

Ruf Estimates of Levels of Giftedness

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Introduction

Any parent who has more than one child knows that regardless of the way they parent or what they provide for their children, the children are different from one another in many, many ways. Although certain characteristics certainly run in families, the looks, temperaments, abilities, talents and interests of each child are usually at least somewhat dissimilar between them. Even our school systems acknowledge that children vary in their learning abilities; but at the same time that we recognize that children are different from one another, we set up school instructional and social situations that treat them as though any differences were either small or nonexistent. The problem may be that there is little or no understanding in schools of how vast the learning differences are.

The customary method of grouping children for instruction in schools is heterogeneous (mixed ability) grouping and whole class instruction. Despite considerable evidence that the achievement span among children of the same age can be – and usually is – quite significant[i], children are almost always strictly grouped with others who are the same age as they. The intellectual differences between children of the same age become socially and academically problematic when the children are continually grouped together in schools all day for all their instruction and activities. For example, when a little girl routinely uses advanced vocabulary and wants to guide the play of her more typical classmates, they may resent her and see her as “bossy” or strange because of the words she uses. If a boy who enjoys reading books on history and wants someone to discuss his passionate interest with, he may be viewed as socially immature if he keeps turning to his teacher for attention instead of playing with the boys his age.

I believe that unless we know and understand how different children can be from one another, we cannot effectively address the best methods for meeting the needs of all children. Some years ago I set out to study learning differences – particularly those of highly intelligent children.

There is a mountain of research on individual learning differences that is available, and has been available, for many years. Although my Estimates of Levels of Giftedness are relevant to children in the upper one-third or so of a typical classroom, differences of a similar magnitude occur throughout the range of learners who are generally in the lowest third of many classrooms.

While the learning differences of children who are slower learners seem to be well accepted by educators, and attended to in schools, the concept of different levels of high intelligence has been fuzzy and confusing for parents and educators alike. Research going back as far as the studies of Lewis Terman (1925)[ii] and Leta Stetter Hollingworth (1926)[iii] and continuing to the present shows that highly intelligent children learn faster, and thus

benefit from being allowed to progress at a faster rate. Research does not support that they suffer in any way, socially or emotionally, or otherwise, from being allowed to move ahead academically[iv].

With all the research evidence, why haven't schools, parents, and teachers accepted the idea of acceleration? *A Nation Deceived*, presents the following reasons why schools hold back America's brightest kids:

- Limited familiarity with the research on acceleration
- Philosophy that children must be kept with their age group
- Belief that acceleration hurries children out of childhood
- Fear that acceleration hurts children socially
- Political concerns about equity
- Worry that other students will be offended if one child is accelerated.[\[v\]](#)

Generally, schools now take one of two primary approaches to addressing the academic needs of students who are very different from each other.

1. Individualized, enriched instruction at grade level. In this approach, children are grouped heterogeneously by age but the advanced learners periodically receive enrichment. This approach is popular but tends to be burdensome for the teacher and is often inconsistently delivered, e.g., it requires considerable planning and may be frequently omitted from the day's schedule. The method does not usually accelerate instruction or learning; it adds *more* at a similar level.
2. Gifted Classes. When special gifted programming exists, it usually places all gifted children in the same program as though all gifted children are alike or of the same ability. One popular type of gifted program pulls children out of regular class for one or two hours a week to offer enriched instruction with other gifted children. A problem with this type of program is that it is often not enough, and sometimes the children are made to make up work missed in the regular classroom.

The problem with many popular approaches to gifted education is that not all gifted children are alike. Some are uneven in their abilities. Some read at a high level, but do not excel at the same high level in other subjects. Few, in fact, are "omnibus gifted" – i.e. gifted in all areas. And the range within the group of children called gifted is quite large, from a beginning level of gifted traits where the child is somewhat ahead of others, to a situation where the child is more than five or six years ahead of other children in what he or she can learn and do.

The remainder of the paper reveals that there are very different abilities among gifted children of the same age, and that this range of apparently inborn abilities—i.e. they reveal themselves so early that environment cannot be the only explanation for this variability—inevitably leads to these children being somewhat different from others. They have different classroom and social needs, as well as different interests, sensitivities, and interactions with others.

