

Background

- Subjective cognitive decline (SCD) may be a risk factor for future cognitive impairment, but relatively little is known about how experiencing SCD impacts daily functioning in real time.
- In research, SCD is typically assessed only sporadically (e.g., once a year). With *ecological momentary assessments (EMAs)*, we can measure short-term fluctuations in SCD as individuals report on their SCD at least daily for several weeks.
- With smartphones, we can passively collect information about people’s real-world behaviors, such as their travel patterns.
- For both daily EMA and passively collected smartphone data, there are different aspects to investigate:
 1. **Intra-individual average:** Global level of endorsement of SCD/mobility across the entire observation period, and
 2. **Intra-individual variability:** Day-to-day changes in SCD endorsement/mobility.

We aimed to investigate daily EMAs of SCD and its associations with smartphone-based mobility measures.

Methods

- 62 cognitively unimpaired participants (75.7±8.1 years, 62% female) were followed for 20.1±3.6 days:
 - They completed daily EMAs of their experiences of various subjective cognitive complaints. They also indicated how bothersome the experiences overall were on a 4-point scale from “not at all” to “quite a bit.”
 - Participants also underwent passive sensing on their smartphones, providing mobility-related data on time spent at home each day.
- Daily intra-individual averages and variability (i.e., standard deviations) were calculated for SCD EMAs and mobility data.
- We ran linear mixed-effects models to investigate relationships between SCD EMAs and passive sensing outcomes.
- Below, we highlight two SCD items and their levels of bother as examples, as they represent relatively highly endorsed, distinct experiences.

Results

- EMAs were completed on 1,023 of 1,432 days across all participants, representing 71% adherence.
- Average endorsement of SCD experiences was relatively low, but EMAs revealed within-person variability over the observation period (Figure 1, 2).
- Participants spent an average of 18h 20m at home each day (range: 12h 11m–23h 36m; Figure 3).
- We found no associations between the average home time and average SCD endorsement of any items.

