



«Tripartite Model of Giftedness»: Cognitive Achievements According to WECHSLER Assessment Intelligence Scales

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ABSTRACT

The appraisal of intellectual ability in gifted students is an interesting though composite hypothesis. The purpose of this study is to analyze and compare the two main and most reliable methods to measure giftedness: the most worldwide used, the quantitative assessment and the qualitative assessing procedures. The Tripartite Model of Giftedness considers of giftedness as a social construction and not something that is real, which incorporates three distinct but complementary perspectives: Giftedness through the perspective of high intelligence, through the perspective of outstanding accomplishments and through the perspective of potential to excel. The first perspective is based on assessing student's intellectual ability using standardized IQ tests. The second one focuses mainly on student's performance in classroom and on academic tasks. According to the third perspective, students are very likely to substantially increase their cognitive abilities and academic performance when provided with special resources or when they are placed in a special gifted program. The Wechsler Intelligence Scales constitute worldwide the most used and most reliable quantitative assessment method of intellectual abilities mainly of verbal comprehension, visual spatial perception, fluid reasoning, working memory, processing speed. In a pure psychometric level, the dominant view is that the most proper appraisal of general intellectual functionality in high intelligent students, is not mainly the measurement of the Full-Scale Intelligence Quotient (FSIQ), yet the assessment of the most complex and composite intellectual abilities, as it is defined from the General Ability Index (GAI). In the present article five common characteristics of intellectual achievements of gifted students are analyzed in depth.

Key Words: *Giftedness, Wechsler Scales, General Ability Index*

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Introduction

Much has been written about gifted persons assessment, thus anyone working with high intelligent or high ability students should become familiar with the literature. Great ancient philosophers such as Confucius in China and Plato in Greece, have written about «heavenly» (gifted) children, while they provided practical recommendations on the ways society should work on to identify and nurture this special group (1).

In the United States of America, large longitudinal research conducted by Lewis Terman, concluded that children of high Intelligence Quotient (140 or higher IQ) were healthier, better adjusted, and higher achievers than other children. Terman helped science more than any other researcher or scientist, as he defined and conceptualized giftedness as high IQ. Thus, almost one hundred years later, his influence on this field remains prominent. Over the past decades substantial changes have occurred concerning definitions and categories of giftedness, while most states continue to consider that giftedness equates to high Intelligence Quotient (2).

Furthermore, there is a strong belief among many psychologists and educators that giftedness is something real, concrete, analogous to biological or countable factors (height, weight, hair color), or analogous to biomedical conditions such as diabetes and arteriosclerosis. According to Borland, giftedness is not a fact of nature, but, instead, a social construction (3). We used to refer to giftedness as it is something real, something that a child either is or not, however, it is a social construction. It was invented to categorize children in groups and to make easier the assessment of their intelligence, thus we should approach giftedness as an absolutely human's created concept that can be operationally defined and measured (2,3).

Mainly in the past, parents' and teachers' views have been used to detect gifted students, focusing on general or specific abilities and talents. This sometimes was seemed helpful to identify creativity or easy and quick learners. However, this approach has some potential problems, as the lack of scientific rigor in that process is obvious. Thus, reliability and validity of the whole procedure is in dispute (3,5).

Another way to assess giftedness is the portfolio assessment, which is the systematic data collection of students' work that provides information about students' abilities, progress, or accomplishments in

specific or general domains. For that purpose, clinicians collect information from classroom and homework assignments, projects, artwork, photographs of creative work, group activities, audiotapes, videotapes of CDs of performances, presentations, interviews, peer interchanges and cooperative learning activities, student journals, logs, or reflection papers (3).

Nowadays a new, representative model developed from Steven Pfeiffer, trying to embrace the already existed thinking for giftedness, but also, to add a clearer way to approach and understand it, while he tried to create a complete model that one can base on it to assess gifted persons. According to Pfeiffer's Tripartite Model of Giftedness, giftedness is not something «real» but a social construction that incorporates three distinct but complementary perspectives through which one can estimate academic giftedness of children with uncommon, advanced, or exceptionally high ability (4).

This model proposes a radical position: gifted assessment should be recurring and open to students who have not been identified as gifted at an earlier time, while students identified as gifted should be evaluated at least every two years to demonstrate continued outstanding performance when facing increasingly challenging academic hurdles. Recurring gifted assessment represents a more valid prediction of a real-world success, out-of-school boundaries. In that way, information about children's strengths and weaknesses it is given, while it is appraised their progress on parts such as creativity, and critical thinking, having as target the modification and improvement of their curriculum (3,4). The tripartite model neither abrogates nor replaces the existing theories concerning gifted assessment; on the contrary, it incorporates them into a new, wider one.

The most worldwide used and standardized in many different countries, including Greece, Intelligence Scales are the Wechsler Intelligence Scales. Matarazzo is referred to Wechsler's great work as it is probably the work of no other psychologists, including Freud and Pavlov that has so directly impinged upon the lives of so many people (5).

The purpose of this study is to analyze and compare the two main and most reliable methods used to measure giftedness. On the one hand, the measurement of the Intelligence Quotient according to the most worldwide used Wechsler Scales, and on the other hand, the assessment of giftedness through a combination of

qualitative and quantitative procedures, as these defined from the Tripartite Model of Giftedness.

