User Authentication for Individuals with Cognitive Disabilities

A large number of individuals with cognitive disabilities depend on computers and the internet for a variety of tasks and therefore, use authentication applications on an everyday basis. However, limited research has been conducted to examine the use of authentication methods by individuals with cognitive disabilities. There is a gap in existing literature between the urgent needs of individuals with cognitive disabilities for effective authentication methods and the limited understandings of their abilities, limitations, and preferences regarding authentication tasks. We conducted an empirical study to systematically investigate how individuals with cognitive disabilities, specifically Down syndrome, interact with various user authentication mechanisms. This research provides the very first benchmark data on the performance of individuals with Down syndrome when using multiple authentication methods. It confirms that individuals with DS are capable of using the traditional text passwords with reasonable efficiency and acceptable error rate. Contrary to the previous belief, this research suggests that mnemonic method is not an effective solution for individuals with DS.

Users’ cognitive disability does have significant impact on performance. Individuals with DS spent substantially longer time to register and login than the neurotypical users when using all three types of passwords. In addition to the difference in performance, users with DS and neurotypical users also have difference in how they evaluate the authentication methods. Based on the findings of the study, we proposed design guidelines that aim to assist both practitioners and researchers in designing and developing effective authentication applications that fit the special needs of individuals with cognitive disabilities.