

The Feasibility of Remote Measurement of Infant Sleep and Motor Development

Aaron DeMasi¹, Mali Waugh¹, Wei Wang¹, and Sarah Berger²

¹City University of New York The Graduate Center

²College of Staten Island

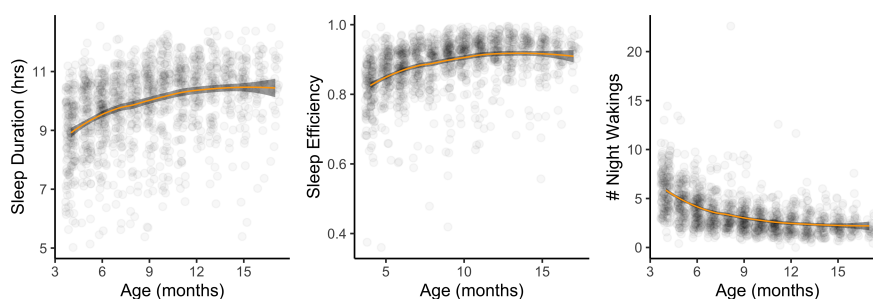
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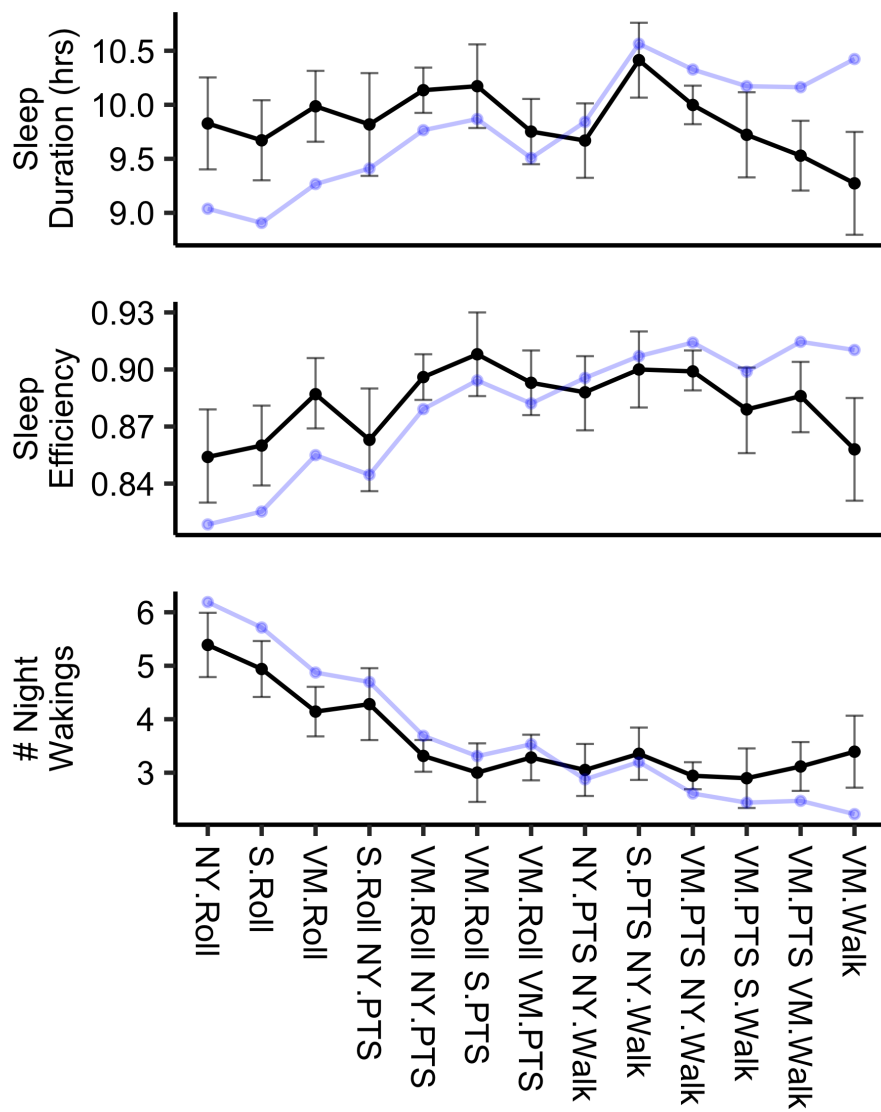
Abstract

