CATCH

The University Of Sheffield.

Centre for Assistive Technology and Connected Healthcare

Improving the accessibility of touchscreen tablet computers for people living with dementia:

How to do it and why it's important

Dr Phil Joddrell
The University of Sheffield

Definitions

Apps

- Short for ‘applications’
- Software or programs on computers, most commonly mobile devices

Definitions

Tablet computers

- Mobile device with a touchscreen
- Popular models include Apple iPad, Samsung Galaxy Tab, Microsoft Surface

Why tablet computers?

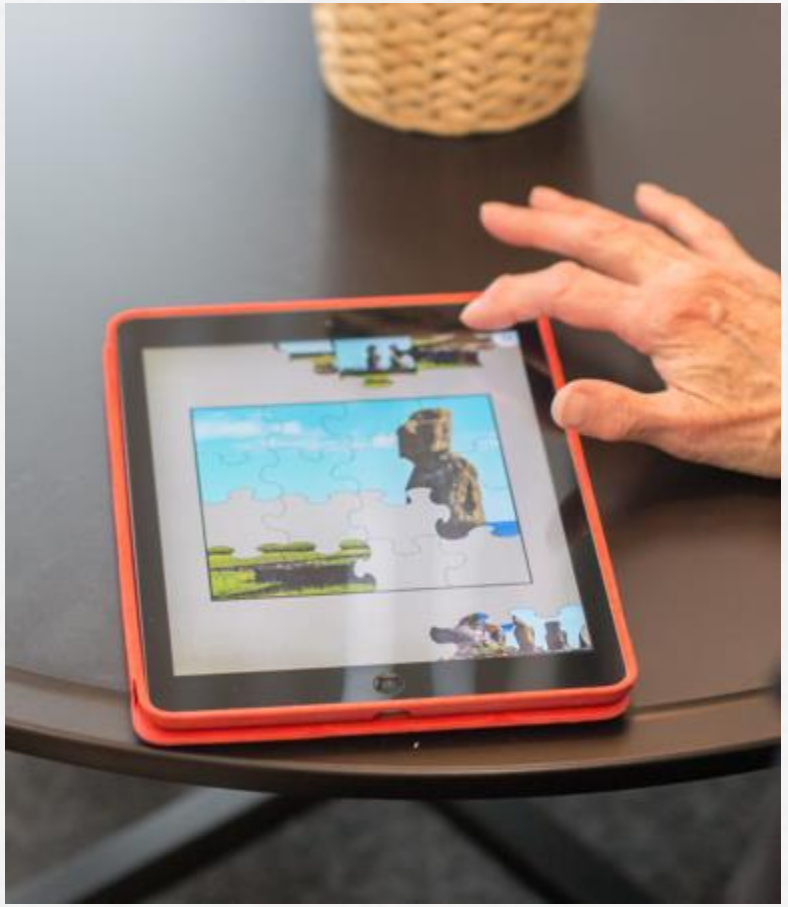
The need to facilitate opportunities for independent activity for people living with dementia is well established

(Harmer & Orrell 2008; Hellman 2014; Jones et al. 2020)

Touchscreen tablet computers are accessible for people living with dementia

(Armstrong et al. 2010, Joddrell & Astell 2016, Kerkhof et al. 2021)

Accessible design for dementia in touchscreen apps has received little attention



Apps

As of 2021, there are **4.5 million** apps available in the Apple App Store, and **2.8 million** in the Google Play Store

(Business of Apps, 2020)

Growing by **100,000** apps each month

(Statista, 2021)

Games account for **20%** of all apps

(Business of Apps, 2020)

Where to start?

Aims

Accessible Touchscreen Apps for People Living with Dementia

1. **Identify** key design features that increase accessibility
2. **Develop** an evidence-based framework to find apps
3. **Collaborate** with developers to improve their apps
4. **Share** app recommendations with people living with dementia and professional/family care providers

1. Identify design features

3 studies evaluating touchscreen apps

11 nursing or residential care services in Sheffield

66 people living with dementia participating

184 sessions of independent tablet interaction

9hrs 50mins video recordings analysed

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2. Develop a framework

Two stage, evidence-based app selection framework:

Stage 1. Finding apps

Stage 2. Evaluating apps

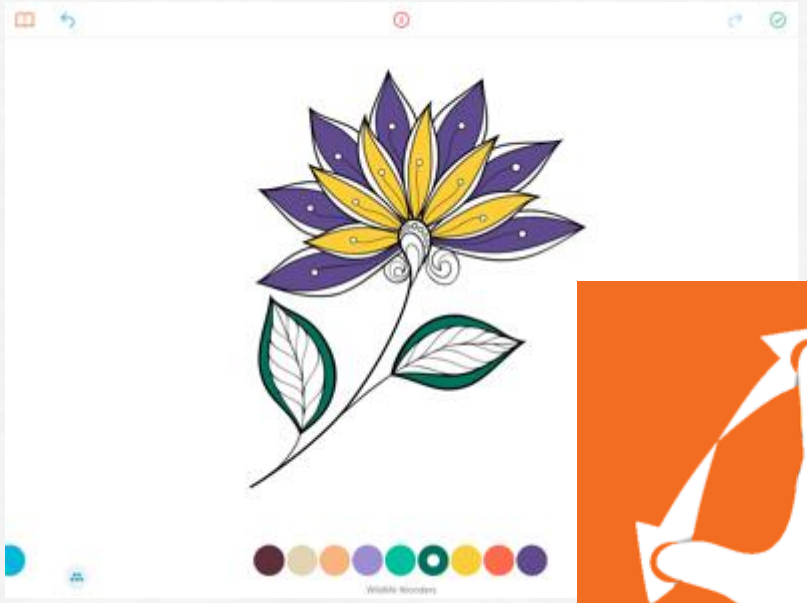
Stage 1. Finding apps

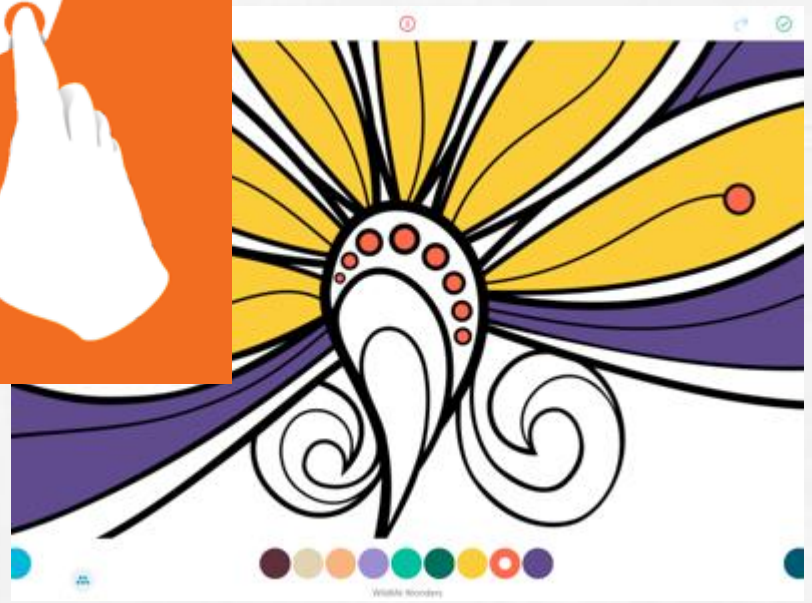
Stage 2. Evaluating apps

App Evaluation Tool

1. Interaction
2. Feedback
3. Visual design
4. Features
5. Customisation
6. Obstacles
7. Age appropriateness
8. Genre specific (e.g. games, art, etc.)

