



Ontario Shores

Centre for Mental Health Sciences



UNIVERSITY OF
TORONTO

Kinect Bowling: Implementing Motion-Based Technologies for People with Dementia

Arlene Astell, PhD, C. Psych

*Erica Dove, BHSc (Hons)



Background

- Motion-based technology (MBT) can provide cognitive, physical and leisure activities to people with dementia¹
- Current lack of information regarding how to introduce, teach and support people with dementia to use MBT²

¹Dove, E., Astell, A. J. (2017). The Use of Motion-Based Technology for People with Dementia or Mild Cognitive Impairment: A Literature Review. *J Med Res*, 19(1), e3.

²Dove, E., Astell, A. (2017) The Kinect Project: Group motion-based gaming for people living with dementia. *Dementia*, (online first).

Objectives

1. To explore the implementation of MBT (Xbox Kinect) as a group activity for people with dementia
2. To examine whether people with dementia can learn to use Xbox Kinect with training and repeated exposure



Methods

- Conducted at three adult day programs for people with dementia and/or other age-related challenges

Demographic Variable	Participants (n=38)
Age (years)	Mean 75.39 (58-93)
Sex (M/F)	18M (47.4%), 20F (52.6%)
MoCA (out of 30)	Mean 12.47 (0-25)
Mobility Device Use	No Device (22; 57.9%) Device User (16; 42.1%) <ul style="list-style-type: none">• Cane (4)• Walker (10)• Wheelchair (2)

Methods

- Participants with dementia were invited to play a digital Xbox Kinect bowling game twice a week for 10 weeks
- Sessions were led using evidence-based techniques, such as²:
 - Task breakdown
 - Gesture modelling
 - Verbal reminders
 - Immediate error correction

²Dove, E., Astell, A. (2017) The Kinect Project: Group motion-based gaming for people living with dementia. *Dementia*, (online first).

Methods



Methods

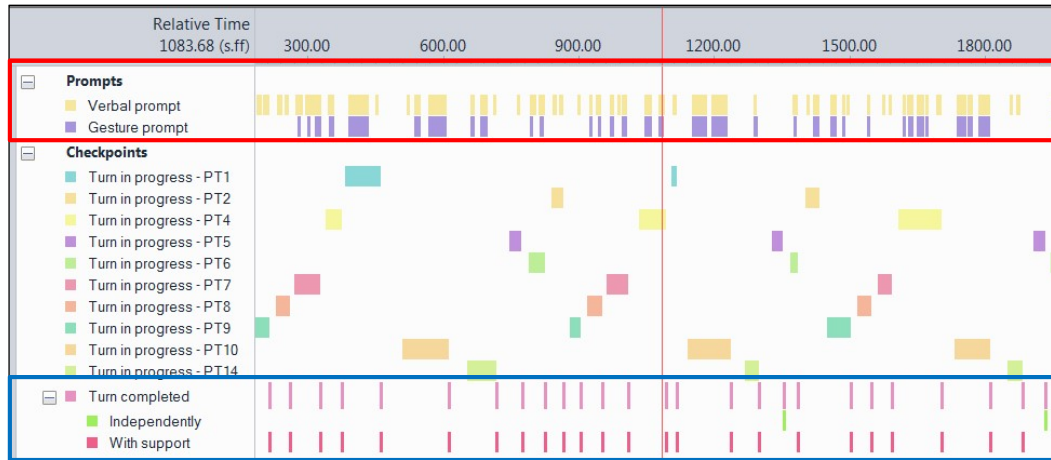
- Recordings were analyzed using behavioral coding software to isolate and track:
 - Number of prompts required per turn
 - Ability to complete turns independently
 - Duration of participants' turns
- Video recordings were compared pre-, mid and post-group participation and analyzed using paired t-tests

Results



Results

Session 1
(Site 2)



