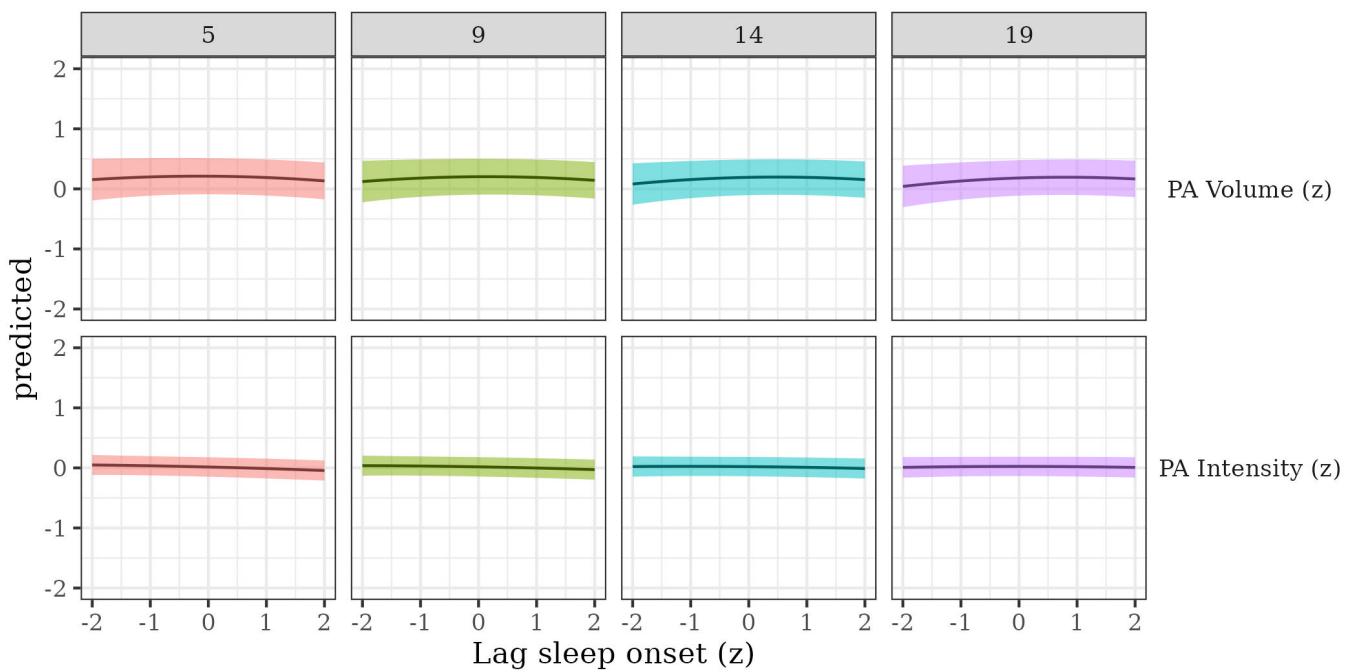


Figure 64. Physical activity by sleep onset moderated by most active hour

