



Tablet-based vs. table-top cognitive games for older adults: Which are more engaging?

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Disclosure

I have no actual or potential conflict of interest in relation to this topic or presentation.

Several thinking skills such as memory and focus decline in older adults with cognitive impairment or dementia



Source: <https://www.remediesforme.com/natural-remedies-improve-memory-focus-concentration/>



Source:
<https://www.carehome.co.uk/news/article.cfm/id/1578909/Dementia-care-home-designed-without-mirrors-reduces-confusion-frustration-and-embarrassment>

Video-game and computerized cognitive training (CCT) improve cognitive functioning in healthy adults

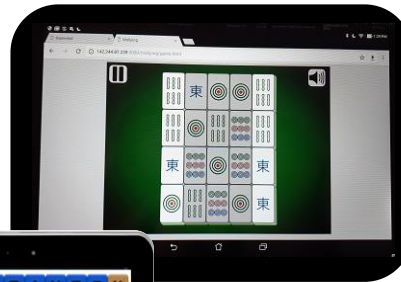
Outcomes	<ul style="list-style-type: none">• Video games and CCT improves several cognitive functions that decline with aging (Toril et al., 2014).• Significant effects on the cognitive functions: nonverbal memory, verbal memory, working memory, processing speed, and visuospatial skills (Lampit, Hallock and Valenzuela, 2014).
Participants	Older participants (>71 years) improved cognitive functions after training than younger participants (60–70 years) (Toril et al., 2014).
Interventions	<ul style="list-style-type: none">• A training of ≤6 weeks (Toril et al., 2014).• ≤3 sessions per week (Lampit, Hallock and Valenzuela, 2014)• Sessions of 30 minutes long or longer (Lampit, Hallock and Valenzuela, 2014)• Group-based interventions (Lampit, Hallock and Valenzuela, 2014).

VibrantMinds

Whack-a-Mole



Mahjong



Bejeweled



Word Search



Software by:

Guana, Murdoch, Lazar, Liu, Stroulia

<https://guana.github.io/phydsl/>

Engagement

- Critical when doing meaningful activities
- Immersion or task involvement
- “player's subjective acceptance of a game's reality and degree of involvement and focus on the task.” (Roozeboom, Visschedijk, & Oprins, 2017, p. 85).

Objective

To describe how older adults with and without cognitive impairment engage during tablet-based vs. table-top cognitive games.

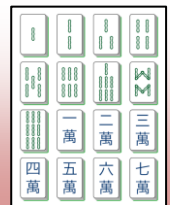
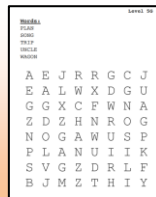
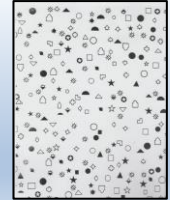
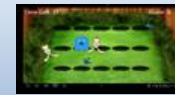
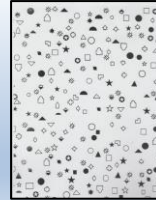
Data and Methods

Single Case Design

Baseline
2- 5 sessions

Intervention
16 sessions

Follow-Up
1- 3 sessions

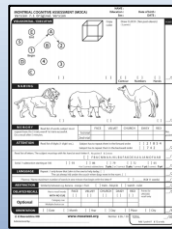
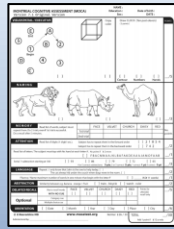


14 Older Adults No CI
6 Older Adults dementia

Baseline

Intervention

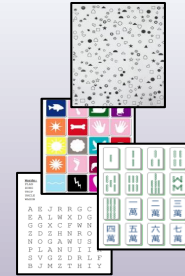
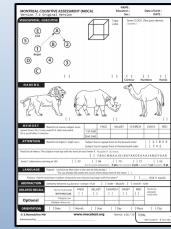
Follow-Up



Baseline worksheet showing a grid of numbers and a drawing of a lion and a rhino.

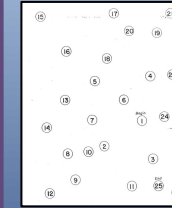
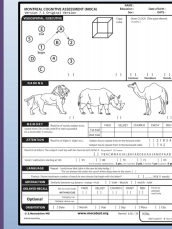


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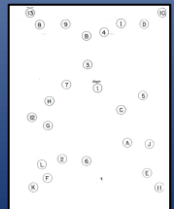
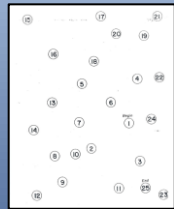
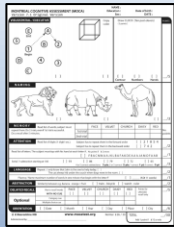


Follow-up worksheet showing a grid of numbers and a drawing of a lion and a rhino.