1. Interaction





- Gesture controls
- Responsive
- Assumed knowledge

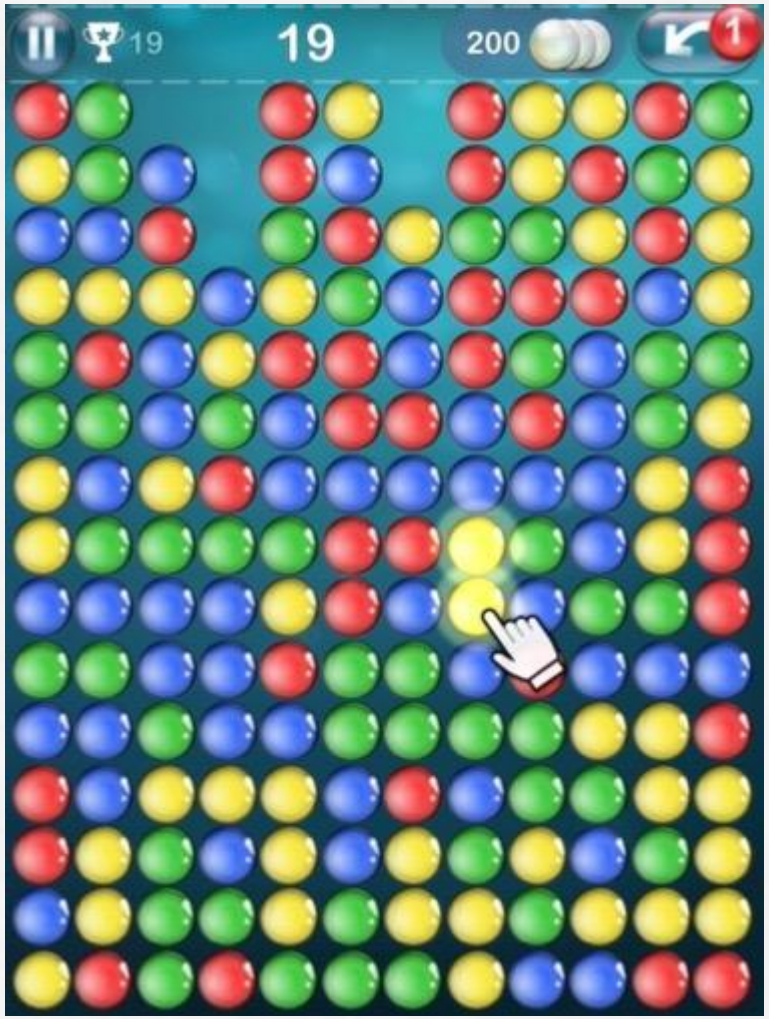
2. Feedback

- Animated
- Audio
- Text
- Haptic

3. Visual design

- Text size
- Font selection
- Object size
- Backgrounds

4. Features

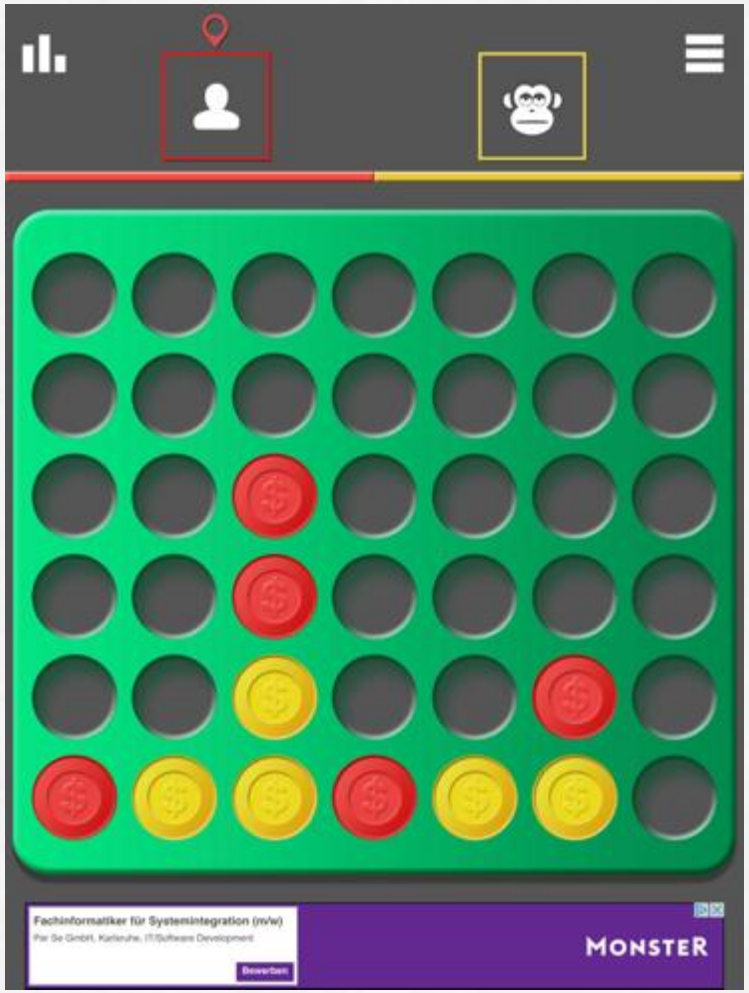


- Auto-prompts
- Hints
- Visible elements

