A Descriptive Analysis of Perceived vs. Objective Activity Data

Kailey Luiken, OTD; Sarah dos Anjos, PhD, OTD, OTR/L
Department of Occupational Therapy | University of Alabama at Birmingham
Site Mentor: Mary H. Bowman, OTR/L, C/NDT, LSVT-BIG | Neuroplasticity Clinical Lab

Introduction

- Most rehabilitation outcome measures focus on capacity (what an individual can do in a standardized environment), rather than performance (what an individual does in real-world context)
- Performance is often measured via self-reported tools
- Wearable sensors such as accelerometers can be a potential solution to objectively measure performance
- Further comparison between subjective and objective measures of performance is still needed
- ***Aim:*** To determine similarities and differences of self-perceived activity levels and objective accelerometry data of the bilateral upper extremities.

Methods

- One participant wore an Actigraph wGT3x-BT on each upper extremity (UE) for two weeks.
- Throughout the two weeks, the participant logged 3 outcome measures: Actigraph wGT3x-BT activity count data, rate of perceived exertion (RPE) using the BORG scale, and self-perceived intensity
- PA level was classified as sedentary, light, moderate, or vigorous according to self-perceived intensity and Actigraph wGT3x-BT categories based on daily activity counts
- Data was analyzed descriptively using median, and percentage of frequency of response for the 3 outcome measures

Results

- A 24-year-old female wore the Actigraph wGT3x-BT
- Two days were excluded due to incomplete data, leaving 12 days for data analysis
- **Figure 1** displays a 75% agreement in PA level classification for the right UE across all outcome measures
- **Figure 2** displays 66.7% agreement in PA level classification for the left UE across all outcome measures
- Agreement rates were specifically associated with “light” PA levels
- No vigorous activity was detected by the Actigraph wGT3x-BT

Results

- Most discrepancies occurred between self-perceived, particularly for activities the participant classified as moderate or vigorous but identified as light by the other two outcome measures.

Figure 1. Right UE Frequency of PA levels of Self Perceived and Actigraph wGT3x-BT Data

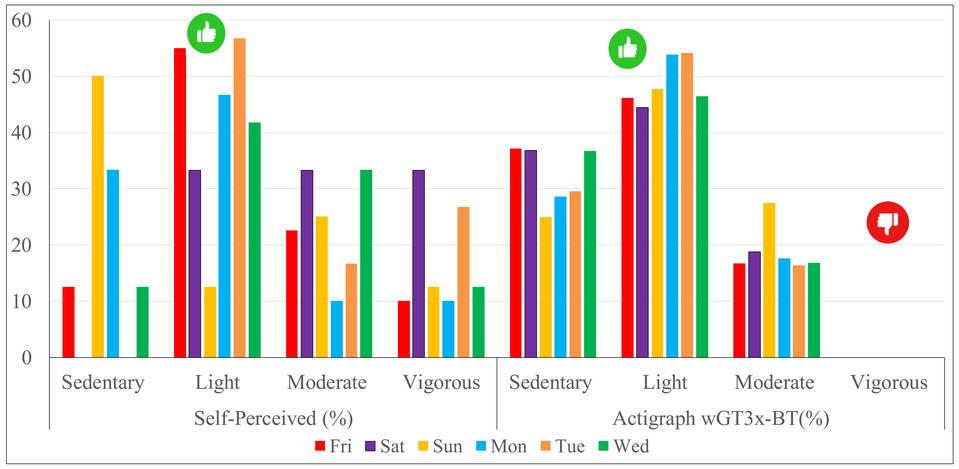
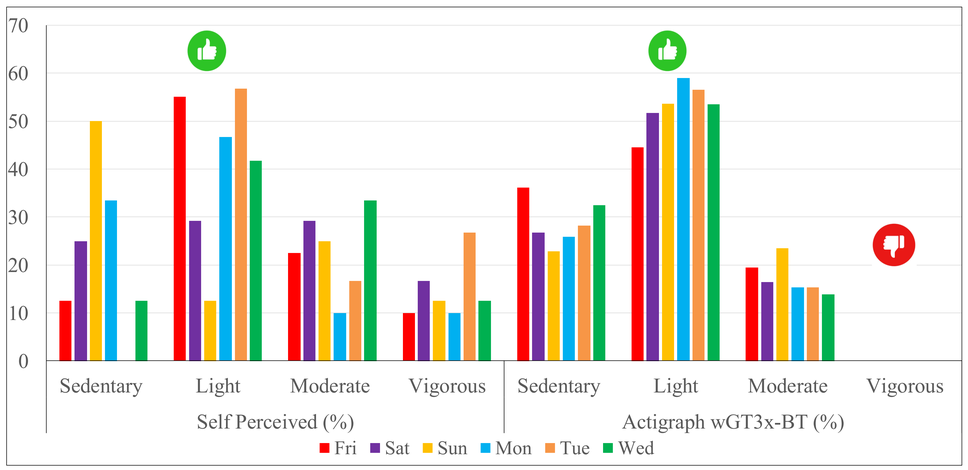


Figure 2. Left UE Frequency of PA levels of Self Perceived and Actigraph wGT3x-BT Data

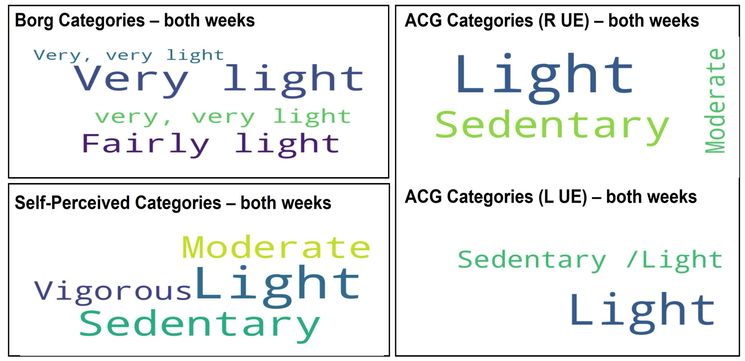


- **Figure 3** displays the general agreement of all 3 outcome measures represented by categories
- Self-Perceived Data is the only outcome measure displaying vigorous activity level

Results Cont.

- There was a high agreement between BORG RPE data and Actigraph wGT3x-BT Data

Figure 3. BUE Frequency of PA levels via categorical data of all 3 outcome measures



Discussion / Conclusion

- Discrepancies on both sedentary and vigorous activities were found between self-perceived and the other two outcome measures.
  - This may be due to differences in classification for criteria such as whole-body vs. upper extremity movement.
  - Lower frequency and limited sensitivity of self-perceived data collection in comparison to the other two measures
- Future studies should aim to improve measurement consistency by refining tools and increasing sample sizes
- ***Conclusion***: Accelerometry offers an objective measure of performance in conjunction with subjective measures like self-perceived activity and BORG RPE
  - Accelerometry could be a valuable tool for measuring performance in rehabilitation settings

Acknowledgement & References

- **Special thanks to**: Sarah dos Anjos, Mary H. Bowman, and Ayat Najmi
- **Contact Information**: kluiken@uab.edu
- **References available via QR code**