Material and Method

In this review, qualitative research was conducted based on literature review and analysis of the findings of researchers, trying to identify giftedness and the assessment of gifted persons/children. Mainly, it is participated and analyzed the most accurate model to assess giftedness, the Tripartite Model, and its three distinct but complementary perspectives/principles through which Clinicians can approach and understand giftedness, in order students to be divided in groups (3,5):

- Giftedness through the perspective of high intelligence.
- Giftedness through the perspective of outstanding accomplishments.
- Giftedness through the perspective of potential to excel.

The value and importance of the above principles are referred and analyzed in the present review.

Cognitive achievements of gifted persons are assessed using Wechsler Intelligence Scales which constitute the most frequent used and most reliable measurement of cognitive abilities worldwide. They measure a great number of cognitive abilities in high validity, while they are applied to important areas such as education, health, administration, justice, demonstrating the wide-ranging fields of application as well as the recognition of their importance and credibility. Three of these scales have been weighted to the Greek population: WAIS-IV for adults, WISC-V for children and adolescents and WPPSI-III for kids of preschool age (6,7,8,9). The last editions of these Scales are referred to the assessment of the following cognitive abilities:

➤ **Verbal Comprehension (Crystallized Intelligence):**

This term is referred to the depth and range of the acquired verbal knowledge. It is appeared to the cognitive abilities which have developed in a great extent through education and person's life experiences. The «declarative, static» knowledge as well as the «procedural, dynamic» knowledge are included. The first one, the emphatic, steady knowledge, consists of real information, comprehension, ideas, perception, rules, and formations, mainly when information is verbal on its basis. The second one, the dynamic, is referred to the process of reasoning with previously learned procedures to transform knowledge, along

the way.

➤ **Visual-spatial Perception (Visual Processing):**

This term is referred to person's ability to produce, storage, retain, analyze, compose, and think based on visual patterns and stimulus. These abilities can be measured through processes where perception and conversion of visual patterns and forms is required, usually included in schematic or geometric context. A person that is able intellectually to convert and transform objects, seems to have the ability to explain how the objects can be converted, it apprehends and reformat objects' display and formations while it maintains the ability of orientation in particular spatial frames.

➤ **Fluid Reasoning:** This term is referred to intellectual procedures used to solve an innovative project that cannot be solved automatically. Some representative examples of these procedures are the formation and recognition of an idea, distinction, and comprehension of correlations between different elements, extraction to conclusions, apprehension of impacts, problem solving, and reorganization and/or reformation of information.

➤ **Working Memory:** This term is referred to the ability of encoding, persistence, and management of information through recalls it. The procedure of recall is limited as one can recall 7 elements of given information (plus/minus 2) in a particular time limit. Short-term working memory is referred both to the ability and extent of primary memory, as well as to the effectiveness of additional control mechanisms that manipulate the information of primary memory.

➤ **Processing Speed:** The ability of completion simple, recurring cognitive projects rapidly and easily, especially under pressure that might affect attention and concentration.

The analysis of cognitive achievements in special groups, such as people with developmental disorders, psychopathology, intellectual disability, is of great importance for these Scales. Among the population groups analyzed during the American weighting, included people with high intellectual ability.

In order a person to be concluded to this group, he/she should meet requirements:

✓ In measurements of cognitive abilities, one should be ≥ 2 Standard Deviations above average (i.e., $FSIQ \geq 130$).

✓ One should get special services at school environment or should be a member of MENSA or similar organizations.

An impressive element in American weighting is that, in all age groups, gifted persons' achievements present similar – common characteristics. These achievements present specific fluctuations in cognitive abilities, that are measured through the 4 Index Scores and 15 Subtests of the Wechsler Scales, in a quite identical way in all age groups of gifted examinees (10,11).

Results

First, it should be analyzed each one of the three fundamental principles of the Tripartite Model of Giftedness as well as the way each one may importantly contribute to the categorization and assessment of gifted persons.

The **first perspective**, that of high intelligence, can be identified through the administration of an intelligence test or IQ test, which assess student's mental giftedness based on compelling evidence that the student is advanced intellectually when compared to his or her peer. The extensively high intelligence quotient constitutes indicator for giftedness (3,5).

Some indicative scales which are administered worldwide are referred below:

- *Wechsler Intelligence Scale for Children (WISC)*
- *Wechsler Preschool & Primary Scale of Intelligence (WPPSI)*
- *Stanford-Binet Intelligence Scales*
- *Woodcock-Johnson IV Tests of Cognitive Abilities*
- *Kaufman Assessment Battery for Children*
- *Reynolds Intellectual Assessment Scales*

Students with exceptionally high intelligence, belonging to the first category of the gifted, typically have IQ scores in the top 2% to 5% when compared to other children of the same age, and obtain IQ scores from 135 to 150 or higher in the early life (2).

