

Perception of Workload and Task Importance During Complex and Dual Task Conditions

Alicia Maul, SPT, Cody Lamont, SPT, Erin Zurbrugg, SPT, Gillian Berry, SPT, Katherine Armstrong, SPT, Lea Keenantasker, SPT, Patricia Eckart, SPT, Cindy Zablonty PT, DPT, NCS, Theresa Raudsepp, PT, MS, GCS, CEEAA, Ryan Jacobson, PT, DPT

BACKGROUND

Why Dual Task?

Why Perception?

- "cognitive processes and movement need to occur concurrently as part of social engagement; voluntary movement is not wholly automatic and when movement occurs, it leads to changing cognitive demands." (McIsaac et al, 2015)
- Current practice for creating dual-task challenges in the clinic include serial subtraction and carrying a glass of water (complex walking task) however these do not always translate to a patient's individualized challenges and goals
- Research has shown that a patient's engagement and performance improves when the task they are performing is meaningful in their lives. (McIsaac et al, 2015)
- Would including items that assess various aspects of patient perception be beneficial to augment how we create task demands in clinic?

METHODS

Exclusion Criteria:

- Ages <20 y.o. and 30 – 64 y.o.
- Unable to perform household ambulation without assistive device
- Mental or physical disability

Community Dwelling Older Adults

- N = 20
- Mean Age: 74 (65-86)
- Mean Education: 75% some college
- Mean Gait Speed (m/s): 1.17 (0.86 - 1.67)

PROMIS

- Physical Function: 48.6 (37.6 - 66.8)
- Satisfaction with Social Roles: 54.0 (42.6 - 68.7)
- Self Efficacy: 51.0 (37.4 - 60.6)

Young Adults

- N = 20
- Mean Age: 24 (22-28)
- Mean Education: 100% some college
- Mean Gait Speed (m/s): 1.39 (1.18 - 1.58)

PROMIS

- Physical Function: 59.8 (48.0 - 68.7)
- Satisfaction with Social Roles: 59.6 (52.3 - 68.7)
- Self Efficacy: 54.3 (42.8 - 69.2)

Screening

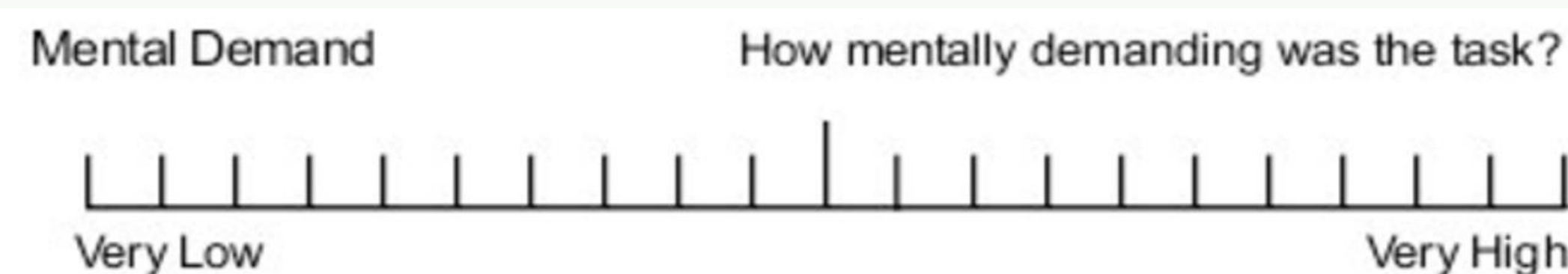
- Visual acuity (reading 5 clock times at 40 feet)
- Fine motor skills (orienting 5 pieces of mail)
- Cognitive abilities (Mini-Cog)
- PROMIS scales for self-efficacy, physical function, and satisfaction with social roles
- 8-meter gait speed

