



IQ testing: What is it and what do I need to know?

Dr Gail Byrne DPsych
Exceptional Children

An Australian Mensa Initiative
2016 Australian Mensa Inc.
mensa.org.au

*Australian Mensa provides this information which may be of interest to members or the public.
The opinions expressed in this document are solely those of the author and not of Australian Mensa.*

IQ testing, intelligence testing, cognitive testing, and cognitive abilities testing all describe an assessment, instrument, or test (terms also used interchangeably) that has been designed to measure critical aspects of what psychologists consider ‘intelligence.’ Psychologists who develop such tests help with updating our knowledge of the way humans think and process information.

Different tests include different activities. Specific cognitive abilities will be chosen to be included in a particular IQ test because the test designer considers those abilities fit with their view of intelligence. Some tests will have a child use a pencil or ink stamper in what are called processing speed activities, while other IQ tests do not see ‘intelligence’ as reflected in performance on processing speed activities and have no such activities.

A test must be ‘normed’ for its country of use. Tests used in Australia (and New Zealand) are first tested before their release on children in those countries. As a result of this norming process, picture items may change (a skunk in a US test may become a possum in ours) and language is changed too (the word “faucet” in a US test will be changed to “tap” in Australia). This norming process, too, gives the Australasian version of the test a comparison group of children from Australia and New Zealand with whom to compare, rather than comparing them with other overseas populations. Along with the test adaptation for a country, over time, test questions become ‘dated,’ language usage changes, and what children might know also changes so tests need to change to reflect this.

Generally, Australian Mensa accepts earlier editions of any accepted test, providing it was the current edition of the test at the time the assessment was conducted.

Why is IQ testing necessary?

IQ testing may be suggested for your child for a number of reasons. Sometimes the school suggests that a child should be assessed because the child is showing strengths in some areas in their learning, or perhaps conversely, they are concerned that the child is not progressing as well as might be expected. A school may be seeking information and, importantly, the psychologist’s recommendations, so that they can design an appropriate program of study for the child.

Sometimes parents believe there is ‘more’ to their child than is being seen and they seek out an IQ assessment to confirm their suspicions that their child may be a child of high intellectual potential. There might be a history of giftedness in the family and parents are seeking information as to whether their child is gifted.

Australian and international research suggests that not all gifted children achieve at a level matching their cognitive abilities—they underachieve. In the gifted population, research suggests that between 15% and 50% of gifted children underachieve based on their ability. The earlier that academic underachievement is identified, the better the chances are of reversing it. Sometimes the gifted child is not thought of as being gifted and is only identified when IQ testing takes place. This may be because in class the child’s grades, or achievement levels, might be ‘at standard’ in a classroom or that the child’s intellectual high potential is not identified at all because it is not being looked for. IQ testing may also be required in the determination of a Specific Learning Disorder or other diagnoses, which may require an IQ assessment to confirm—or exclude—lower levels of cognitive ability in what may be a diagnosable condition.

Australian Mensa accepts a number of different tests for both children and adults. For the latest list see mensa.org.au.

Most parents who enquire about IQ testing for their child will find that the psychologist will recommend an individual (that is, one-on-one) assessment using either the Wechsler assessments, the Stanford-Binet 5 assessment, or the Woodcock-Johnson Test of Cognitive Abilities. In Australia, some states appear to favour one particular assessment over another and the psychologist you speak to may only have access to one of the above cognitive assessments. Some clinics and large practices may have access to more than one of the above assessments but as they can be expensive, many psychologists may only buy their preferred test. Here are the three most widely used assessments:

In the Wechsler Intelligence Scales there are three tests: the Wechsler Preschool and Primary Scale of Intelligence (WPPSI-IV); the Wechsler Intelligence Scale for Children (WISC-V) and the Wechsler Adult Intelligence Scale (WAIS-IV). All have Australian or Australasian adaptations.