It is important to note that test scores are not the sole determinant of giftedness level. Gagné pointed out in his *Differentiated Model of Giftedness and Talent*[vi] that beyond natural abilities, there are also factors of chance, environment (opportunity for instruction and practice, for example), and one's own intrapersonal qualities. It is these intrapersonal qualities that finally determine whether children within the same score range will be a Level One or Two, or a Level Five or Four. In recognition of these additional qualities, when preparing and analyzing the data for a book about giftedness levels[vii], a number of intrapersonal qualities were considered. These qualitative factors were determined through an analysis of parent-provided information for ninety gifted children initially selected for their range of *Stanford-Binet L-M* IQs between 120 and 250. These include:

- Early childhood intellectual milestones and behaviors
- General personality
- Degree of intrinsic motivation
- Inner drive for continued independent learning

Following is a general summary of the Ruf Estimates of Levels of Giftedness. There is overlap in each of the levels, and inner qualities – qualities that can sometimes change over time due to environmental circumstances – are often the factors that make the difference among several Levels. For example, the degree of personal intensity and drive seem to be one big difference between Level Four and Level Five, the highest level. Some gifted children demonstrate a higher level of intensity and drive than others of similar assessed ability levels, while others only “catch fire” when they find or discover a new interest—an interest they are allowed to pursue—that becomes an all-consuming passion. In the other direction, a gifted child whose inner drive leads him to want to study everything he can get his hands on concerning the ocean, but who is forced to attend school all day with children who cannot yet read well, may at least temporarily lose his passion for learning and appear to be of lower personal drive for the time being.

Level One Gifted:

- Approximately 90th-98th percentiles on standardized tests
- Terms Superior* to Moderately Gifted on IQ tests
- Generally top one-third to one-fourth of students in a mixed-ability class
- Many in this Level don't qualify for gifted programs (scores don't meet school criteria)
- Predominate gifted program population due to higher frequency compared to Levels Two through Five
- Start kindergarten with end-of-year skills already mastered

Level Two Gifted:

- Mostly 98-99th percentiles on standardized tests
- Terms Moderately to Highly Gifted or Very Advanced on IQ tests
- As many as one to three in typical mixed-ability classroom
- Qualify for gifted programs
- Second most common in gifted programs

- Master most kindergarten skills one to two years before kindergarten (by age 4)

Level Three Gifted:

- Approximately 98-99th percentiles on standardized tests
- Terms Highly to Exceptionally Gifted or Very Advanced on IQ tests
- One or two per grade level, more in high socioeconomic schools
- Qualify for gifted programs – above level of most other participants and material
- Unless gifted program includes more than one grade level, student may be only one of same ability in gifted class
- Master majority of kindergarten skills by age 3 or 4
- Question Santa or Tooth Fairy by age 3 to 5
- Most spontaneously read with or w/o previous instruction before kindergarten
- Most read simple chapter books by age 5-6
- Most intuitively use numbers for all operations before kindergarten

Level Four Gifted:

- Primarily 99th percentile on standardized tests – former exceptionally and profoundly gifted range
- One or two across two grade levels; two or three per grade level in high socioeconomic schools (e.g., 100 students in grade level)
- Majority of kindergarten skills by age 3
- Question Santa or Tooth Fairy by age 3 to 4
- Majority at 2nd-3rd grade equivalency in academic subjects by early kindergarten
- Majority at upper high school grade equivalencies by 4th-5th grades
- Show concern for existential topics and life's purpose by early elementary school age

Level Five Gifted:

- Primarily 99th percentiles on standardized tests – former exceptionally and profoundly gifted range
- High intellectual profile across ability domains, great inner drive to learn across domains
- Exceptionally to Profoundly Gifted or Highly Advanced on IQ tests
- Nationally at least 1:250,000, a higher proportion in metropolitan areas and high socioeconomic background schools
- Majority have kindergarten skills by about 2½ years or sooner
- Question Santa or Tooth Fairy by age 2 to 3
- Majority spontaneously read, understand fairly complex math, have existential concerns by age 4-5 with or without any instruction
- Majority have high school level grade equivalencies by age 7 or 8 years old, mostly through their own reading and question asking

Standard IQ Score Ranges for the Levels

Not all Level Four or Five children are specifically identified as being qualitatively different from Levels Two and Three, and certainly not from each other, because their test scores look about the same. In fact, Levels Four and Five almost always test about the same until they take out-of-level tests. Out-of-level means a test normed on an older student sample so that the bright younger child's results are compared to an older group of students. This has the effect of giving the younger child "more test" in order to show what he really knows. This is also sometimes referred to as more "ceiling." Some tests have ceilings that are too low, and this means that too many children within an age group can get all the answers correct and we cannot tell if they are actually more or less capable than each other. When the same group of top scorers is given a test with more ceiling or that is out-of-level (e.g., the 8th grade *Explore Test* for 5th and 6th graders) their ability differences become more clear as their scores are spread out rather than clustered at the 99th percentile. Some modern standardized tests also have a top score limit even though their actual ceilings are quite high, as with the *Stanford-Binet 5* and *WISC-IV*. The scaled scores within such tests still allow for more detailed discrimination beyond the 145-150 upper limit that even Levels Four and Five children obtain on those instruments. For all of these reasons, it is wise not to use specific score cutoffs to determine Level of Giftedness.

