Implementing accessibility options for dementia in existing touchscreen apps

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Project Aims

The AcTo Dementia project is investigating the accessibility of touchscreen apps for people living with dementia, with four key aims:

- Identify design features that increase accessibility
- Develop an evidence-based framework to find apps
- Collaborate with developers to improve their apps
- Share app recommendations with people living with dementia and caregivers through a public website

Background

- Facilitating independent activities would benefit people living with dementia and their caregivers (Alm et al. 2009)
- Touchscreen tablet computers are accessible for people with dementia (Joddrell & Astell 2016), but identification of suitable apps is required to maximise their potential
- Original study (Astell et al. 2016) identified problematic design features for people living with dementia within two commercially available gaming apps
- Developers of these two apps worked in collaboration with the research team to implement dementia-enabling accessibility features

Apps

Accessibility settings implemented in Solitaire (MobilityWare):
- Option to select control method
- Emphasised auto-hint (Fig. 1)
- Hidden menu bar

Accessibility settings implemented in Bubble Explode (Spooky House Studios):
- Auto-hint
- Reduced fade speed of text feedback
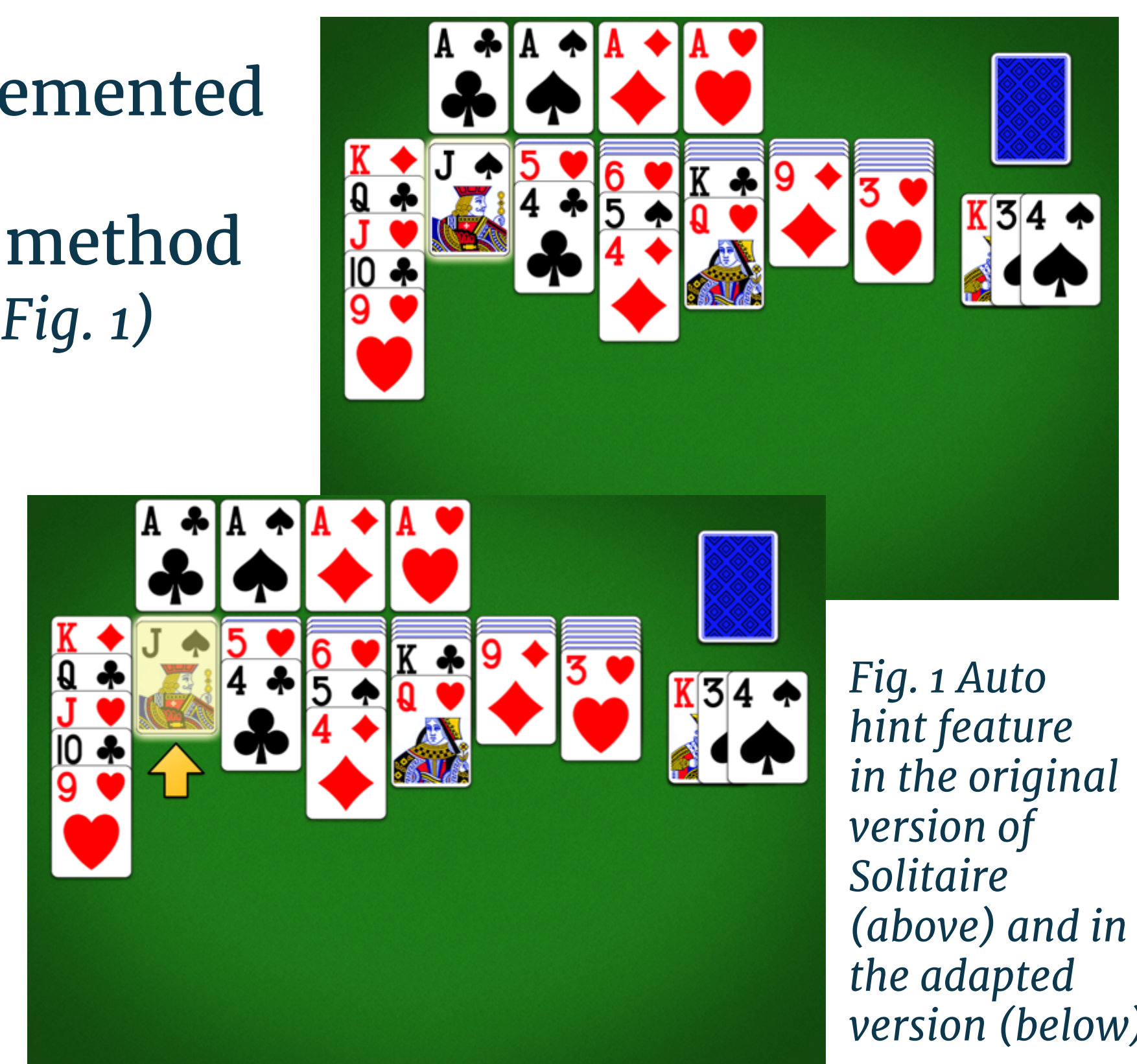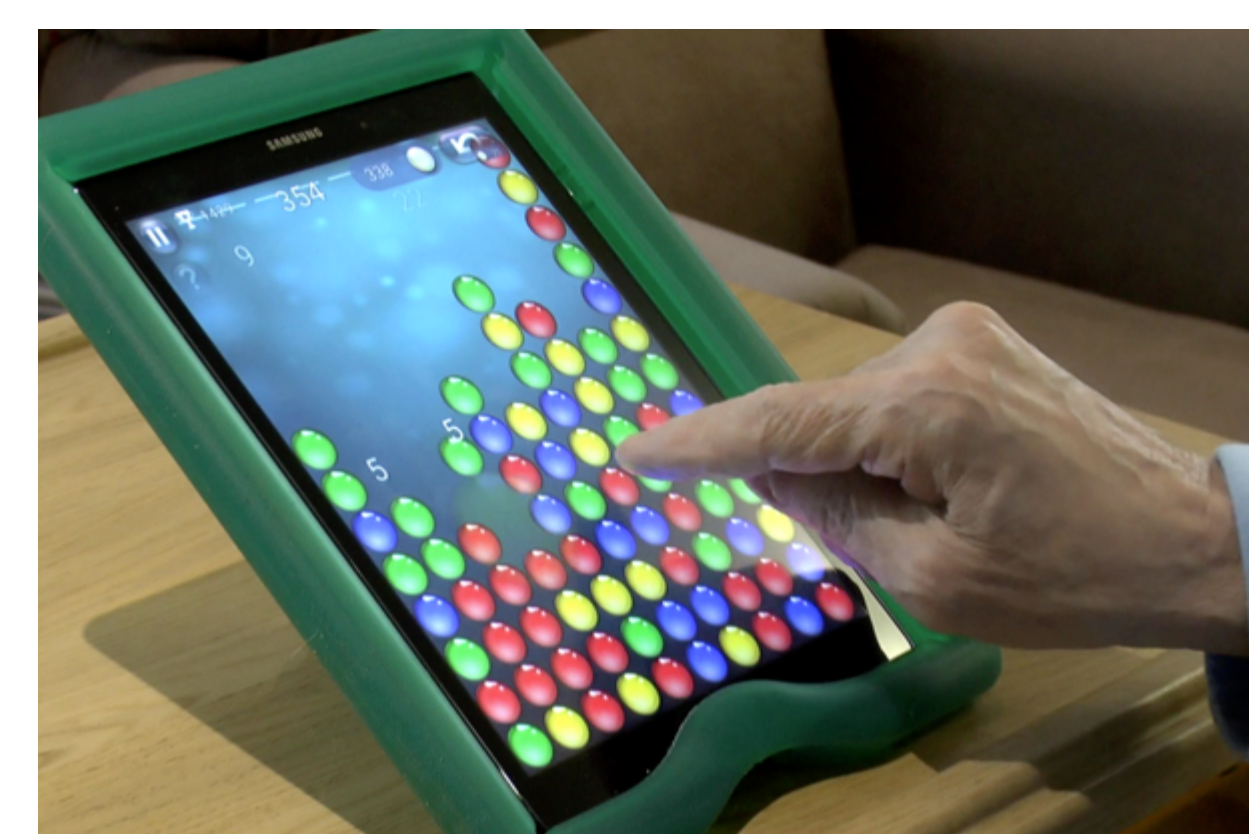
Not all recommendations were able to be delivered

