

# Association of Mood and Gait Parameters in Healthy Adults: An Ecological Momentary Assessment Study

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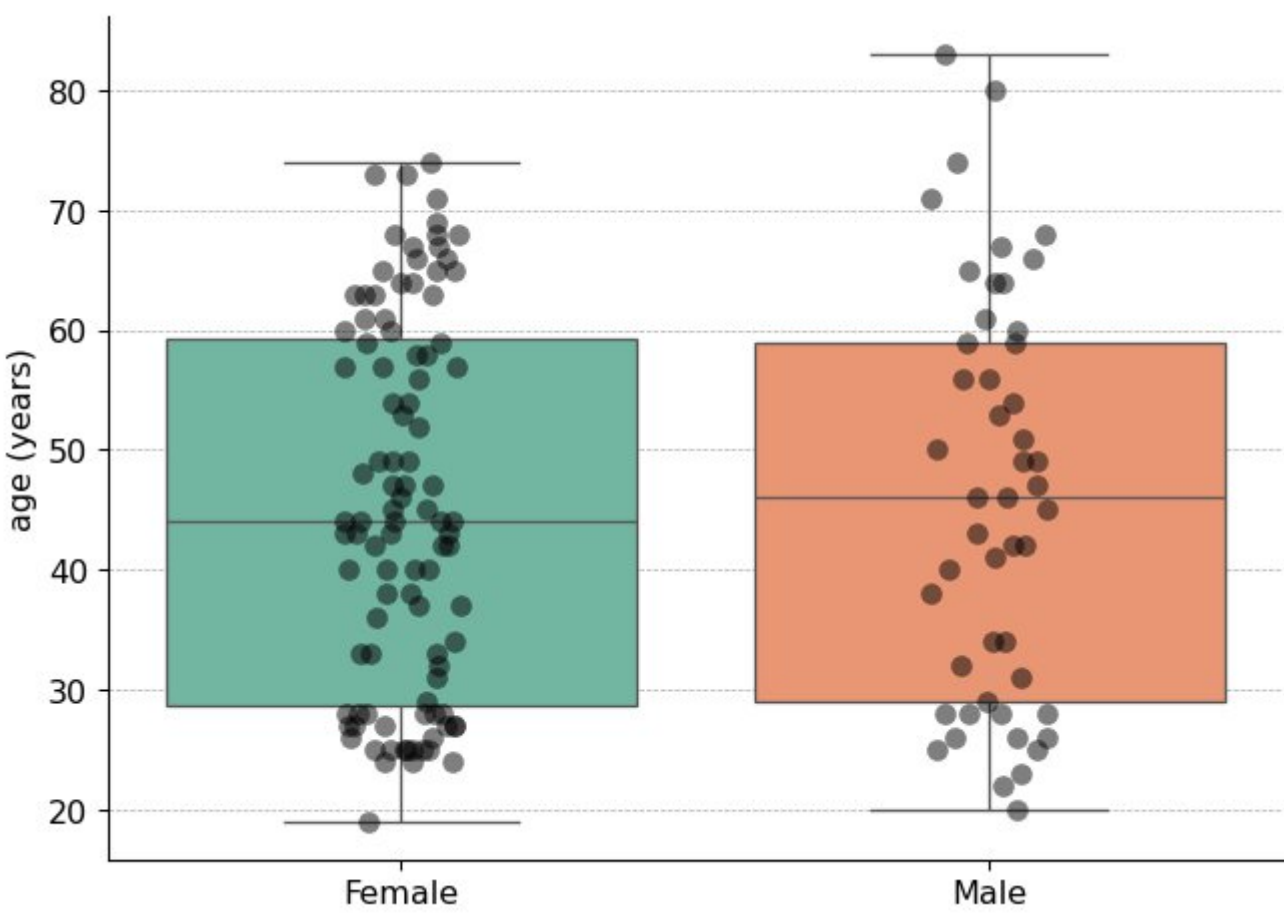
## Introduction

- Depressive mood are associated with reduced step length, increased cadence and reduced gait speed [1]
- To date, studies have mainly compared people with depression to people without depression [2]
- Here, we explore the association between mood and gait in healthy volunteers (HV) using ecological momentary assessment (EMA) for recording momentary mood
- Specifically, we look at:
  - people < 60 years old, and
  - people ≥ 60 years
- We hypothesize that there is a significant correlation between current mood and selected gait parameters, particularly among people aged 60 years or older compared to people younger than 60 years.