5. Customisation

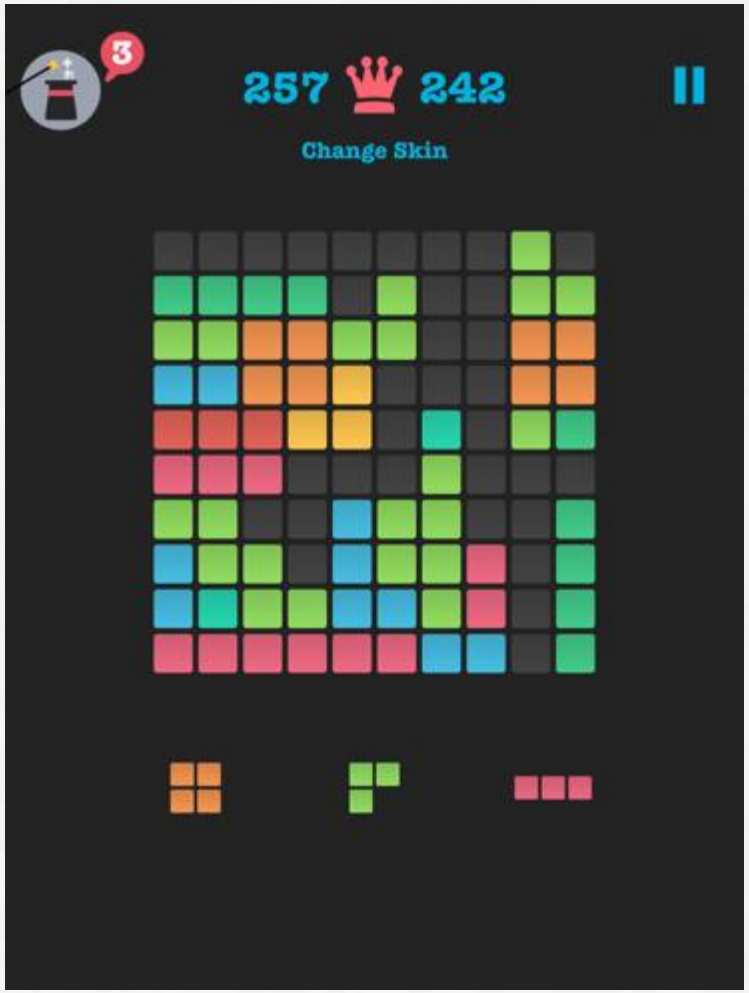
- Difficulty level
- Sound effects
- Font size
- Colour scheme
- Speed

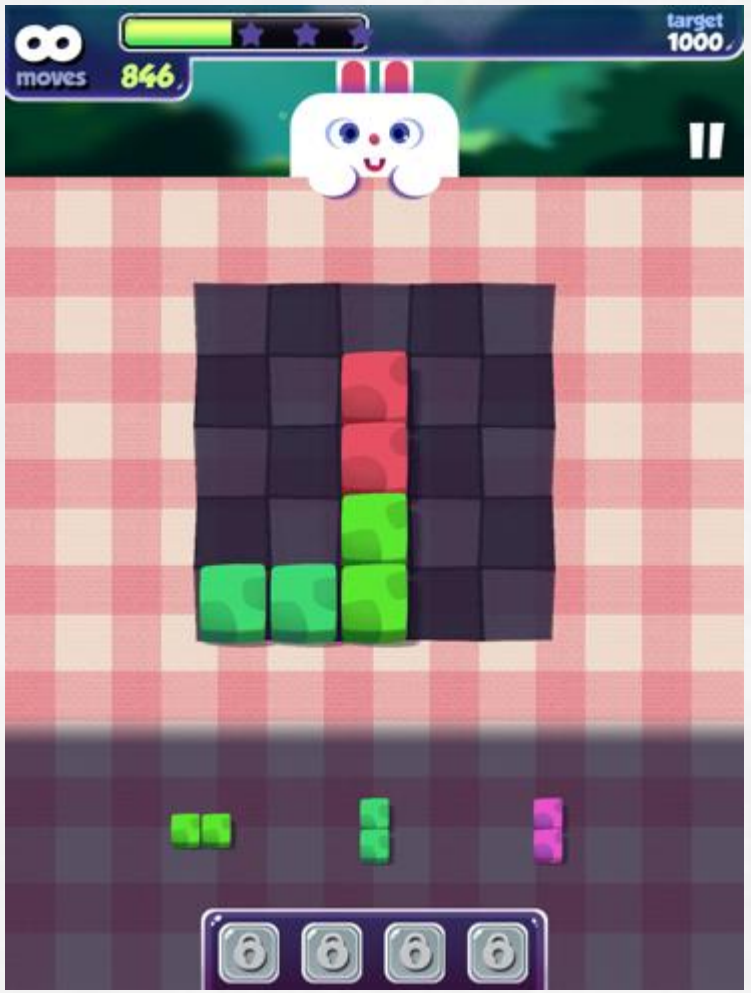
6. Obstacles



- Advertising
- Cost
- Pop-ups
- Stability

7. Age appropriateness





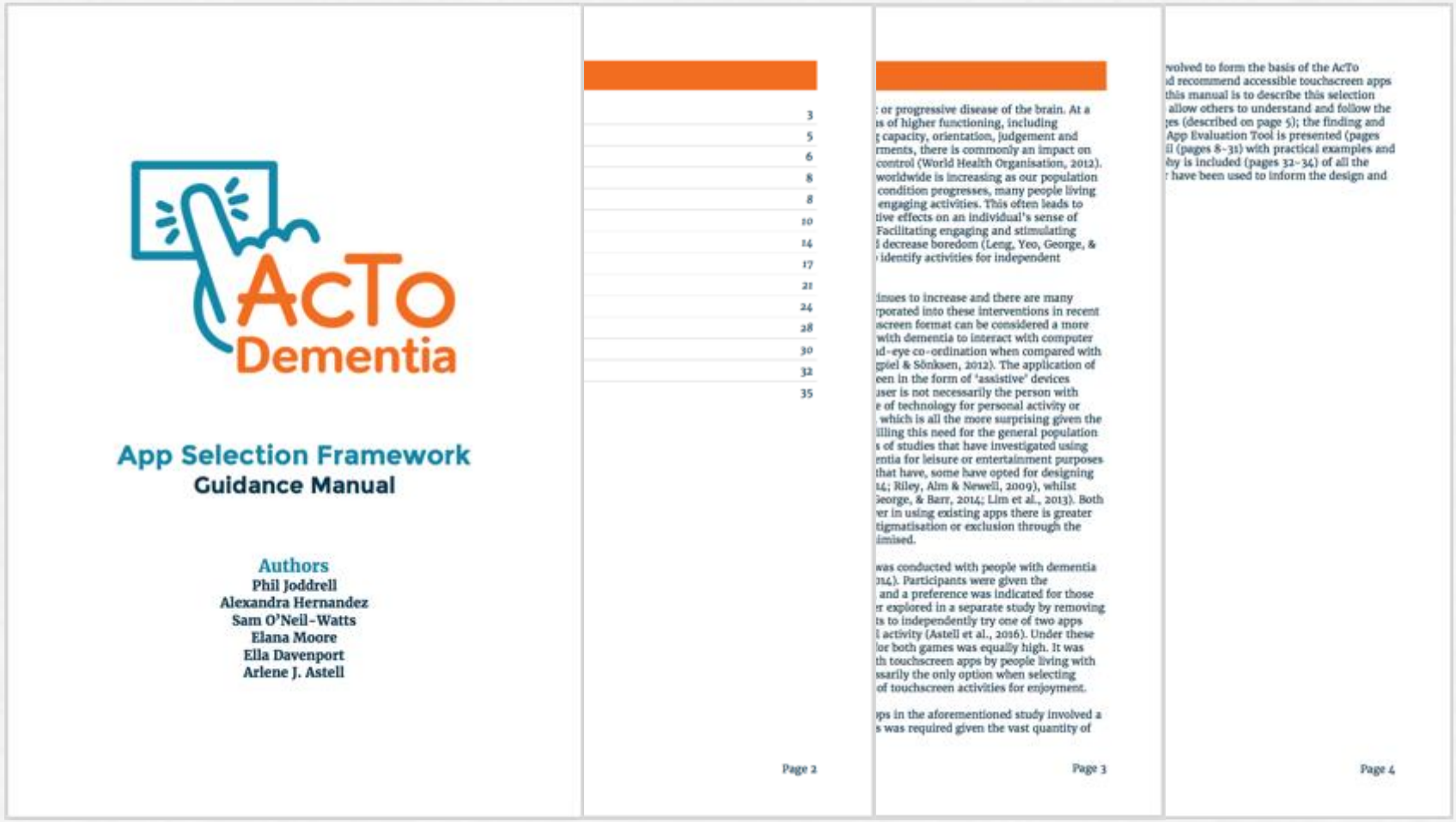
- Theme
- Characters
- Music
- Recommended age

