

Systems: a screening test of higher mental function in childhood

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Children with deficits of higher mental function are often referred to paediatricians and child neurologists. The referrals may occur for the specific evaluation of a child's school difficulties or because of a symptom, such as school refusal, headache or deterioration in behaviour. It is generally accepted that examination of the higher mental abilities could be a routine part of a complete neurological examination in any child presenting with such problems. Despite this, there is very little information concerning normal values for screening tests of higher mental function at different ages in childhood.

SYSTEMS (The Sydney Screening Test for the Evaluation of Higher Mental Status in Childhood) is a short screening test developed in a group of 630 normal Australian children and a clinical group of 70 children aged between 4 and 12 years. As a starting point, the screening test extended the adult Mini-Mental State Examination^[1] with age-appropriate items. The test, which in its prototype form contained 98 items, could be administered in approximately 15 min. Control population studies have shown that test results are gender-neutral and that socio-economic status does not affect scores. There is a high correlation ($r=0.86$) between the score on the 98 item version of the test and the mental age (as measured by an abbreviated version of the Stanford-Binet test) given to every 15th child in the control series. Clinical studies have been undertaken in order to assist with the selection of items for the definitive test. Progress results indicate a high sensitivity and specificity for impairment of mental function. Items have been reduced to 46 and the test now takes approximately 7 to 10 min to administer. The 46 items for the definitive test were selected on the basis of their contribution to the total test score, their ability to discriminate by age and their ability to discriminate between clinical and control groups. A few items relevant to specific clinical diagnoses were also included.

Rigorous validation and reliability studies are being completed on the 46 item SYSTEMS and include a group of Australian school children and a clinical population of mentally impaired students attending Australian schools, an inter-rater reliability study and a test re-test study. Reference studies of Australian Aboriginal children and of Arabic and Vietnamese speaking children living in Australia are underway. The test will be applicable as a baseline record of mental abilities and will permit clinicians to select, in a more valid fashion, those children who require more detailed psychological evaluation. There are many potential applications for a test such as this, the first brief screening test of mental functioning so far described in such a wide age range^[2].

[1] Folstein MF, Folstein SE, McHugh PR. Mini-Mental State: a practical method for grading the cognitive state of patients for the clinician. *J Psychiatr Res* 1975;12:189-198.

[2] Ouvrier RA, Goldsmith RF, Goldsmith RF, Ouvrier S, Williams DC. The value of the Mini-Mental State Examination in childhood. A preliminary study. *J Child Neurol* 1993;8:145-148.