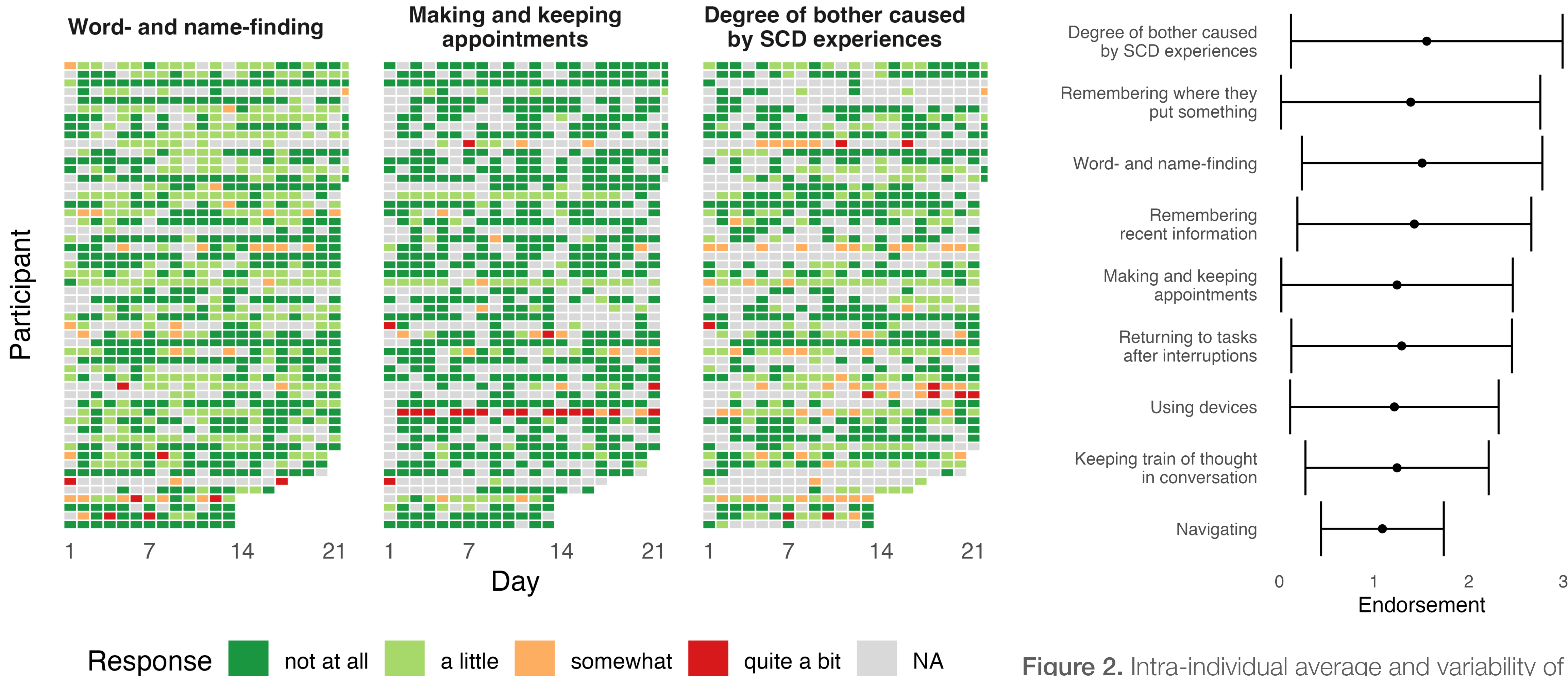


Figure 1. Daily EMA reports of two selected SCD experiences, and the degree of bother.

Figure 2. Intra-individual average and variability of SCD endorsement by item.

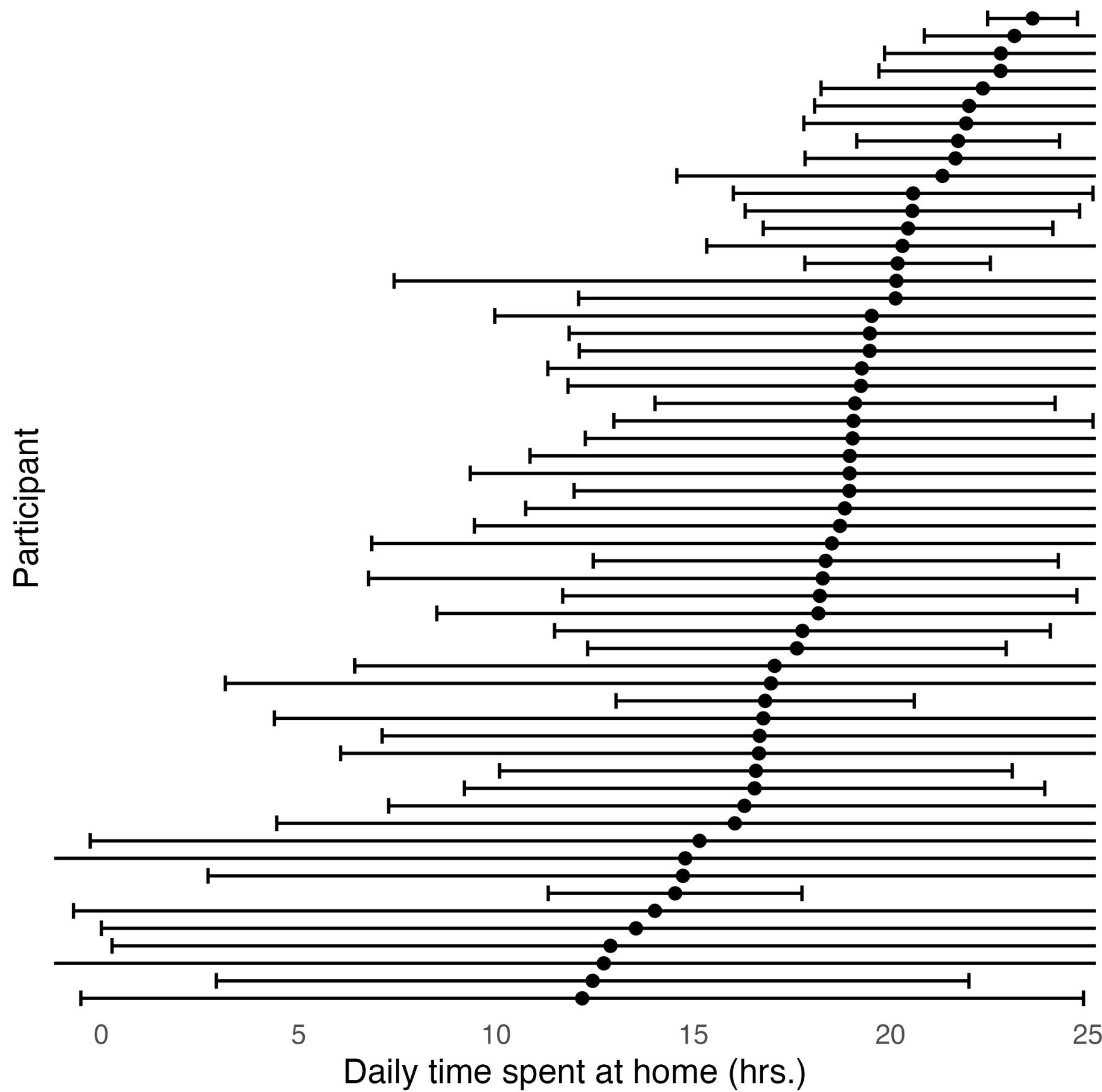


Figure 3. Variability in time spent at home by participant. The dots represent the average home time for each participant, while the error bars represent the intra-individual variability.

