

Introduction

Falls threaten the safety of the older adults. Falls have a negative impact on older adults themselves, their families and the economics of healthcare systems. Vision status is one of the factors associated with falls or multiple falls. The relationship between visual attention and balance and mobility has been recognized in previous studies in our lab^{1,2}. These studies measured mobility by clinical measures or performance on a mobility course.

In this study we are examining the relationship between a variety of studies of visual attention, balance as measured on a force plate and mobility measured by walking speed and stride length.

Purpose

We anticipate that

- Two commonly used tests of visual attention, the useful field of view (UFV) and multiple object tracking (MOT), will show an association with each other.
- Tests of visual attention (UFV and MOT) will both have a significant association with balance (measured with the force plate) and mobility/gait (measured by analysis of walking speed and stride length), but MOT (which is a sustained measure of visual attention) will have the stronger agreement.
- Tests of visual attention (UFV and MOT) will have a stronger agreement with performance in Xbox games which have a strong visual attention component, compared with those that only have a physical component.

Methods and Materials

- Inclusion criteria:-
 - ⇒ Age 65+ years
 - ⇒ Relatively healthy (no disease or medications that are known to severely affect balance)
 - ⇒ Visual acuity 6/12 or better.
 - ⇒ Can walk independently.
 - ⇒ Have not played Xbox or Wii before.



Balance:-

- A portable force platform (AccuGait, AMTI, Inc.) is used to measure ground reaction forces and moments under the feet of participants.

- Balance was measured for the conditions of eyes open, both legs (1 min.) and one leg (30 Sec.).

Mobility:-

- **Five meters walking test.** Participants walk on 9 meter long paper with inked stickers attached under the heels of their shoes.
- Stride length and walking speed will be measured for the middle 5 meters (i.e. excluding 2 meters at the beginning and end).
- Time, stride length and stride width will be the measured.

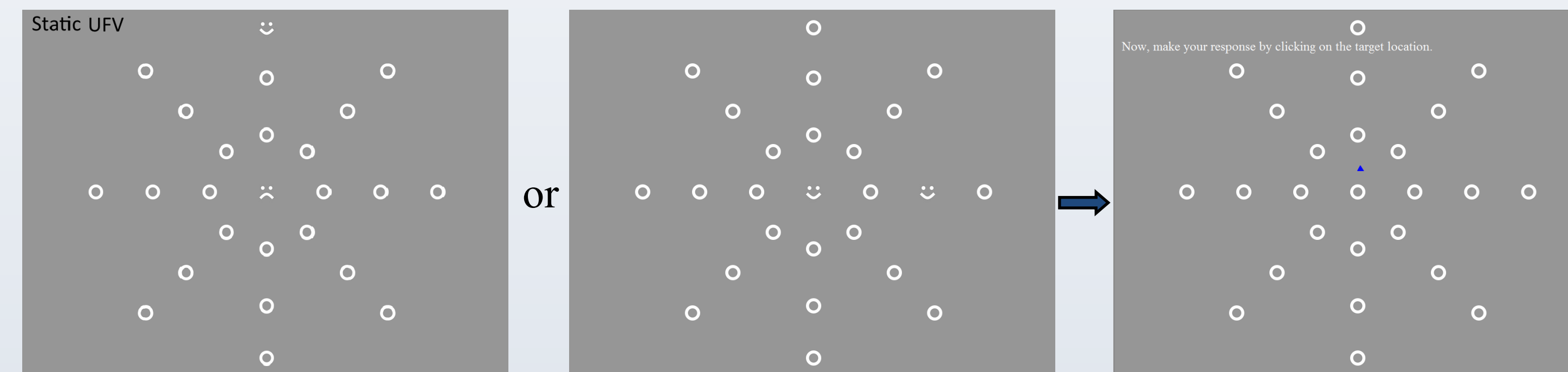


Methods and Materials (Cont.)

