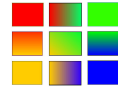


Stat-Fu

The Path of Turning Data into Information



A child's educational test scores contain data. Statistics is the process by which information is gleaned from raw data. For parents, a working knowledge of the basic statistics used in education enables them to express their concerns effectively. Stat-Fu is designed to provide the parent with a path towards understanding the significance of their child's tested results. And, as with all paths, Stat-Fu is only meaningful if it is traveled.

Stat-Fu is not a substitute for a good textbook on statistics. Stat-Fu helps parents understand key concepts regarding their child's testing. In time, with practice, the parent will become effective in expressing their concerns to their district at the time it matters most: during the gifted child's GIEP Team meeting.

Stat-Fu is founded on this core principle: Educating the gifted is common-sense. Stat-Fu recognizes this simple truth: Advocating for a gifted child is the persistent application of common-sense. Stat-Fu assists with the application of common-sense. The persistence must come from the parent.

The eye sees only what the mind is prepared to comprehend.

Henri Bergson

The Path:

The path the parent must travel goes through the Gifted IEP Team meeting. The GIEP Team meeting is the place where the significance of the child's tested results is discussed. The GIEP Meeting is the place and time where the child's educational needs are determined, and his or her plan created. GIEP Meetings are part discussion and part negotiation. To be an effective advocate for their child, a parent's Stat-Fu must be strong.

There are many reasons why this is so: districts tend to discuss their programs rather than the child's plan, districts tend to underplay the extent of the child's giftedness. District may claim the exceptional results achieved by the child are ordinary in the context of the district, and therefore do not require special consideration or planning. Districts intentionally or unintentionally confuse parents about the meaning of the tested results.

If their Stat-Fu is weak, the parent may approve an inappropriate plan. If their Stat-Fu is weak, the parent will not have the conversation their child needs them to have. If the parent's Stat-Fu is strong, however, that will not happen. The parent will not approve the proposed Gifted IEP without first understanding the plan or agreeing with the content. The parent will continue the conversation with the GIEP Team in a meaningful way, based on data. Stat-Fu is not adversarial, it is statistics. Statistics become adversarial only when misused.

I pointed towards the Moon; they looked at my finger.

Zen koan

Gifted children are exceptional in this way: they are the exception, not the rule. As exceptions, gifted children have educational needs fall which fall outside the ordinary capabilities of the curriculum and the normal resources available to the teacher. As such, a plan needs to be developed for the gifted child. The plan gives the teacher those resources necessary to educate the gifted child appropriately – the chief resource teachers need being 'time'.

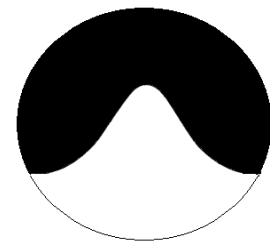
The regular education curriculum adopted by school districts is designed to meet the educational needs of most children within the district. That is why districts adopted their curriculum.

In any population, however, there are those for whom the regular education curriculum is inappropriate. They are outside the boundaries of what can be classified as 'normal.' Statistics allows the identification of those who fall outside the boundary of 'normal.' Once identified as needing additional planning, parents and districts can plan so that the gifted student's educational needs are met.

Stat-Fu is concerned with those statistics which are commonly used in educational situations, specifically during Gifted IEP meetings. More importantly, Stat-Fu is designed to help parents advocate effectively for their child when it matters – while decisions about the gifted child's education are being made.

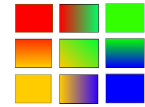
By three methods we may learn wisdom: First, by reflection, which is the most noble; second, by imitation, which is easiest; and third by experience, which is the most bitter.

