The State of Motion

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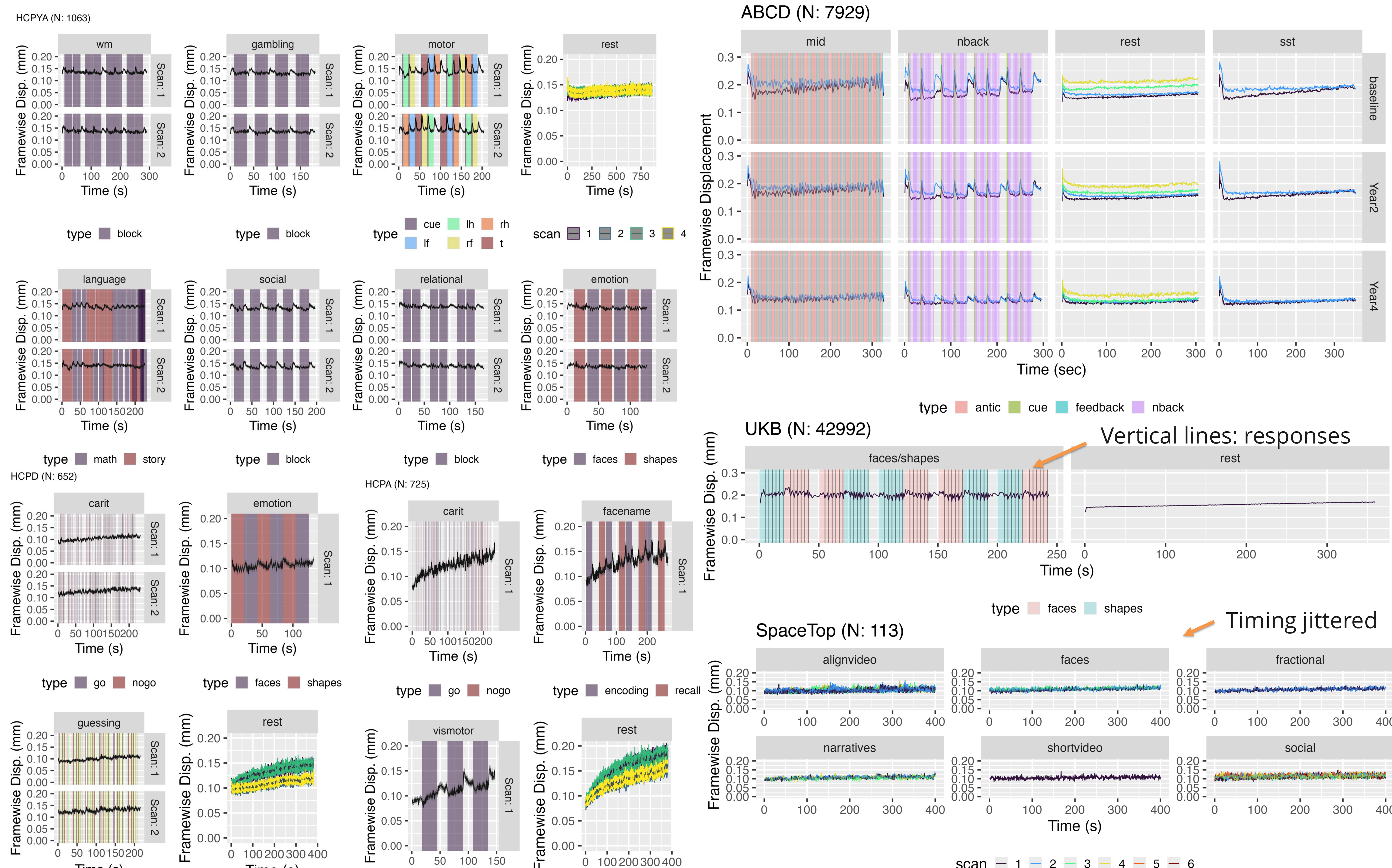
Introduction