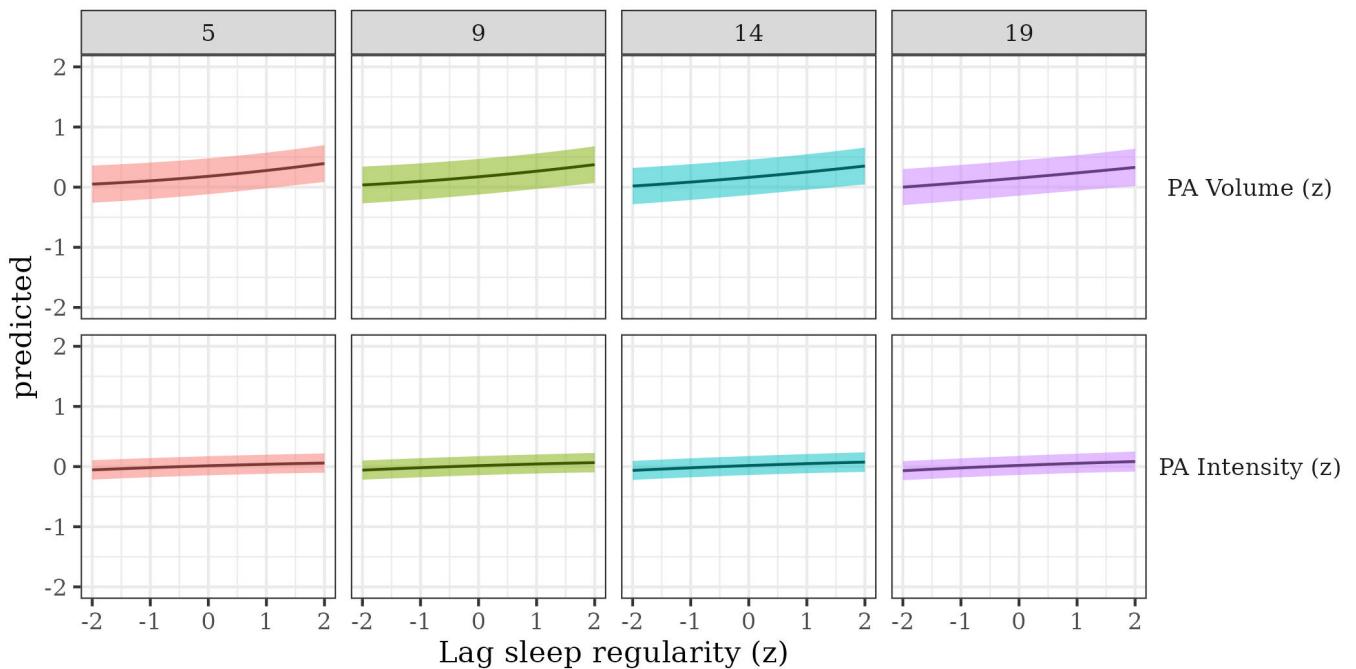


Figure 65. Physical activity by sleep regularity moderated by most active hour

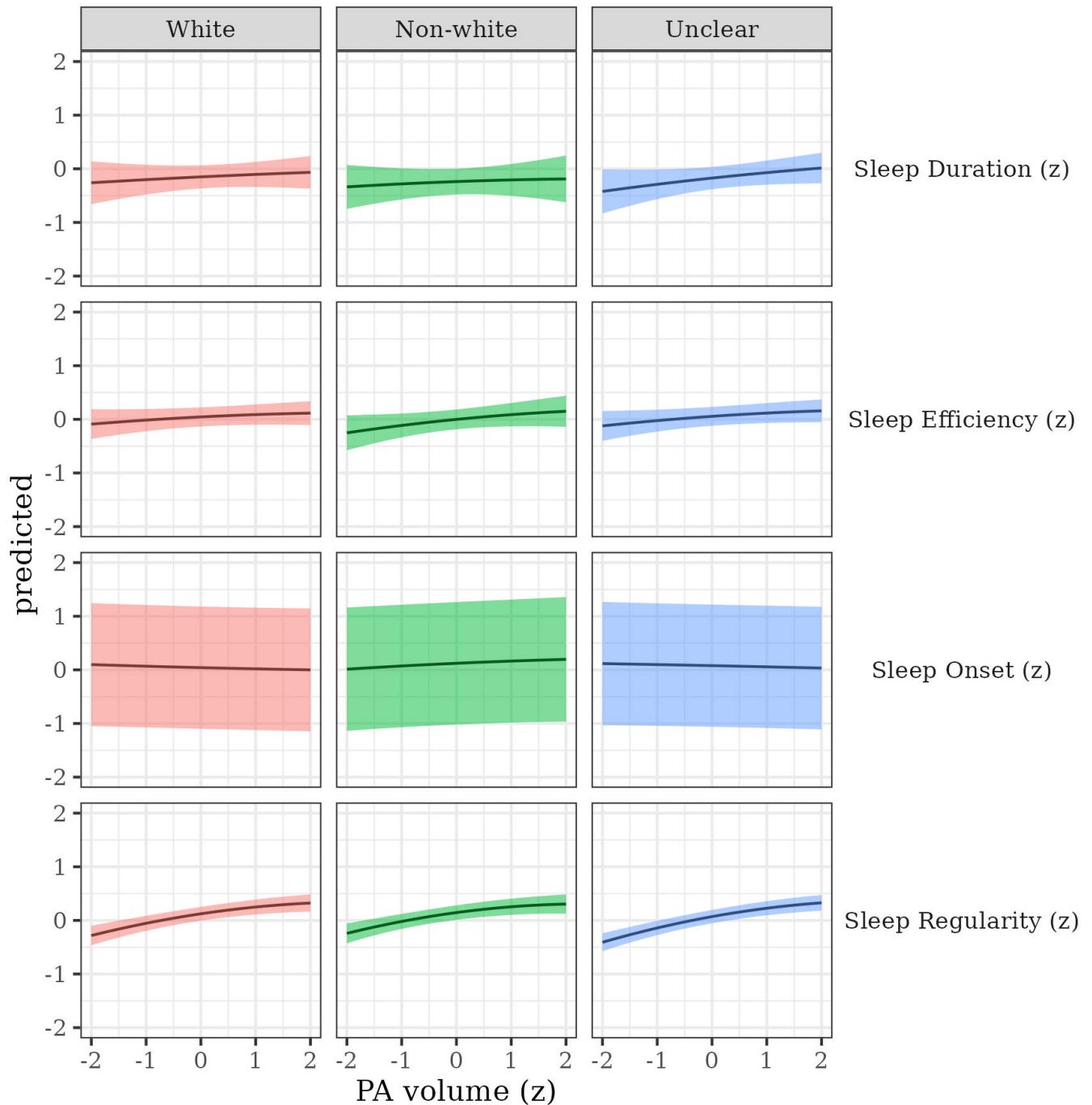