Confucius

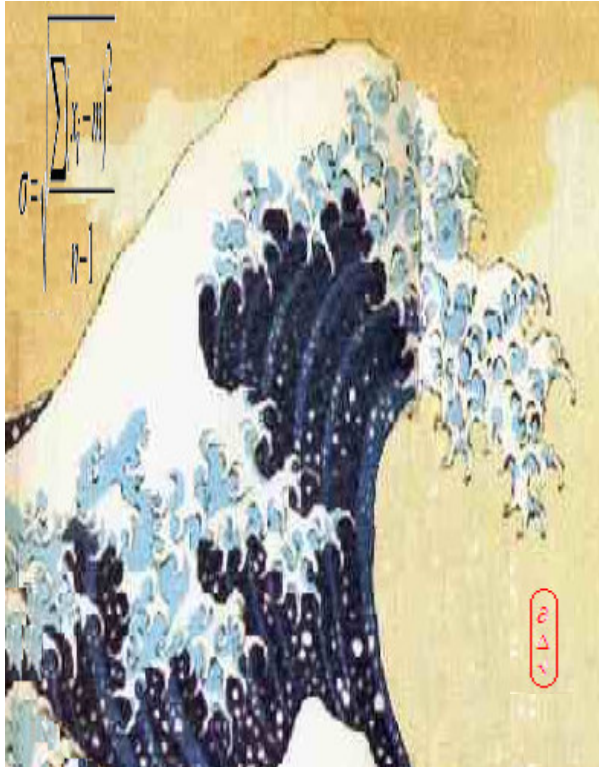


Stat-Fu: The Path of Turning Data into Information

To succeed at Gifted IEP meetings, your Stat-Fu must be strong.



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All models are wrong, some models are useful.

G. E. P. Box

The Bell Curve: Normal Distribution

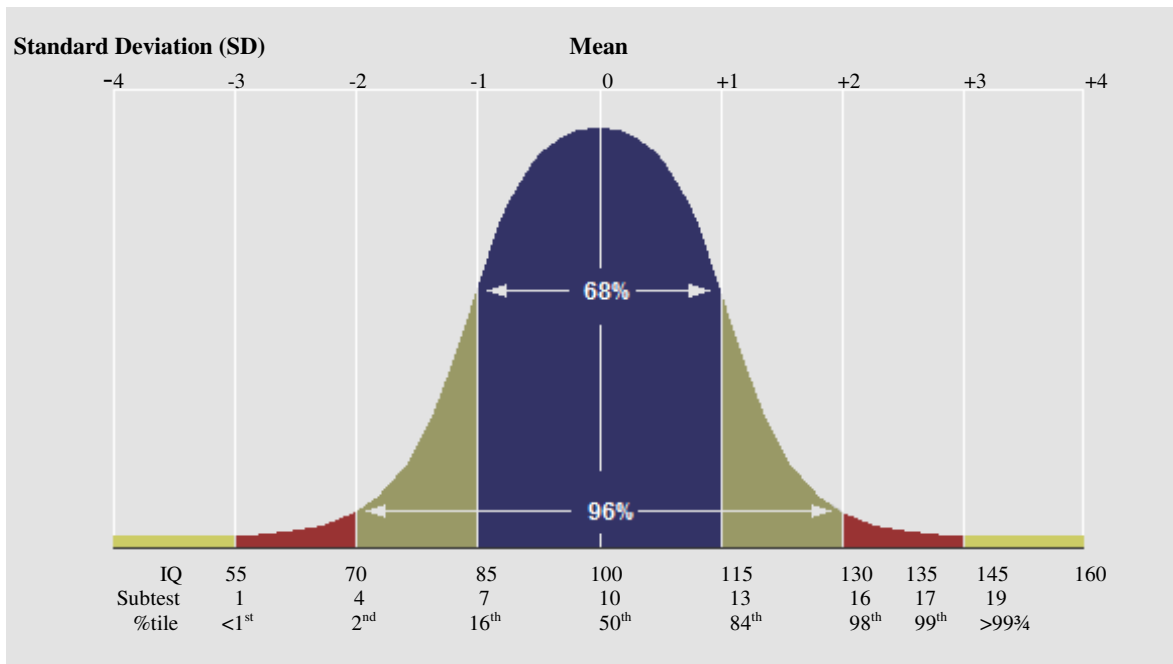
The Bell Curve is the fundamental truth of educational statistics. The parent must understand its significance to be an effective advocate. The shape shows the normal distribution of data, such as test scores, for a population. It is expected that the results for most people will be in or around 'the middle' of the group with progressively fewer scores found the farther they are from the middle. The curve is shaped like a bell.