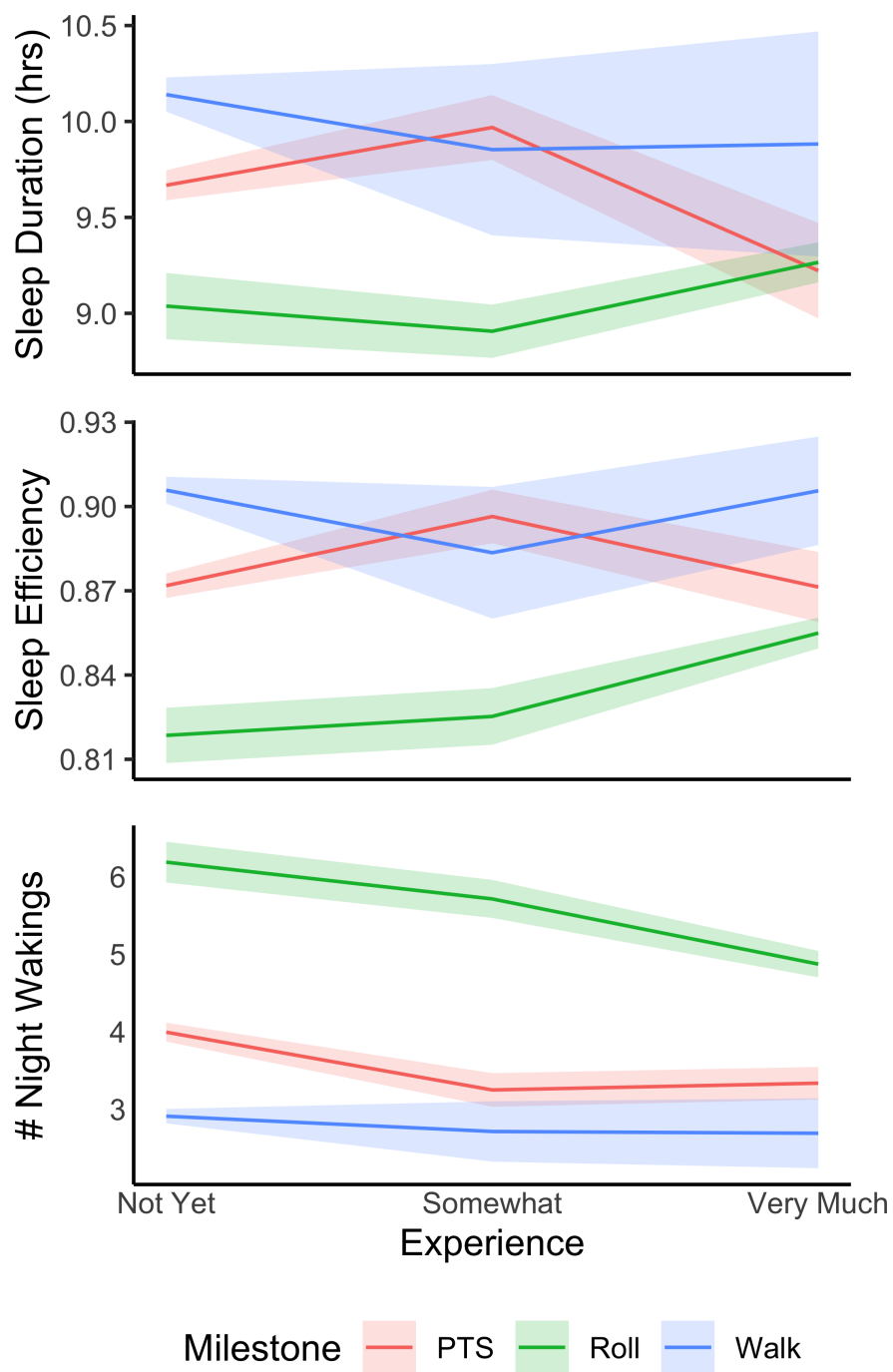
In response to the COVID-19 pandemic shut-down of in-person research laboratories, remote data collection became mainstream in developmental psychology research. The aim of this study was to test the feasibility of two remote data collection methods for studying sleep and motor development in infancy and the relationship between the two. We asked 1,371 parents of infants aged 4 to 17 months who used the Nanit baby monitor to take the on-line Survey of Well-being of Young Children (SWYC) about their infants' motor experience. Nanit uses auto-videosomnography and computer vision algorithms to calculate and report summary statistics of infants' sleep. Nanit replicated all expected developmental trends in sleep, while the SWYC only replicated some, appearing to underestimate infants at the transition between motor milestones. However, we replicated some well-established findings regarding the relationship between sleep and motor development using both measures, suggesting that both Nanit and the SWYC can feasibly be used for remote data collection, especially if some modifications were made to how researchers explained using the SWYC to caregivers. Researchers should consider alternatives to traditional research methods not only when in-person participation is difficult or impossible, but also when large samples are needed and/or simple measurement tools are sufficient.