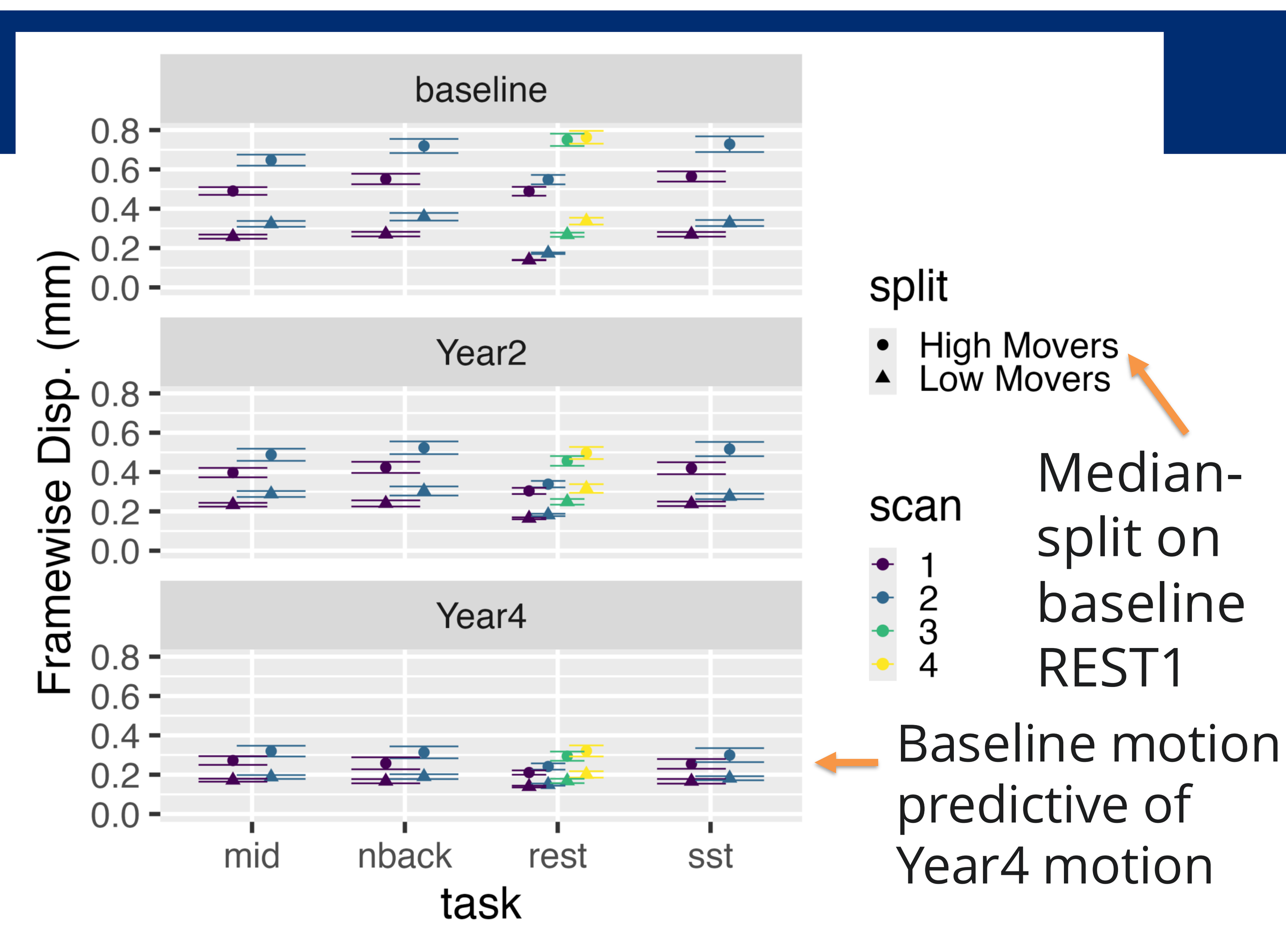
- Participant motion remains problematic
  - Failing to account for motion-induced artifacts drastically increases likelihood of biased conclusions
  - Mitigation possible, but a need exists to exclude participants
  - In some datasets, rates of participant exclusion can be substantial (e.g., 40-60%)
- Aims:
  - Quantify motion in several large datasets
  - Measure stability of motion across time
  - Assess rates of exclusion due to motion

