

The Limitations of IQ Testing in Individuals with Williams syndrome

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Williams syndrome (WS) is a rare genetic disorder associated with abnormal brain development and intellectual disability. There are also more specific areas of cognitive deficit associated with the condition, such as problems with attention, visual-scanning, fine-motor skills and cognitive flexibility.

Cognitive and intellectual abilities can vary considerably across individuals with WS and range from profound to average. Overall, intellect typically falls in the mild to moderate range in WS, with a mental age equivalence of approximately 5 to 11 years in adulthood.

Most individuals with WS show huge scatter in their cognitive and intellectual strengths and weaknesses, with some areas very impaired and other areas at age-appropriate levels.

There is some information about IQ testing and implications of IQ testing for WS individuals that parents and education and health professionals should be aware of:

Facts about IQ Testing

There are a range of IQ tests available. The most common batteries include the Wechsler tests (WPPSI, WISC and WAIS); the Differential Ability Scales, The Stanford Binet and the Kaufman.

Most IQ tests include the administration of a number of tasks (called sub-tests) that measure different abilities. General areas covered by IQ tests include the following domains (called composites): nonverbal (spatial) skills, verbal skills (e.g. vocabulary), information processing (e.g. immediate memory span) and processing speed. Each composite score is an average score across two or three sub-tests. The overall level or Full-Scale IQ (FSIQ) is the average score across all subtests.

Important information about IQ testing:

In General

- Repeat IQ testing (using the same battery) is not recommended within a 12 month period. Otherwise, there can be substantial practice effects that invalidate scores.
- IQ tests do not measure specific cognitive abilities in any detail and they do not assess academic abilities such as literacy or numeracy.
- IQ scores are not necessarily strongly related to academic performance.
- There is measurement error in IQ tests, so scores can vary by up to approx. 6 points on different occasions of testing.
- IQ levels can change considerably over time (increase or decrease), but for the most part tend to remain stable.
- The examiner must obtain a good rapport with the examinee or scores can be invalid.
- Illness, reduced motivation, fatigue, cultural differences etc. can all affect IQ scores.

In WS

- IQ tests generally presume intact motor and sensory abilities, so difficulties in these areas in WS can impact on IQ scores.
- Because of the scatter in WS abilities, FSIQ is generally not valid for individuals with WS, even composite scores can be invalid if there is a lot of scatter in abilities. IQ tests should only be scored and interpreted by trained professionals, preferably those familiar with WS.

- IQ tests do not adequately cover more specific cognitive abilities (e.g. attention), so, ideally, a more comprehensive neuropsychological assessment should be conducted, especially when seeking support for funding or school or work placement.
- Level of intellectual disability is now determined by two things: i) performance on an IQ test and ii) level of adaptive functioning or level of daily independence (measured by an interview and/or parent report questionnaire). Intellectual levels and adaptive functions can vary considerably from one another in WS, so levels of disability should preferably be determined by professionals familiar with WS.