



Wheelchair Cushion Degradation During Everyday Use

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Introduction

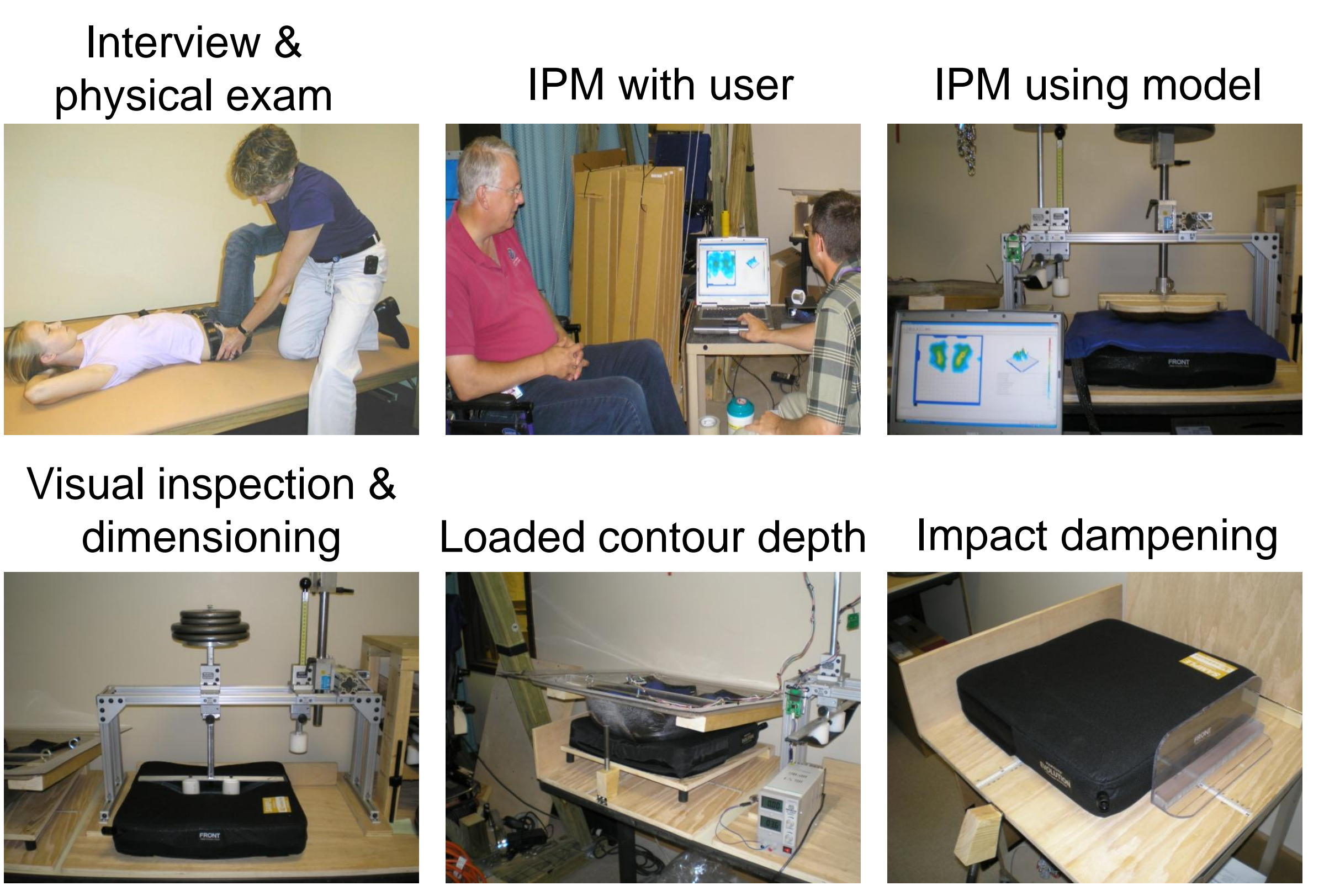
- In the US, wheelchair cushions are deemed durable medical equipment – therein, the life expectancy is 60 months
- Understanding variations in cushion performance over time during use can inform design and clinical interventions