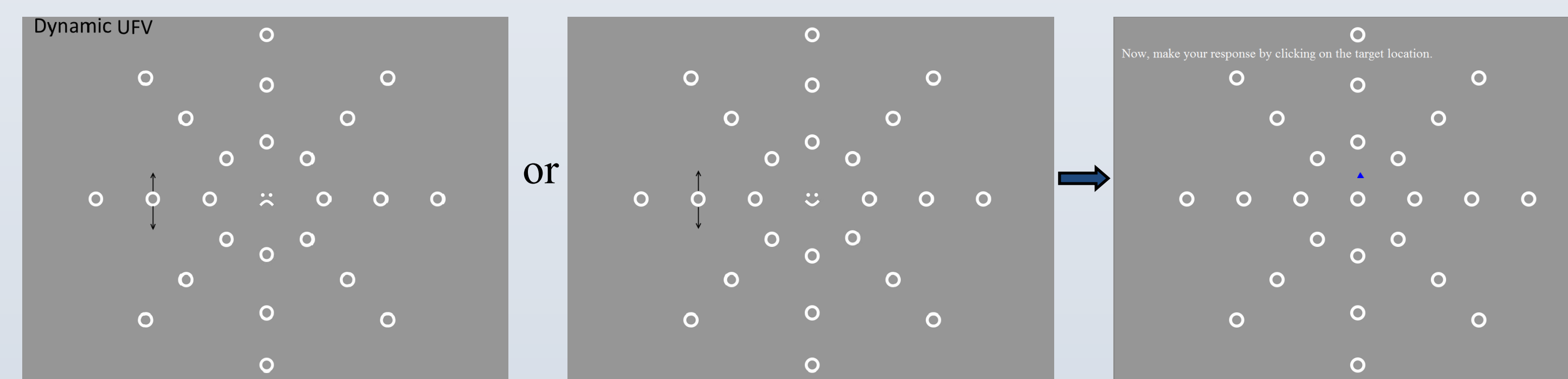
Visual Attention tests:

A. Useful Field of View (UFV)

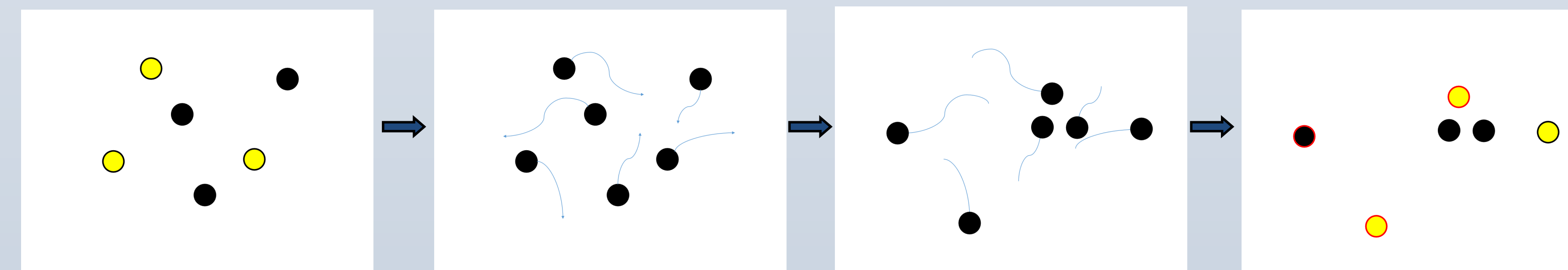
- **Static UFV**



- **Dynamic UFV**



B. Multiple Object Tracking (MOT)



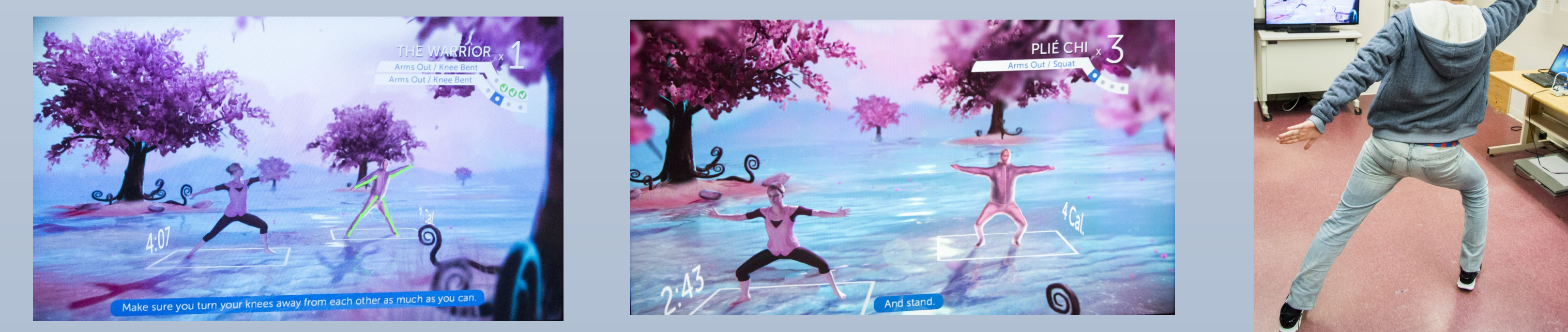
Xbox Video Games:

