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Background: What is the Activity Card Sort?
The Activity Card Sort (Baum and Edwards, 2008) is a self-report outcome measure that provides insight into people’s occupational history and participation recognized internationally as a useful tool in both clinical practice and research (e.g. Eriksson, et al, 2011). The Activity Card Sort - United Kingdom (ACS-UK; Laver-Fawcett and Mahlison, 2013) comprises 93 graph activity cards and has three different versions for use in various settings: Recovery (Form A); Institutional (Form B); and Community Living (Form C). The ACS-UK is designed to measure changes in participation of older adults in four activity domains: instrumental (IADL); low demand leisure; high demand leisure; and social / cultural activities. This study aimed to evaluate the reliability of the ACS-UK community living version (Form C). The study was undertaken by three occupational therapy students for a third year research project.

Aim: To establish the inter-rater reliability and test-retest reliability of the ACS-UK (Form C). Inter-rater reliability determines how similar the data collected by different raters are (Gwet, 2014) and test-retest reliability measures the stability of an instrument in measuring the same construct over time within a specific population (Portney and Watkins, 2009). Two convenience samples of older people were recruited through local charity social groups. Participants completed the ACS-UK three times. To establish inter-rater reliability (IRR), ACS-UK was administered twice on the first day, with a break in between, by two different student researchers. To establish test-retest reliability (TRR), it was administered the third time, approximately two weeks later. Written consent was obtained prior to the initial data collection with verbal consent gained before each subsequent administration. Data for sample one was collected June 14 - January 2015 and for sample two between November 2015 – January 2016. Changes were made to the administration and scoring instructions and, in response to the face validity study findings (Laver-Fawcett et al, 2016) written additional notes to some ACS-UK cards between the data collection for the two samples.

Results
Analysis
Intraclass correlation coefficients (ICC) from a one-way ANOVA random effects model between Test 1 and Test 2 (two different raters or same rater at two different times). ICC > 0.75 is moderate and > 0.975 is good to excellent reliability (Bowers, 2014; Portney and Watkins, 2009).

Inter-rater reliability
Sample 1: n=17 completed the inter-rater reliability assessments. ICC for the Global Retained Activity Score (GRAS) of Sample 1 is moderate reliability (r=0.641), with a 95% confidence interval of 0.004 to 0.914, and a p-value of p<0.024.

Sample 2: n=17 completed the inter-rater reliability assessments. ICC for the GRAS of Sample 2 is excellent reliability (r=0.863) with a 95% confidence interval of 0.579 to 0.960 and a p-value of p<0.000. ICC values for the ACS-UK subscales are statistically significant (Bowers, 2014).

Test-retest reliability
Sample 1: n=15/17 completed the test-retest assessments. ICC for the Global Retained Activity Score (GRAS) of Sample 1 is moderate test-retest reliability (r=0.712), with a 95% confidence interval of 0.422 to 0.909 with a p-value of p<0.004.

Sample 2: n=17/17 completed the test-retest assessments. ICC for the GRAS of Sample 2 is excellent test-retest reliability (r=0.951), with a 95% confidence interval of 0.855 to 0.960 and a p-value of p<0.000.

Discussion
The inter-rater and test-retest reliability findings suggested that the ACS-UK has moderate to excellent reliability (Portney and Watkins, 2009) with single measures ICC figures ranging from 0.64 to 0.86 for the GRAS of inter-rater reliability and 0.754 to 0.830 for test-retest reliability for Samples 1 and 2 respectively. It is hypothesised that the inter-rater and test-retest reliability ICC’s for sample 2 were higher than those for Sample 1 owing to improvements being made to the administration and scoring of the ACS-UK photograph cards. For example, changes to cards included adding verbal explanations to some of the activity cards in order to clarify the data collection and changing the activities or scoring of some activities in order to depict the activity better (see the example “Taking care of pets’ card). ACS-UK’s test-retest reliability for Sample 2 (ICC 0.86) was slightly lower than that of the ACS over a 1 week interval (ICC 0.89) but higher than the ACS test-retest reliability over a 2 week period (ICC 0.83) (Baum and Edwards, 2008) and lower than ACS-NL (ICC 0.89) (Jong, van Nes and Lindemob, 2012). The consistency of the five most important activities selected by the client at the end of the ACS-UK was also examined over-time and across raters, but was not found to have adequate levels of reliability. In a study examining the reliability of the Netherlands version of the ACS, the ACS-NL, Jong, van Nes and Lindemob (2012) also highlighted differences between the top five activities chosen for participants. Therefore, the selection of the top five activities should only be used as a guide for selecting meaningful activities when setting goals and not as part of the re-test for evaluation.

Limitations
The convenience sample was homogeneous in terms of participants’ ethnicity. There were few older adults around the age of 65. There were significantly more women than men included within the sample. The sampling strategy, recruiting participants through social clubs, may have produced a biased sample.

Future research:
Only the community living version (Form C) of the ACS-UK was investigated. Future ACS-UK studies need to recruit from the wider community. Evaluation of the reliability of the ACS-UK Institutional version (Form A) and Recovery version (Form B) is required.

Conclusion:
The ACS-UK has good inter-rater and test-retest reliability.

Application to Practice:
ACS-UK enables occupational therapists to assess participation and plan interventions to support older people’s activity engagement. It can be used to evaluate participation outcomes related to IADL, leisure and social / cultural activities in clinical practice and research.