Figure 66. Sleep metrics on Physical activity volume by ethnicity

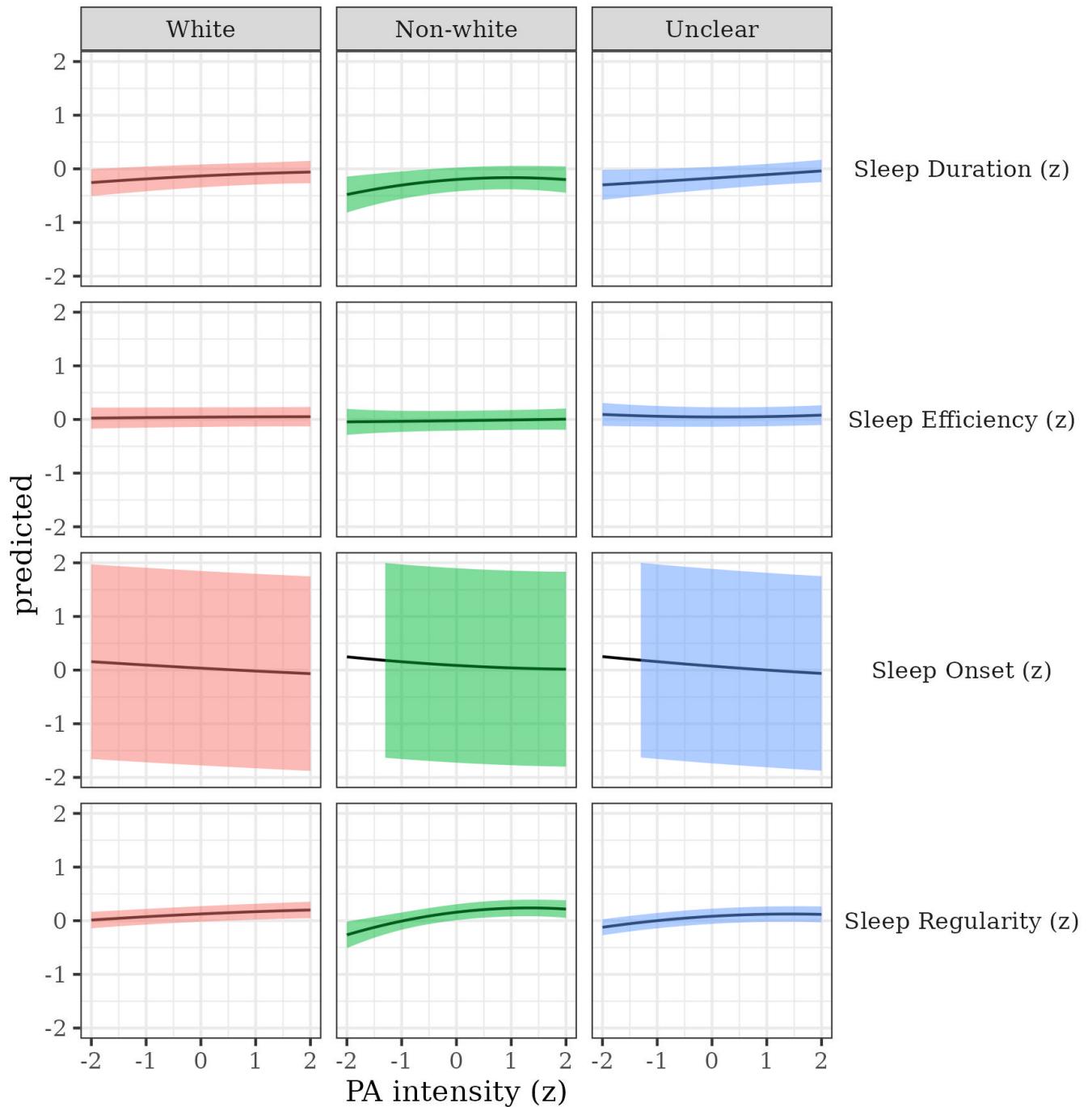