The WPPSI-IV (2014) can be used for assessing children from 2 years 6 months to 7 years 7 months. There are two different testing procedures with one for testing children 2.5 years to 3 years 11 months and another for children 4 years through to 7 years 7 months. In the WPPSI-IV assessment the child needs to complete six compulsory subtests (activities) to obtain an IQ score. There are another nine optional subtests which could be completed to provide more information. Testing on the compulsory activities at ages 2:6 to 3:11 is about 30-45 minutes and at ages 4:0 to 7:7 is 45-60 minutes.

The WISC-V (2016) is used for testing children

of school age and may be used from 6 years through to 16 years 11 months. The child usually starts at the recommended level based on their age and continues until they stop achieving success on test items and testing in that activity. In the WISC-V there are seven subtests which must be completed for an IQ score and nine optional subtests. Testing on the compulsory activities usually takes about 60 minutes.

The WAIS-IV (2008) is used for people from 16 years through adulthood. The WAIS-IV consists of 10 compulsory subtests that are needed for an IQ score and five optional, or supplementary, subtests. Testing time on the compulsory activities takes about 67 minutes.

Especially where higher abilities are suspected, in many cases the WISC-V might be chosen for children once they are six years of age, rather than the WPPSI-IV; or, the WAIS-IV might be the preferred instrument when the child is 16. This has to do with what are called the 'ceilings' of a test. A highly able six-year-old may not be able to fully show the extent of their abilities on a test designed to show performances which have an age-equivalent up to 7 years 7 months. If that child were tested on a WISC-V, however, they may be able to score at a level expected of, for example, a 10- or 12-year-old child.

The Stanford-Binet 5 (SB5) (2003) is the most recent version of a family of tests that assess intellectual ability. The current edition of the Stanford-Binet (SB5) reflects a tradition from the first IQ test designed by Alfred Binet in 1905. The SB5 can be used for examinees from 2 years through to 85+ years. In spanning the entire life span there are fewer issues with children 'ceiling' activities. Unlike many other IQ tests the Stanford-Binet has no processing speed tasks and can be completed without the child picking up a pencil or ink stamper. Again, unlike many

other assessments there is a lack of emphasis on timed tasks although guides are given to the examiner. Regardless of the age of the child being tested 10 activities (called testlets in the SB5), are administered. There are no optional or supplementary activities. Although the test publisher does not specify a guide on testing time, expect it to be around 60 minutes. It is likely that the SB5 will be revised in the next couple of years in the US and that the Australian adaptation will follow some time after.

The Woodcock-Johnson Cognitive Ability Test (WJ-IV) (2014). The Australasian Adaptation is now available in Australia and is suitable for test takers between the ages of two and 90. The WJ-IV comprises a 'standard' set of 10 activities and an additional 'extended' set of eight activities. It includes assessments of working memory, perceptual speed and phonological processing. The WJIV has no suggested administration time and may vary considerably depending on whether any of the other Woodcock-Johnson tests (there are three individual and co-normed test batteries: Tests of Cognitive Abilities; Tests of Achievement; Tests of Oral Language) are used. Psychologists may administer a number of activities from the other WJ tests to provide further information depending upon why the child is being assessed.

What activities are completed in an IQ assessment?

The answer to this varies on the actual test being completed. In answering this question, too, parents need to be aware that IQ tests are 'restricted' tests. What this means is that the details of the actual questions—and the child's answers to those questions—cannot be shared with non-psychologists. Testing (particularly IQ testing) is therefore something of a 'mystery' to the public.

Generally, parents are not present during their child's assessment. It is the experience of many psychologists who assess children that generally children perform better without a parent in the room. If a parent is present in the testing room, then the child will often look to them before answering or will try to read their parent's non-verbal response to an answer they have just provided. Both the child's behaviour and responses can change based on what they see when they look at their parent. Parents, too, can find it difficult to avoid reacting (indrawn breath or chuckling; smiling or frowning), which gives feedback to the child as to their performance. This could lead to the outcomes of the testing not accurately reflecting the child's ability but perhaps indicating their level of distraction at having a parent present or the child's nervousness at providing answers in their parent's hearing. Sometimes parents may intervene in the testing inadvertently and may even invalidate the testing.

