Measuring computer attitudes and experience in an older Australian adult sample in the CogSCAN Study

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Summary and Significance

The majority of CogSCAN participants to date have generally positive attitudes to computers and related technologies, and at least some experience with them.

The *CogSCAN Computer Experience and Opinion Questionnaire* will be used to investigate how older Australian adults' attitudes to computers and experience with computers influence the performance of prominent computerised neuropsychological tests. It can also be used to inform clinical decisions about individual suitability for computerised cognitive testing.

Background

- Computerised tests allow large scale cognitive screening and monitoring of cognition in older adults. The CogSCAN study is investigating the psychometric properties, performance and acceptability of four prominent computerised neuropsychological tests (CANTAB, Cogstate, CBS, NIH Toolbox) in older Australian adults, including those with MCI or dementia.
- Attitudes to computers and previous experience with computers are likely to affect performance on the tests and test validity, reliability and acceptability[1].
- Available measures of computer attitudes and experience are outdated, too long, assume a high level of sophistication in technology use, and/or are not validated for use with older adults.

Aims

1. To develop an instrument to measure **attitudes to computers** and **experience with computers and related technologies** suitable for use with older Australian adults.
2. To report the results on these measures for CogSCAN participants to date.

Methods

- We reviewed published measures of attitudes to and usage of computers and related technologies to identify psychometrically-validated measures appropriate for use by older Australian adults.
- Five attitude sub-scales were identified: **Computer Anxiety**[2,3], **Discomfort** (feelings of discomfort with the computer and its use)[4], **Positive Attitudes towards Technology**[5], **Negative Attitudes towards Technology**[5], **Efficacy** (feelings of competence with the computer)[4]
- Computer experience items: **Self-reported experience with a computer/ laptop computer, an ipad or tablet computer, and a smartphone** on a 5-point scale; attendance at a computer training course; checklist of common activities carried out using a computer, tablet or smartphone.
- Relevant items were pseudo-randomised to form a new questionnaire that was piloted with older Australian computer instructors (n = 3) and community-living older adults (n = 10) and revised after feedback.
- We are administering the questionnaire to participants in the CogSCAN study alongside a demographic interview and pen-and-paper and computerised cognitive tests.

Participant characteristics

29 (28%) men, 76 (72%) women
Mean age 71.2 years (s.d. 6.5, range 60-89)
Mean years of education 14.8 (s.d. 3.6)
Mean estimated IQ (TOPF) 108.3 (s.d. 10.9)
Mean MOCA score /30 25.2 (s.d. 2.9)

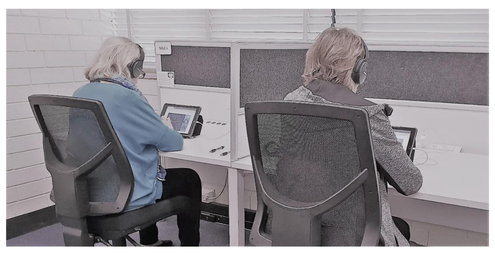

Figure 1. Pilot CogSCAN participants

Results: Computer self-efficacy

- 55% of respondents reported that they knew how to use a computer already.
- The remainder typically endorsed responses indicating low computer self-efficacy e.g. % disagree/strongly disagree: **"I think I am the kind of person who would learn to use a computer well."** 84%; **"I think I am capable of learning to use a computer"** 66%