Objectives

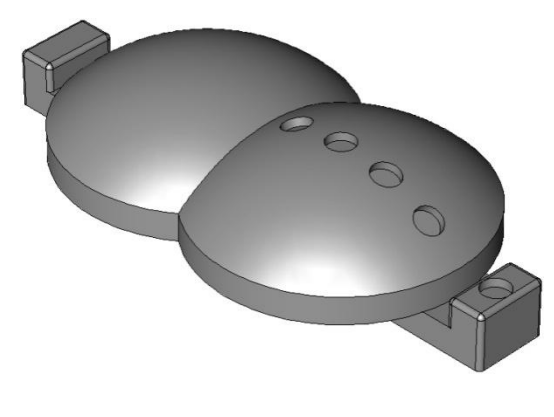
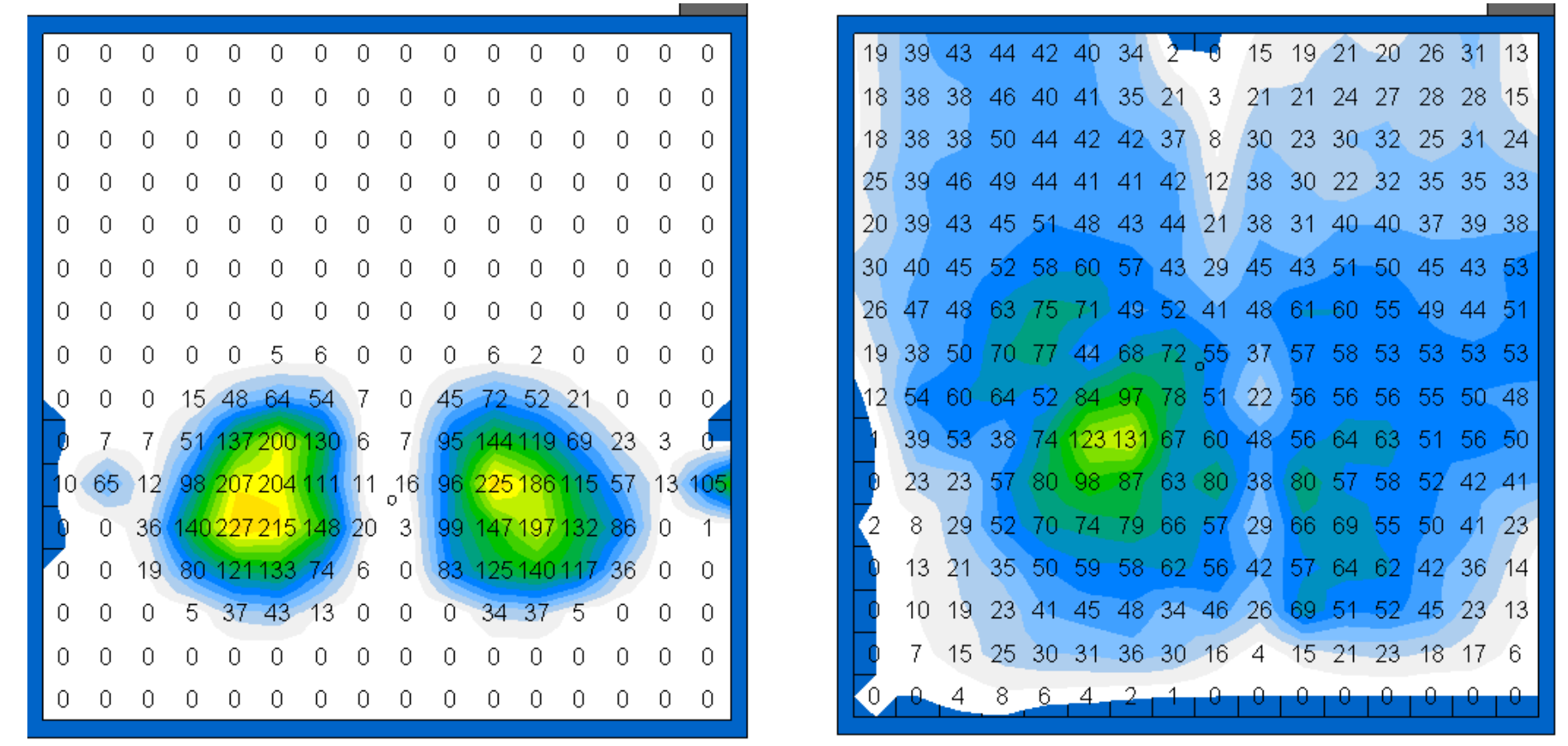
- Document cushion performance over lifespan
- Identify predictors of cushion degradation
- Develop and validate a clinical measure of seat cushion degradation

Methods

- 138 different cushions studied
 - Most common: Jay2 (32), Roho Hi Profile (26), Evolution (14)
- Repeated measures on 24 cushions
- Data Collection
- Client evaluation – diagnosis, weight, pressure ulcer history
- Visual inspection of cushion
- Seated posture and cushion performance measures using human and buttock model interface pressures

