Investigating people living with dementia's response to prompts in digital touchscreen games using eye-tracking

Arlene J. Astell[a] and Phil Joddrell[b]
[a]University of Toronto, Toronto, ON, Canada. Contact: arlene.astell@utoronto.ca
[b]Centre for Assistive Technology and Connected Healthcare, The University of Sheffield, UK. Contact: p.joddrell@sheffield.ac.uk

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

- Prompts are used in digital tasks to focus or regain the attention of users.
- Various digital prompt designs have been created for people with dementia but there is inconsistent evidence on the efficacy and it is likely that different designs will suit different tasks.
- The AcTo Dementia project created accessibility settings specifically for people living with dementia within two mainstream gaming apps – Solitaire (*see Fig. 1*) and Bubble Explode.
- Eye-tracking technology was used to examine the effectiveness of the prompts and their mechanism of action when playing the gaming apps.
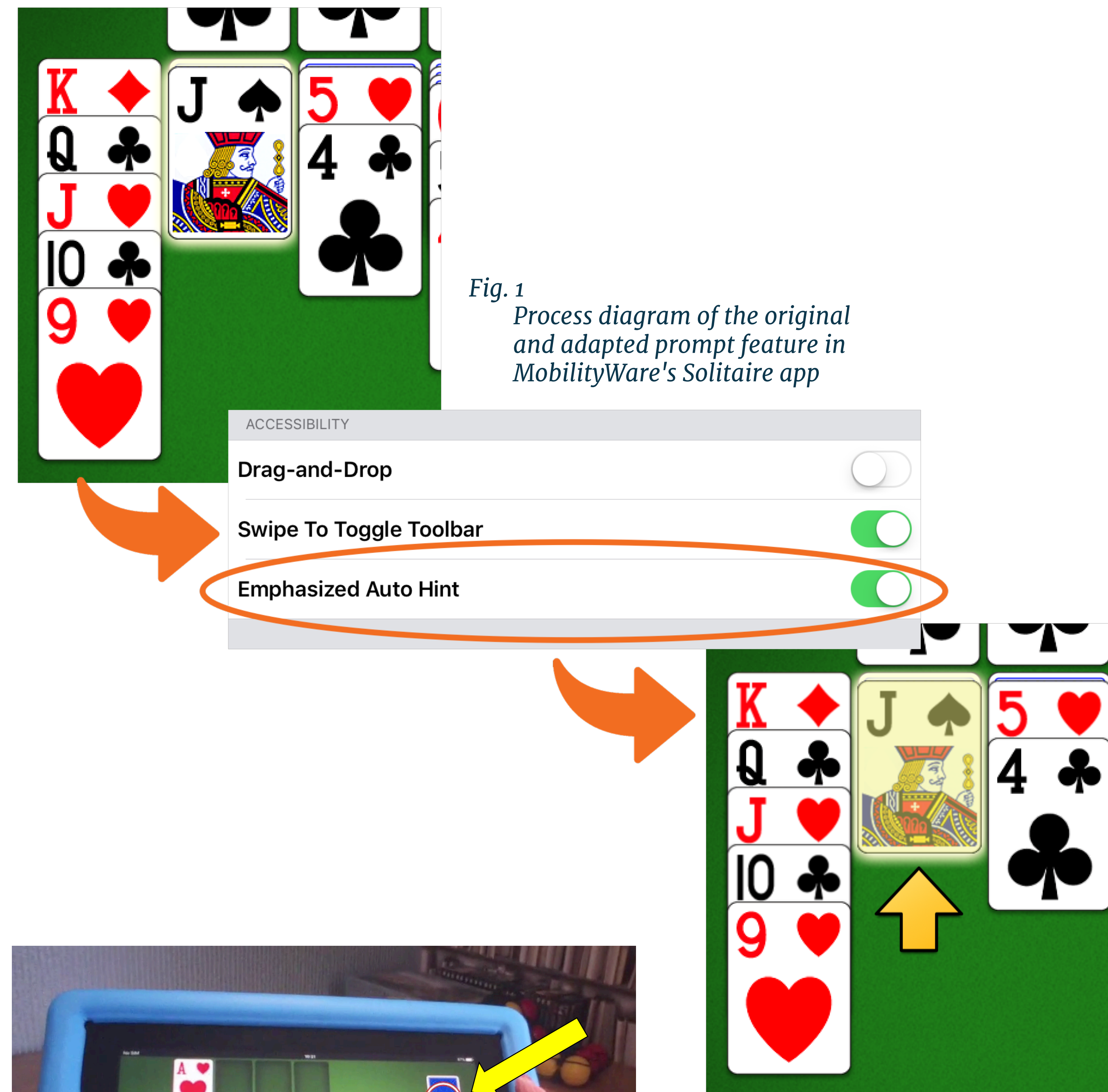