8. Genre specific (if applicable)

For example, games:

- Multiplayer
- Faithful adaptation
- Game specific rules

Guidance manual



AcTo Dementia

App Selection Framework
Guidance Manual

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or progressive disease of the brain. At a
s of higher functioning, including
capacity, orientation, judgement and
rments, there is commonly an impact on
control (World Health Organisation, 2012).
worldwide is increasing as our population
condition progresses, many people living
engaging activities. This often leads to
tive effects on an individual's sense of
Facilitating engaging and stimulating
decrease boredom (Leng, Yeo, George, &
identify activities for independent

issues to increase and there are many
rporated into these interventions in recent
screen format can be considered a more
with dementia to interact with computer
d-eye co-ordination when compared with
gdel & Sönksen, 2012). The application of
een in the form of 'assistive' devices
ser is not necessarily the person with
e of technology for personal activity or
which is all the more surprising given the
illing this need for the general population
s of studies that have investigated using
ntia for leisure or entertainment purposes
that have, some have opted for designing
14; Riley, Alm & Newell, 2009), whilst
George, & Barr, 2014; Lim et al., 2013). Both
er in using existing apps there is greater
tigmatisation or exclusion through the
limised.

was conducted with people with dementia
014). Participants were given the
and a preference was indicated for those
r explored in a separate study by removing
ts to independently try one of two apps
l activity (Astell et al., 2016). Under these
or both games was equally high. It was
th touchscreen apps by people living with
ssarily the only option when selecting
of touchscreen activities for enjoyment.

ps in the aforementioned study involved a
s was required given the vast quantity of

Page 3

volved to form the basis of the AcTo
d recommend accessible touchscreen apps
this manual is to describe this selection
allow others to understand and follow the
es (described on page 5); the finding and
App Evaluation Tool is presented (pages
l (pages 8-31) with practical examples and
dy is included (pages 32-34) of all the
have been used to inform the design and

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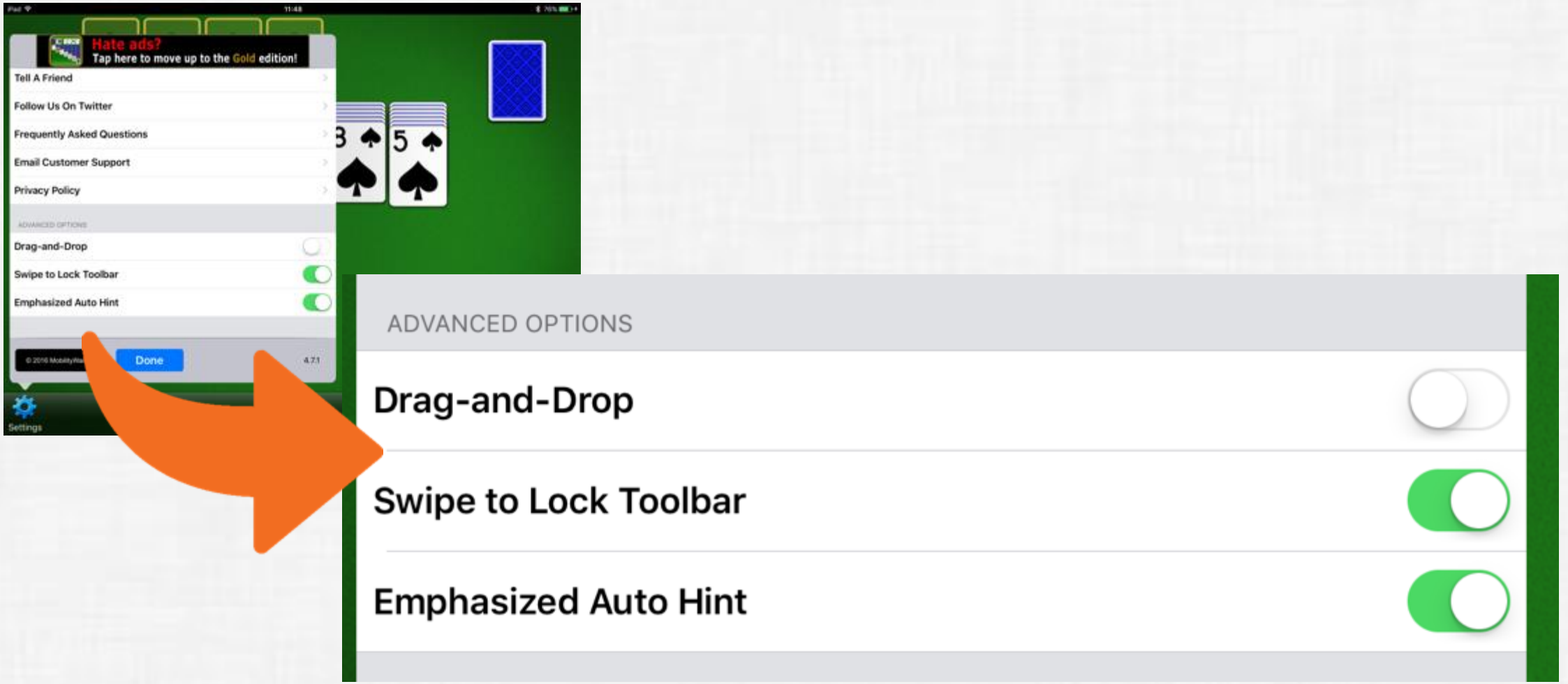
3. Collaboration with app developers