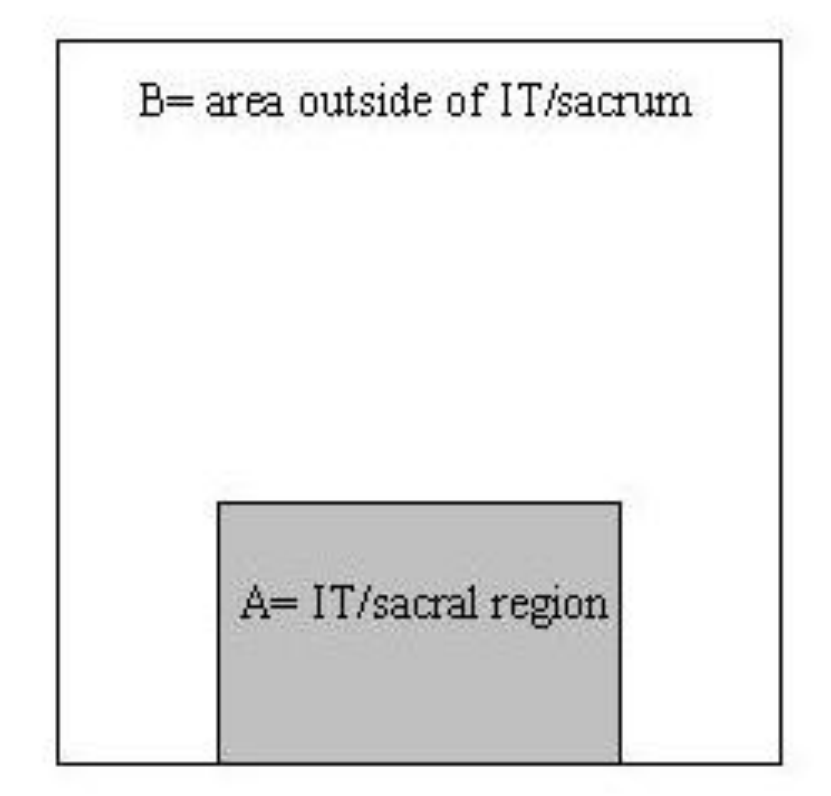
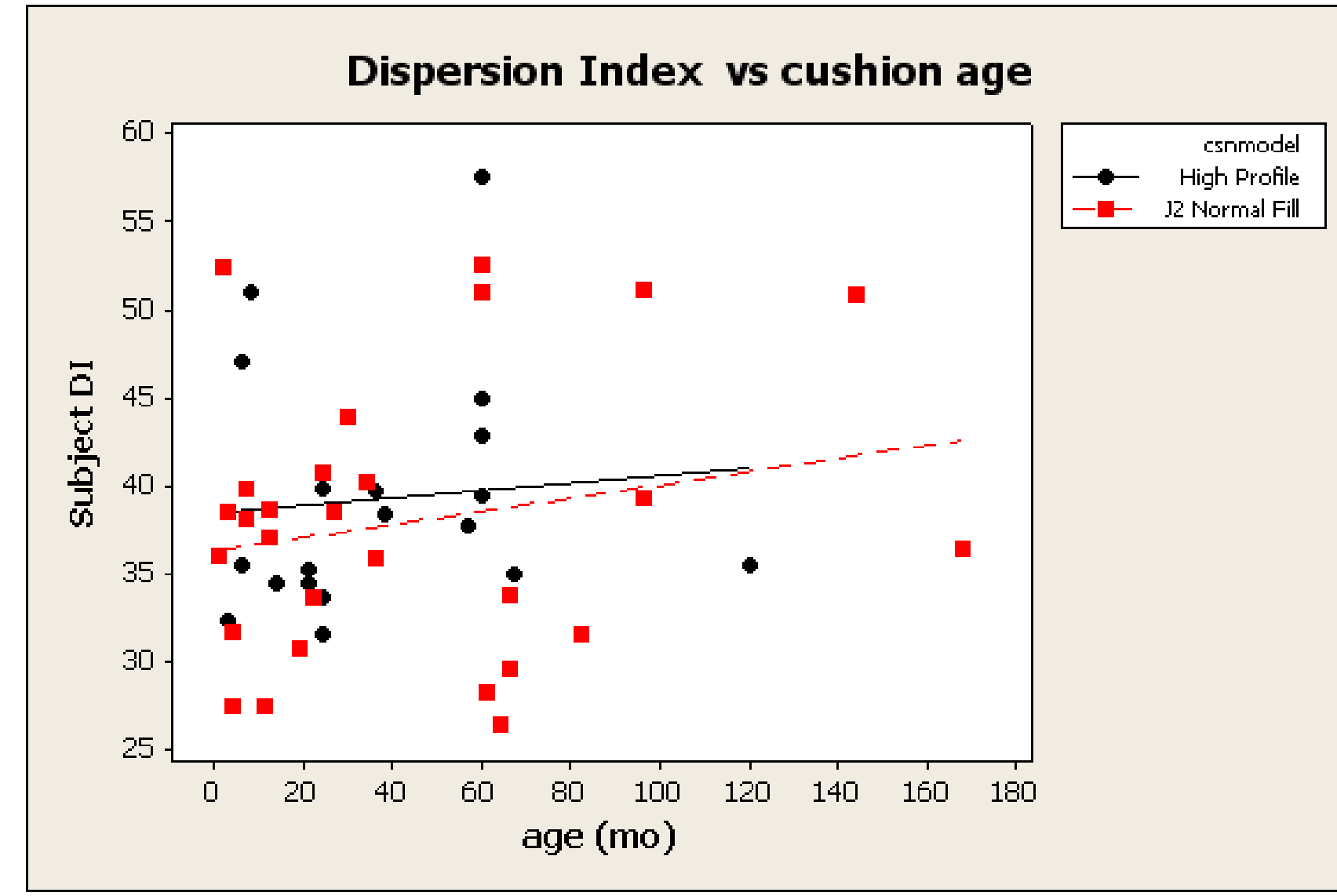


