**Standardized Usability and Proficiency Measures for mHealth Apps**

**Proficiency Measures:**

**The Mobile Device Proficiency Questionnaire**

The Mobile Device Proficiency Questionnaire (MDPQ) is a scale developed to accurately assess the mobile device proficiency of older adults. There is a full version and a short 16-question version of the MDPQ (MDPQ-16). The MDPQ, its subscales, and the MDPQ-16 have been found to be highly reliable and valid measures of mobile device proficiency. The MDPQ and MDPQ-16 may serve as useful tools for facilitating mobile device training of older adults and measuring mobile device proficiency for research purposes.

Roque, N. A., & Boot, W. R. (2018). A new tool for assessing mobile device proficiency in older adults: the mobile device proficiency questionnaire. Journal of Applied Gerontology, 37(2), 131-156.

**Computer Proficiency Questionnaire (CPQ)**

The Computer Proficiency Questionnaire (CPQ) assesses proficiency using computers in six domains represented by subscales (basics, printer, communication, Internet, calendar, and entertainment). The 33 items ask about how easily one can complete each task on a computer with items rated on a five-point scale ranging from 1 (never tried) to 5 (very easily). Total scores are generated from average scores from each subscale, with higher scores indicating greater computer proficiency.

Boot W.R., Charness N., Czaja S.J., et al.(2013). Computer proficiency questionnaire: assessing low and high computer proficient seniors. Gerontologist, 55(3), 404-411.

**Usability Measures:**

**System Usability Scale (SUS)**

The system usability scale (SUS) is a simple, ten-item attitude Likert scale giving a global view of subjective assessments of usability. It was developed by John Brooke at Digital Equipment Corporation in the UK in 1986 as a tool to be used in usability engineering of electronic office systems.

The usability of a system, as defined by the ISO standard ISO 9241 Part 11, can be measured only by taking into account the context of use of the system—i.e., who is using the system, what they are using it for, and the environment in which they are using it. Furthermore, measurements of usability have several different aspects: effectiveness (can users successfully achieve their objectives), efficiency (how much effort and resource is expended in achieving those objectives), and satisfaction (was the experience satisfactory).

Brooke, J. (1986). SUS: a "quick and dirty" usability scale. In P. W. Jordan, B. Thomas, B. A. Weerdmeester, & A. L. McClelland (eds.). Usability Evaluation in Industry. London: Taylor and Francis.

**Mobile App Rating Scale (MARS)**

Mobile App Rating Scale (MARS) is a well-known standardized tool developed by the Queensland University of Technology. The MARS is a simple, objective, and reliable tool for classifying and assessing the quality of mobile health apps. It is designed to score apps on the criteria of engagement, functionality, aesthetics, and information quality. It can also be used to provide a checklist for the design and development of new health apps.

Stoyanov, S. R. and Hides, L. PhD (2015). Mobile App Rating Scale: A New Tool for Assessing the Quality of Health Mobile Apps. JMIR Mhealth Uhealth, 3(1). doi:[10.2196/mhealth.3422](https://dx.doi.org/10.2196/mhealth.3422).

**The SUPR-Q (Standardized User Experience Percentile Rank Questionnaire)**

The SUPR-Q (Standardized User Experience Percentile Rank Questionnaire) is a standardized questionnaire that measures the quality of the website user experience. It's an 8-item instrument that's gone through multiple rounds of psychometric validation and is used by hundreds of organizations around the world.

Sauro, J. (2015). SUPR-Q: a comprehensive measure of the quality of the website user experience. Journal of Usability Studies, 10(2). <https://dl.acm.org/doi/10.5555/2817315.2817317>

**Patient Satisfaction Measures:**

**Client Satisfaction Questionnaire (CSQ)**

The Client Satisfaction Questionnaire is an 8-item measure of client/patient satisfaction.

Larsen‚ D. L.‚ Attkisson‚ C. C.‚ Hargreaves‚ W. A.‚ & Nguyen‚ T. D. (1979). Assessment of client/patient satisfaction: Development of a general scale. Evaluation and Program Planning‚ 2‚ 197-207.

**Mobile Agnew Relationship Measure (mARM)**

The Agnew Relationship Measure (ARM) is a well-validated measure of therapeutic alliance in face-to-face therapy. Researchers have developed a mHealth version of the ARM, the mARM, that has good face and content validity. The authors encourage researchers to include this easy-to-use tool in digital health intervention studies to gather further data about its psychometric properties and advance our understanding of how therapeutic alliance influences the efficacy of mHealth interventions.

Berry, K., Salter, A., Morris, R., James, S., Bucci, S. (2018). Assessing Therapeutic Alliance in the Context of mHealth Interventions for Mental Health Problems: Development of the Mobile Agnew Relationship Measure (mARM) Questionnaire. J Med Internet Res, 20(4). doi: 10.2196/jmir.8252.

**Other mHealth Measures:**

**mHealth evidence reporting and assessment (mERA) checklist**

The mERA checklist seeks to standardize the reporting of mHealth findings and to promote the expansion of the evidence base by supplementing existing reporting standards to provide a concrete checklist of criteria specific to reporting on digital innovations; and elaborating on the existing criteria to support high-quality methodological reporting of evidence.

Agarwal, S. et al (2016). Guidelines for reporting of health interventions using mobile phones: mobile health (mHealth) evidence reporting and assessment (mERA) checklist. BMJ, 352:i1174. doi: <https://doi.org/10.1136/bmj.i1174>

**RE-AIM (Reach, Effectiveness, Adoption, Implementation, Maintenance)**

Questions to Ask about RE-AIM Dimensions When Evaluating Health Promotion Programs and Policies

<http://www.re-aim.org/wp-content/uploads/2016/09/questions.pdf>. Harden, Samantha. RE-AIM.org: