

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

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Abstract

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## **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

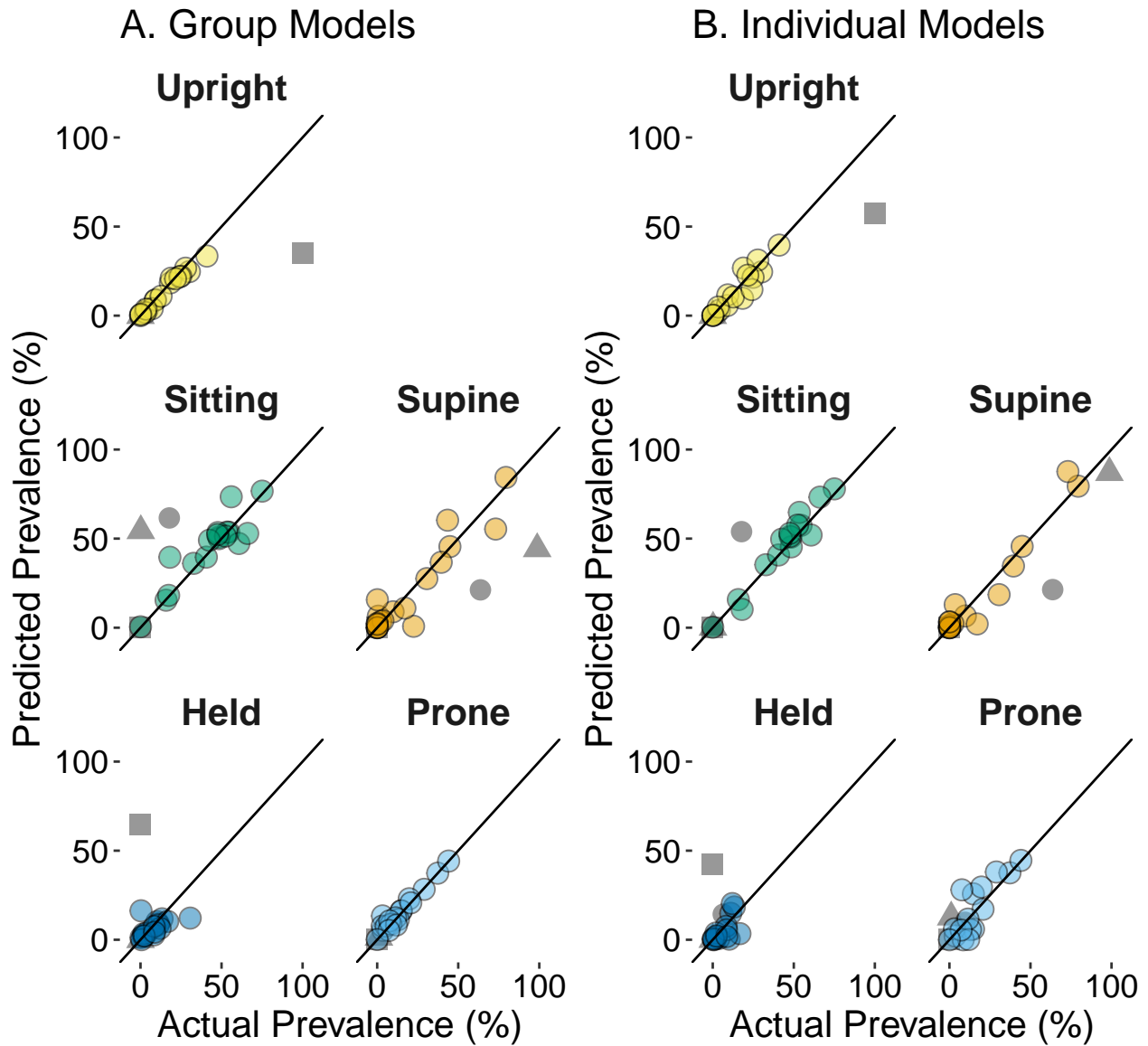
*Correlations between human-coded and model-predicted body position durations across the entire long delay period. Correlations are provided within each posture and overall, and computed separately using group and individual models with and without outlier participants.*

