

Multiverse analysis

First Author¹ & Ernst-August Doelle^{1,2}

¹ Wilhelm-Wundt-University

² Konstanz Business School

Author Note

Add complete departmental affiliations for each author here. Each new line herein must be indented, like this line.

Enter author note here.

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

Correspondence concerning this article should be addressed to First Author, Postal address. E-mail: my@email.com

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

Multiverse

In this document we show the relationship between sleep and physical activity by the moderators that were pre-registered in our protocol.

Moderation

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

Table 1

Model diagnostics

Model name	Skewness	Kurtosis	Converged (%)
Models moderated by age			
Scale sleep duration by PA volume	0.09	-2.39	100.00%
Scale sleep efficiency by PA volume	-0.93	-3.79	100.00%
Scale sleep onset by PA volume	0.47	-4.84	100.00%
Scale sleep regularity by PA volume	-0.86	-3.20	100.00%
Scale sleep duration by PA intensity	0.09	-2.37	100.00%
Scale sleep efficiency by PA intensity	-0.93	-3.77	100.00%
Scale sleep onset by PA intensity	0.47	-4.75	100.00%
Scale sleep regularity by PA intensity	-0.85	-3.16	100.00%
Scale PA volume by sleep duration(lagged)	1.14	-12.71	100.00%
Scale PA intensity by sleep duration(lagged)	0.14	-2.74	100.00%
Scale PA volume by sleep efficiency(lagged)	1.14	-12.78	100.00%
Scale PA intensity by sleep efficiency(lagged)	0.14	-2.73	100.00%
Scale PA volume by sleep onset(lagged)	1.14	-12.71	100.00%
Scale PA intensity by sleep onset(lagged)	0.14	-2.73	100.00%
Scale PA volume by sleep regularity(lagged)	1.18	-13.08	100.00%
Scale PA intensity by sleep regularity(lagged)	0.18	-2.67	100.00%
Models moderated by bmi			
Scale sleep duration by PA volume	0.09	-2.40	100.00%
Scale sleep efficiency by PA volume	-0.93	-3.79	100.00%
Scale sleep onset by PA volume	0.47	-4.83	100.00%
Scale sleep regularity by PA volume	-0.86	-3.22	100.00%
Scale sleep duration by PA intensity	0.09	-2.37	100.00%
Scale sleep efficiency by PA intensity	-0.93	-3.77	100.00%
Scale sleep onset by PA intensity	0.47	-4.75	100.00%
Scale sleep regularity by PA intensity	-0.86	-3.13	100.00%
Scale PA volume by sleep duration(lagged)	1.14	-12.72	100.00%
Scale PA intensity by sleep duration(lagged)	0.14	-2.75	100.00%
Scale PA volume by sleep efficiency(lagged)	1.14	-12.78	100.00%
Scale PA intensity by sleep efficiency(lagged)	0.14	-2.73	100.00%
Scale PA volume by sleep onset(lagged)	1.14	-12.73	100.00%
Scale PA intensity by sleep onset(lagged)	0.14	-2.73	100.00%
Scale PA volume by sleep regularity(lagged)	1.18	-13.06	100.00%
Scale PA intensity by sleep regularity(lagged)	0.17	-2.67	100.00%

Table 1 continued

Model name	Skewness	Kurtosis	Converged (%)
Models moderated by ses			
Scale sleep duration by PA volume	0.09	-2.40	100.00%
Scale sleep efficiency by PA volume	-0.93	-3.78	100.00%
Scale sleep onset by PA volume	0.46	-4.84	100.00%
Scale sleep regularity by PA volume	-0.86	-3.19	100.00%
Scale sleep duration by PA intensity	0.09	-2.37	100.00%
Scale sleep efficiency by PA intensity	-0.93	-3.77	100.00%
Scale sleep onset by PA intensity	0.47	-4.76	100.00%
Scale sleep regularity by PA intensity	-0.86	-3.11	100.00%
Scale PA volume by sleep duration(lagged)	1.14	-12.71	100.00%
Scale PA intensity by sleep duration(lagged)	0.14	-2.75	100.00%
Scale PA volume by sleep efficiency(lagged)	1.14	-12.78	100.00%
Scale PA intensity by sleep efficiency(lagged)	0.14	-2.73	100.00%
Scale PA volume by sleep onset(lagged)	1.14	-12.72	100.00%
Scale PA intensity by sleep onset(lagged)	0.14	-2.73	100.00%
Scale PA volume by sleep regularity(lagged)	1.18	-13.06	100.00%
Scale PA intensity by sleep regularity(lagged)	0.17	-2.68	100.00%
Models moderated by sex			
Scale sleep duration by PA volume	0.09	-2.40	100.00%
Scale sleep efficiency by PA volume	-0.93	-3.77	100.00%
Scale sleep onset by PA volume	0.47	-4.82	100.00%
Scale sleep regularity by PA volume	-0.86	-3.19	100.00%
Scale sleep duration by PA intensity	0.09	-2.37	100.00%
Scale sleep efficiency by PA intensity	-0.93	-3.78	100.00%
Scale sleep onset by PA intensity	0.47	-4.75	100.00%
Scale sleep regularity by PA intensity	-0.86	-3.12	100.00%
Scale PA volume by sleep duration(lagged)	1.14	-12.73	100.00%
Scale PA intensity by sleep duration(lagged)	0.14	-2.75	100.00%
Scale PA volume by sleep efficiency(lagged)	1.14	-12.76	100.00%
Scale PA intensity by sleep efficiency(lagged)	0.14	-2.73	100.00%
Scale PA volume by sleep onset(lagged)	1.14	-12.71	100.00%
Scale PA intensity by sleep onset(lagged)	0.14	-2.73	100.00%
Scale PA volume by sleep regularity(lagged)	1.18	-13.08	100.00%
Scale PA intensity by sleep regularity(lagged)	0.17	-2.67	100.00%
Models moderated by weekday			