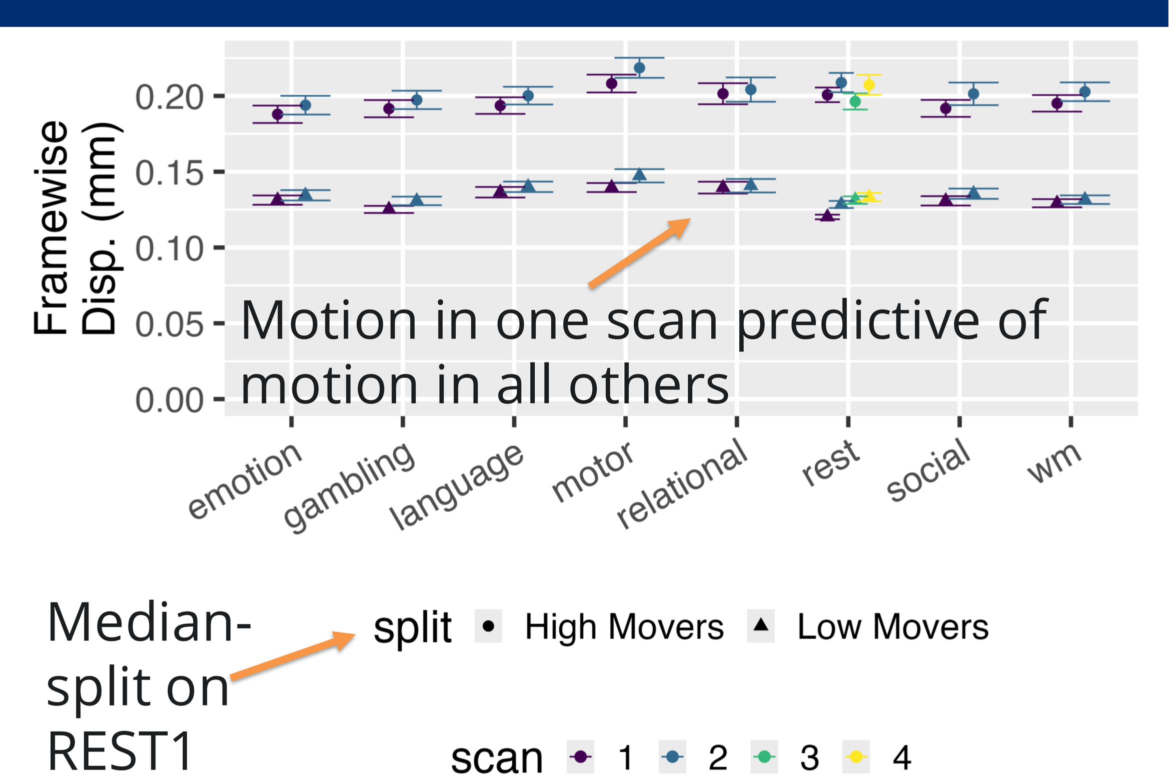
How Much do Participants Move?