Follow-up worksheet showing a grid of numbers and a drawing of a lion and a rhino.



Cognitive measures



Cognitive measures

MONTREAL COGNITIVE ASSESSMENT (MOCA)
Version 7.3.1 (Original) Version

NAME: _____ Date of birth: _____
Education: _____ Sex: _____ DATE: _____

VISUOSPATIAL / EXECUTIVE

Copy cube

Draw CLOCK (Ten past eleven) (3 points)

Points: _____ / 5

End
A
B
C
D
E
1
2
3
4
5

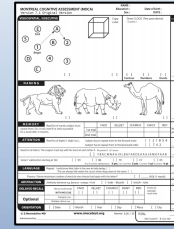
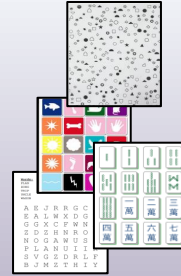
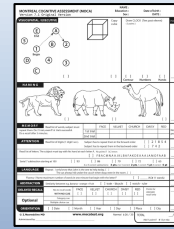
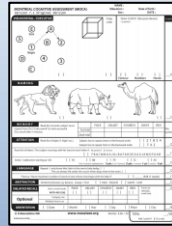
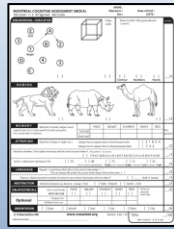
15 17 21
20 19
16

13 8 9 1 10
B 4
3
7
Begin
1
5
H
C
12
G
A
J
L 2 6
F E
K 11

TMT-A

TMT-B

Sessions



Memory (short-term) memory

Name: _____ Participant ID: _____

Name of game played (Circle the subject)

What is it like? How many? How many? How many?

Instructions: Please put in 1 under the correct word that describes how you felt when you played the game.

Circle:

How many?	How many?	How many?	How many?
1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16
17	18	19	20
21	22	23	24
25	26	27	28
29	30	31	32



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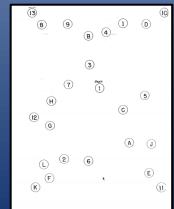
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17	18	19	20
21	22	23	24
25	26	27	28
29	30	31	32



Each session

Match Week - Participant Registration Form

Date: _____ Participant ID: _____

Name of game played (check the column):

Word Search Word Search Word Search Word Search Word Search

Instructions: Please print and fill out the section that best describes how you felt when you played the game.

Comments:

During the game:

Rate	Not at all	Not really	Somewhat	Very much
1. I enjoyed the game				
2. I felt challenged				
3. I felt motivated				
4. I felt confident				
5. I felt happy				
6. I felt relaxed				
7. I felt energized				
8. I felt focused				
9. I felt calm				
10. I felt stressed				
11. I felt nervous				
12. I felt angry				
13. I felt sad				
14. I felt lonely				
15. I felt bored				

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15. I felt bored				



Each session

PANAS

Date: _____ Participant ID: _____

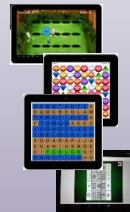
Name of game played (Circle the option):

Whack-A-Mole Word Search Bejewelled Mahjong

This scale consists of a number of words that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to that word. Indicate to what extent you feel this way right now, that is, at the present moment.

1	2	3	4	5
very slightly or not at all	a little	moderately	quite a bit	extremely

____ interested	____ irritable
____ distressed	____ alert
____ excited	____ ashamed
____ upset	____ inspired
____ strong	____ nervous
____ guilty	____ determined
____ scared	____ attentive
____ hostile	____ jittery
____ enthusiastic	____ active
____ proud	____ afraid