Model and Human IPM

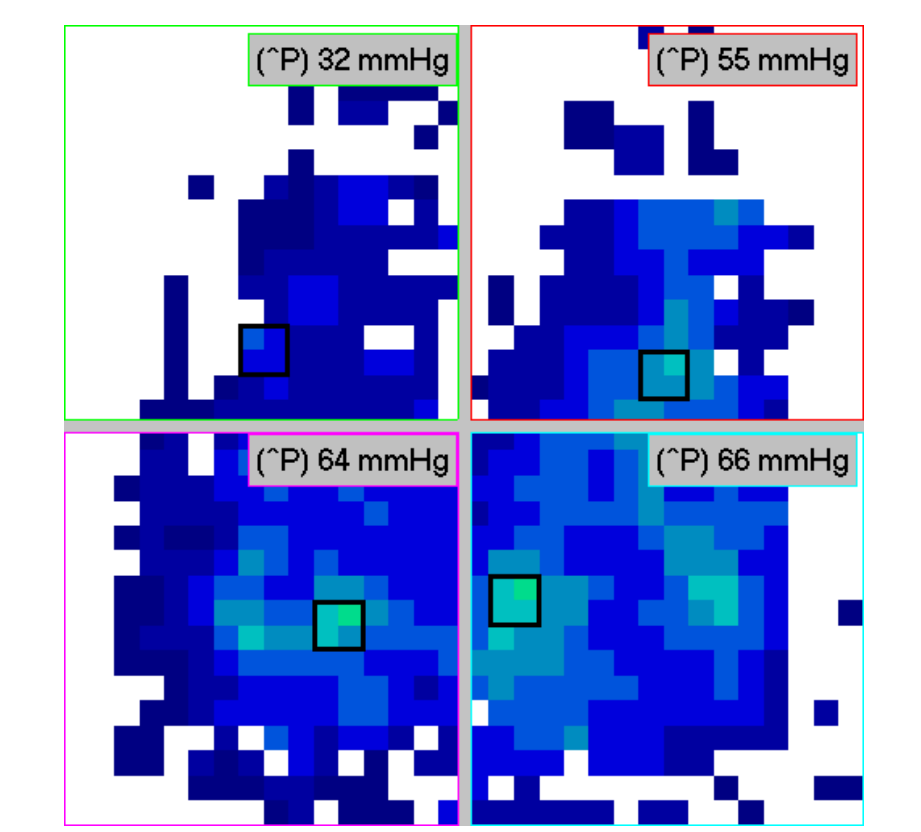
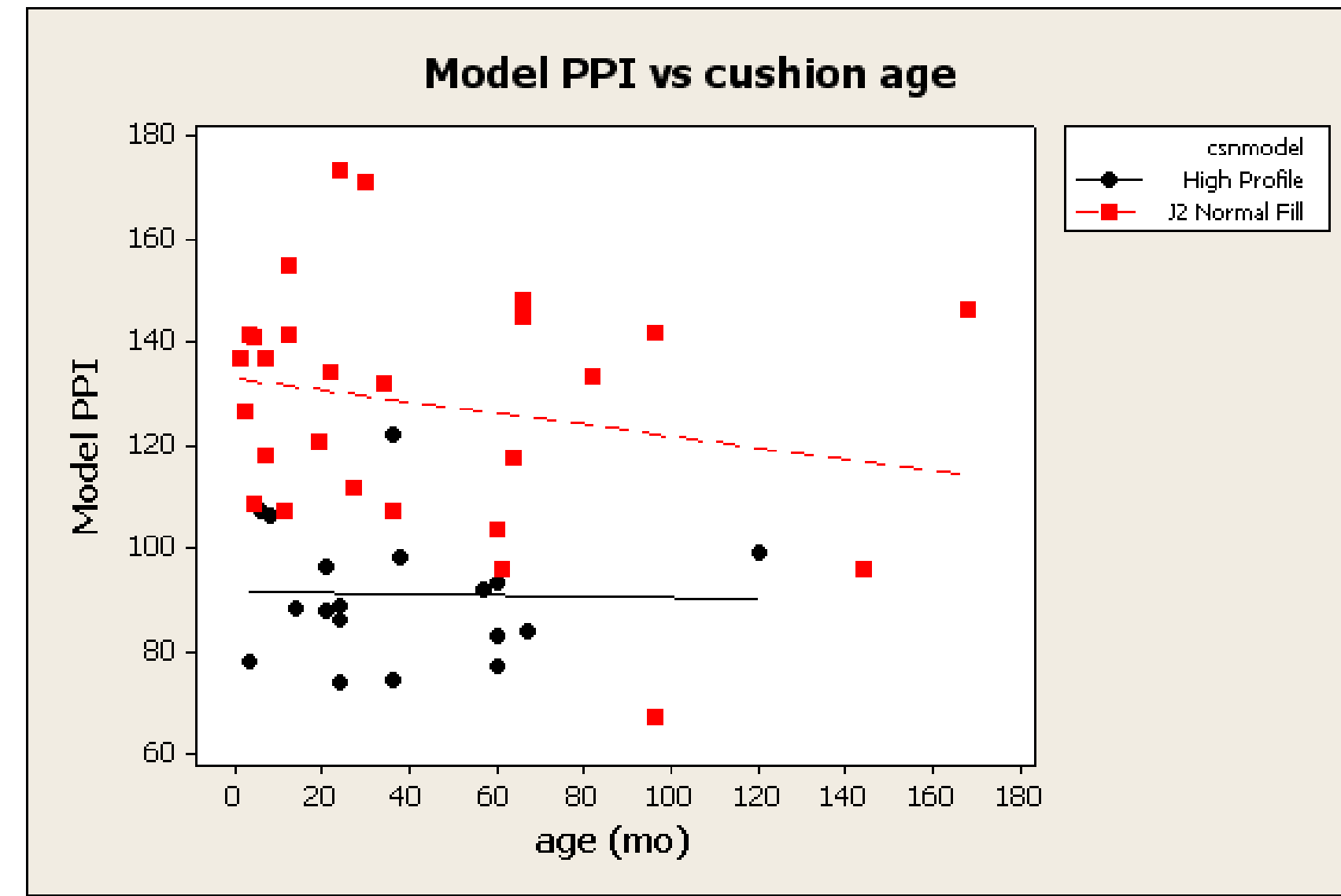