Figure 67. Sleep metrics on Physical activity intensity moderated by ethnicity

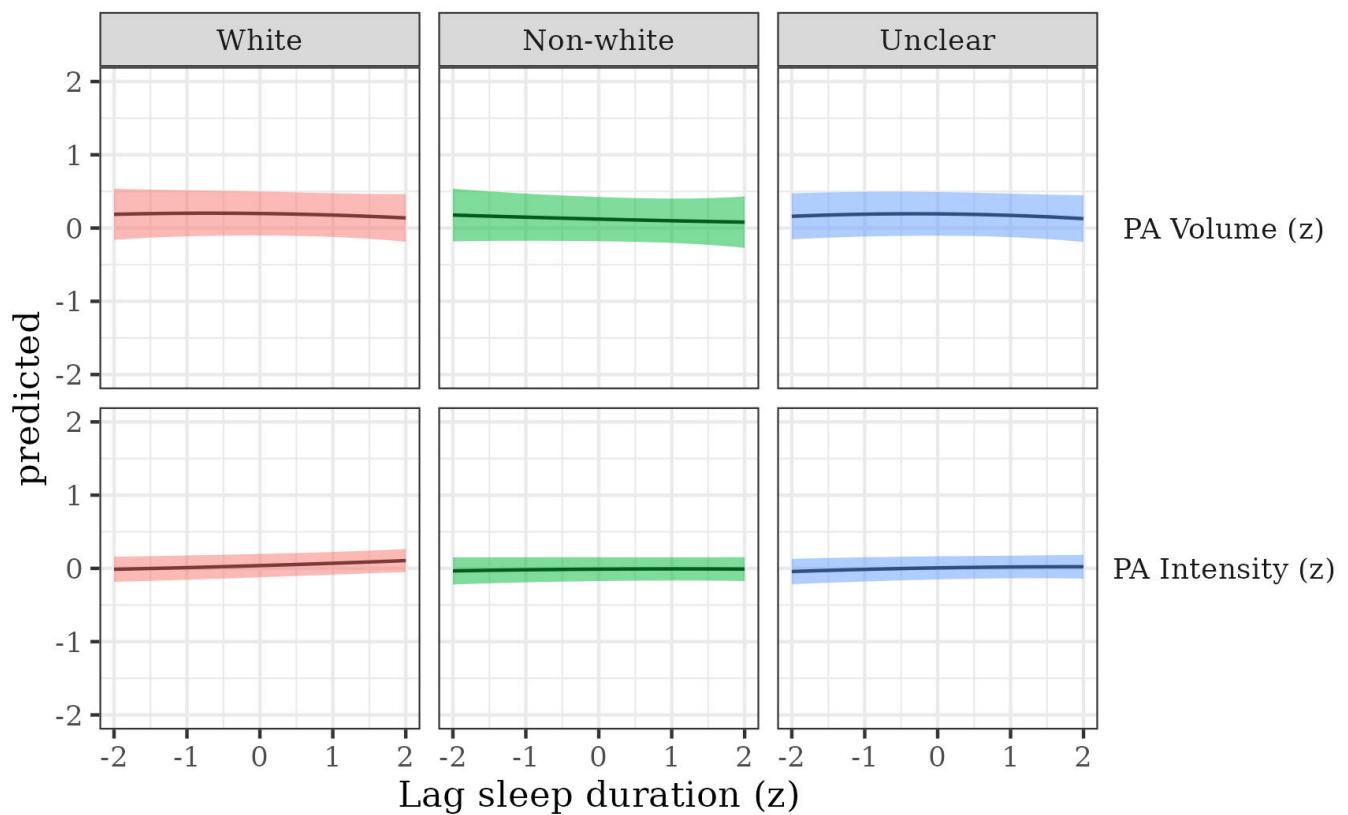