Table 1 continued

Model name	Skewness	Kurtosis	Converged (%)
Scale sleep duration by PA volume	0.07	-2.35	100.00%
Scale sleep efficiency by PA volume	-0.92	-3.79	100.00%
Scale sleep onset by PA volume	0.45	-4.92	100.00%
Scale sleep regularity by PA volume	-0.91	-3.59	100.00%
Scale sleep duration by PA intensity	0.07	-2.35	100.00%
Scale sleep efficiency by PA intensity	-0.91	-3.76	100.00%
Scale sleep onset by PA intensity	0.46	-4.80	100.00%
Scale sleep regularity by PA intensity	-0.92	-3.62	100.00%
Scale PA volume by sleep duration(lagged)	1.20	-13.14	100.00%
Scale PA intensity by sleep duration(lagged)	0.19	-2.84	100.00%
Scale PA volume by sleep efficiency(lagged)	1.19	-13.22	100.00%
Scale PA intensity by sleep efficiency(lagged)	0.19	-2.88	100.00%
Scale PA volume by sleep onset(lagged)	1.20	-13.19	100.00%
Scale PA intensity by sleep onset(lagged)	0.20	-2.89	100.00%
Scale PA volume by sleep regularity(lagged)	1.22	-13.34	100.00%
Scale PA intensity by sleep regularity(lagged)	0.21	-2.76	100.00%
Models moderated by season			
Scale sleep duration by PA volume	0.09	-2.38	100.00%
Scale sleep efficiency by PA volume	-0.92	-3.77	100.00%
Scale sleep onset by PA volume	0.47	-4.82	100.00%
Scale sleep regularity by PA volume	-0.86	-3.23	100.00%
Scale sleep duration by PA intensity	0.09	-2.36	100.00%
Scale sleep efficiency by PA intensity	-0.93	-3.77	100.00%
Scale sleep onset by PA intensity	0.47	-4.76	100.00%
Scale sleep regularity by PA intensity	-0.86	-3.11	100.00%
Scale PA volume by sleep duration(lagged)	1.14	-12.67	100.00%
Scale PA intensity by sleep duration(lagged)	0.14	-2.76	100.00%
Scale PA volume by sleep efficiency(lagged)	1.14	-12.79	100.00%
Scale PA intensity by sleep efficiency(lagged)	0.14	-2.73	100.00%
Scale PA volume by sleep onset(lagged)	1.14	-12.67	100.00%
Scale PA intensity by sleep onset(lagged)	0.14	-2.74	100.00%
Scale PA volume by sleep regularity(lagged)	1.18	-13.09	100.00%
Scale PA intensity by sleep regularity(lagged)	0.17	-2.68	100.00%
Models moderated by region			
Scale sleep duration by PA volume	0.09	-2.41	100.00%