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

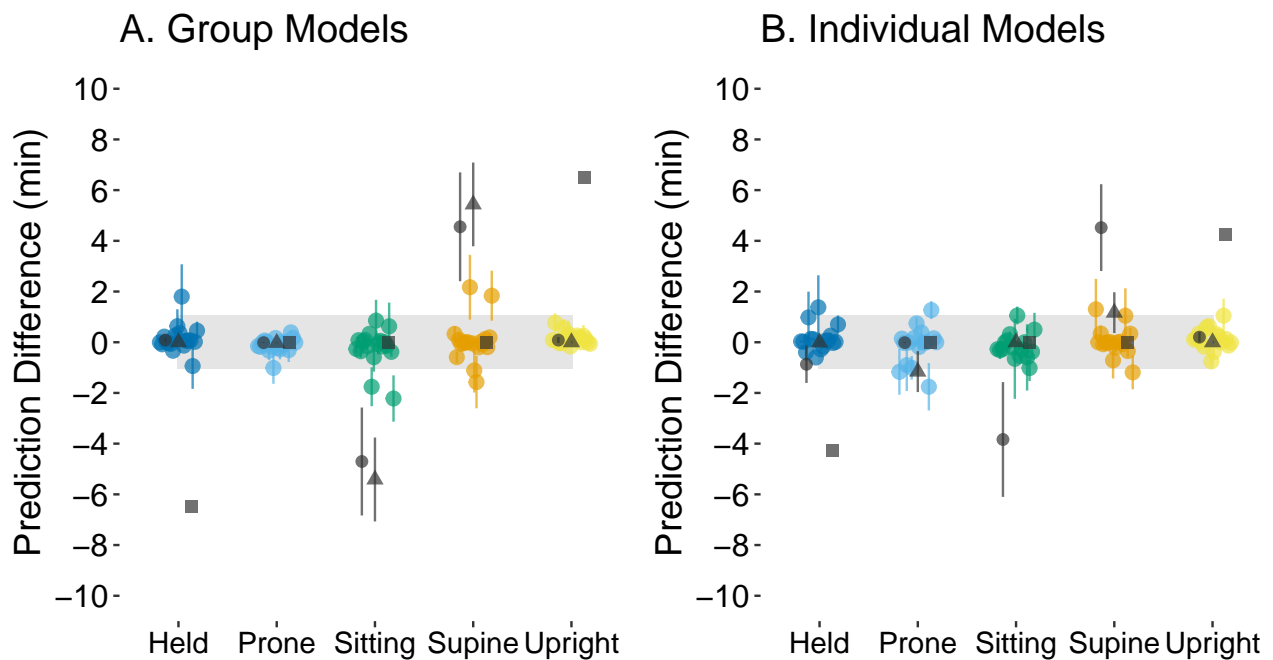
Table 2

*Correlations between human-coded and model-predicted body position durations using 10-minute bins during the long delay period. Correlations are provided within each posture and overall, and computed separately using group and individual models with and without outlier participants.*