Tasks

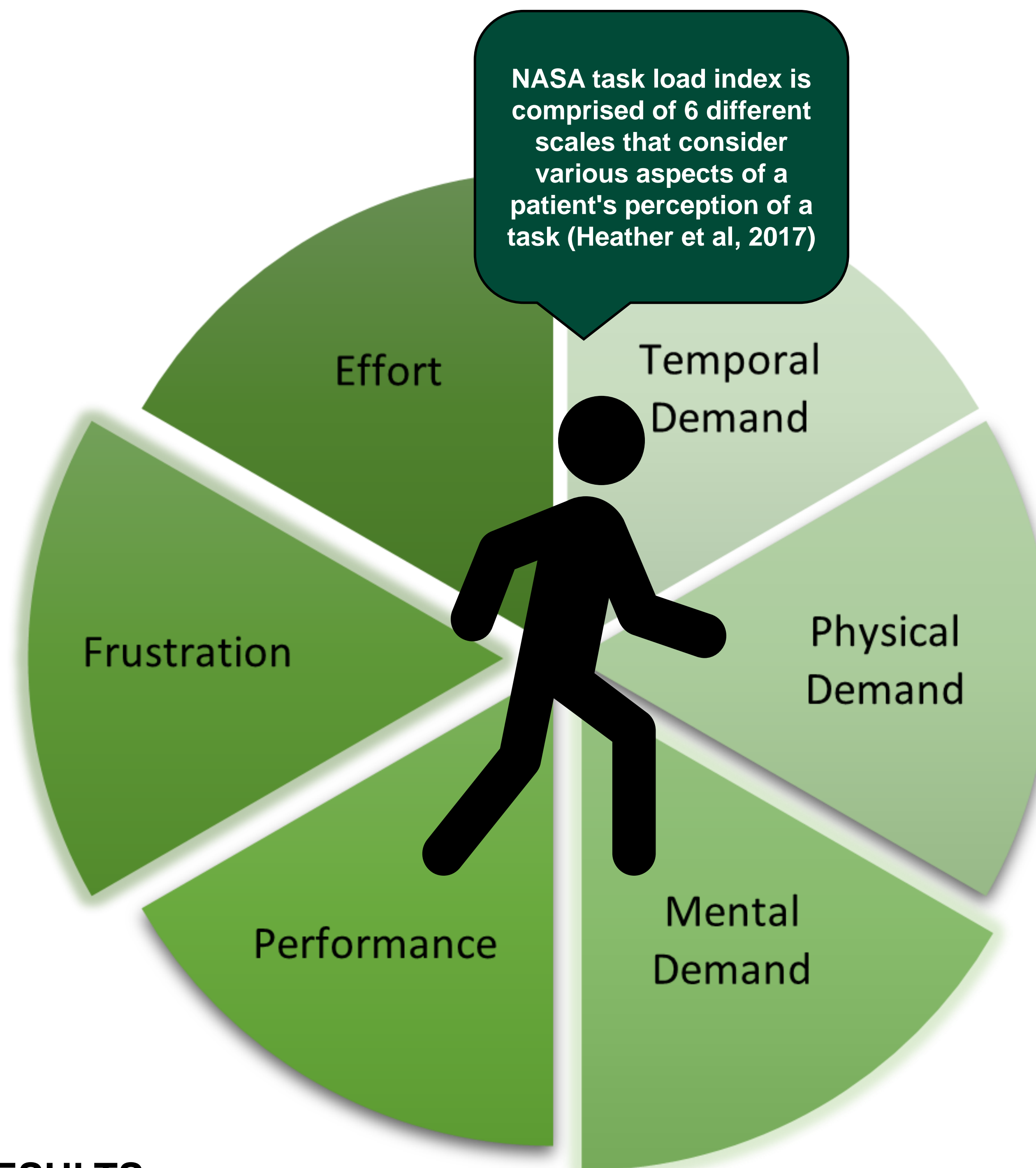
- Carrying a glass of water: without spillage
- Mail sorting: orienting stack of 12 pieces of mail so that the stamp is in the top right corner
- Serial subtraction: counting backwards by 7's, starting at a given number
- Clock task: read the time displayed ahead and state whether it is before or after the given time

Procedure

- Randomized order of each task
- 12-meter course
- 4 total trials: 2 single (standing) task trials & 2 dual task (walking) trials
- Measurements: mean time, complete NASA load index