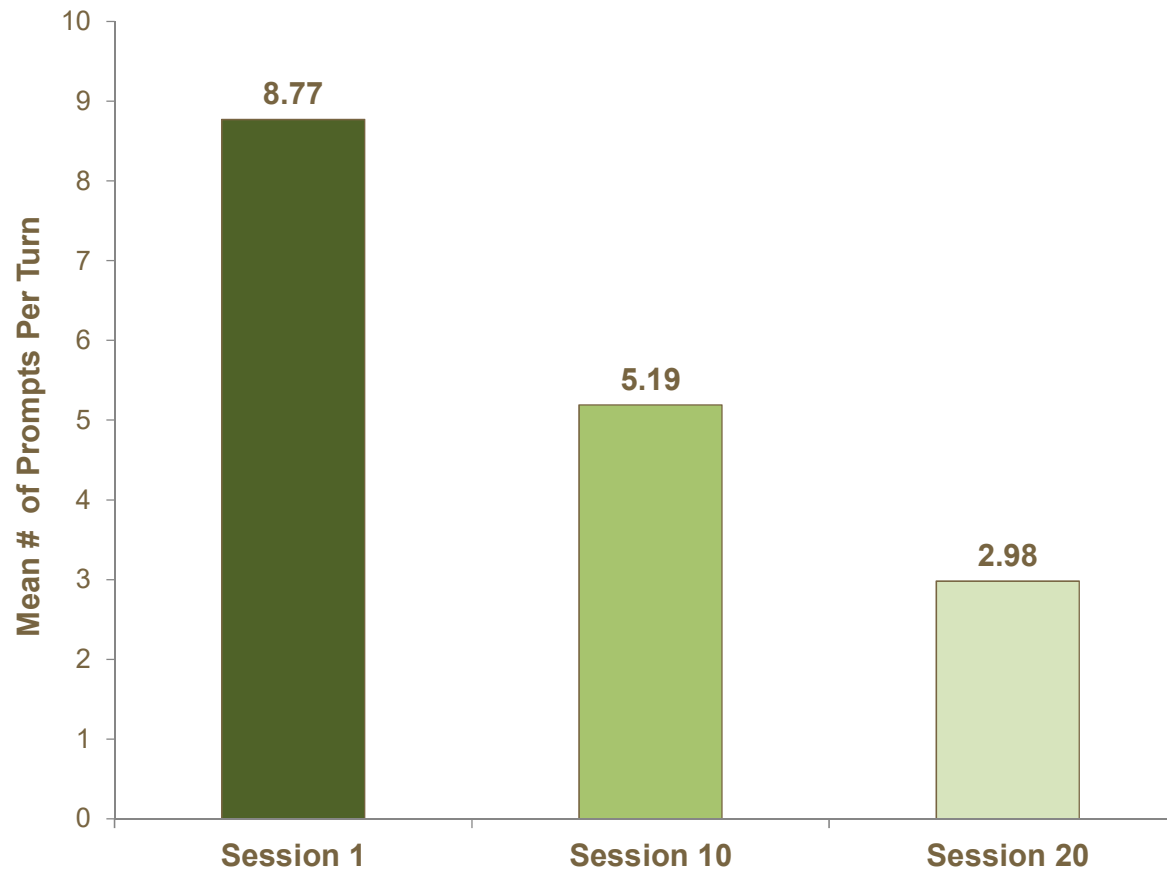
Session 20
(Site 2)