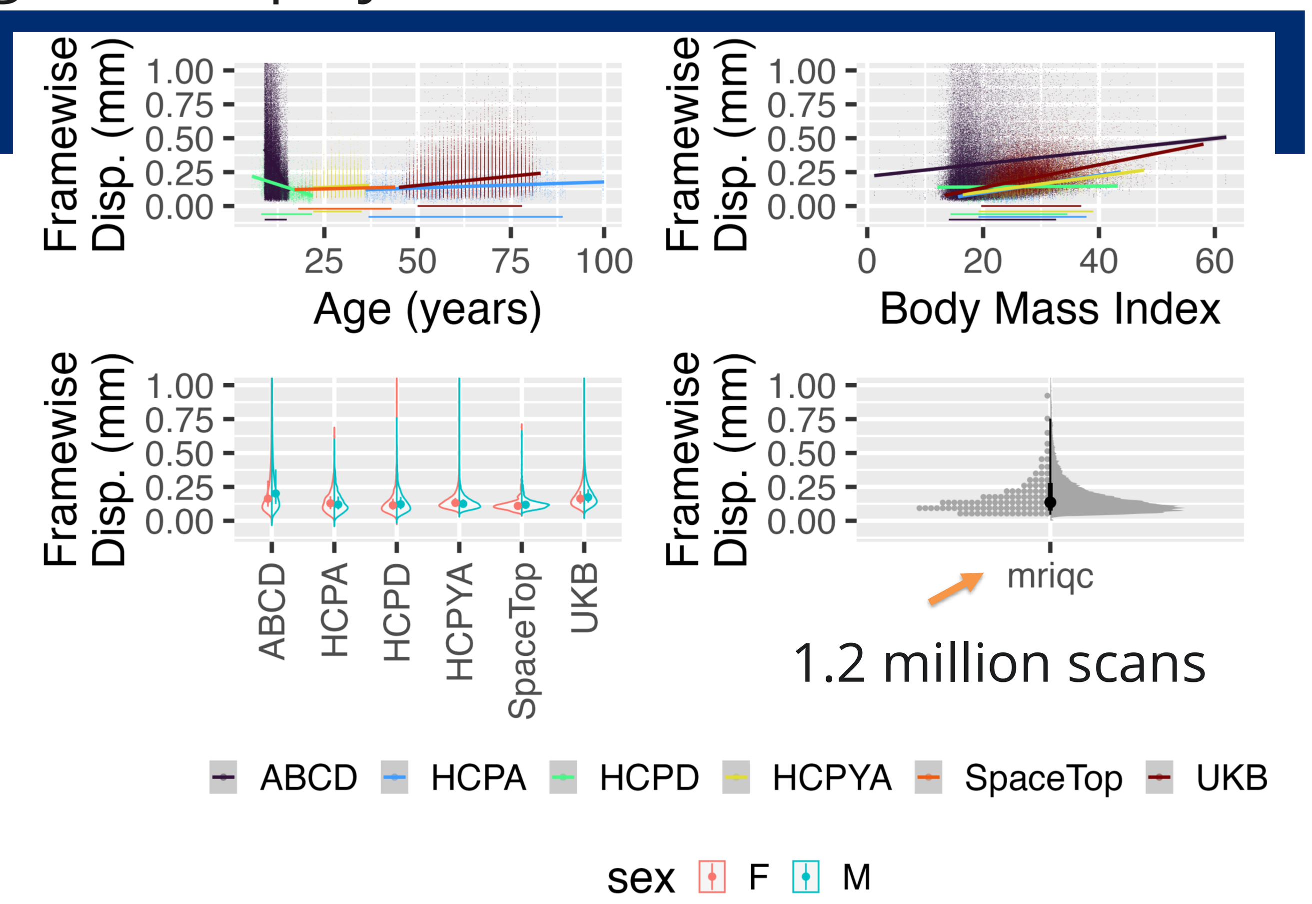


Median (±2 SEM) framewise displacement (across participants). When consistent, averaged task timings are displayed.