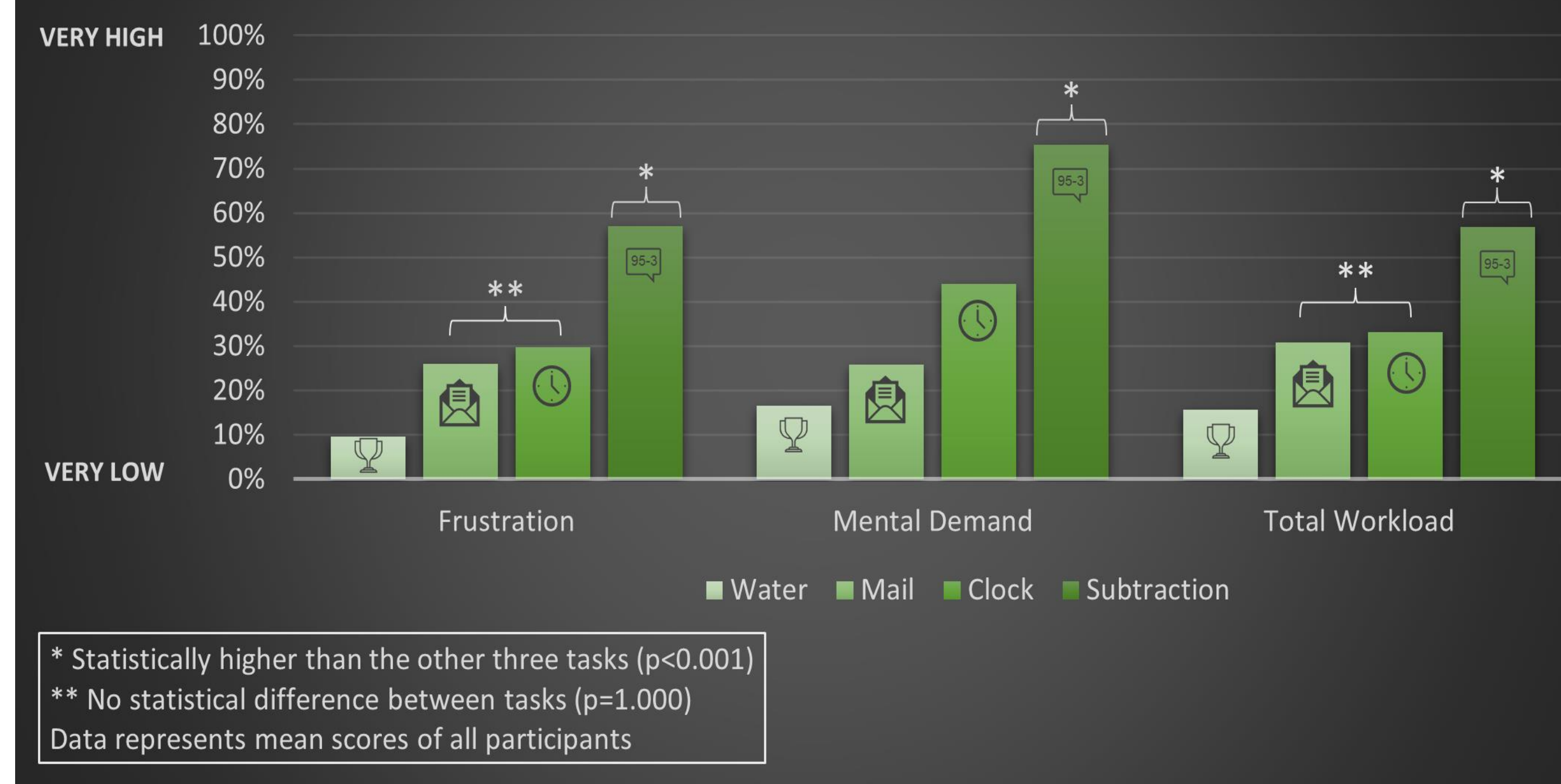


Subjects grade the six scales of the NASA task load index for each task on an interval line like the one above. A similar scale was used to address importance (see graphic under results cont.)