The Mean: In the case of IQ Testing, the Mean – the middle of the group - is a score of 100. Half the IQ scores will be above 100 and half below. For subtest scores, the mean score is 10.

Standard Deviation: A standard deviation allows the significance of a specific result - the child's scores - to be determined. The further those results are from the middle, the greater their significance. A standard deviation is determined by the test publisher and are based on accepted statistical practices.

For educational testing purposes, the standard deviation is almost always these: IQ test scores have a standard deviation of 15, subtest scores of 3.

Bell Curve: Standard 'Normal' Distribution



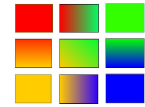
Using the Bell Curve, out of 100 Students:

- Sixty-eight should have an IQ between 85 and 115.
- Sixty-eight students should have subtest scores between 7 and 13.
- Students with IQ scores between 70 and 130 or subtest scores between 4 and 16 should represent nearly 96% of the student population.

Note: No district in Pennsylvania has, to our knowledge, offered conclusive proof that their student population has a significantly higher IQ than average. An IQ of 130 is in the 98th percentile everywhere, including wealthy suburban districts with lots of professionals. Also, the numbers shown on the chart reflect rounding. For the needlessly precise, the actual percentile range for $\pm 2\sigma$ is 95.44997361036%

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A judicious person uses statistics, not to get knowledge, but to save himself from having ignorance foisted upon him.

Thomas Carlyle

Distribution and Percentile:

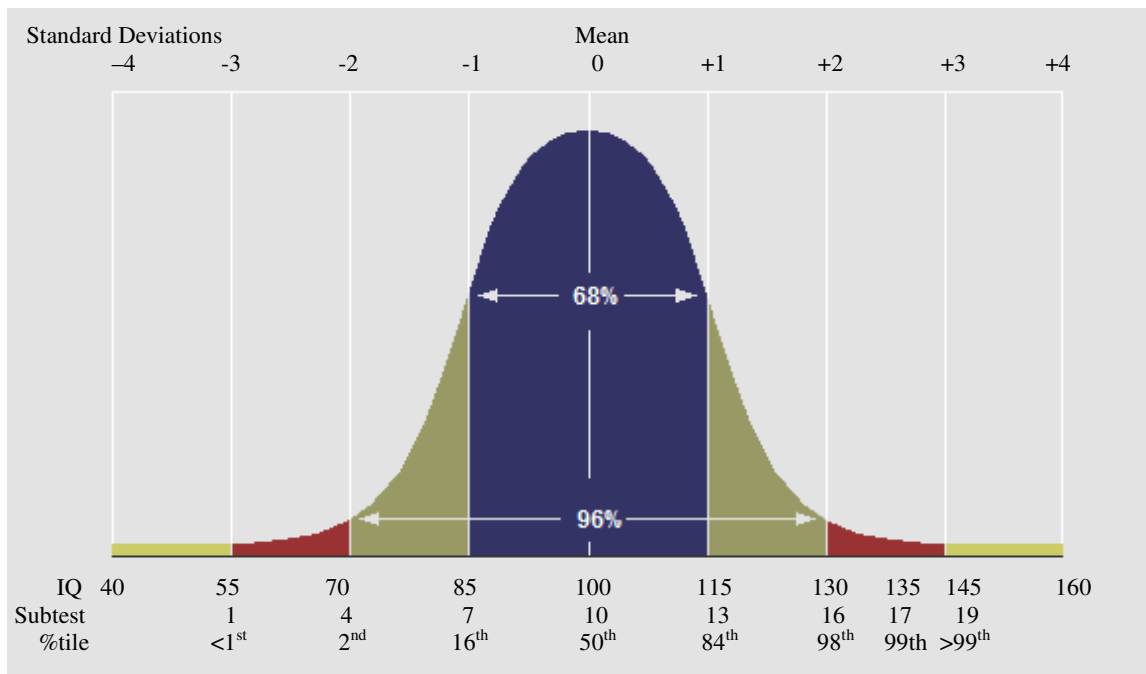
The information in a distribution curve can also be shown as a percentile chart. This translates the child's position relative to the mean, or middle, to a representation of their ranking among a population.