mobilityware

Spooky House Studios®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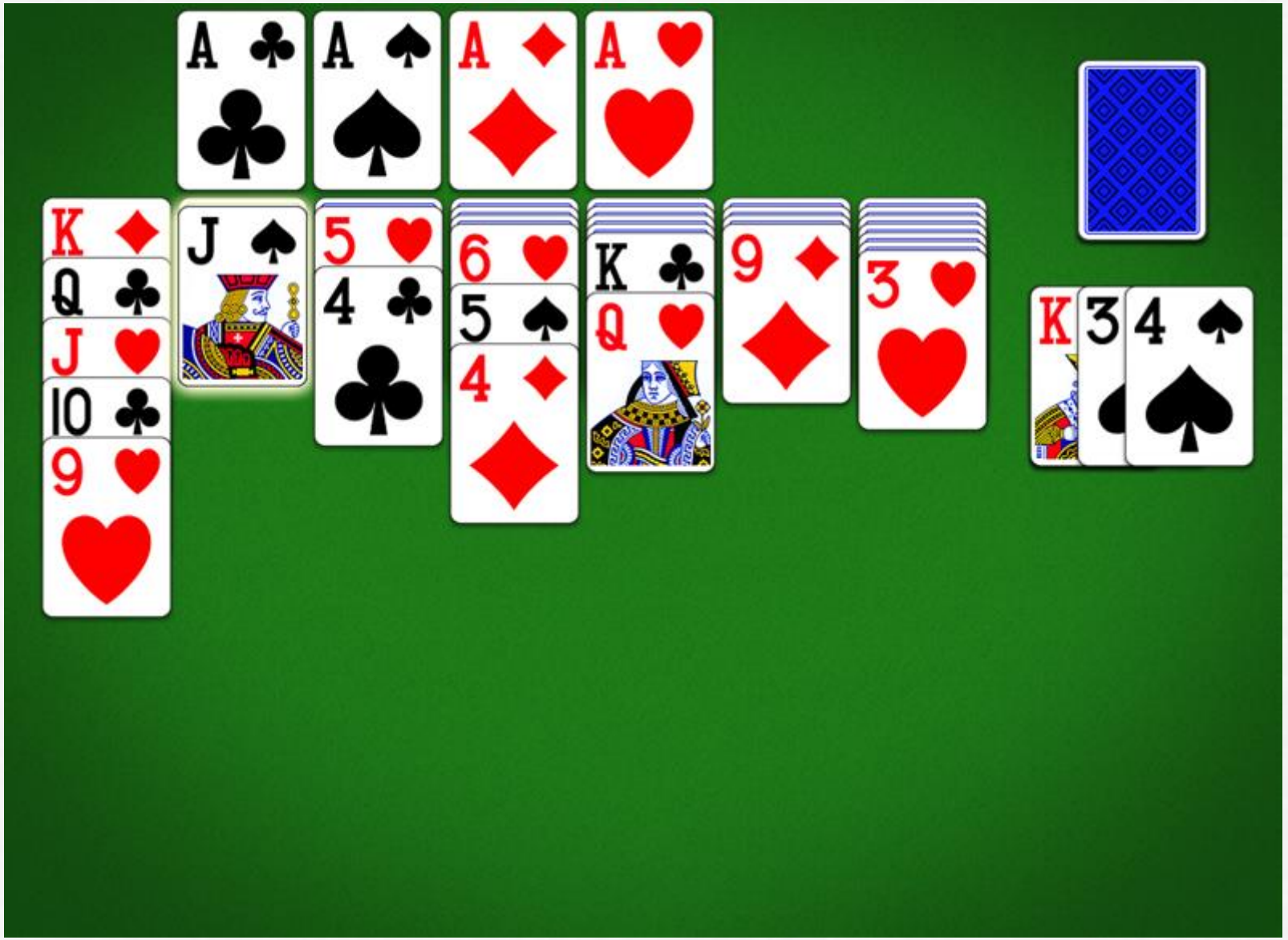
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