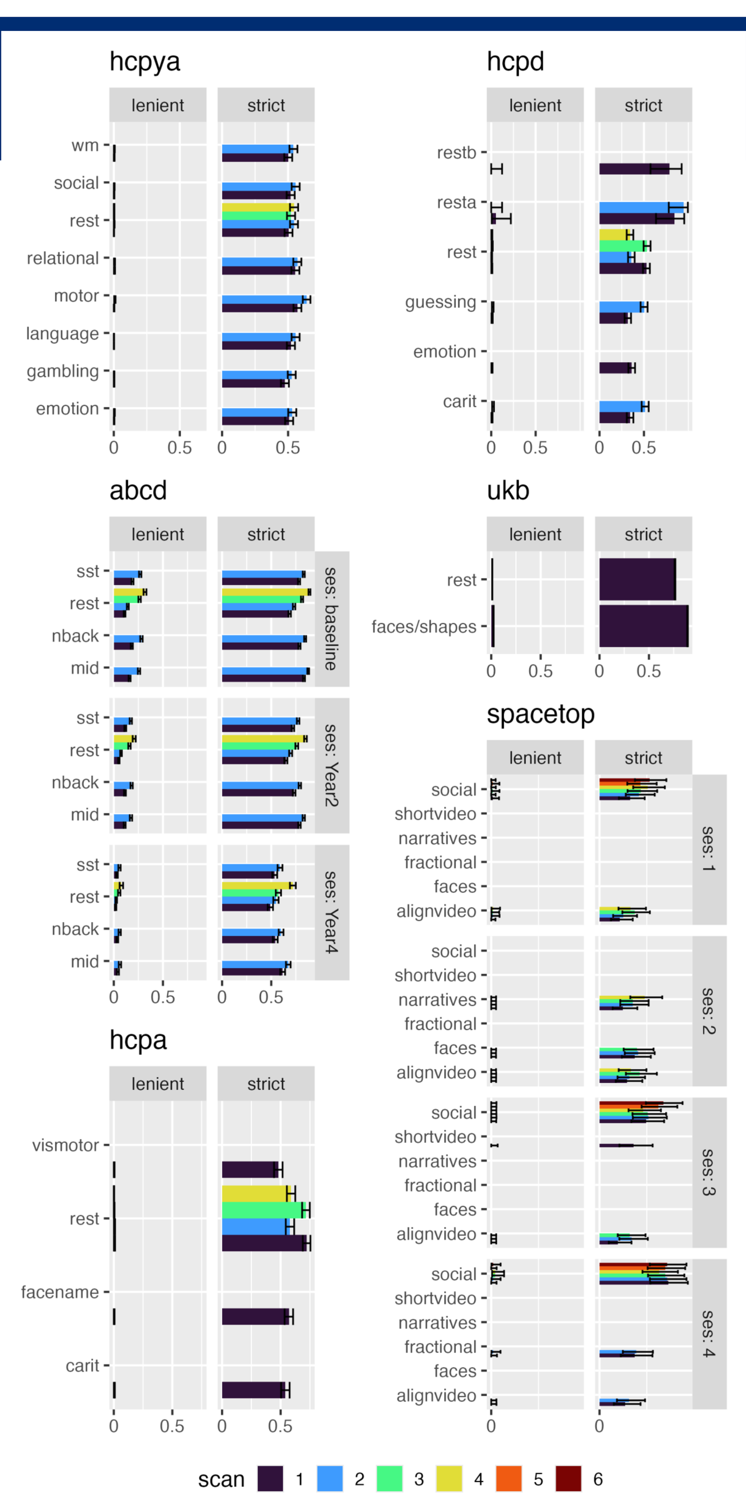
Who Moves?