Generally, IQ tests do not resemble school work. High scores can be obtained on IQ tests without reading, writing, or mathematical ability. Test materials may include blocks of various types, other types of counters, miniatures, picture booklets showing puzzle boards and various patterns, and stampers. The child may be required to move blocks or place cards in different places. Some activities will be timed but many are not. In most cases the activities look like puzzles and even games to the child.

The activities are designed to measure children's abilities in a number of areas. What these areas are called will depend on the theory of intelligence the test designer is using but some of the most common areas being assessed include:

Activities to measure verbal ability. A child's verbal abilities are measured in a variety of ways

appropriate to their age. A child might name a picture shown to them or may point at the one picture on a page that describes the word the psychologist is saying. The child might be asked to define a word or to explain how two objects or concepts are similar in some way. There may be questions designed to measure 'general' knowledge or questions about general principles and social situations, about how or why we behave as we do in certain situations. The child might be asked to provide directions to get to various places in a picture prompt or to explain what is absurd, silly or ridiculous in a picture.

Activities to measure non-verbal ability.

Different tests will use different terminology and will assess this area in different ways. One test could report "non-verbal" abilities and measure them in perhaps five different areas (the Stanford-Binet 5 uses the terms Fluid Reasoning, Knowledge, Quantitative Reasoning, Visual Spatial and Working Memory). Another IQ test may not use the term "non-verbal" at all and report a child's abilities using terms such as Visual Spatial or Fluid Reasoning abilities instead (WISC-V). Generally though, these abilities are assessed using activities that do not require a verbal response. The child may be required to point to a picture, select a piece to complete a puzzle or pattern, manoeuvre blocks, identify miniatures or copy designs using tangram-like blocks.

Activities to measure working memory ability.

Working memory requires attention and concentration. In measuring this area, the child might be asked to recall visual material (target pictures, tapping of blocks in order) or auditory material (numbers, letters or sentences). The child needs to 'hold' the information to be recalled in what is called 'temporary storage' and then recall the information verbatim or

transform the material in some way. As the child is asked to perform the action within a short intervening period the assessment is one of short-term rather than long-term recall.

Activities to measure processing speed. As mentioned earlier, not all IQ tests have the child use either a stamper or pencil. Those which do may ask the child to mark target objects in an array of different pictures in different presentations on a page. The child may be asked to determine whether a single item appears in a group of perhaps five items or may require the child to utilise a legend to 'code' different characters. These activities are all timed.

What does an IQ test tell us?

An IQ test only provides information about cognitive functioning. That is, the strengths and weaknesses in processing information demonstrated by the child being tested. Any testing of this kind is a 'snap shot' of these innate abilities on the day of testing. A child's performance on the various activities will be affected by their personal engagement or interest in a particular activity, their motivation, life experience, health, emotional state, interests and talents. In the case of children, particularly young children such as pre-schoolers, performance on the day of testing can be affected by the child's willingness to work with an unknown adult (the tester) on activities not of their choosing and for a sustained period of time.

IQ scores are not cast in concrete. IQ scores do change over time. Sometimes, especially when they are assessed at a very young age, children's scores will change—sometimes dramatically—if they are re-tested a few years later. This is one of the reasons why, when a psychologist reports their findings, you will see they use more than a single figure to describe abilities. Instead, they

provide a range. They use what is called a 'confidence interval', which provides a range of scores both higher and lower than the single number the child scores. This range of scores tells us that if the child is tested again, there is a 95% chance that their score will be within the range seen in the confidence interval. We know that children grow and develop and an area of weakness (or strength) on the day of testing may not always remain so.

Who can complete an assessment?