Fig. 1
Process diagram of the original and adapted prompt feature in MobilityWare's Solitaire app
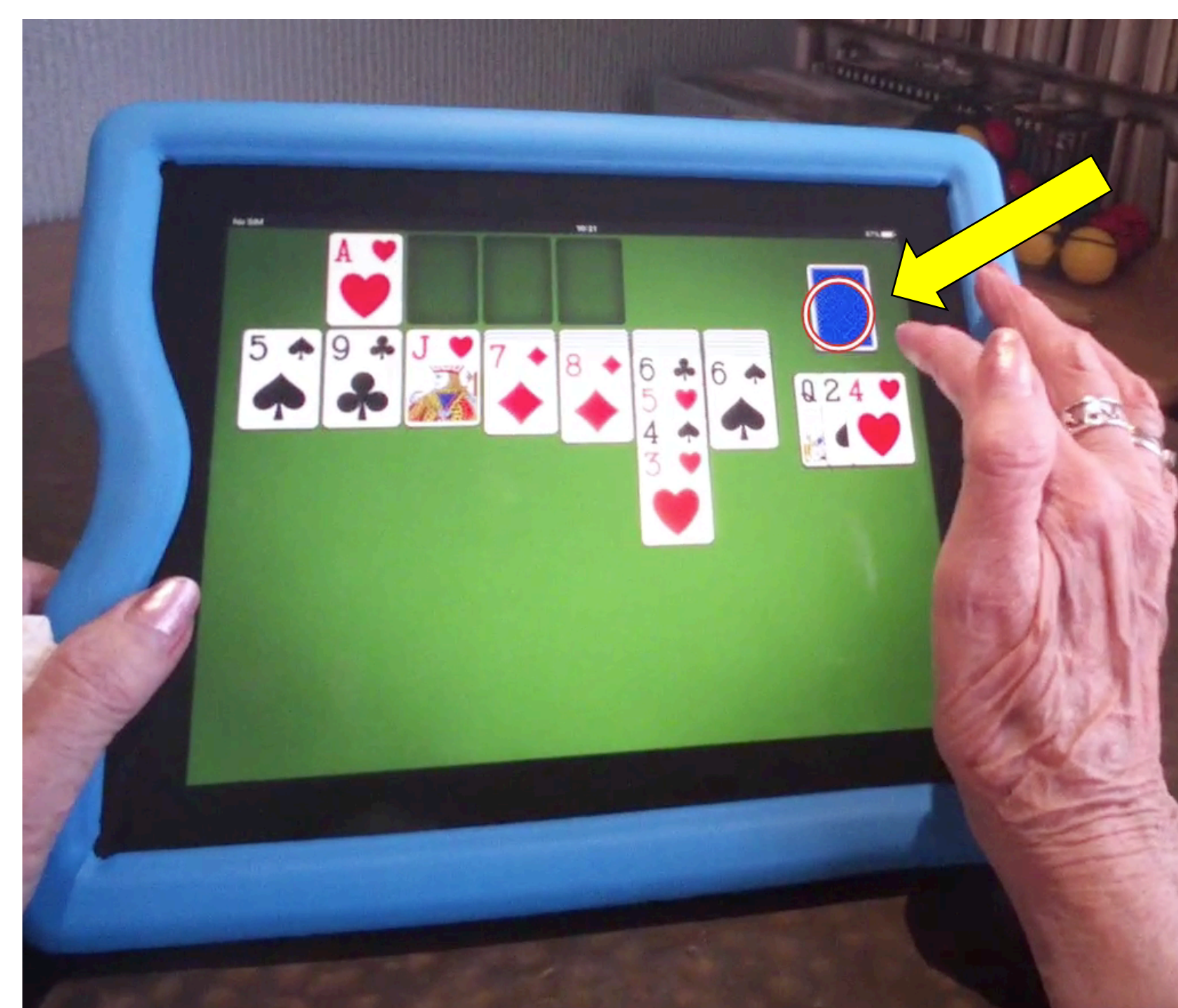

Fig. 2
A still image from the video output of the Tobii Pro Glasses 2 during a Solitaire gameplay session, featuring the eye-tracking marker (indicated by the arrow in the upper-right corner of the image)

Method

- Six people living with dementia were recruited; participants each played one of the games on three occasions (total 18 gameplay sessions).
- Wearable eye-tracking technology was employed to record the location of their gaze throughout their gameplay (*see Fig. 2*).
- Videos were coded to analyse whether (i) each generated prompt was visually fixated upon and utilised, and (ii) the time elapsed for each of these.

Results

- Participants playing Solitaire with the redesigned prompt utilised the feature significantly quicker than participants using the original version, once they had noticed it.
- There was also evidence that this redesigned prompt was more frequently and more quickly fixated upon than the original.
- The prompt in Bubble Explode was not easily noticed, but when focused on participants responded quickly and effectively.

Conclusions

- The findings of this study provide insight into the effectiveness and mechanisms of prompts (i.e., their ability to attract attention and convey purpose) in digital touchscreen games for people with dementia.

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