A. Xbox games with little visual attention component.

1. Leg Exercise



2. Tai Chi

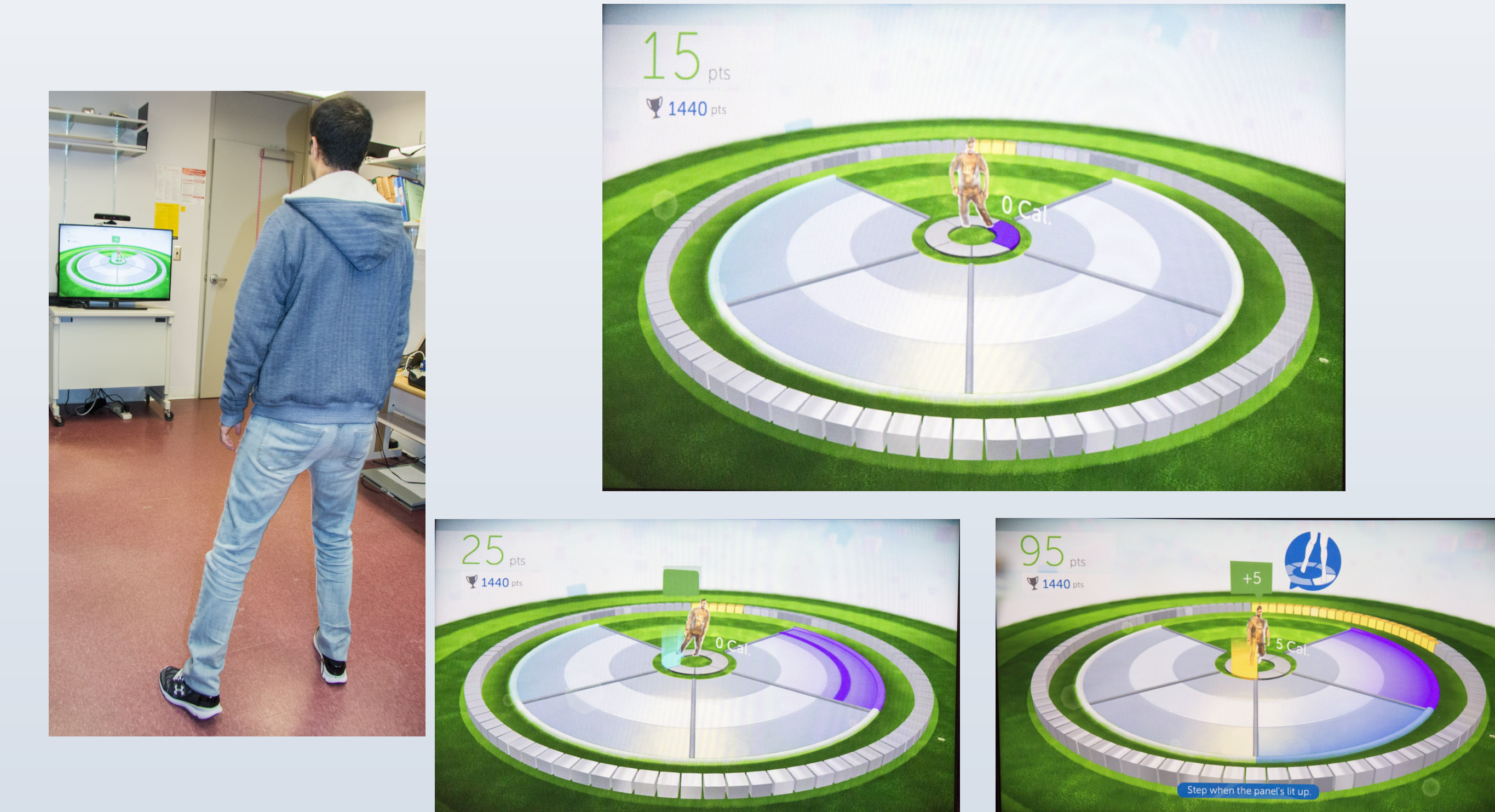


B. Xbox games with strong visual attention component.

1. Skiing



2. Stomp it



Results

- Data Analysis

Correlation analyses, corrected for age and sex, will compare the associations between the performance on the Xbox games, the visual attention measurements and the balance and mobility tests.

Significance of the Study

This study will provide new data of

- The associations between these commonly used tests of visual attention and also between these tests and balance and mobility measures.
- We also hope to demonstrate that there is a demonstrable difference in the visual attention component of the Xbox games with and without an apparent strong visual attention component. This is an important step before we start a randomized clinical trial to compare training using games with and without a visual attention component.

References

1. Althomali M, Leat SJ (2013) Visual correlates of balance, mobility and fear of falling in older adults. American Academy of Optometry, Seattle, Oct.
2. Leat SJ, Lovie-Kitchin JE. (2008) Visual function, visual attention and mobility performance in low vision. Optom. Vis. Sci. 85,1049-56.

Acknowledgements

1. COTEF, Canada
2. King Saud University, Riyadh, Saudi Arabia.