

CONSTRUCTING A 30-ITEM TEST FOR CHARACTER AMNESIA

Steven Langsford, Xu Zebo & Zhenguang G. Cai
(Chinese University of Hong Kong)
stevenwilliamlangsford@cuhk.edu.hk

In the digital age, handwriting literacy has declined to a worrying degree, especially in non-alphabetic writing systems. In particular, Chinese (and also Japanese) handwriters have suffered from character amnesia (提笔忘字), where people cannot correctly produce a character though they can recognize it. Though character amnesia is widespread, there is no diagnostic test for it. In this study, we developed a fast and practical test for an individual's character amnesia rate calibrated for adult native speakers of Mandarin. We made use of a large-scale handwriting database, where 42 native Mandarin speakers each handwrote 1200 characters from dictation prompts (e.g., 水稻的稻, read shuǐ₃ dào₄ de dào₄ meaning "rice from the word rice-plant"). After handwriting, participants were presented with the target character and reported whether their handwriting was correct, they knew the character but could not fully handwrite it (i.e. character amnesia), or did not understand the dictation phrase. We used a two-parameter Item Response Theory to model the correct handwriting and character amnesia response, after excluding the don't-know responses. Using item characteristics estimated from this model, we investigate the performance of short-form tests constructed with *random*, *maximum discrimination*, and *diverse difficulty* subsetting strategies. We construct a 30-item test that can be completed in about 15 minutes, and by repeatedly holding out subsets of participants, estimate that the character amnesia assessments from it can be expected to correlate between $r=0.82$ and $r=0.89$ with amnesia rates in a comprehensive 1200 item test. We suggest that our short test can be used to provide quick assessment of character amnesia for adult Chinese handwriters and can be straightforwardly re-calibrated to prescreen for developmental dysgraphia in children and neurodegenerative diseases in elderly people.