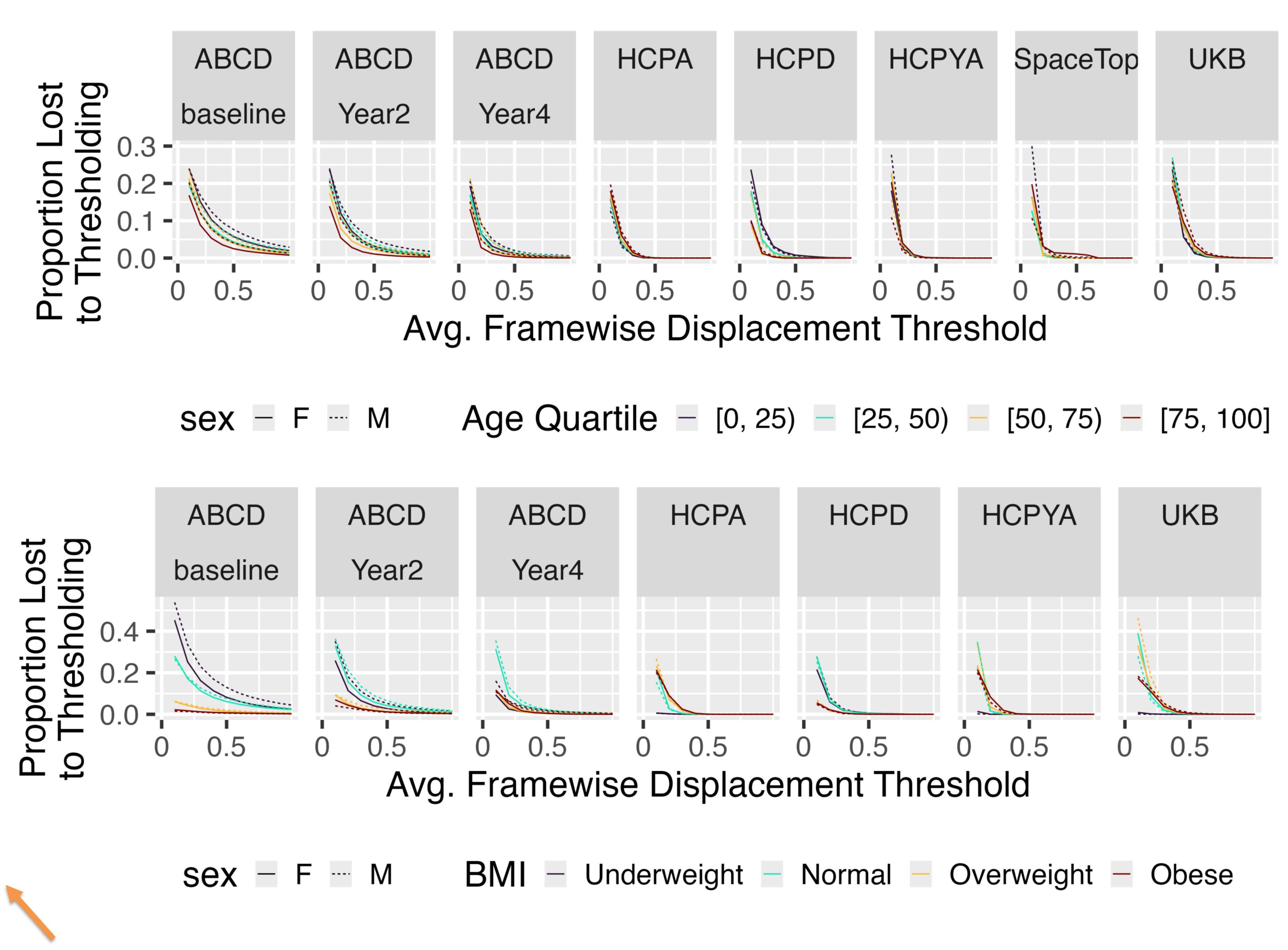






Rates of Exclusion





Lenient: (avg<0.55mm); *Strict*: (avg<0.25mm or max<5mm or %censored<0.2mm)

Summary

- Many datasets exhibit substantial motion coincident with task design
- Degree of motion exhibits stability
  - Relationships with age and BMI apparent (with substantial dataset effects)
- When applying common thresholds, rates of exclusion are substantial in most datasets
  - Thresholds may warrant updates given modern denoising techniques

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