Results: Computer attitudes

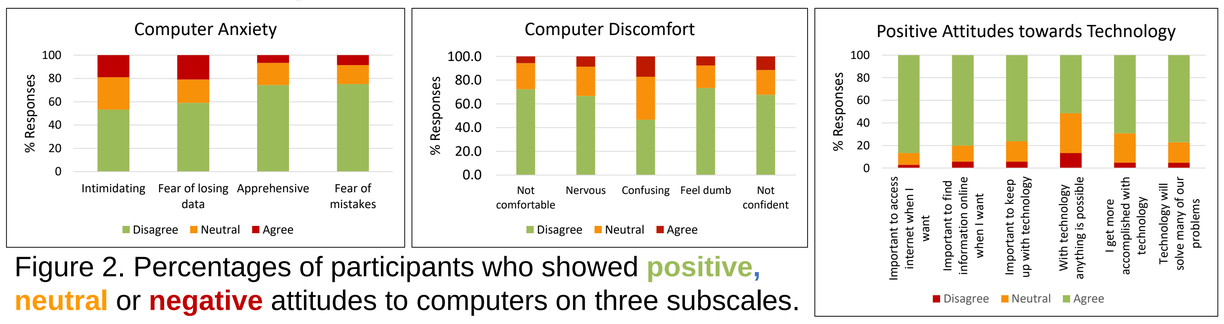

Figure 2. Percentages of participants who showed **positive**, **neutral** or **negative** attitudes to computers on three subscales.

Results: Computer experience

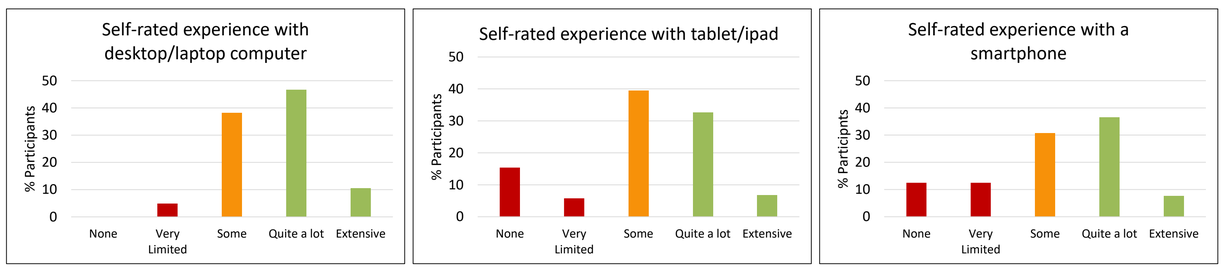

Figure 3. Percentage of participants who rated their experience with computers and related technologies as **none or very limited**, **some**, or **quite a lot or extensive**.

Results: Relationships between computer attitudes and computer experience

- Linear regression was used to examine the relationship between computer experience (the dependent variable) and *Computer Anxiety, Computer Discomfort,* and *Positive Attitudes towards Technology* as independent variables. Age, sex, years of education, estimated IQ and MoCA scores were included as control variables.
- When each of the computer attitude scales were included singly in the model, all were related to computer experience in the expected directions (negative for anxiety and discomfort and positive for positive attitudes, β's = -.42, -.53, .34 respectively; all p's <.001)
- When all three computer attitude scales were included simultaneously in the model, only *Computer Discomfort,* and *Positive Attitudes towards Technology* were statistically significant (β's = -.48, and .21; with p's of .001 and .009, respectively).
- In all analyses, age was significantly related to lower levels of computer experience, with β's ranging from -.37 to -.50; all p's < .001.

Discussion

- Participants to date generally report low computer anxiety, low discomfort and positive attitudes towards computers and related technologies.
- Younger participants and those who are more comfortable and less anxious with computers and who have positive attitudes towards technology report more experience with computers, tablets and smartphones, but the majority have at least some experience with them.
- Participants who report not knowing how to use a computer already have low self-efficacy with regard to learning.
- Recruitment is ongoing. We aim to attract more individuals with limited computer experience and more computer anxiety and discomfort to participate in future.
- We will conduct an exploratory factor analysis on responses from up to 200 community-living participants to identify the factor structure of the questionnaire and remove redundant items. The validity of the latent structure will be tested on responses from up to 200 further community-living participants using confirmatory factory analysis. We will also test the usability of the questionnaire with individuals diagnosed with MCI or mild dementia.

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