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



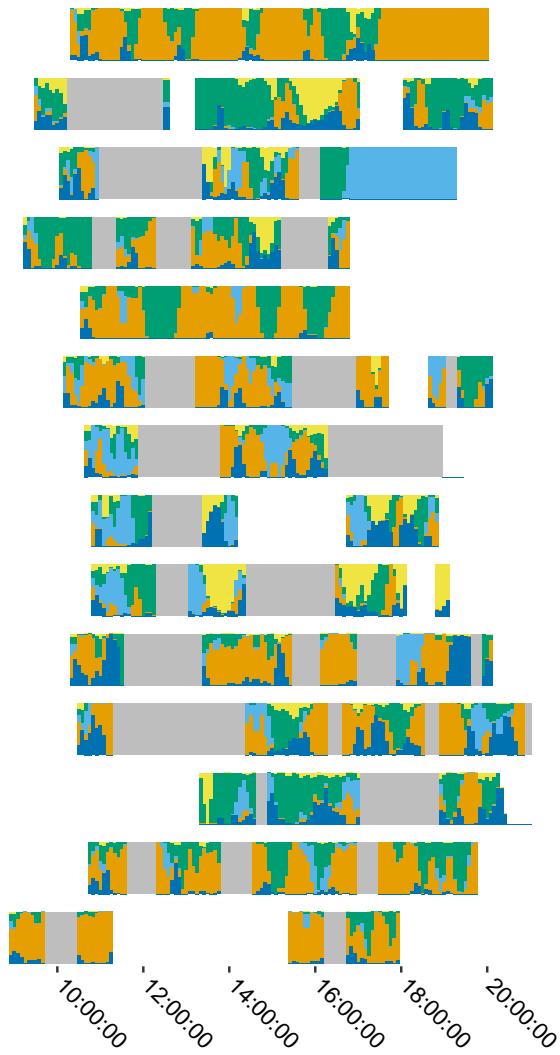
*Figure 1.* Overall agreement between human-coded body position and model-predicted body position in the long-delay period. Agreement for group models is shown in (A) and agreement for individual models is shown in (B). Plots are shown separately for each body position with a reference line that indicates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



*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 average 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.

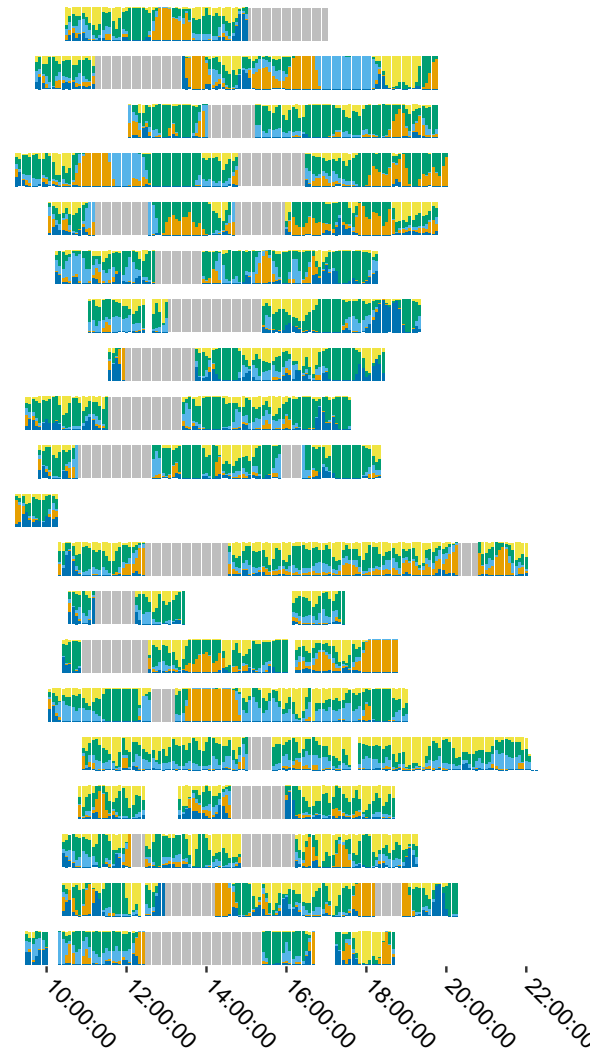


A. 4–7 Months



Position    Nap    Sitting    Supine  
 Upright    Prone    Held

B. 11–14 Months



Position    Nap    Sitting    Supine  
 Upright    Prone    Held

Figure 3. Timelines