The percentile chart needs to be considered in light of the standard deviation, which provides a consistent interval from the statistical mean, the middle. Which standard deviations the score is found shows the significance of the scores relative to the population. The standard deviations is a fundamental part educational statistics. It is not important for parents to understand why standard deviations work in order to make use of them any more than it is necessary to know how to build a watch to be able to tell the time of day.



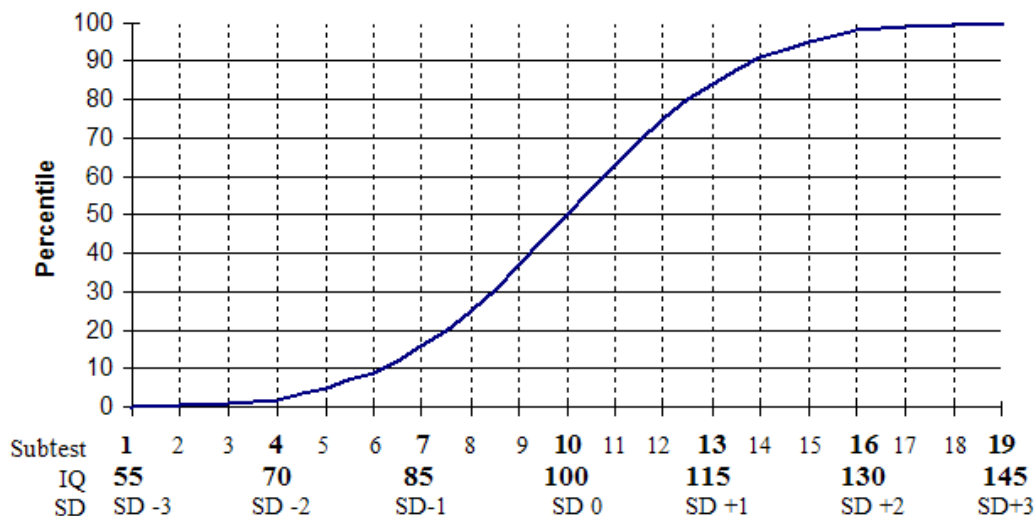
of

Distribution Curve, Relative to Mean



Distribution Curve - Percentile

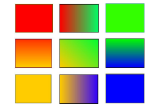
Sub IQ %tile



Subtest	Sub IQ	%tile
19	145	> 99.75
18	140	> 99.5
17	135	99
16	130	98
15	125	96
14	120	91
13	115	84
12	110	75
11	105	63
10	100	50
9	95	37
8	90	25
7	85	16
6	80	9
5	75	5
4	70	2
3	65	1
2	60	< 0.5
1	55	< 0.25

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'Box and Whiskers' Plot with Percentiles