Metrics cover:
magnitude
asymmetry
dispersion

Roho and Jay2 Cushion Performance



DI= ratio of IT pressures to total pressure



PPI= measure of pressure magnitude

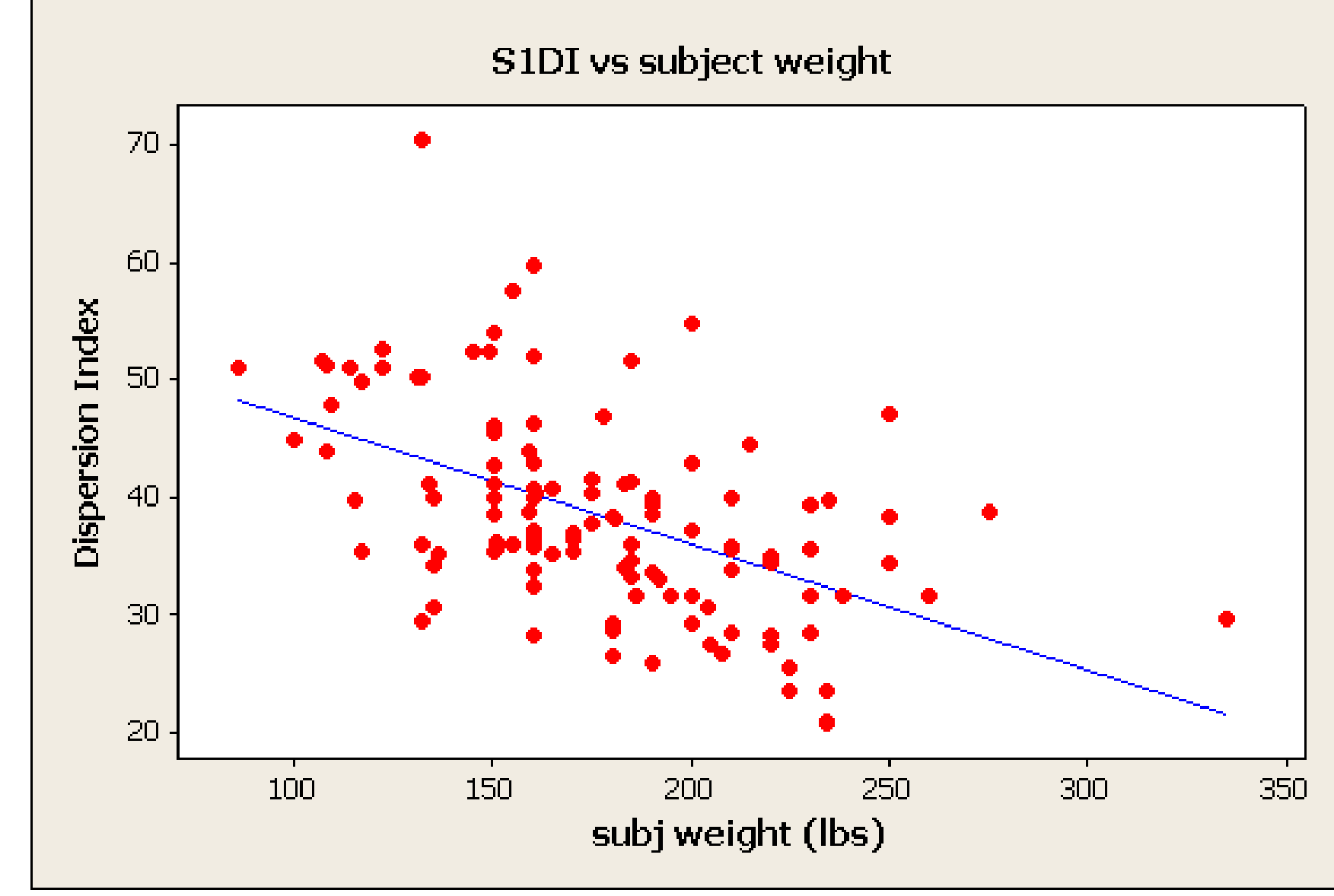
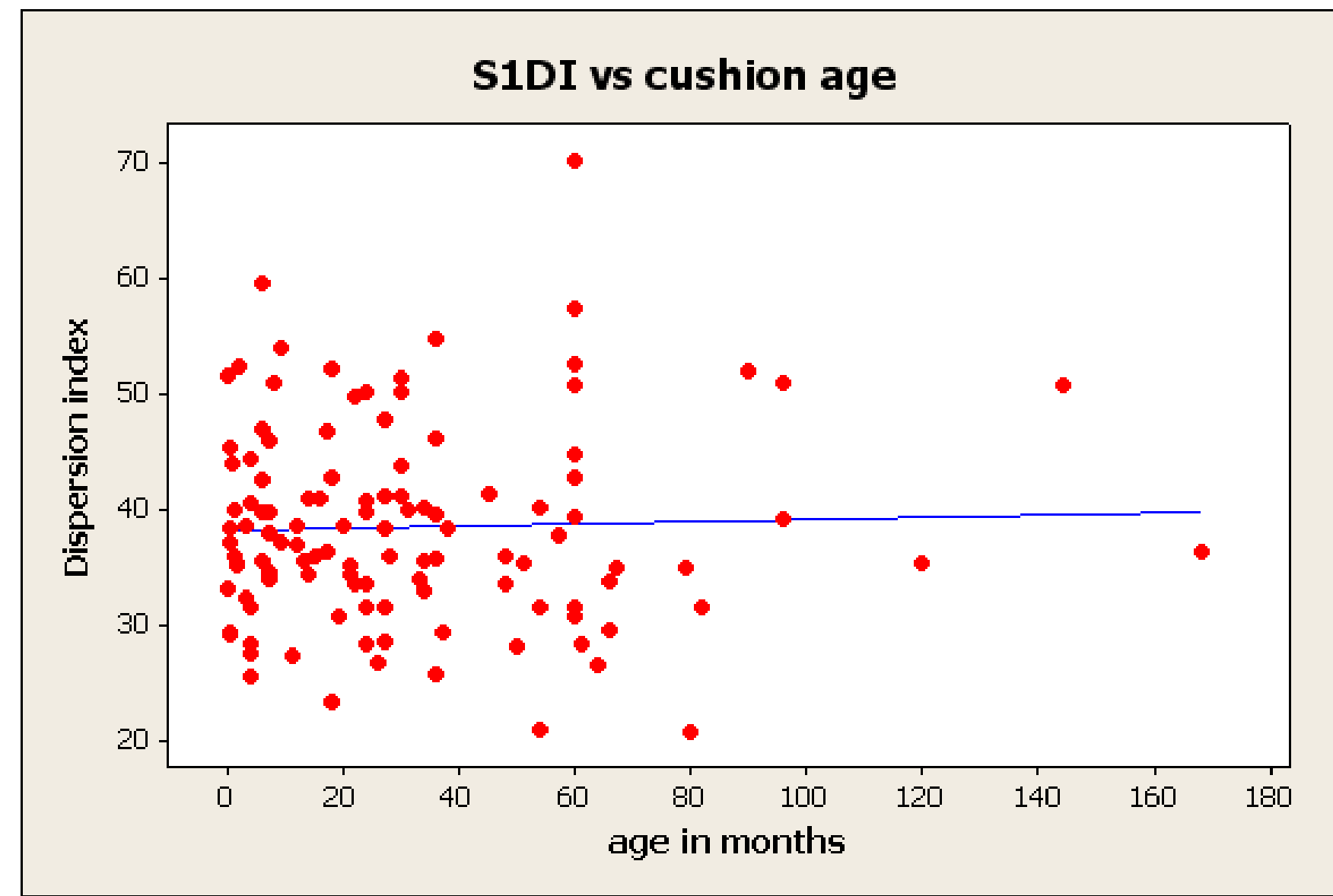
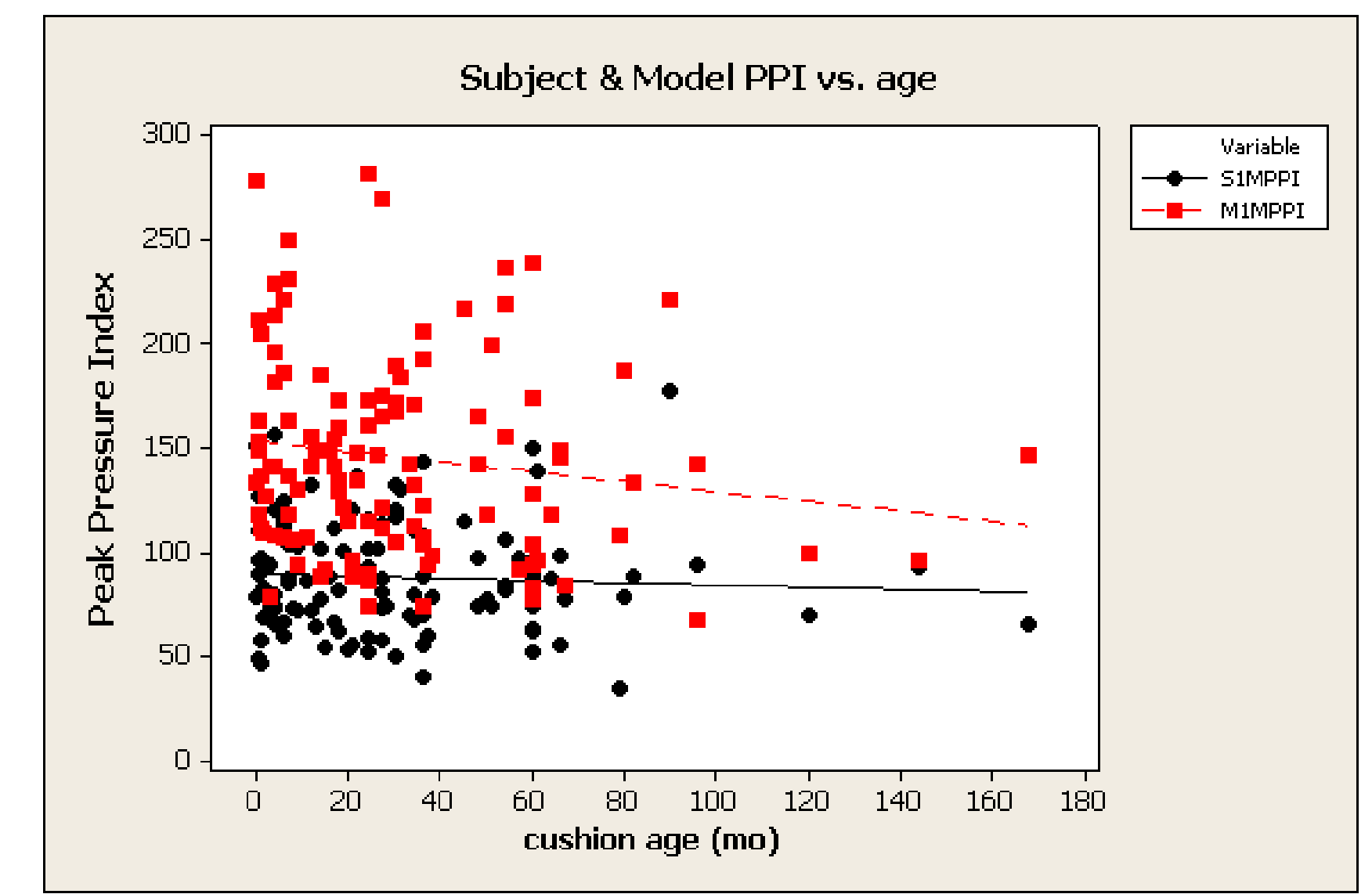
Results