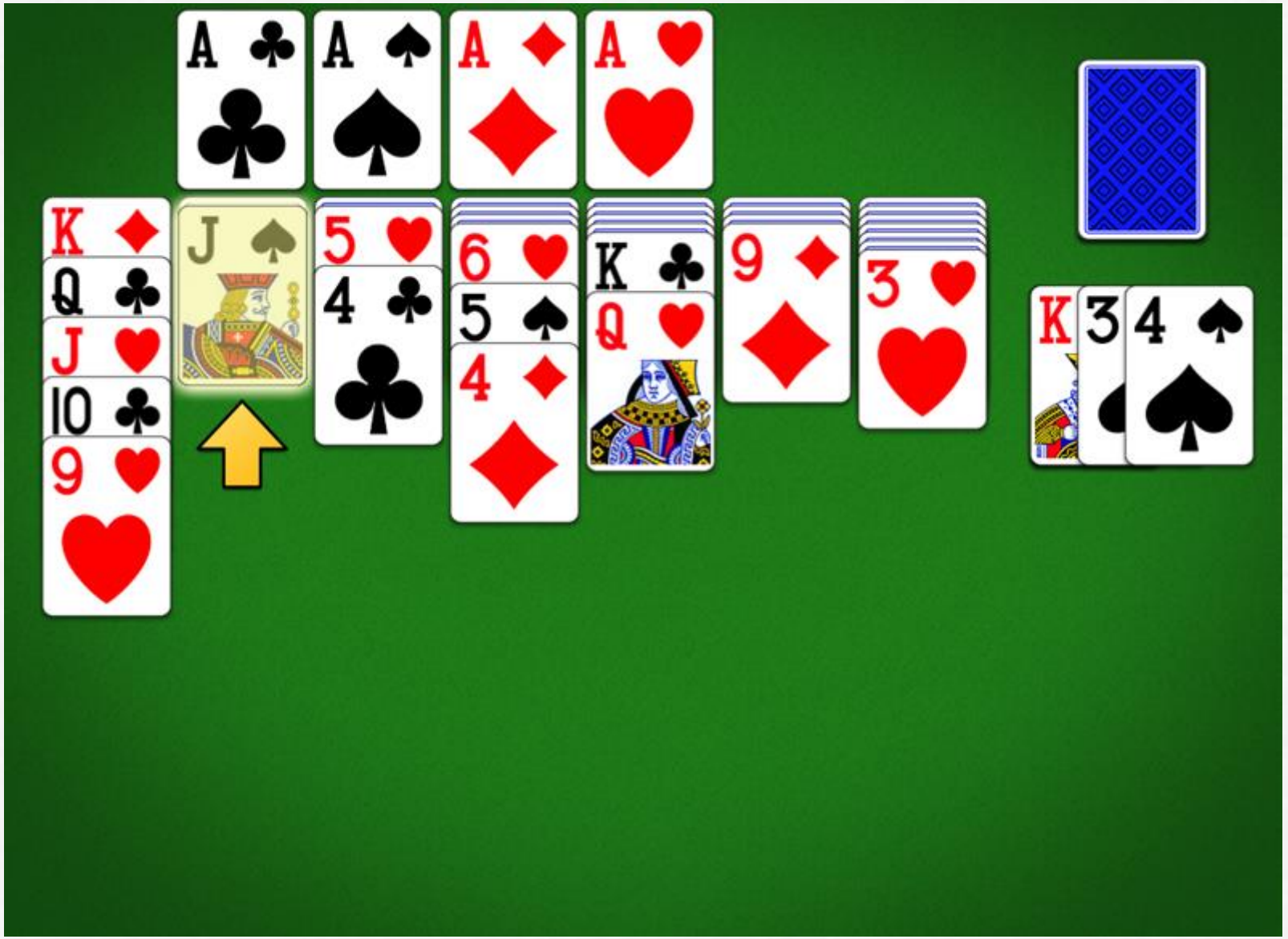
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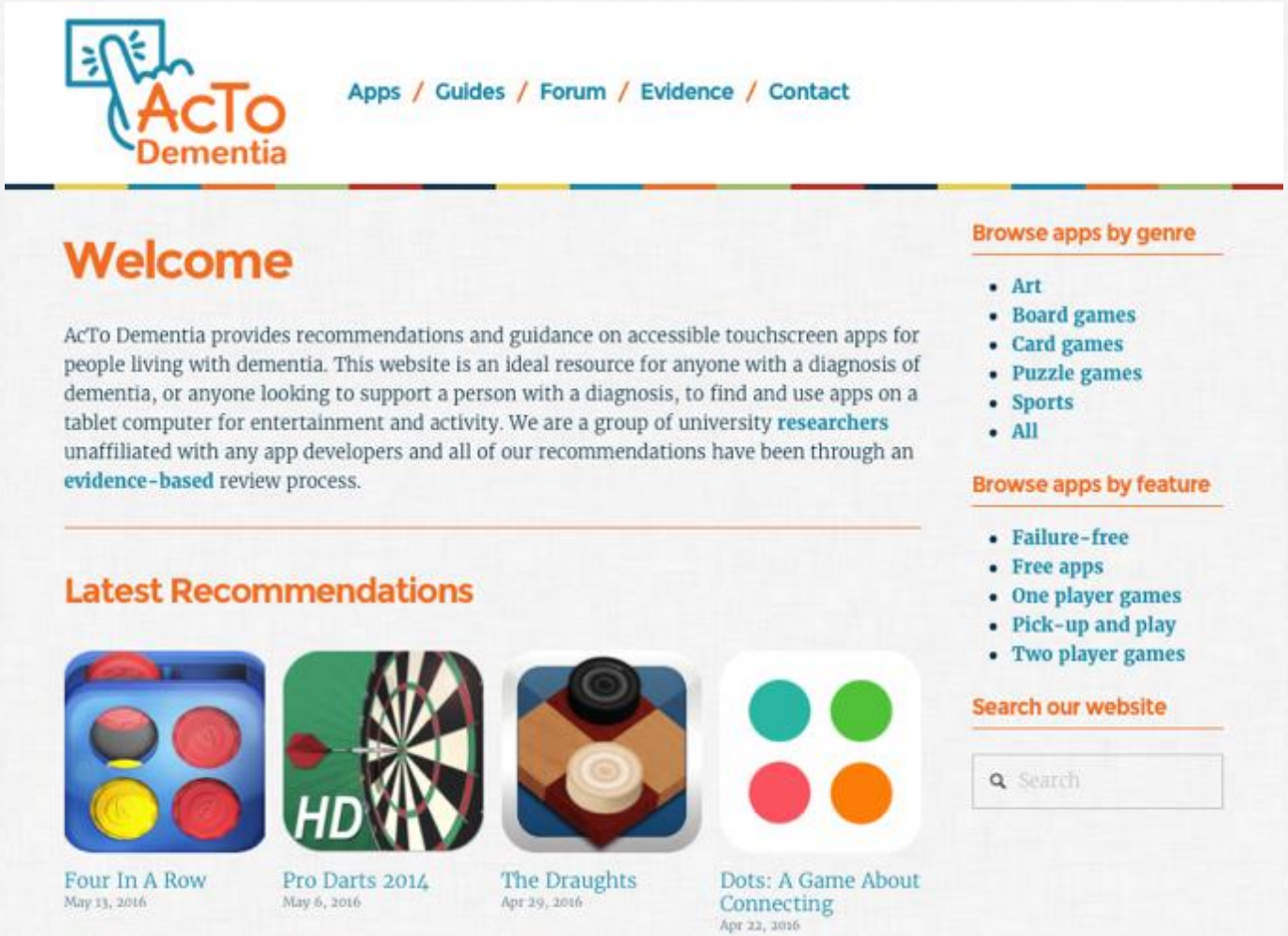
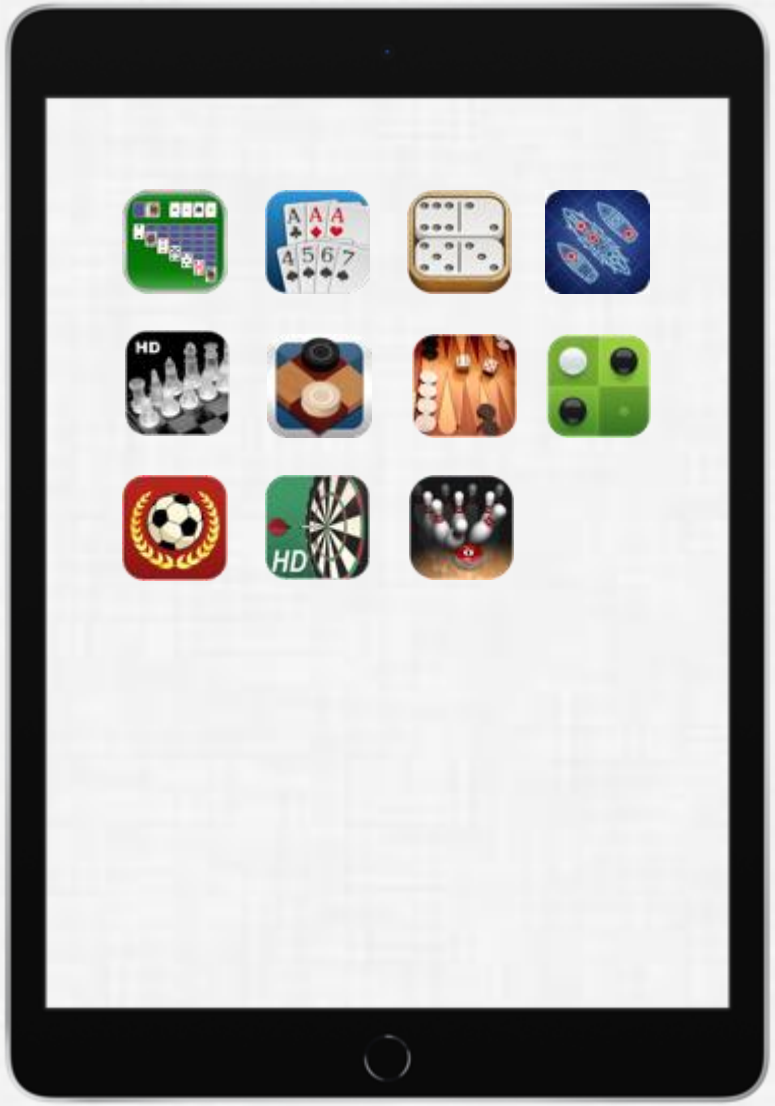
4. Share recommendations