Fig. 1 Auto hint feature in the original version of Solitaire (above) and in the adapted version (below)
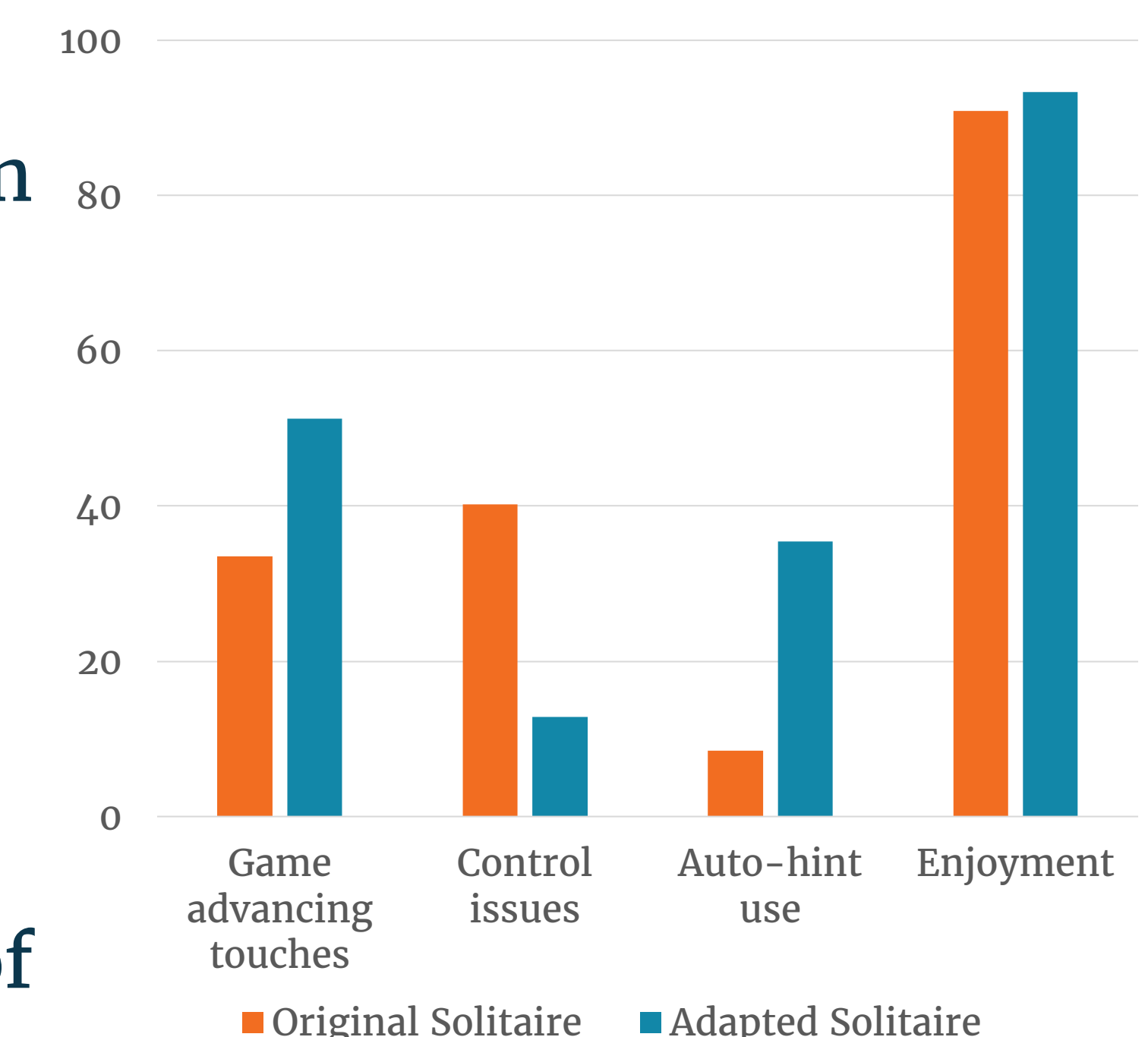
Method

- A repeat of the original study was conducted with 30 different participants living with dementia, to evaluate the effectiveness of the new features by comparing results
- Each participant was asked to play one of the adapted apps on three separate occasions (90 gameplay sessions)
- Each session was video recorded to allow for thorough analysis in a lab environment (using Observer™ software)