Figure 68. Physical activity by sleep duration moderated by ethnicity

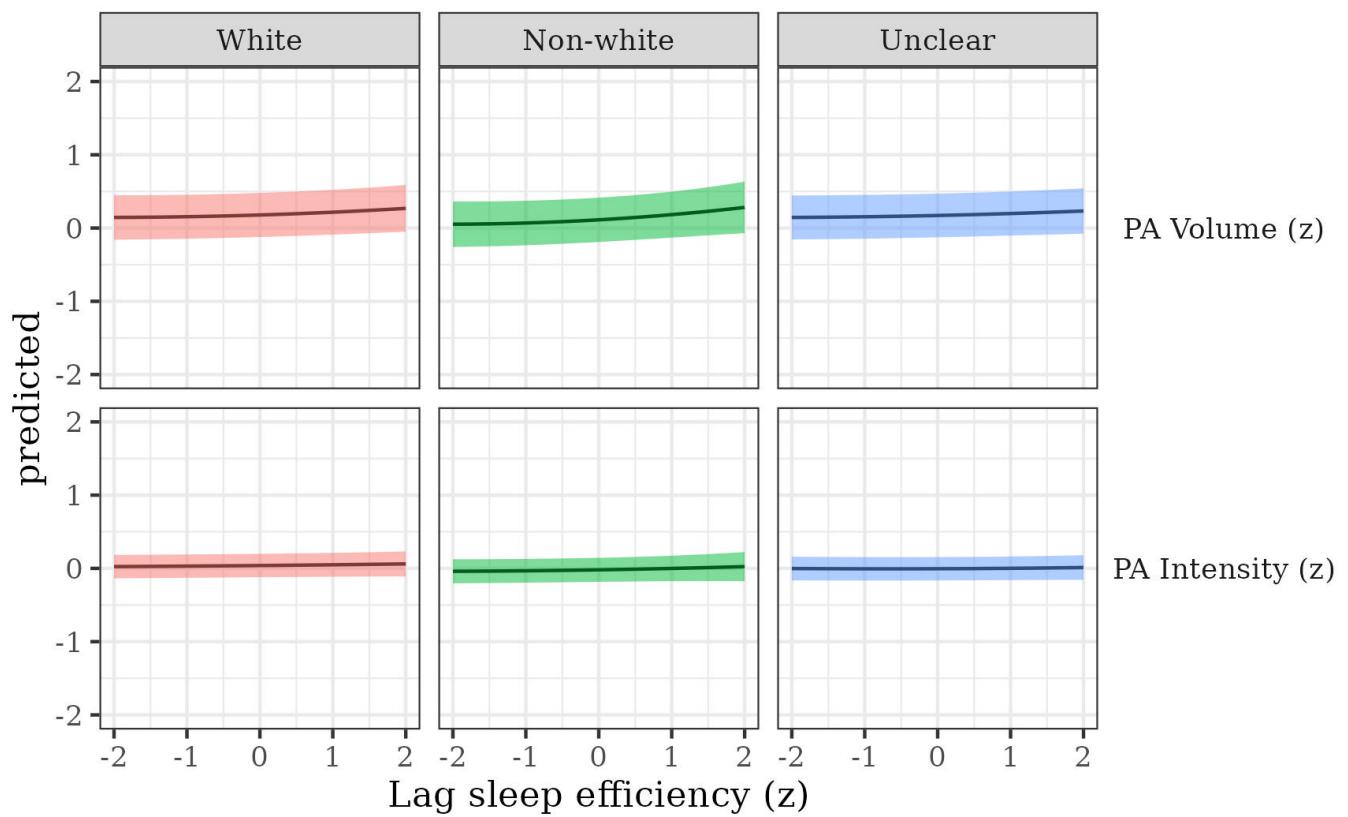


Figure 69. Physical activity by