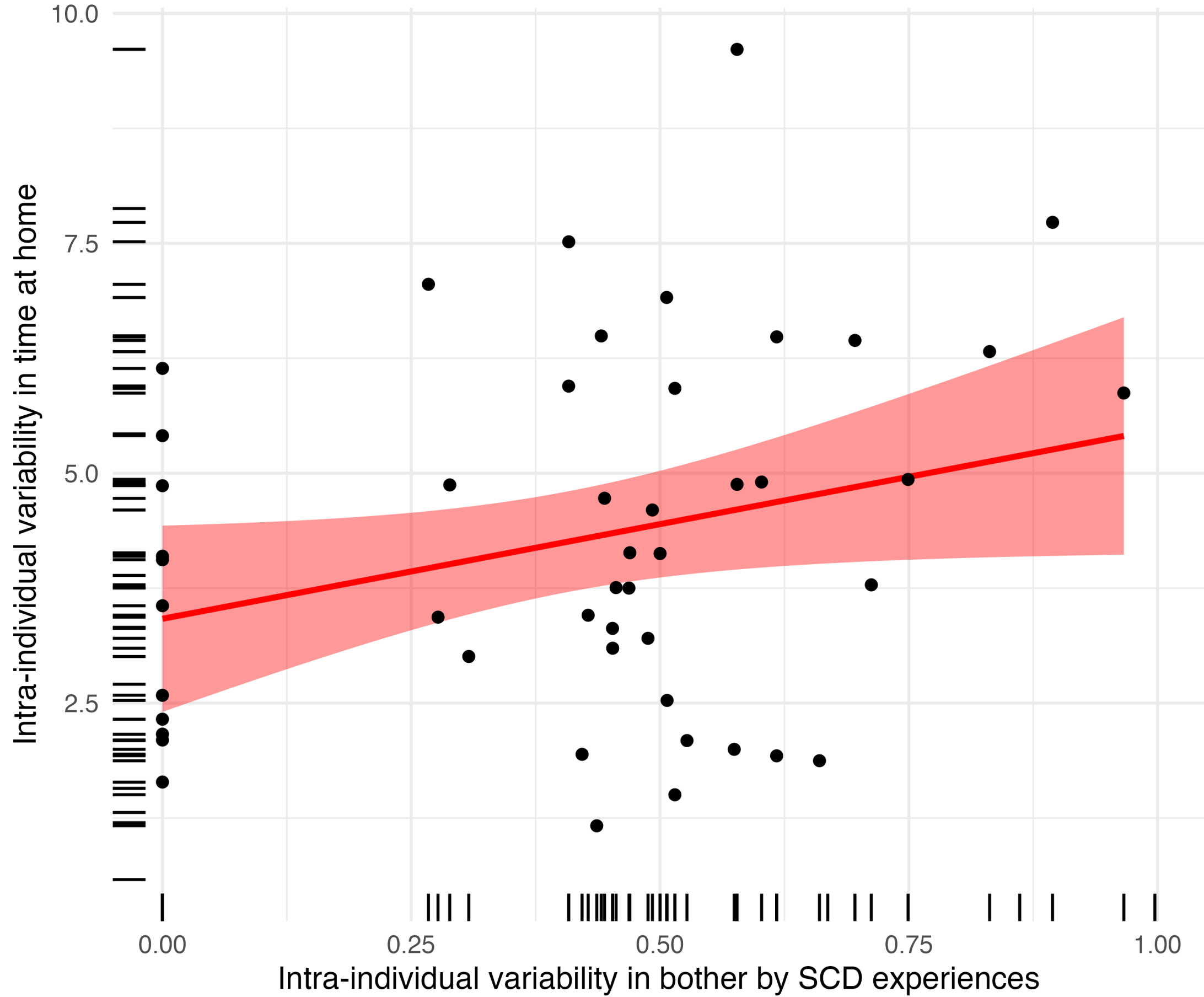


Figure 4. Association between intra-individual variability in bother caused by SCD experiences and home time.

Results (cont’d)

- We found trend-level associations between intra-individual variability in perceived bother from SCD experiences and home time (estimate: 2.06, 95%CI = [-0.03, 4.15], $p = 0.054$), suggesting that people who perceive more “ups and downs” might have more variable mobility patterns.
- We did not observe any significant associations between other SCD items and home time.

EMAs show intra-individual variability of SCD experiences over a 3-week interval. Changes in cognitive complaints may be related to changes in real-world behaviors.