- Outcomes analysed in both studies for comparison:
  - *Gameplay touches that advanced the game*
  - *Touches indicating a control issue*
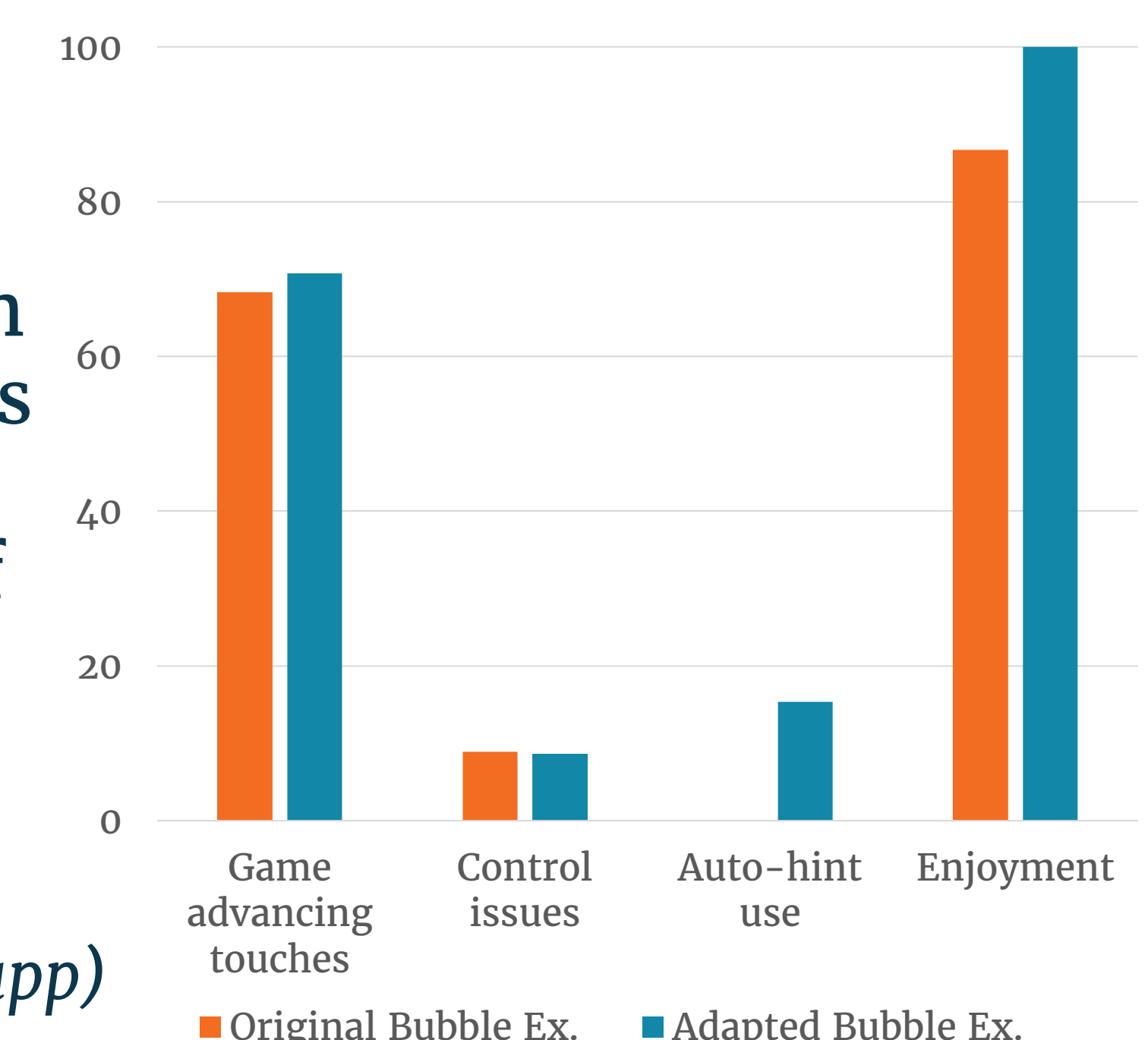 - *Auto-hint usage*
  - *Enjoyment (interview)*

Results

The adapted version of Solitaire saw more game advancing touches (not sig.), fewer control issues (sig. <.05), more use of the auto-hint feature (sig. <.05) and similar levels of enjoyment

There were no significant differences between any of the outcomes in the original and adapted versions of Bubble Ex. (NB. no comparison for auto-hint use as this was a newly introduced feature in the adapted app)

Conclusions

Adaptations to Solitaire were more effective than those to Bubble Ex. High levels of enjoyment were not sig. affected. There is clear potential for improving access to digital technology for people living with dementia through collaboration, but communication with developers is key.

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