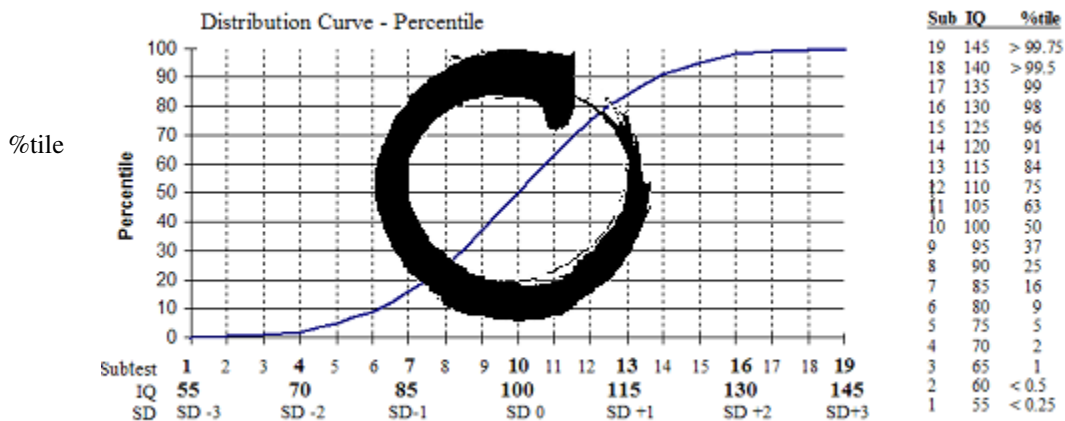
'Box and Whiskers' charts are a descriptive approach to displaying data and its distribution. This type of chart assists parents in the visualization of their child's tested results, quantifies what is 'normal', and shows the relative significance of the test results compared to the test-taking population.

The 'box' - in this case a calligraphic circle - shows the line on which those scores that represent the range from the 25th to the 75th percentiles. Half the scores in the group of data will be along the line that is 'inside the box'. The 'whiskers' show the range of the scores. The highest score and lowest score are the end points of the 'whiskers'.

'Normal' is defined statistically as 50% of the scores. In the case of IQ Testing, the publisher provides the data that describes the normal range. For IQ Tests 'normal' scores are IQ scores between 90 and 110. For subtest scores, 'normal' scores are scores between 8 and 12.

This chart shows the distribution curve as percentile ranking with the 'normal' box overlaid on the graph. The whiskers are the distribution of scores represented as percentile rankings. The closer the child's scores are to the end of the whiskers, the more exceptional the results.

'Normal'

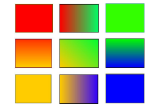


'The Exception'



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Either you deal with what is the reality, or you can be sure that the reality is going to deal with you.

- Alex Haley

Significance and Subtest Scatter

The GIEP Team must consider the data in light of its own meaning, not from a biased or desire to conform the gifted child to one particular vision or another. Two interrelated criteria must be considered during the meeting: significance and scatter.

Significance

The further from the mean, the more significant the result. In general, IQ scores above 130 or subtest scores that are above 16 or below 7 have a significance that must be discussed by the student's GIEP team.

The school psychologist can help the GIEP Team discuss the significance of the scores and what they indicate about the student's cognitive functioning. The GIEP Team should then discuss the results in terms of what curriculum adaptations need to be made and what resources the teacher will require to appropriately educate the child.

Scatter:

Subtest scatter is the difference between the results of the subtests. Widely scattered subtest scores within a particular test, for example a test where two subtests show a difference of six or greater, could be significant.

Subtest scores with significant scatter might indicate a condition which is masking the child's giftedness. If that is the case, further testing may be warranted. Subtest score scatter, if present in the child's test data, must be discussed at the meeting.

The school psychologist is the first person to ask. If the parent's Stat-Fu is strong, they will know whether the answers given 'make sense'.

Tests have protocols provided by the publisher that need to be followed for the test to be valid. If there are lingering concerns regarding the test score interpretation, parents can contact the test publisher or an independent certified school psychologist for help at interpreting the child's scores.



People will accept your idea much more readily if you tell them Benjamin Franklin said it first.

David H. Comins

Summary:

As Benjamin Franklin once said: The path of Stat-Fu is simple, but not easy. The key to having strong Stat-Fu is awareness. A parent must be aware of their role in the process, awareness of their child's educational tests, and awareness of the statistics involved. More importantly, parents must use their Stat-Fu during the GIEP Meeting. This takes practice and patience, most of all, persistence.

Do not confuse having strong Stat-Fu with becoming beholden to the statistics themselves. Statistics are tools to be used by adults, not laws to be obeyed by children.

Σ 夫