Both model and subject pressures indicate NO relationship over time

Black: IPM using buttock model
Red: IPM using cushion user

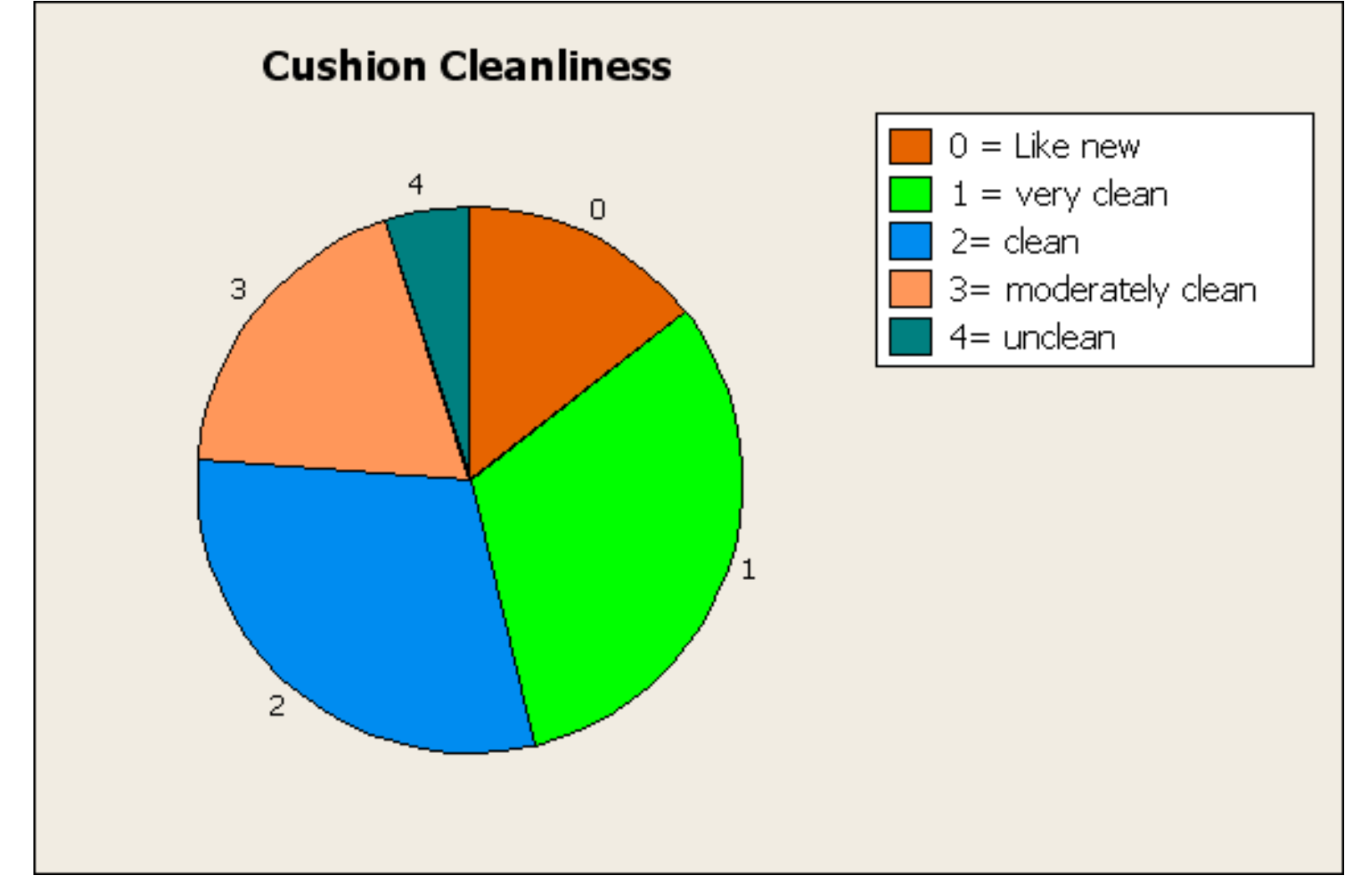
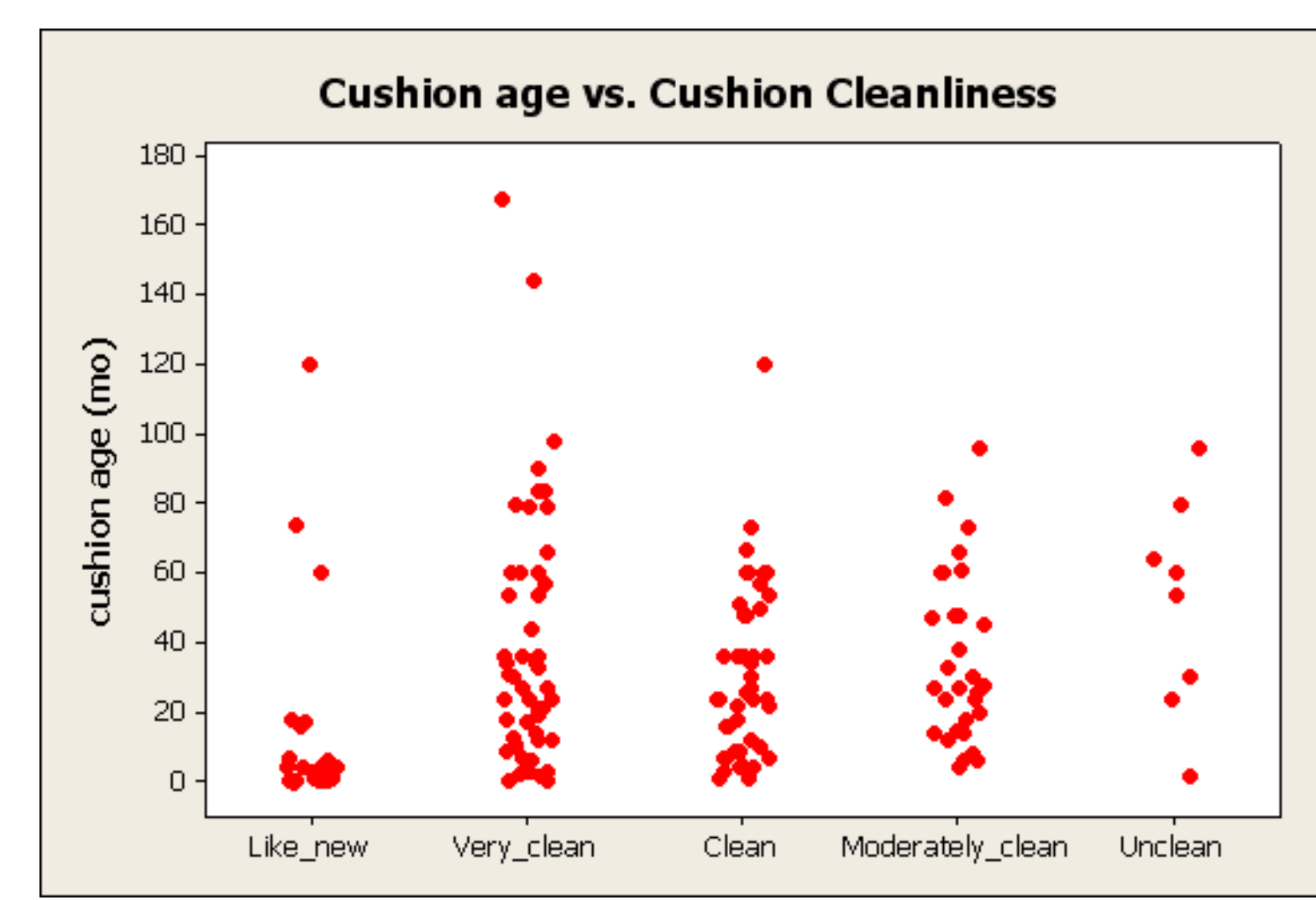
Look at variability of red model data compared to variability of black subject data

Pressure magnitudes- ALL 162 cushions



About 3/4 of cushion deemed 'clean' 'Unclean' cushions ranged in age

Cushion Cleanliness



Conclusions

- Strong positive correlation between temperature and relative humidity
- Controlled tests did not reach steady-state, while most empirical bouts reached steady-state after approximately 90 minutes

Acknowledgements

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For more information, please visit www.mobilityrerc.gatech.edu