Results

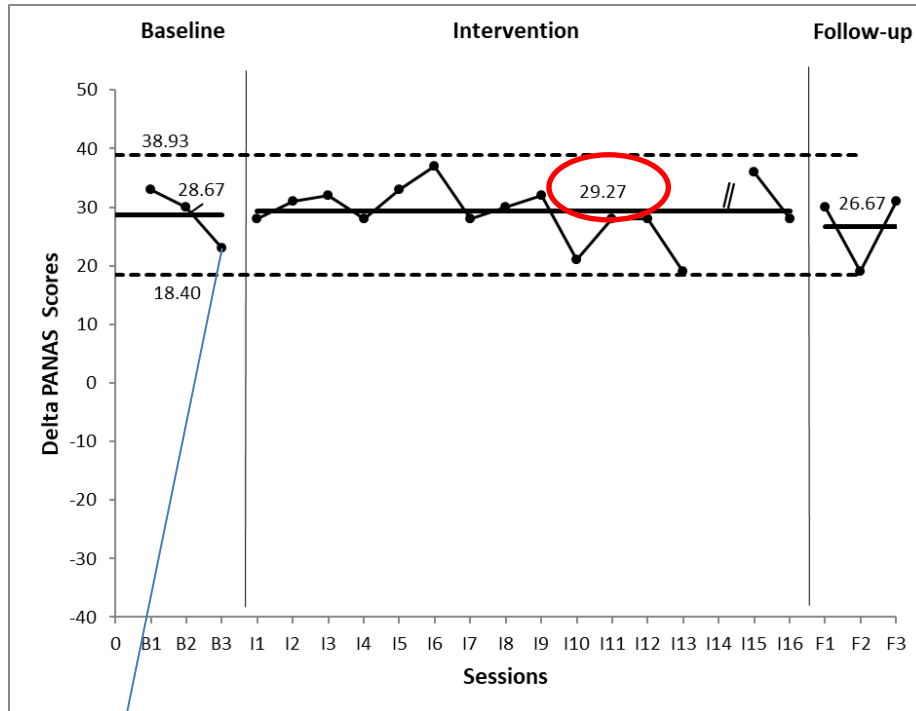
Variable	P3	P15
Age in years	74	83
Female	Y	Y
Diagnosis of cognitive impairment	Y	N
Residential Status	Lives in community with partner	Retirement home/assisted living
Education Level	College Diploma	Bachelor's Degree
Handedness	Right	Right
Technological Literacy (use of computers, tablets, or smartphones)	Daily	Daily