sleep efficiency moderated by ethnicity

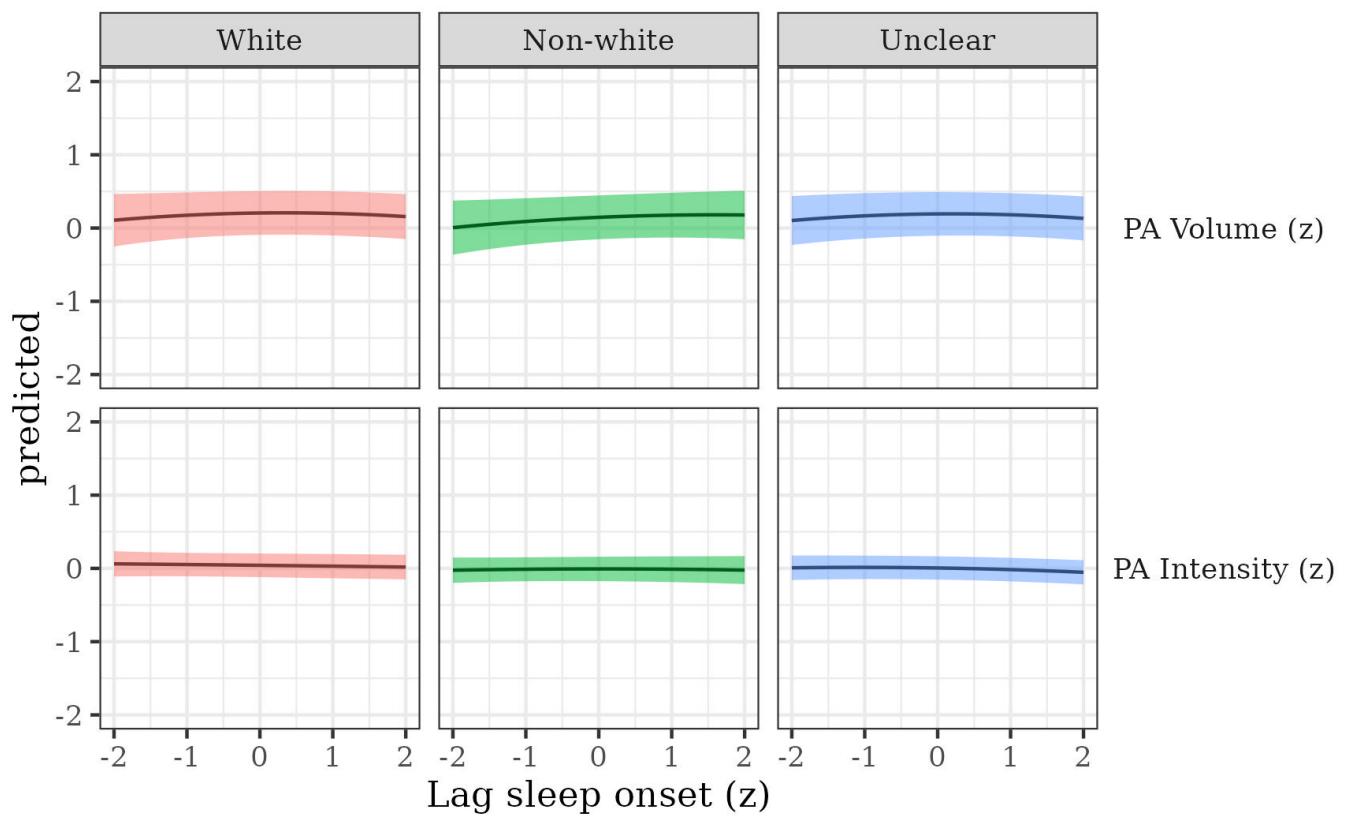


Figure 70. Physical activity by sleep onset moderated by ethnicity