www.actodementia.com

@actodementia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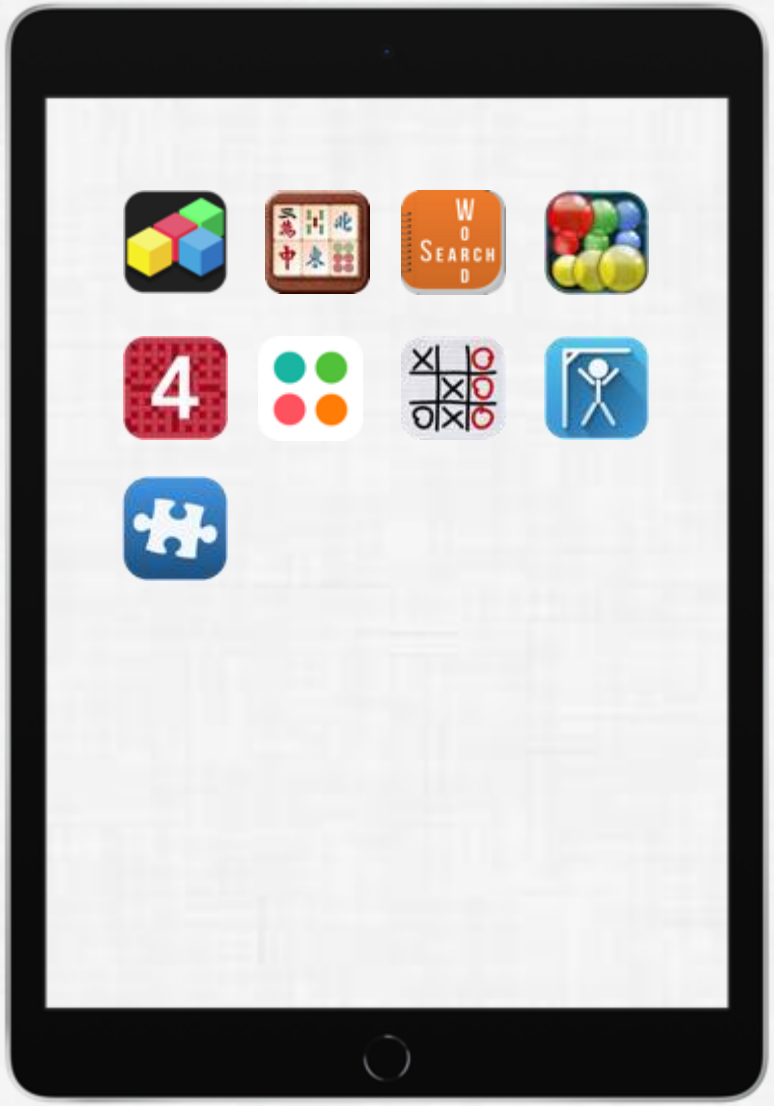
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Findings

