

Full-day, in home validation of infant body position measurements from inertial sensors

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Abstract

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Keywords: body position, motor development, everyday experiences, sitting, machine learning

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Full-day, in home validation of infant body position measurements from inertial sensors

Current Study

Methods

Participants

Apparatus

Procedure

Body position annotation

Body position classification

Results

Goal 1: Optimize and validate body position classification model

Goal 2: Assess classification accuracy over long recordings

Goal 3: Compare classification estimates to prior literature

Goal 4: Examine wear time and compliance in full-day data collection

Discussion

References

Table 1

Position	With Outliers		Without Outliers	
	Group	Individual	Group	Individual
Held	-0.02	0.16	0.55	0.63
Prone	0.97	0.83	0.97	0.84
Sitting	0.72	0.93	0.91	0.97
Supine	0.84	0.93	0.94	0.97
Upright	0.84	0.93	0.99	0.94
Overall	0.79	0.90	0.95	0.96

Table 2

Position	With Outliers		Without Outliers	
	Group	Individual	Group	Individual
Held	0.45	0.44	0.57	0.56
Prone	0.96	0.81	0.96	0.88
Sitting	0.72	0.93	0.91	0.93
Supine	0.75	0.93	0.90	0.94
Upright	0.93	0.95	0.97	0.95
Overall	0.80	0.92	0.92	0.94