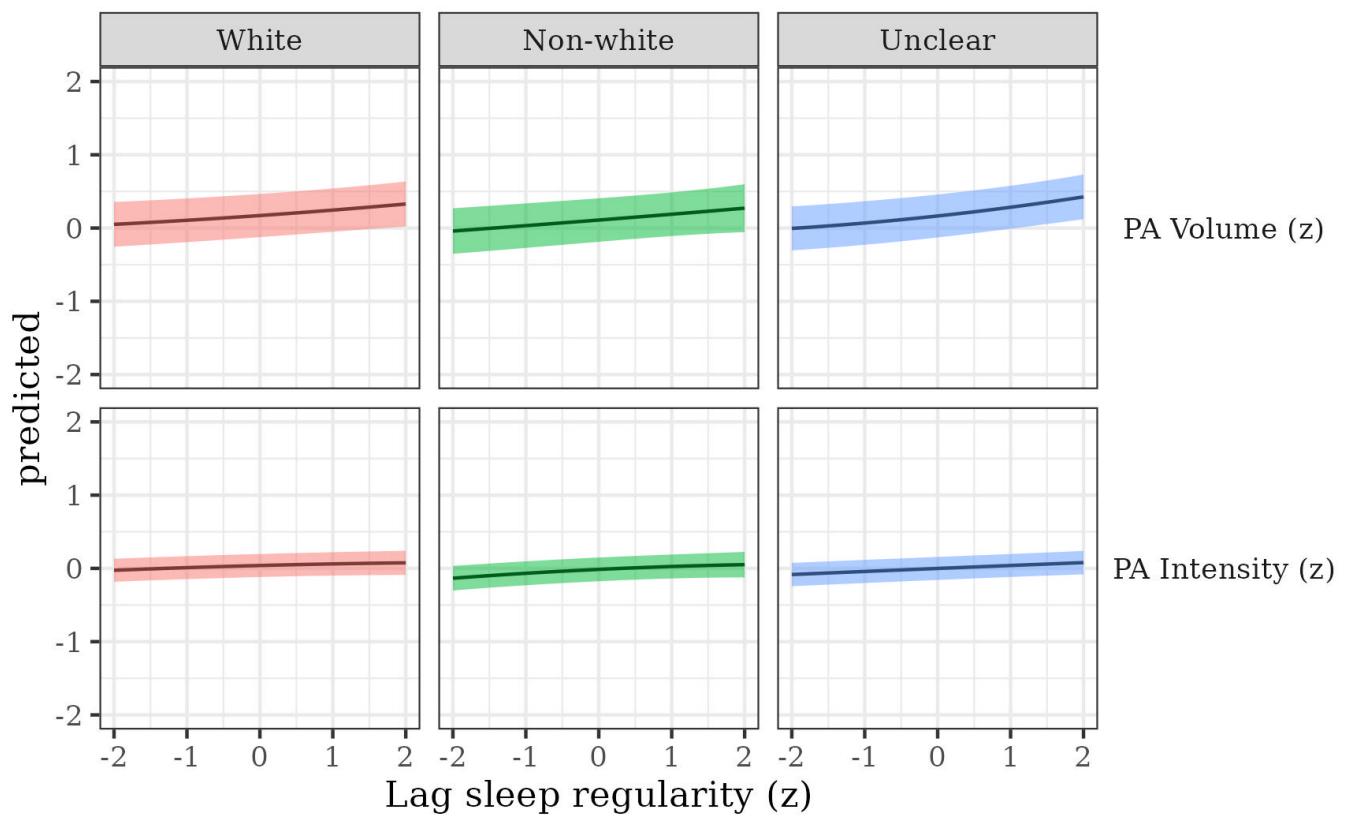


Figure 71. Physical activity by sleep regularity moderated by ethnicity