Levels of Giftedness	Approximate Score Range	Descriptive Designation
UPDATED Level One	117-129	Moderately Gifted 120-124/ Gifted 125-129
Level Two	125-135	Highly Gifted
Level Three	130-140	Exceptionally Gifted
Level Four	135-141+	Exceptionally to Profoundly Gifted
Level Five	141+ (but still not always a Level Five even with these scores)	Exceptionally to Profoundly Gifted

*Author note: Because of the limitations of current IQ tests, Levels Four and Five above appear to be identical, but are not. The differences between the two levels are in the degree of the behaviors, as illustrated in the list of milestone attainments. This table does not consider ratio IQ scores and is not except in the most general way related to the old ratio IQ results. *Superior is the term utilized by test publishers to designate the intellectual range prior to either gifted or advanced.*

Because of the theoretical shape of the bell curve, there are more children at the 130 IQ level than at the 150 IQ level, and fewer yet at the levels that are higher. What do we know about measured ability level and corresponding accomplishments? Using standard score test data from the 1950s and 1960s, it was estimated[viii] that the mean IQ of high school graduates was about 105, the mean of college graduates was 115, and the mean of people getting medical degrees and Ph.D.s was about 125 in the United States. This is, of course, different than saying the average person with a 125 IQ goes to medical school.

Five Levels of Giftedness

The information that follows about Levels of Giftedness is gathered from my own personal experience with families whose gifted children I tested. The families completed a questionnaire asking them when their child reached various milestones like reading unassisted, or talking in sentences. From the responses of these families, and the corresponding test data, I was able to see a pattern of gifted behaviors for the various Levels of Giftedness. From this same sort of experience and public score reports, estimates of numbers of each Level of Giftedness in different schools were also made.

Level One Gifted

How many Level One children are there in our schools? The average ability level of different school districts and the schools within them can vary significantly. This will always affect how many gifted children are expected in any school and within any classroom. Children whose abilities are very low or mentally delayed are not placed in most classrooms, which raises the average within the school compared to the full population within the school's attendance area. A typical elementary school 28-student classroom that draws from a generally middle-class socioeconomic community has from 3 to 6 children in the Level One ability range. In public or private schools which draw from mostly a high socioeconomic population – and schools in districts where most of the parents are highly educated professionals – Level One children are average learners and constitute the majority of the students in such schools.

- Many recognized colors and could rote count before age two.
- Most knew and said many words before 18 months.
- Many liked puzzles before age two.
- Sat still and attended to TV by 18 to 30 months.
- Real counting, most letters and colors by age three.
- Complex speaking and extensive vocabulary by age three.
- Recognized simple signs, own written name, and most knew alphabet by age four.
- Most did simple addition and subtraction by age four.
- Most showed interest in learning to read before age five.
- All read simple signs and most read beginner books by age six.
- Most were independent on computer and started to keyboard by age six.
- Most fully grasped counting and basic number facts by age six.
- All were reading and were two to three years beyond grade level by age seven.
- All could read chapter books independently by age seven to seven and a half.
- Many showing impatience with repetition and slow pace at school by age seven or eight.

Children of Level One can easily go to college, can benefit from accelerated coursework, and are often, but not necessarily, good and cooperative students.

Level Two Gifted Summary

How many Level Two children are there in our schools? A typical elementary school that draws from a generally middle-class socioeconomic community with 100 children

per grade level has at least four to six Level Two children at each grade level, one to two per class. A school with a large number of well-educated families may have more; a school with fewer well-educated parents may have fewer.