Hosted file

Blinded-SWYC-Manuscript.docx available at <https://authorea.com/users/588620/articles/625751-the-feasibility-of-remote-measurement-of-infant-sleep-and-motor-development>







| Variables | n | % |
|--------------------------------|-----|--------|
| Race/Ethnicity | | |
| African American | 5 | 0.04% |
| Asian | 40 | 2.91% |
| Chose not to answer | 15 | 1.09% |
| Hispanic | 31 | 2.26% |
| Not asked | 894 | 65.21% |
| Other | 16 | 1.17% |
| White | 370 | 26.99% |
| Highest degree | | |
| Graduate | 183 | 13.35% |
| College | 241 | 17.58% |
| Some college | 34 | 2.48% |
| High school | 15 | 1.09% |
| Less than high school | 1 | 0.07% |
| Chose not to answer | 3 | 0.22% |
| Not asked | 894 | 65.21% |
| Country | | |
| United States | 366 | 26.70% |
| Canada | 62 | 4.52% |
| United Kingdom | 22 | 1.61% |
| Australia | 5 | 0.37% |
| Israel | 4 | 0.29% |
| Ireland | 2 | 0.15% |
| Mexico | 2 | 0.15% |
| Other | 12 | 8.75% |
| Not asked | 896 | 65.35% |
| Annual Household Income | | |
| > \$200,000 | 114 | 8.32% |
| \$150,000-200,000 | 83 | 6.05% |
| \$100,000-150,000 | 105 | 7.66% |
| \$75,000-100,000 | 52 | 3.79% |
| \$50,000-75,000 | 50 | 3.65% |
| \$25,000-50,000 | 15 | 1.09% |
| < \$25,0000 | 6 | 0.44% |
| Chose not to answer | 52 | 3.79% |
| Not asked | 894 | 65.21% |