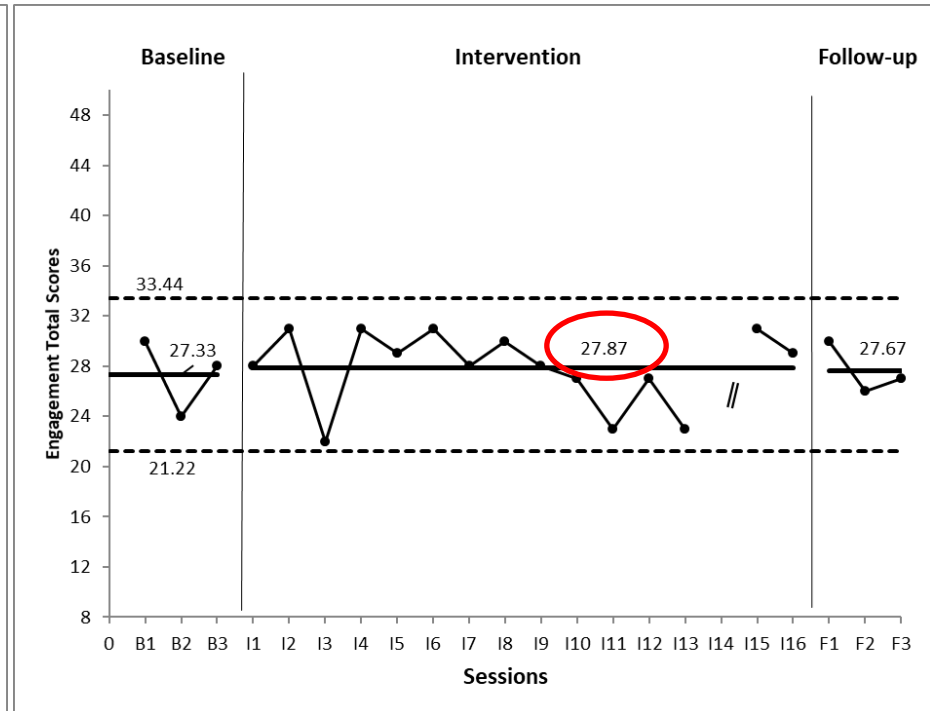
Word Search

Results

PANAS



ENGAGEMENT



Forgot
glasses

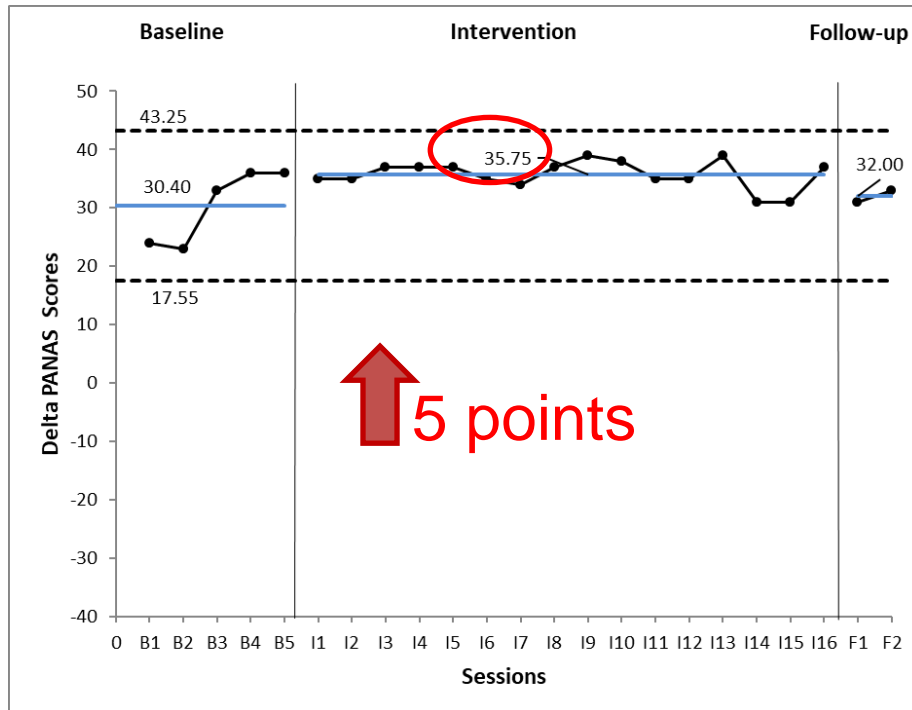
MOCA (Score)	PreBL	PostBL	PostInt	Follow-Up
P03	8	11	13	8
TMT A&B (Sec.)	PreBL	PostBL	PostInt	Follow-Up
P03	---	995	942	839

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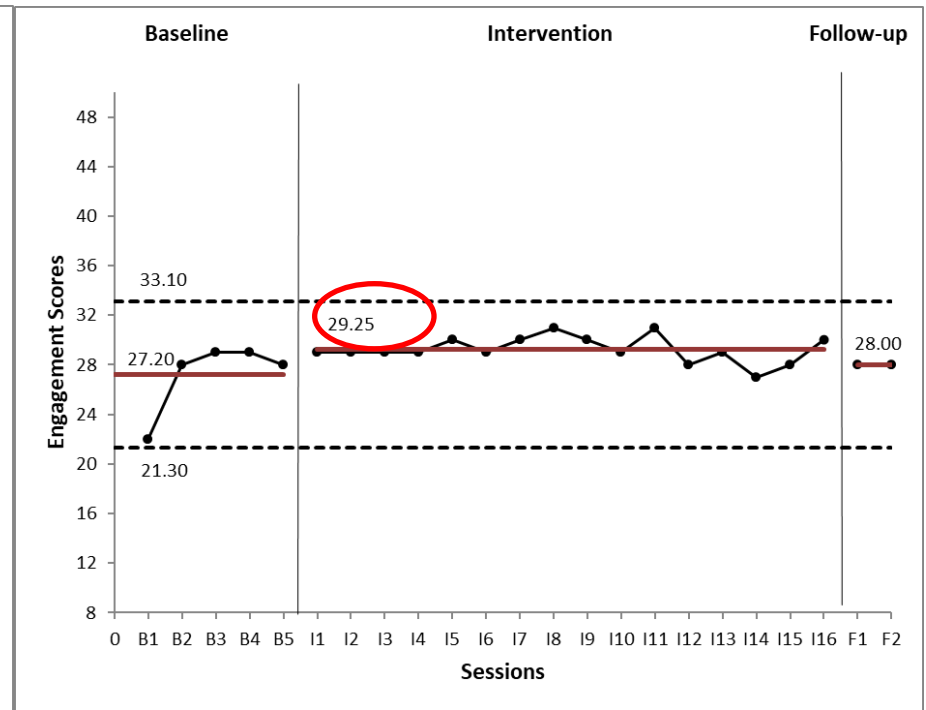
↑ 15.7%

Results

PANAS



ENGAGEMENT



MOCA (Score)	PreBL	PostBL	PostInt	Follow-Up
P15	30	28	29	30
TMT A&B (Sec.)		PostBL	PostInt	Follow-Up
P15	165	166	169	148

10%

Conclusion

- Emotions and engagement increased during the intervention; however, it was not significant.
- Measuring engagement in older adults with dementia is challenging.
- Tablet-based games provided clear and immediate feedback → play more independently compared with the table-top games
- An alternative for people with dementia to engage in cognitive activities.

Acknowledgments

Research assistants





UNIVERSITY OF
ALBERTA

Thank you!

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