- Almost all the children understood adult directives and questions at 6 to 12 months.
- The majority independently looked at and turned pages of books by 11-15 months.
- About half the children said two-word phrases by 15 months.
- A number of children played with shape sorters by 15 months.
- Most knew many letters at 15-18 months.
- Most knew most colors by 15-20 months.
- Many liked puzzles by 12 to 15 months (8-10 piece puzzles).
- Most knew and called out names on signs and stores between 11 and 16 months.
- Several “read” numerous sight words at 16-24 months.
- Almost all were speaking in three-word and longer sentences by age two.
- Many recognized and picked out specific numbers by 12-22 months.
- About 25% knew the entire alphabet by 17-24 months.
- Most did one-to-one counting for small quantities by age 3.
- Most knew most letters and colors by age three.
- Most had extensive vocabularies and did complex speaking by age three.
- Many could print letters, numbers, words, and their names between 3 and 4 years.
- Several had high interest in facts, how things work, and science by 3½ to 4½.
- Most knew many sight words by age 4.
- Several read easy readers by age 4.
- Most were independent on computer by age 4½.
- Most fully grasped counting and basic number facts by age five.
- Many showed intuitive grasp of number concepts by age five.
- Most enjoyed having advanced level books and stories read to them by age five.
- Most read easy reader books before age five, nearly all by 5½.
- Most read for pleasure and information by six.
- All read two to five years beyond grade level by age 7.
- All read chapter books independently by age 7-7½.
- Many showed impatience with repetition and slow pace at school by age 6-7.

Level Two children have the ability to do accelerated coursework almost from the time they enter school, take advanced placement courses and hold leadership positions, are capable of getting into competitive colleges and universities, and often go on to some form of graduate school. Although many Level Two children are excellent students, a number of them may resist typical school expectations and achieve less than they are capable of achieving due to the discrepancy between their learning ability and that of the majority of their same-age classmates. They may prefer to “fit in,” or they may conclude that the work is simply wrong for them and refuse to comply with what they see as “stupid” expectations.

Level Three Gifted Summary

How many Level Three children are there in our schools? A typical elementary school in a middle class neighborhood with 100 children per grade level probably has one or two of these children at each grade level.

- Most were alert at birth or soon thereafter.
- Most had books as a favorite interest before age one.
- Almost all understood what someone was talking about by 6 months.
- Most independently looked at and turned pages of books before 10 months.
- Most made their families understand what they wanted before 12 months.
- Most had large vocabularies, receptive and expressive, by 16 months.
- A number of children played with shape sorters by 11 months.
- Many recognized some colors, shapes, numbers and letters before 12 months.
- Many recognized and picked out specific numbers and letters by 12-15 months.
- Most knew many colors by 15-18 months.
- Many liked puzzles by 15 to 24 months (35+ piece puzzles).
- Most “read” names on signs and stores from between 20 months and 3¾ years.
- Many children “read” numerous sight words between 15 and 20 months.
- Many memorized the books that were read to them before they were two years old.
- Many showed interest in letter sounds and sounding out short words by age 2½.
- Most were speaking in complex sentences, more than four words, by 15 to 24 months.
- Many could rote count to 10, many higher, by 15 to 24 months.
- Almost all knew the entire alphabet by 17-24 months.
- Most could print letters, numbers, words, and their names between 2¾ and 3½ years.
- Many had high interest in factual information, how things work, science, by 3 to 4.
- Most knew many sight words by age 3-3½.
- Half could read very simple books – perhaps memorized – by age 3-3½.
- Most grasp skip counting, backwards, basic addition and subtraction, by 3 to 4 years.
- Many keyboarding – typing – by 3 to 4½ years.
- Most could read easy readers by age 4 to 5 years.
- Many questioned the reality of Santa Claus and Tooth Fairy by 3 to 5 years.
- Most read children’s-level chapter books by 4¼ to 5½ years.
- Many understood some multiplication, division and some fractions to 5½.
- Most read for pleasure and information by six.
- All were reading two to five years beyond grade level by age six.
- All could read youth and young adult chapter books independently by age 7-7½.

Level Three children are capable of achieving in any career field. Opportunity and their own inner drive will determine which individuals eventually achieve at the highest levels.

Level Four Gifted Summary

How many Level Four children are there in our schools? Keeping in mind that the parents of many Level Four children turn to home schooling to solve some of the school behavior issues, schools where most of the parents are highly educated professionals – can expect that about 2% of their students may be at Level Four or higher. This means that there might be 2 to 3 per grade level in a school with 80 to 100 children per grade level. A

large high school in a professional community will generally have 6 to 12 students at this intellectual level from a grade level class size of about 400 students. A middle class population elementary school with 100 children per grade level will have one or two of these children for every two grade levels, which means the school will probably not have a student this intelligent every year. By the time the students from such a district are all drawn together for high school, the honors and advanced classes can expect 1 to 3 students at Level Four.