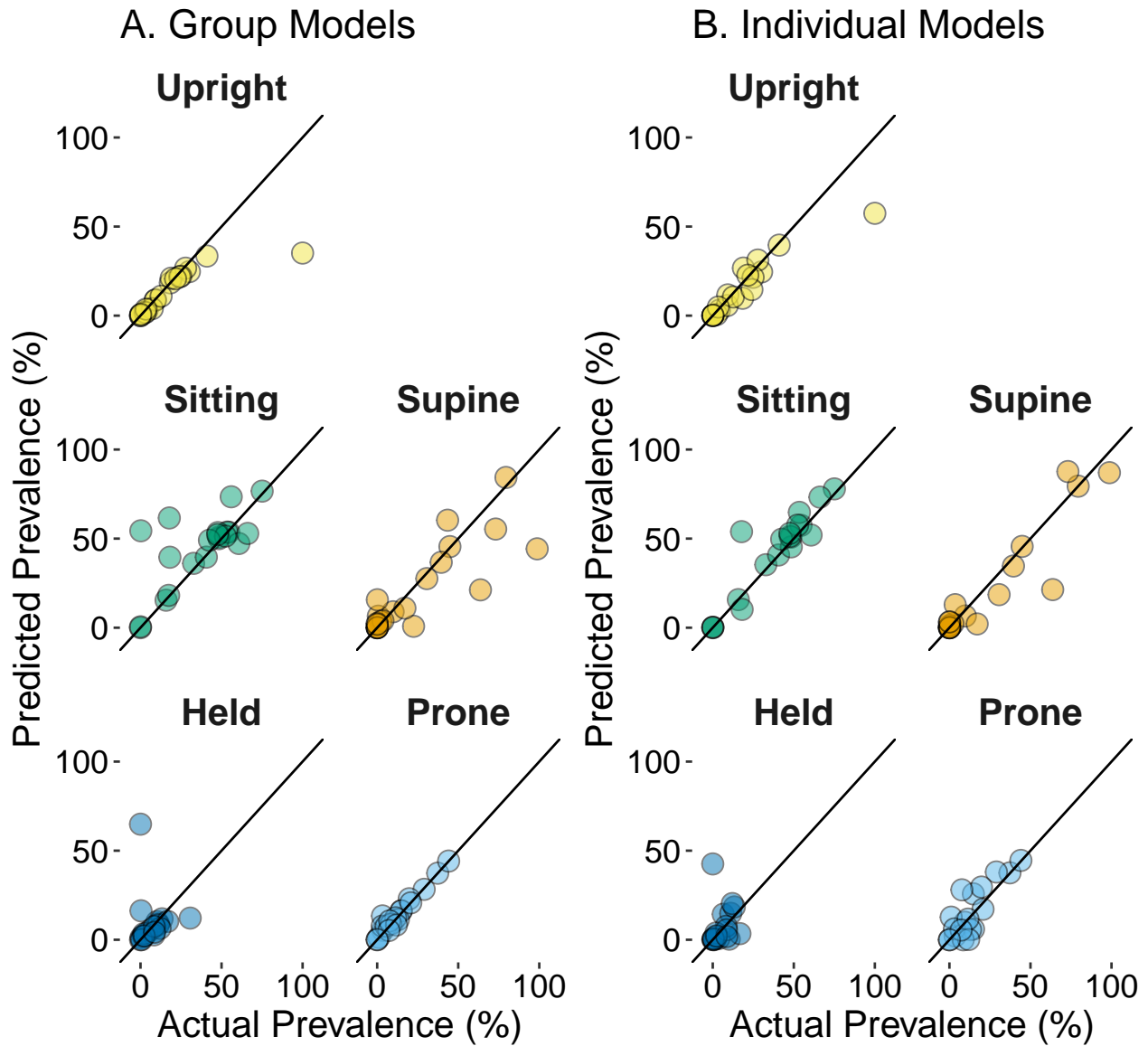


Figure 1. Overall agreement between human-coded body position and model-predicted body position in the long-delay period. Agreement for group models is shown in (A) and agreement for individual models is shown in (B). Plots are shown separately for each body position with a reference line that indicates perfect agreement; each point in a plot represent data for a single participant.

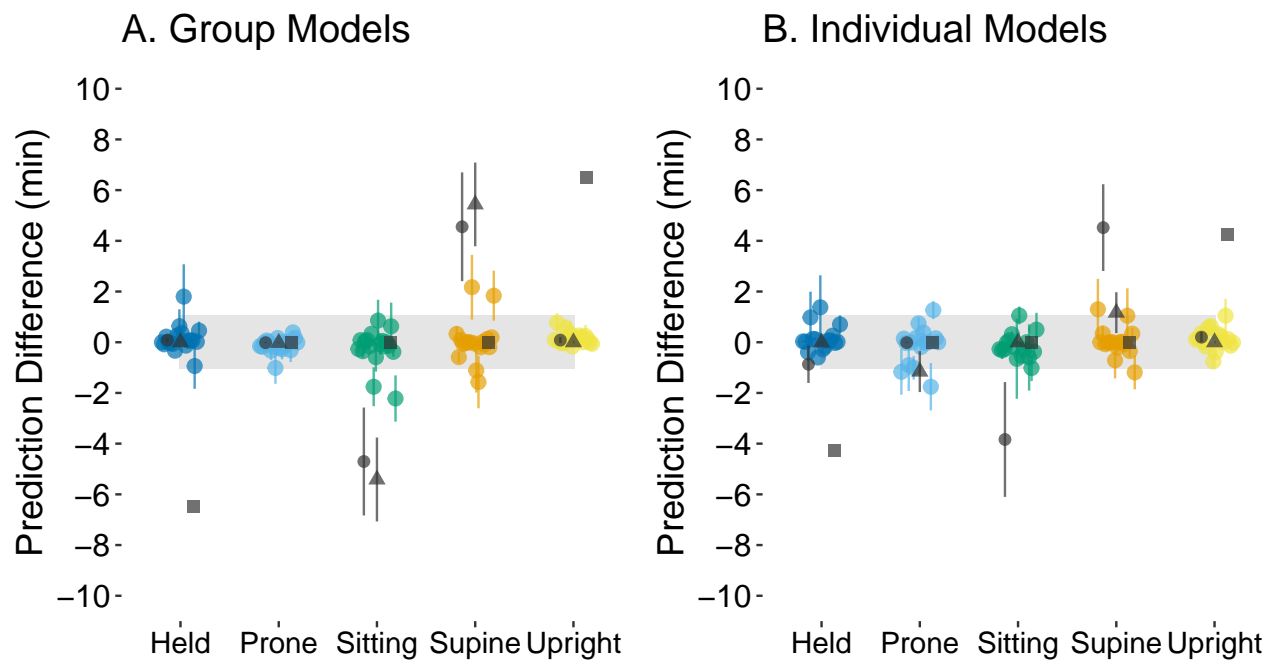


Figure 2. Prediction performance (difference in minutes between human-coded and model-predicted body position) for 10-minute bins in the long delay period. Each point shows the mean and SE for a single participant for each body position, summarizing the prediction difference for each of their 10-minute bins. Points falling within the gray shaded region indicate that prediction errors were less than 1 minute. Performance is plotted separately for (A) group models and (B) individual models. The three outlier participants are plotted in dark gray, with a different shape marking each individual.