RESULTS

NASA Task Load Index Scores

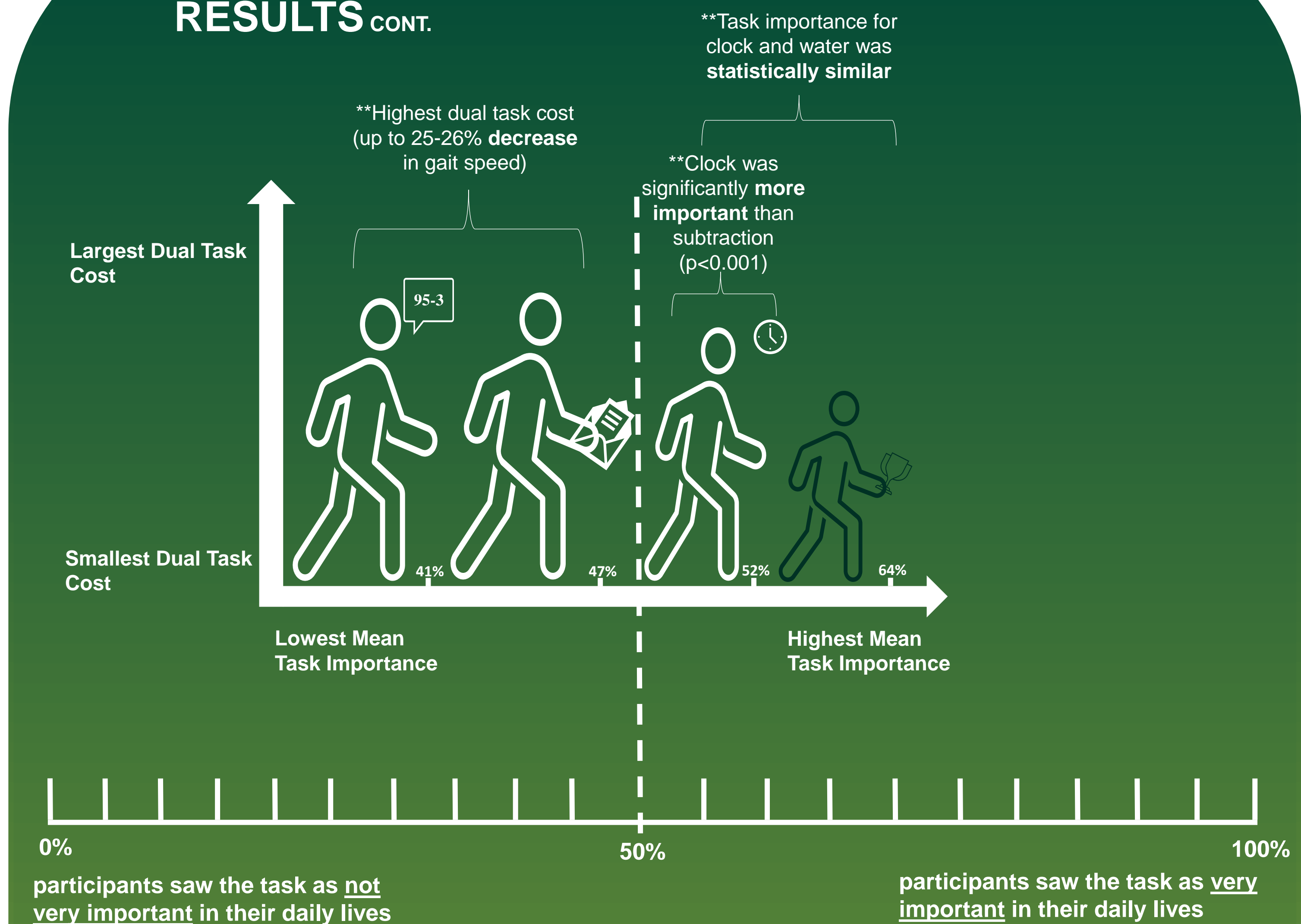


- Clock was statistically lower for **frustration and mental demand** compared to subtraction (p<0.001)
- All four** tasks showed no age-related statistical difference in importance or NASA total workload scores.
- Mail, subtraction, and clock tasks **posed a greater dual-task cost** for older subjects compared to younger ones, according to gait speed (p≤0.002)

LIMITATIONS

- Small population acquired through convenience sample
- High average education level
- Subjects did not participate in deciding novel tasks
- All timing for speeds utilized for DT cost measures are subject to human error due to hand timing

RESULTS CONT.



**=statistically significant

CONCLUSION

- Patient perception can **augment** dual task training
- Dual task training can utilize **perception** and **DT cost** to use activities that are meaningful to patients in the clinic
- ARE ALL TASKS CREATED EQUAL? – Not Quite.**
 - This research demonstrates the use of **measuring importance AND dual task cost**
 - Just because a task is important, does not mean it is challenging, and vice versa!
 - Mail sorting demonstrates **we can meet in the middle**, with a high dual task cost, low frustration and increased importance

TAKEAWAYS

- We have the ability as PTs to be **creative** when focusing on Dual Task
- Should we bother to assess patient perception and what is important to them?
 - YES!**
- Serial subtraction remains a great option for dual task, especially when needing a standardized measure
- Previous research has suggested the importance of **meaningfulness and autonomy in improved motor learning** (Wulf, Lewthwaite, 2016). We can assess meaningfulness in many ways to supplement the goal of increased stability during dual tasking

REFERENCES