IQ testing can only be completed by a registered psychologist. The actual administration of the test on the day is only one part of the whole assessment process. The scoring and interpretation of the results is complex and requires a level of knowledge that calls upon specialist training in various theories and models, statistics and test interpretation.

The report the psychologist prepares for parents of the child being tested should provide more than just tables and numbers. The report should also include an explanation of what the 'numbers' mean and an interpretation that is not just 'generic' but specific to the child being tested and why the child is being referred for testing in the first place.

Who can be assessed?

Depending upon the particular test being administered an IQ assessment can be completed for people between the age of two and about 85. Different tests may be used at different ages. As parents, you need to discuss your child's particular circumstances with the testing psychologist so that the psychologist can recommend the most appropriate test to meet your needs and the best time to complete it. In

some states of Australia one test may be more widely used than another. Parents also need to be aware that once a child (or adult) is assessed, they generally cannot take the same test for approximately two years.

How long does an IQ test take?

Testing is likely to take between 45 minutes and 1.5 hours. Timing varies due to the assessment used, the age and ability of the child, whether a break for a snack is included, and the speed with which the child works. Some assessments have timed activities.

Although each IQ test has a suggested testing time, this usually only reflects the time taken to administer the compulsory activities that must be completed to obtain an IQ score. Psychologists may complete a number of additional activities that provide further information.

How can I help my child prepare or study for his or her IQ test?

IQ tests measure what we call innate intellectual potential—they do not measure learned abilities in the way that a maths or spelling test does. IQ tests present the child with novel puzzles and problem solving activities that require a child to think and employ reasoning to solve tasks that look nothing like school-work. IQ tests are not so much about 'preparing and studying' but about the thinking and levels of reasoning the child can bring to the task to solve previously unseen activities.

There are things you, as parents, can do, though.

Ensure your child has a good night's sleep the night before the assessment. A child who attends a sleep-over the night before the assessment is

very likely to have had little sleep! Tired children generally do not perform well.

Make sure the child eats a good breakfast on the morning of the assessment. Or, if being assessed later in the day, that they have morning tea, lunch or afternoon tea prior to the assessment. Rumbling tummies and hunger are rarely conducive to thinking and problem solving.

If your child is unwell on the day of the assessment contact the psychologist about rescheduling. This is important because, as stated, once a child has been assessed they cannot be assessed on the same test for around two years. If the child is unwell, has a broken arm or is on a course of medication for a condition at the time of testing, speak to the psychologist about the wisdom of assessing at this time.

Consider carefully what you tell the child about the testing. Most psychologists will not use the terms 'IQ test' or even 'test' in front of the child. The idea of a 'test' could be associated with previously unpleasant memories for the child and you, as parents. When you make an appointment, you can ask the psychologist what you could say to the child as they should have some suggestions for you.

Try to control your own nervousness about your child's testing. Many children actually enjoy the tests but it can create some stress for parents who wonder about the merits or wisdom of testing. Your child will tune in to your emotions, so if you are calm this will help your child.

Be aware that in most cases you will not be in the room while the assessment is being completed. As in the above point, if you are not concerned about this, it will help your child adjust to this. Mentioning to your child

beforehand, that you will not be in the room, is often helpful, as is reminding the child that parents don't stay with them at school or kinder either.

Dr Gail Byrne operates a practice, Exceptional Children, which specialises in assessing children. She has also been a teacher and Head of Special Education. For the past seventeen years she has served as Chairperson of the CHIP (Children of High Intellectual Potential) Foundation. She has many years' experience assessing children on the Wechsler and Stanford Binet tests as well as educational and achievements tests.

Mensa is a not-for-profit society whose members qualify by having an IQ in the top 2% of the population. Mensa's goals include identifying and fostering human intelligence for the benefit of humanity, and encouraging research in the nature, characteristics, and uses of intelligence. The Australian Mensa Information Initiative draws on experts to answer 'frequently asked questions' in an accessible way. For more information, visit: mensa.org.au/giftedchildren.