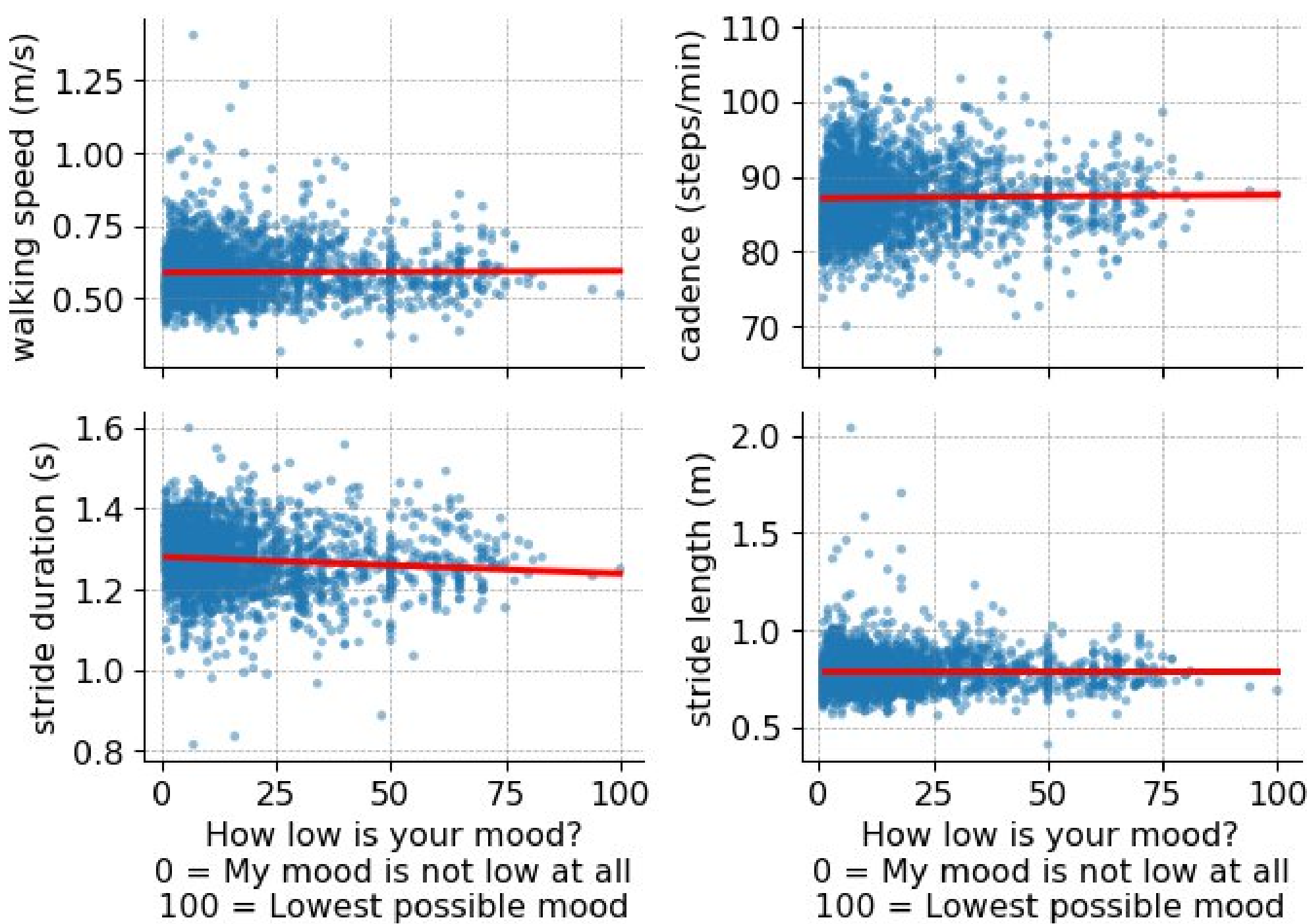
## Conclusion

- Initial results showed **weak but significant** correlations between mood and cadence and step duration in people < 60 years; however, when accounting for repeated measures through linear mixed effects models, these observed effects were not present.
- For people ≥ 60 years, a **highly significant** association between mood and cadence and stride length was found:
  - a more negative mood was associated with an increased cadence
  - a more negative mood was associated with shorter stride length
- However, when using linear mixed effects models were used to assess the association, the results did not show statistical significance
- These preliminary results suggested that there might be a relevant association between mood and select gait parameters, particularly cadence, that is more pronounced in people ≥ 60 years