- Almost all paid attention within months of birth while someone to read to them.
- Books were a favorite interest before three or four months.
- Almost all understood parental directives by 6 months.
- Most knew and said some words by 5½ to 9 months.
- Many had large vocabularies, receptive and expressive, by 14 months.
- Many recognized and picked out specific numbers and letters by 12-15 months.
- Most knew many colors by 15-18 months.
- Many liked puzzles by 15 to 36 months (35+ piece puzzles).
- Many “read” numerous sight words between 15 and 20 months.
- Almost all knew the entire alphabet by 15-22 months.
- Most “read” names on signs and stores from between 20 months and 3¾ years.
- Many memorized the books that were read to them before they were 2 years old.
- Many showed interest in letter sounds and sounding out short words by age 2½.
- Most were speaking in complex sentences, more than four words, by 15 to 24 months.
- Many could rote count to 10, many higher, by 13 to 20 months.
- Most printed letters, numbers, words, and their names between 2¾ and 3½ years.
- Many had high interest in factual information, how things work, science, by 3 to 4.
- Most knew many sight words by age 3-3½.
- Most grasp skip counting, backwards, addition, subtraction, more and less, by 3 to 4 years.
- Most were independent on computer by age 3 to 4½ years, most keyboarding by five.
- Most read easy readers by age 3½ to 4½ years.
- Many question the reality of Santa Claus or Tooth Fairy by 3 to 4 years.
- Many understand some multiplication, division and some fractions by 5.
- Most read for pleasure and information by five.
- All read two to five years beyond grade level by age six.
- All read youth and adult chapter books independently by age 6-6½.

Most Level Four children were capable of finishing all academic coursework through 8th grade before they reached 3rd or 4th grade, but few of them had the opportunity. If the environment, inner drive, and general opportunities are right for them, Level Four children are capable of performing at the highest levels in their areas and fields of interest.

Level Five Gifted Summary

How many Level Five children are there in our schools? The sample demonstrates that few Level Five children follow a traditional educational path, and various options – such

as intermittent home schooling – mean that few Level Five children remain in the regular schools throughout their youth. Children in Level Five are not one in a million occurrences. Their occurrence and presence is somewhat more serendipitous than previous Levels. However, it is likely that none of these children has ever had someone else in their classroom as intellectually able as they.

- All were alert at birth or soon thereafter.
- Books were a favorite interest of most before three or four months.
- All appeared to understand parental directives between birth and four months.
- The majority independently looked at and turned pages of books before 6 months.
- Most knew and said some words by 5½ to 9 months.
- All had large receptive vocabularies by 8-9 months.
- Half spoke well before age one.
- All spoke at near-adult level complexity by age two.
- Most played with shape sorters before 11 months.
- Many recognized and picked out specific numbers and letters by 10 -14 months.
- All knew colors, numbers, the alphabet and shapes by about 15 months.
- Most were good at puzzles before 12 months, 35+ piece puzzles by 15 months.
- All showed musical aptitude before 18 months.
- All “read” words on signs and simple books and labels before two years.
- Many read numerous sight words by 15 months.
- All memorized books read to them before 20 months.
- All had favorite TV shows or videos before 6-8 months.
- Many could rote count to 10, many higher, by 13 to 20 months.
- Most could print letters, numbers, words, and their names between 16 and 24 months.
- High interest in factual information, how things work, science, by two years.
- Most read simple books, “board” books, by age 18-24 months.
- Most grasp skip counting, backwards, addition, subtraction, more or less, by two years.
- All were independent on computer by age two years, all keyboarding before three.
- All read children’s chapter books by age 3½ to 4½ years.
- All showed interest in pure facts, almanacs, dictionaries, etc. by age 3½.
- All question the reality of Santa Claus or Tooth Fairy by 3 or 4 years.
- All read any level fiction and nonfiction by 4¼ to 5 years.
- All understand abstract math concepts and basic math functions before age four.
- All played adult level games – ages 12 and up – by the time they were 3½ to 4.
- All read six or more years beyond grade level by age six.

The advantages to looking at a child’s Level of Giftedness are that those responsible for their care and education can know better what each child needs in order to thrive. Cronbach and Snow first named their own similar theory “Aptitude-Treatment-Interaction,” or ATI[ix]. When you know what a child is like, how she learns and how she responds to various stimuli, then you can devise the appropriate instructional and parenting approaches in order to fully develop her abilities. When we ignore individual differences, we risk the actual mistreatment of individual needs.

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