| <i>Milestone subgroups</i> | <i>n</i> |
|-----------------------------------------------|----------|
| Not Yet Roll ^e | 57 |
| Somewhat Roll ^e | 95 |
| Very Much Roll ^e | 147 |
| Somewhat Roll and Not Yet PTS ^e | 27 |
| Very Much Roll and Not Yet PTS ^e | 217 |
| Very Much Roll and Somewhat PTS ^e | 40 |
| Very Much Roll and Very Much PTS ^e | 66 |
| Not Yet PTS and Not Yet Walk ^e | 48 |
| Somewhat PTS and Not Yet Walk ^e | 47 |
| Very Much PTS and Not Yet Walk ^e | 317 |
| Very Much PTS and Somewhat Walk ^e | 43 |
| Very Much PTS and Very Much Walk ^e | 110 |
| Very Much Walk ^e | 117 |
| | |
| <i>Excluded subgroups</i> | |
| Not Yet Roll and Not Yet PTS ^e | 6 |
| Somewhat Roll and Somewhat PTS ^e | 6 |
| Somewhat Roll and Very Much PTS | 8 |
| Not Yet PTS and Very Much Walk | 1 |
| Somewhat PTS and Somewhat Walk ^e | 1 |
| Somewhat PTS and Very Much Walk | 2 |
| Somewhat Walk ^e | 4 |
| Not Yet Walk ^e | 12 |

| | | Age (months) | | | | | | | | | | | | | | | |
|------|-----------|--------------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|
| | | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | | |
| Roll | Not Yet | <i>N</i> | 45 | 12 | 4 | 2 | 0 | - | - | - | - | - | - | - | - | - | - |
| | | <i>z</i> | 9.24 | -0.33 | -3.32 | -3.16 | -3.43 | - | - | - | - | - | - | - | - | - | - |
| | Somewhat | <i>N</i> | 61 | 34 | 26 | 13 | 2 | - | - | - | - | - | - | - | - | - | - |
| | | <i>z</i> | 6.35 | 1.41 | -1.26 | -2.77 | -4.83 | - | - | - | - | - | - | - | - | - | - |
| | Very Much | <i>N</i> | 55 | 92 | 125 | 103 | 95 | - | - | - | - | - | - | - | - | - | - |
| | | <i>z</i> | -11.50 | -1.04 | 3.23 | 4.46 | 6.45 | - | - | - | - | - | - | - | - | - | - |
| PTS | Not Yet | <i>N</i> | - | - | 127 | 78 | 45 | 25 | 12 | 6 | 3 | 3 | 0 | - | - | - | - |
| | | <i>z</i> | - | - | 11.05 | 6.60 | 2.54 | -2.43 | -3.93 | -4.78 | -4.69 | -4.38 | -4.37 | - | - | - | - |
| | Somewhat | <i>N</i> | - | - | 16 | 16 | 14 | 24 | 13 | 6 | 6 | 1 | 0 | - | - | - | - |
| | | <i>z</i> | - | - | 0.03 | 1.13 | 1.3 | 3.06 | 0.49 | -1.47 | -0.97 | -2.47 | -2.48 | - | - | - | - |
| | Very Much | <i>N</i> | - | - | 12 | 24 | 38 | 78 | 86 | 94 | 78 | 74 | 60 | - | - | - | - |
| | | <i>z</i> | - | - | -8.21 | -5.37 | -2.43 | 0.52 | 2.71 | 4.16 | 3.89 | 4.29 | 4.28 | - | - | - | - |
| Walk | Not Yet | <i>N</i> | - | - | - | - | - | 119 | 101 | 82 | 52 | 39 | 19 | 10 | 2 | 0 | 0 |
| | | <i>z</i> | - | - | - | - | - | 4.83 | 4.15 | 2.25 | -0.08 | -1.18 | -2.86 | -4.79 | -4.57 | -3.89 | - |
| | Somewhat | <i>N</i> | - | - | - | - | - | 3 | 7 | 11 | 11 | 7 | 5 | 3 | 1 | 0 | 0 |
| | | <i>z</i> | - | - | - | - | - | -1.93 | -0.21 | 1.39 | 2.07 | 0.72 | 0.44 | -0.74 | -1.08 | -1.31 | - |
| | Very Much | <i>N</i> | - | - | - | - | - | 5 | 3 | 13 | 24 | 32 | 36 | 54 | 38 | 25 | 25 |
| | | <i>z</i> | - | - | - | - | - | -5.68 | -5.53 | -3.69 | -0.84 | 1.28 | 3.69 | 6.84 | 6.70 | 5.87 | 5.87 |