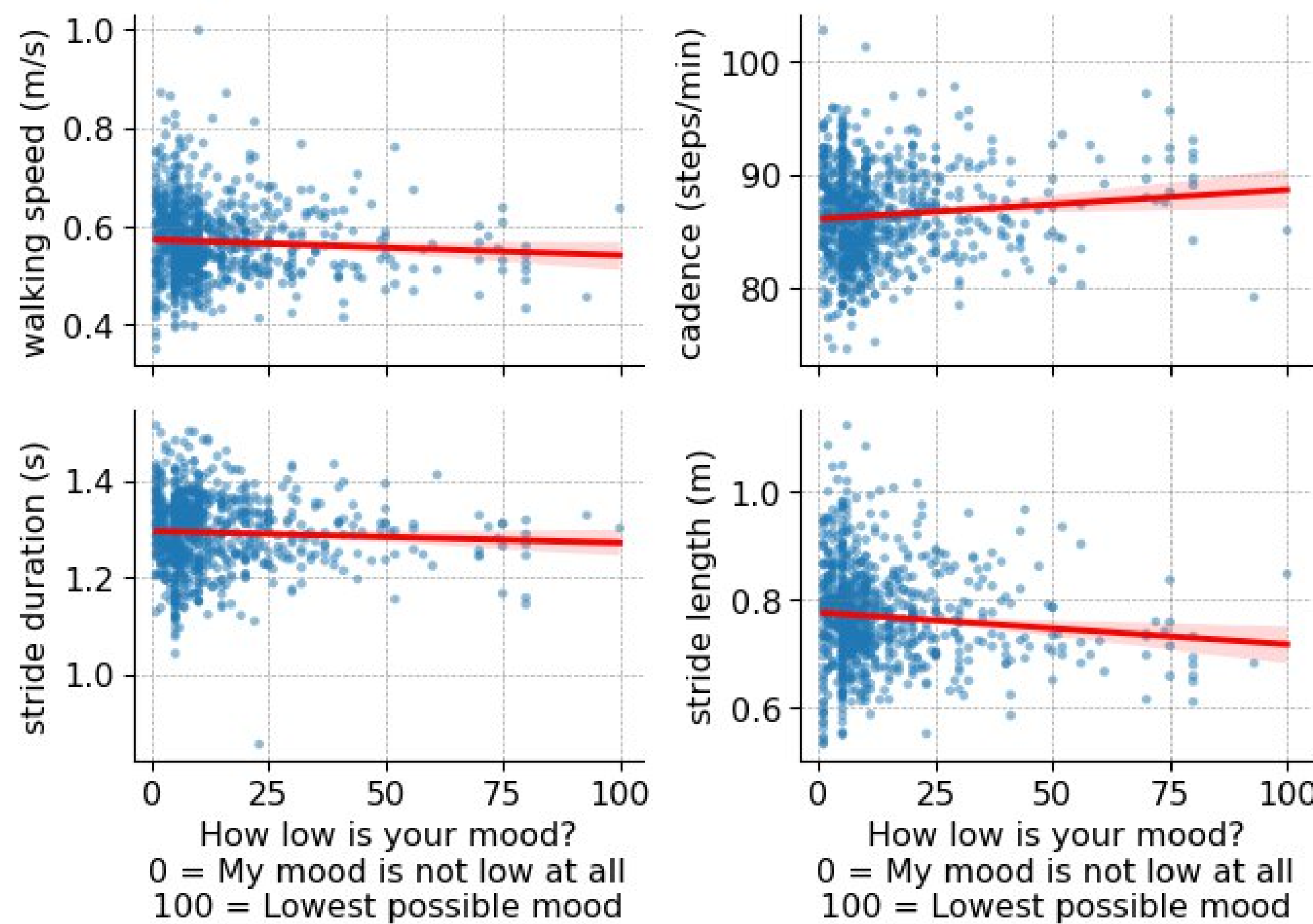
## Results



**Fig. 1:** Age (in years) and gender for 149 healthy volunteers.



**Fig. 2:** Correlation between gait parameters and mood for people < 60 years.

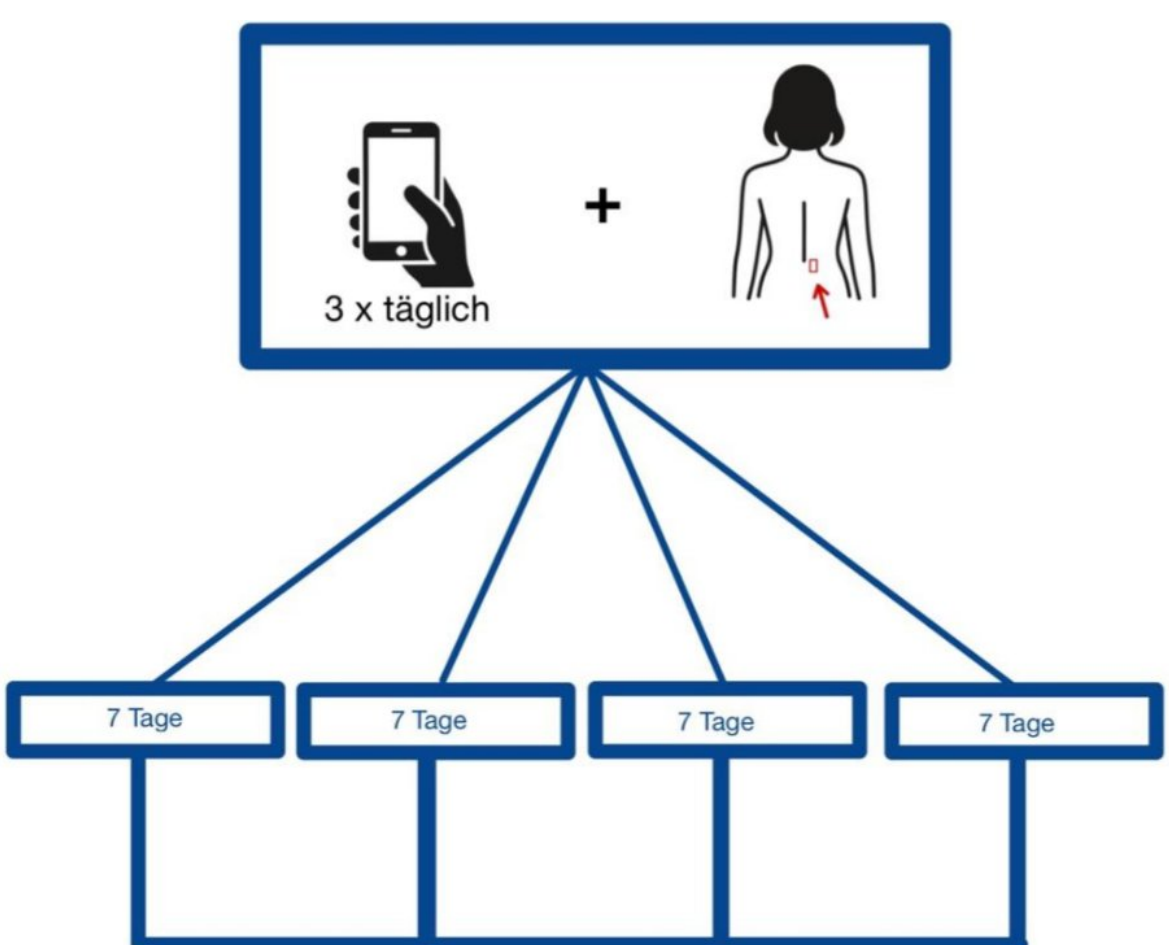


**Fig. 3:** Correlation between gait parameters and mood for people ≥ 60 years.

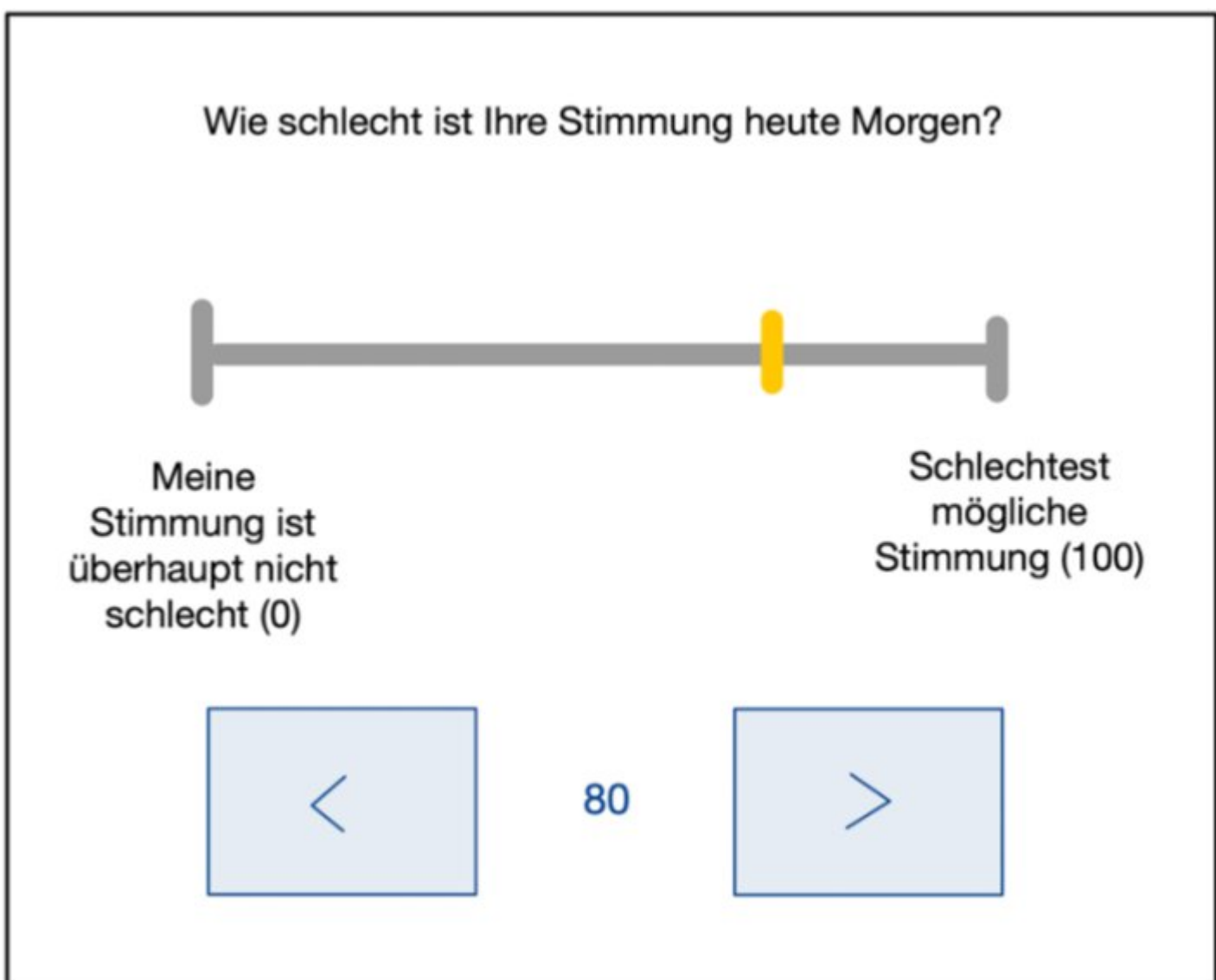
**Table 1:** Regression coefficients,  $\beta$ , for the people < 60 years (left) and ≥ 60 years (right).

|                       | $\beta$ | 95% C.I.        | p value | $\beta$ | 95% C.I.        | p value |
|-----------------------|---------|-----------------|---------|---------|-----------------|---------|
| Cadence (steps / min) | -0.004  | [-0.018, 0.010] | 0.559   | -0.004  | [-0.023, 0.016] | 0.709   |
| Stride duration (s)   | -0.000  | [-0.000, 0.000] | 0.739   | 0.000   | [-0.000, 0.001] | 0.309   |
| Stride length (m)     | -0.000  | [-0.000, 0.001] | 0.794   | 0.000   | [-0.000, 0.001] | 0.694   |
| Walking speed (m / s) | -0.002  | [-0.018, 0.014] | 0.808   | 0.000   | [-0.000, 0.000] | 0.980   |

## Methods



- IDEA-FAST Clinical observation study (COS)
- $n = 149$  healthy volunteers
- Four technology use periods (TUPs)
  - Lower back accelerometry (AX6)
  - Ecological momentary assessment (CANTAB)
- Time windows of 2 hours, centered around the response to the EMA entry



## References

- [1] Zhang et al. (2022). JMIR mHealth and uHealth, 10(10), e40667. <https://doi.org/10.2196/40667>
- [2] Adolph et al. (2021). Cognitive Therapy and Research 45 (6): 1128–40. <https://doi.org/10.1007/s10608-021-10215-7>