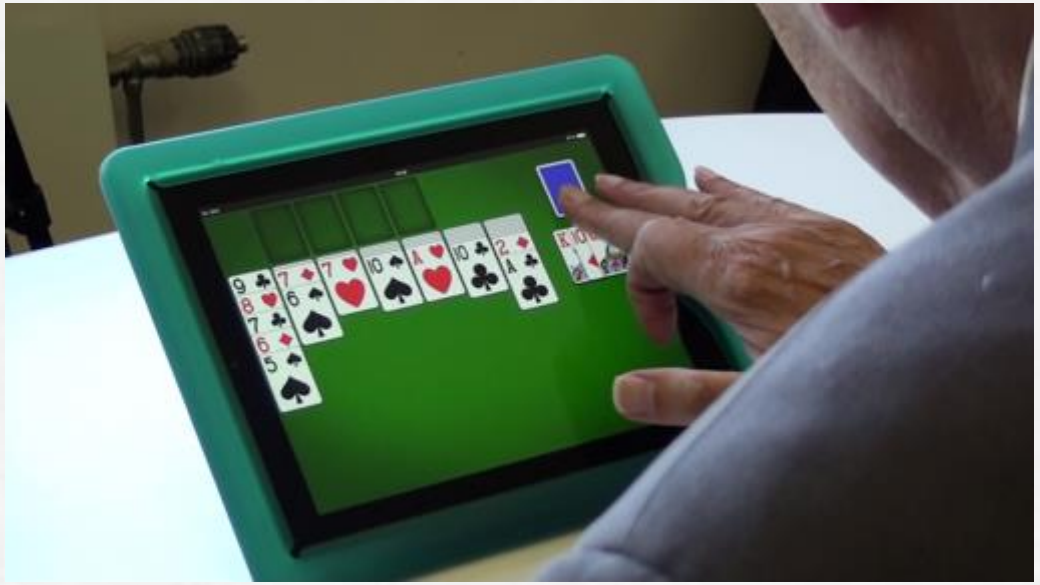
Findings: Independent use

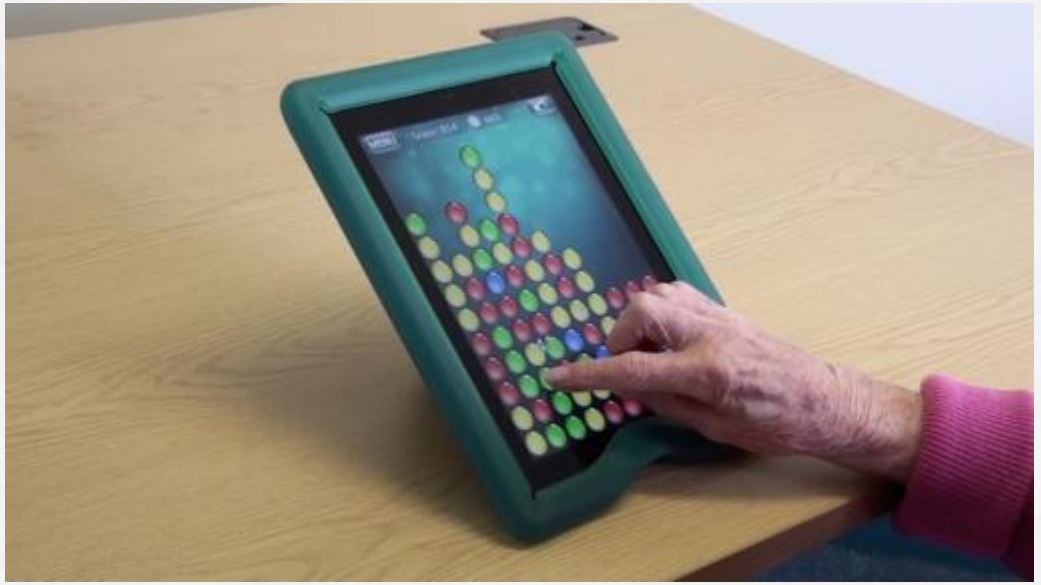
98%

participants interacted independently

Findings: Familiarity vs novelty

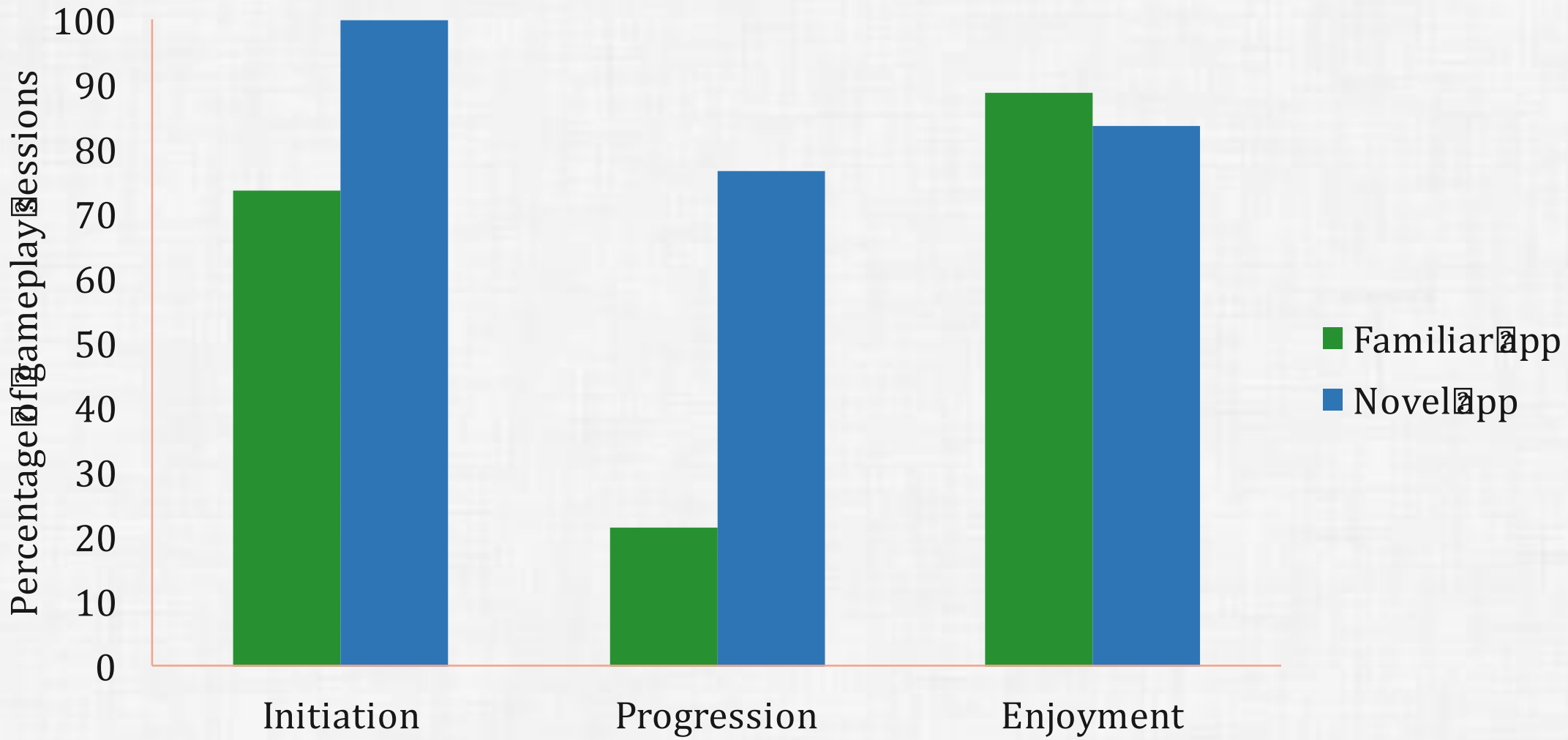
Avoid an over-reliance on familiarity



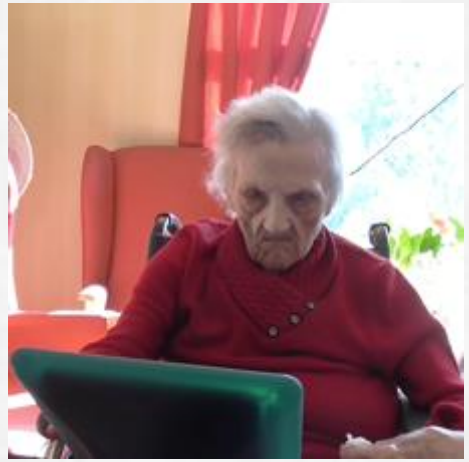
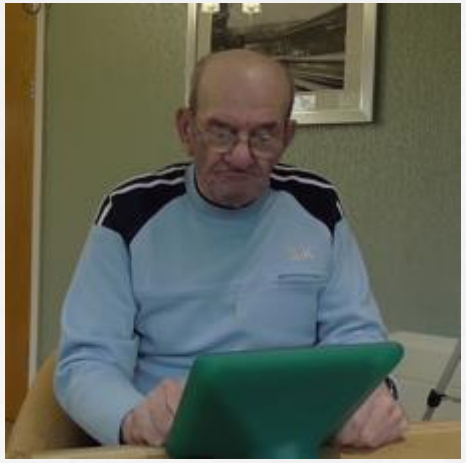


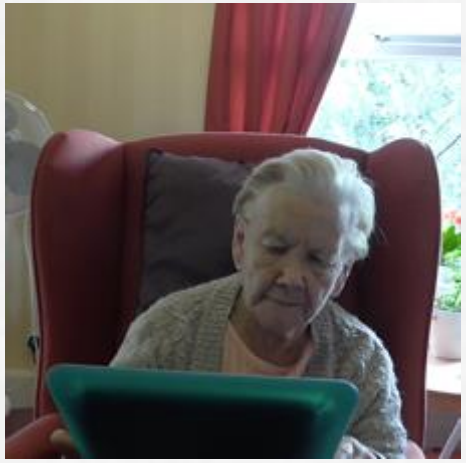
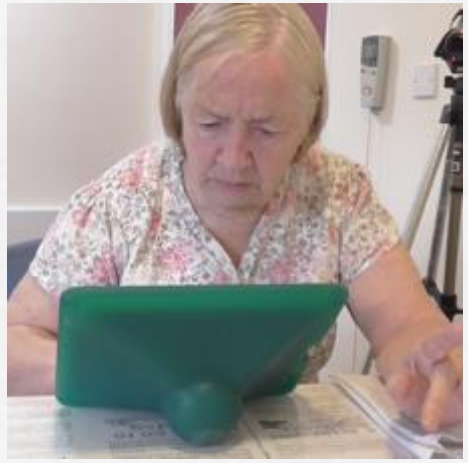
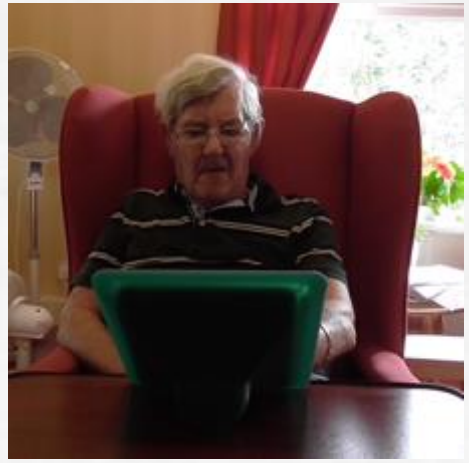
Don’t dismiss novelty

Findings: Enjoyment



Findings: Engagement

Involvement of stakeholders

AcTo

www.actodementia.com

Future directions...

Pilot and evaluate a tablet loan scheme – tablet computers with preloaded apps and settings

Expansion of app genres on the website, e.g. music, reading, cognition

Setup a UK network for digital resources for dementia

Thank you

Phil Joddrell

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