Table 1 continued

Model name	Skewness	Kurtosis	Converged (%)
Scale sleep efficiency by PA volume	-0.92	-3.81	100.00%
Scale sleep onset by PA volume	0.46	-4.82	100.00%
Scale sleep regularity by PA volume	-0.86	-3.22	100.00%
Scale sleep duration by PA intensity	0.09	-2.36	100.00%
Scale sleep efficiency by PA intensity	-0.92	-3.76	100.00%
Scale sleep onset by PA intensity	0.46	-4.73	100.00%
Scale sleep regularity by PA intensity	-0.84	-3.07	100.00%
Scale PA volume by sleep duration(lagged)	1.15	-12.72	100.00%
Scale PA intensity by sleep duration(lagged)	0.14	-2.77	100.00%
Scale PA volume by sleep efficiency(lagged)	1.14	-12.73	100.00%
Scale PA intensity by sleep efficiency(lagged)	0.14	-2.74	100.00%
Scale PA volume by sleep onset(lagged)	1.14	-12.74	100.00%
Scale PA intensity by sleep onset(lagged)	0.13	-2.74	100.00%
Scale PA volume by sleep regularity(lagged)	1.19	-13.08	100.00%
Scale PA intensity by sleep regularity(lagged)	0.17	-2.67	100.00%
Models moderated by daylight			
Scale sleep duration by PA volume	0.09	-2.41	100.00%
Scale sleep efficiency by PA volume	-0.93	-3.79	100.00%
Scale sleep onset by PA volume	0.47	-4.83	100.00%
Scale sleep regularity by PA volume	-0.86	-3.21	100.00%
Scale sleep duration by PA intensity	0.09	-2.38	100.00%
Scale sleep efficiency by PA intensity	-0.93	-3.78	100.00%
Scale sleep onset by PA intensity	0.47	-4.75	100.00%
Scale sleep regularity by PA intensity	-0.86	-3.12	100.00%
Scale PA volume by sleep duration(lagged)	1.14	-12.72	100.00%
Scale PA intensity by sleep duration(lagged)	0.14	-2.76	100.00%
Scale PA volume by sleep efficiency(lagged)	1.14	-12.78	100.00%
Scale PA intensity by sleep efficiency(lagged)	0.14	-2.73	100.00%
Scale PA volume by sleep onset(lagged)	1.14	-12.73	100.00%
Scale PA intensity by sleep onset(lagged)	0.14	-2.74	100.00%
Scale PA volume by sleep regularity(lagged)	1.18	-13.07	100.00%
Scale PA intensity by sleep regularity(lagged)	0.18	-2.66	100.00%
Models moderated by wear location			
Scale sleep duration by PA volume	0.09	-2.40	100.00%
Scale sleep efficiency by PA volume	-0.92	-3.82	100.00%

Table 1 continued

Model name	Skewness	Kurtosis	Converged (%)
Scale sleep onset by PA volume	0.47	-4.85	100.00%
Scale sleep regularity by PA volume	-0.86	-3.21	100.00%
Scale sleep duration by PA intensity	0.09	-2.37	100.00%
Scale sleep efficiency by PA intensity	-0.92	-3.76	100.00%
Scale sleep onset by PA intensity	0.48	-4.73	100.00%
Scale sleep regularity by PA intensity	-0.85	-3.14	100.00%
Scale PA volume by sleep duration(lagged)	1.14	-12.71	100.00%
Scale PA intensity by sleep duration(lagged)	0.14	-2.75	100.00%
Scale PA volume by sleep efficiency(lagged)	1.14	-12.78	100.00%
Scale PA intensity by sleep efficiency(lagged)	0.14	-2.73	100.00%
Scale PA volume by sleep onset(lagged)	1.14	-12.75	100.00%
Scale PA intensity by sleep onset(lagged)	0.14	-2.73	100.00%
Scale PA volume by sleep regularity(lagged)	1.18	-13.07	100.00%
Scale PA intensity by sleep regularity(lagged)	0.19	-2.67	100.00%
Models moderated by PA mostactivehr			
Scale sleep duration by PA volume	0.09	-2.40	100.00%
Scale sleep efficiency by PA volume	-0.93	-3.79	100.00%
Scale sleep onset by PA volume	0.47	-4.83	100.00%
Scale sleep regularity by PA volume	-0.85	-3.16	100.00%
Scale sleep duration by PA intensity	0.09	-2.37	100.00%
Scale sleep efficiency by PA intensity	-0.93	-3.78	100.00%
Scale sleep onset by PA intensity	0.47	-4.74	100.00%
Scale sleep regularity by PA intensity	-0.85	-3.06	100.00%
Scale PA volume by sleep duration(lagged)	1.14	-12.61	100.00%
Scale PA intensity by sleep duration(lagged)	0.14	-2.75	100.00%
Scale PA volume by sleep efficiency(lagged)	1.13	-12.70	100.00%
Scale PA intensity by sleep efficiency(lagged)	0.14	-2.73	100.00%
Scale PA volume by sleep onset(lagged)	1.13	-12.63	100.00%
Scale PA intensity by sleep onset(lagged)	0.14	-2.73	100.00%
Scale PA volume by sleep regularity(lagged)	1.17	-12.93	100.00%
Scale PA intensity by sleep regularity(lagged)	0.17	-2.66	100.00%