

SLEEP DURATION AND TIMING IN A RURAL POPULATION IN MADAGASCAR



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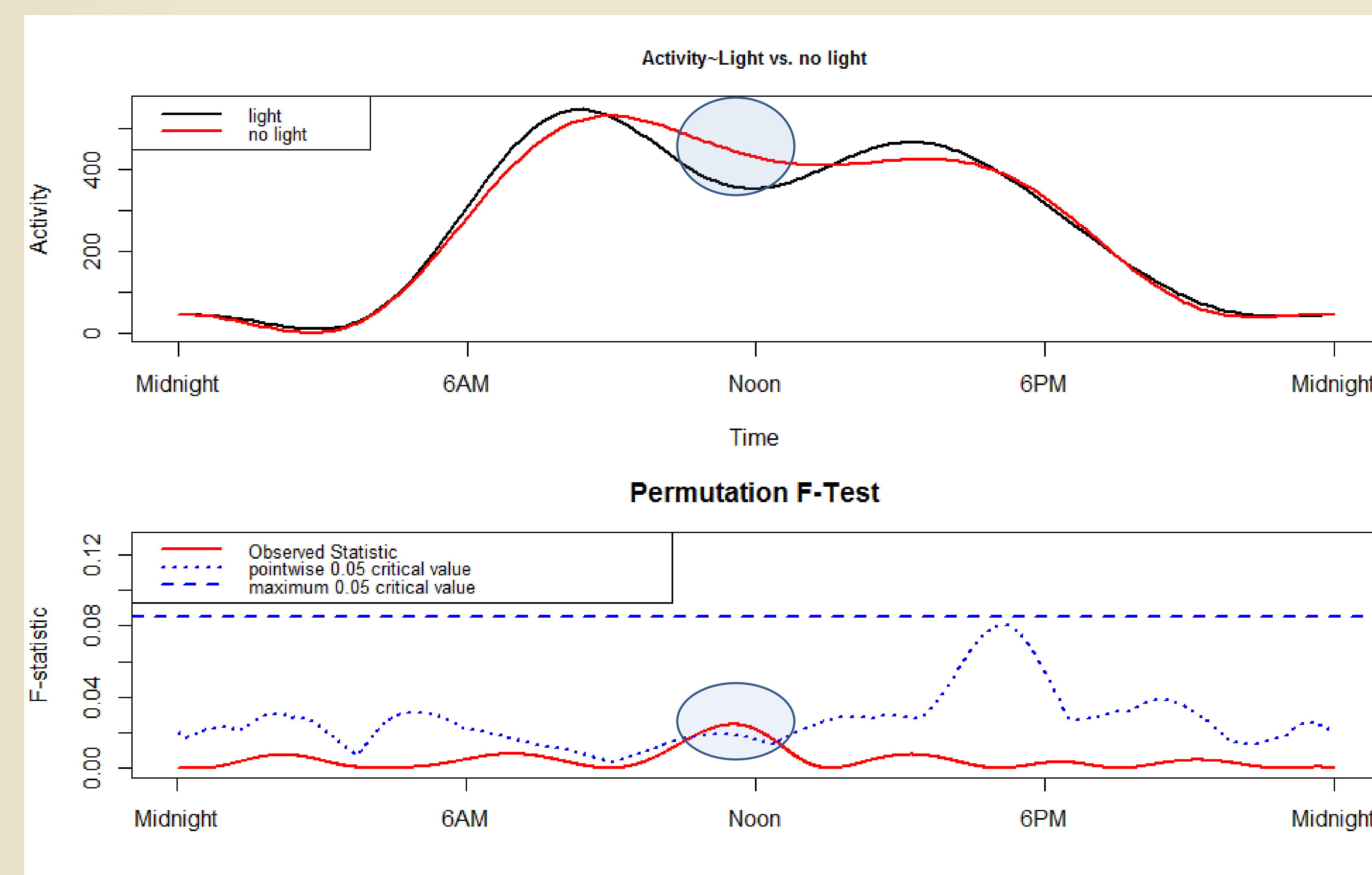
Sleep comprises 36% of the average human lifespan in developed countries, yet little is known about sleep quality in “traditional” small-scale societies that lack access to electricity. It is widely thought that access to electricity shortens and consolidates sleep durations, with individuals sacrificing sleep for work, entertainment and socializing after dark. We used actigraphy and polysomnography to investigate sleep in a community without electricity in Madagascar, including through a novel experiment that provided high quality lighting for some participants.

PROJECT OBJECTIVES

- Collect basic sleep measures and assess sleep quality.
- Use mobile polysomnography to validate field generated actigraphy.
- Compare sleep measures with measures collected in developed countries.
- Investigate effects of artificial lighting on consolidation of sleep.



Putting on actigraphic watches.



Testing the role of light in sleep consolidation

METHODOLOGY

- Twenty-three Madagascar residents (10 females, 13 males) volunteered to generate actigraphy for up to 21 days per individual (n total nights = 329).
- Polysomnography: two individuals (1 male, 1 female) underwent a total of four nights with sleep monitoring.
- We used a linear mixed effects model to examine the associations between measures of sleep and age, sex, household size, and occupation.
- We used functional linear modeling to determine the role of artificial light in the consolidation of sleep phases.

CONCLUSIONS

- Sleep onset occurred on average at 19:21 hours.
- Individuals slept on average 6.5 h per night.
- Older individuals actually slept longer ($\beta = 0.31$, $z = 2.82$, $p = 0.004$), and farmers slept less than non-farmers ($\beta = -0.41$, $z = 3.22$, $p = 0.001$) and had more fragmented sleep.
- Counter to expectations, artificial lighting did not lead to more consolidated sleep. Instead, individuals provided with lighting increased activity during the night ($\beta = 0.15$, $p = 0.056$), and altered their activity during daylight (see circled areas on Figure).



Mobile polysomnography for field use.

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