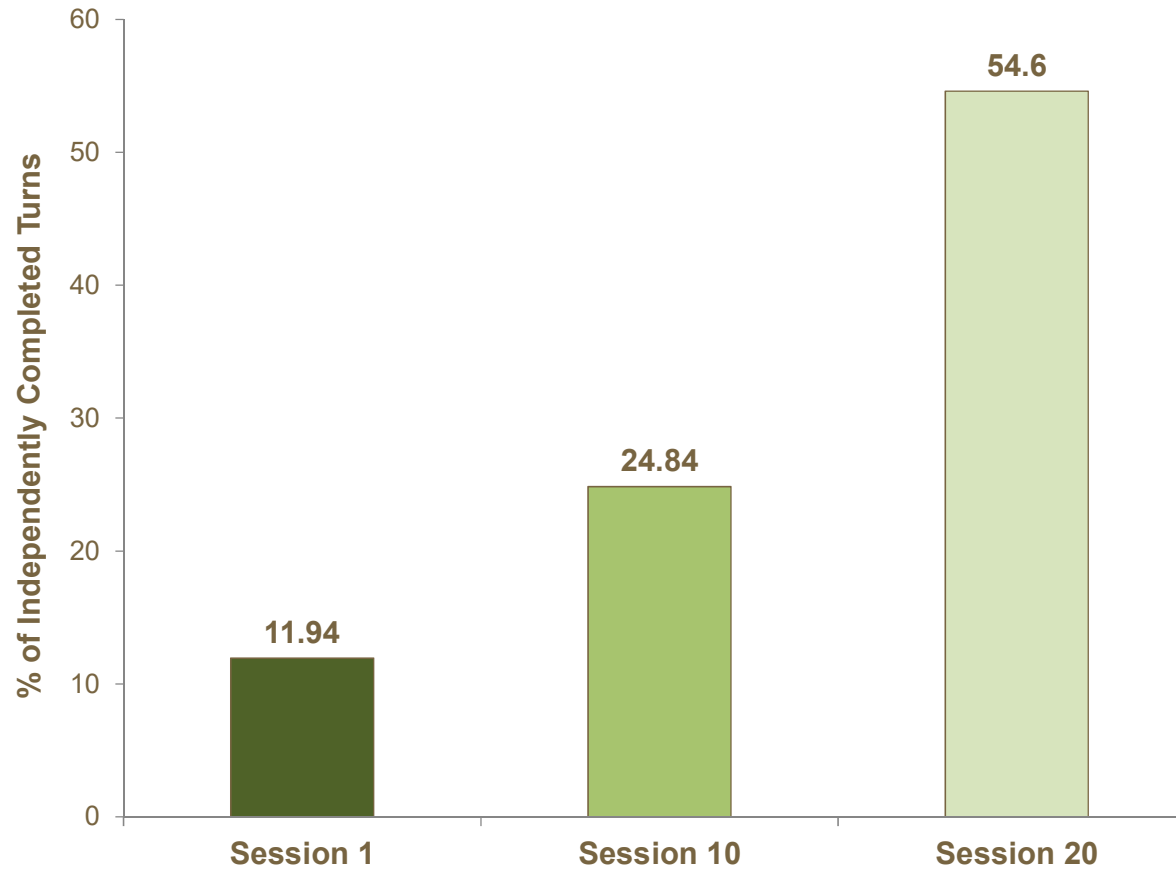
Reduced
Assistive
Prompts

Increased
Independent Play

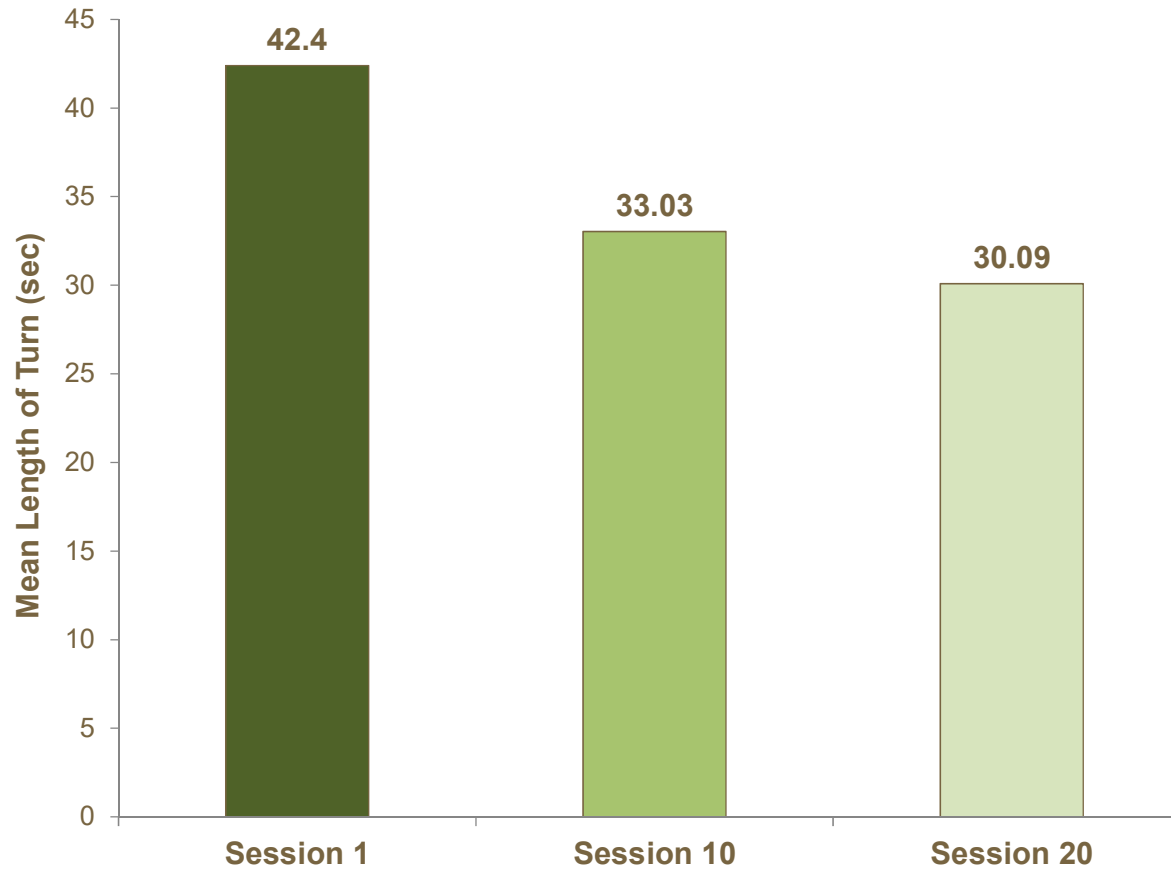
Results: Assistive Prompts



Results: Independent Play



Results: Turn Duration



Results

Outcome Measure	Day 1 Mean (SD)	Day 10 Mean (SD)	Day 20 Mean (SD)	P-value (Day 1 → Day 10)	P-value (Day 1 → Day 20)
Number of Prompts Required Per Turn	8.77 (5.86)	5.19 (7.75)	2.98 (6.65)	0.044*	0.001***
Percentage of Turns Completed Independently	11.94 (21.98)	24.84 (29.6)	54.6 (32.93)	0.024*	0.000****
Turn Duration (sec)	42.4 (15.12)	33.03 (10.4)	30.09 (8.78)	0.001***	0.000****

*p≤0.05
 ***p≤0.001
 ****p≤0.0001

Discussion

- People with dementia learned to bowl on Xbox Kinect and improved over time:
 - Fewer prompts required
 - Increased independent play
 - Shorter turn duration
- These findings challenge negative stereotypes about their abilities and capacity to learn

Conclusions

- All three day programs purchased an Xbox Kinect and use it regularly as a group activity with clients
- Supports feasibility of implementing MBTs in adult day programs as an engaging group activity for people with dementia

Thank you!

Arlene Astell: arlene.astell@utoronto.ca

@Positive_Ageing

@LabAstell

Erica Dove: dovee@ontarioshores.ca

@Dove__E