The **second perspective** of the gifted tripartite model that of academically gifted learners emphasizes on classroom activities and assignments, as well as on academic achievements, as criteria of great importance

and representative for children's gifted assessment. According to this principle, the exceptionally high academic achievements are essential to certify a student as gifted, and to integrate him/her into an educating program adjusted to gifted children (5). Students' creativity is an extremely important index to assess giftedness, according to this principle.

Psychologists and educators who embrace this principle, should rely on direct measurements referring to students' academic achievements to assess giftedness, and not on intelligent tests, which measure of course cognitive abilities, but they don't assess the direct elements that demonstrate the «authentic» students' academic excellence. Students' «creativity» is an important index when we want to assess giftedness according to this second perspective, while it is substantial to assess four additional clearly nonintellectual factors: motivation, drive, persistence, and academic passion (5,12). Beyond doubt, these last four nonintellectual factors affect the learning and talent development of all students, not only those of exceptionally high ability (13).

Before continuing to the third perspective, it is necessary to understand the term «creativity». According to Pfeiffer, the assessment of creativity in students and the way an educational program affect creativity, should be considered as important and laudatory goals. Creativity could be conceptualized through the perspective of talent development of gifted students. It is an essential element but also expression of special knowledge and excellence on fields with distinct cultural value (art, science, athletics) (14).

The assessment of creativity is not a common practice as part of gifted assessment. It is based on the measurement of four different perspectives: 1. the person 2. the process 3. the product 4. the environment. There have been developed multiple models and techniques to measure creativity. In order an idea, product, or performance to be creative, it should satisfy the above criteria:

- *To be original.*
- *To satisfy some usefulness or utility standards, whether scientific or esthetic.*
- *To be surprising (14).*

Creativity should be distinct from talent. Nowadays, great researchers as François Gagne (15,16), Rena Subotnik

(17,18), and Julian Stanley (19) stand in favor of the conceptualization that giftedness concerns natural abilities (talent), that are transformed through learning and training into high-level skills in particular occupational fields. They consider gifts as residing within the child, the result of favorable genetics, prenatal environment, and neurobiological status. Subotnik (17,18), supports, also, that giftedness is a dynamic construct, develops over time, and is not identical to high intelligence quotient. According to her model, talent development is the transformation of biological abilities into competencies, competencies into expertise, and expertise into outstanding performance or seminal ideas (17).

The **third perspective** is that of potential to excel. It refers to students, who, for multiple reasons, did not have enough opportunity or the proper intellectual stimulation to develop their intellectual or academic abilities (children raised in poverty, children with different maternal language than one used in the country they live, children that growing up in dangerous, rural, or overcrowded communities, where intellectual stimulation and educational opportunities are rare or even not given at all) (20,21,5,12).

According to this principle, students with high potential to excel are considered as very likely to substantially increase their academic performance and cognitive abilities when provided with specific help or placement in a particular program for gifted children. The assumption underlying this perspective is that an encouraging and stimulating environment, combined with the proper psycho-educational intervention, will bring on the surface their high potential to excel while at the same time it will distinguish them from their peers as gifted (22).

In other words, nurturance, stimulation, and encouragement of these students, will lead to significant increase in their intelligent quotient and their academic performance. For all the above reasons, education program for this category of students should consist of a highly motivating and enriched curriculum that may include compensatory interventions (6).

Persons belong to the first category of this model, that of high intelligence, typically belong to 2 to 5% of persons from the same age. Their intelligence quotient fluctuates between 135 and 150 (5). The intelligence quotient of persons from the second category, that of outstanding

accomplishments, fluctuates between 120 and 130 or even higher (5). Finally, the intelligence quotient of persons belonging to the third category, that of potential to excel, fluctuates between 110 and 115 (5).

Common Characteristics on Cognitive Achievements of Gifted Persons through WECHSLER Scales

As it was found, according to Wechsler Intelligence Scales, there are five common elements for all gifted persons concerning their cognitive achievements:

- *1st Common Characteristic:* The achievements on the Verbal Comprehension Index are average the highest in comparison with the rest measurements of intellectual abilities in gifted persons: the mean achievements in that measurement are approximately 2 Standard Deviations above the Mean, while in all the three Scales they are in a higher level from the rest measurements. It is seemed that their Crystallized Verbal Ability is extremely developed, either the verbal apprehension or verbal expression. This ability constitutes the basic measurement of examinees' general culture and cultural background, and it is directly affected from educational level (23,4).
- *2nd Common Characteristic:* The achievements on Processing Speed Index are average the lowest comparing with the rest measurements of intellectual abilities in gifted persons: the achievements on this Index are approximately 1 Standard Deviation above the Mean and fluctuate in a clearly lower level from the rest measurements. Simple repeatedly cognitive projects, must be completed quickly and in a simple way (executant function), present the lowest cognitive achievements in giftedness (23,4).
- *3rd Common Characteristic:* The extremely high achievements in «Vocabulary» Subtest: On average «Vocabulary» is the Subtest that appears the highest achievements in examinees with high intelligence. Abilities such as lingual development, knowledge extent, learning ability, verbal meaning formation, verbal fluency, lingual uptake, and expression ability, is seemed to be extremely developed in high intelligent persons. This Subtest is concluded in Verbal Comprehension Index, which documents the highest achievements in gifted examinees (23,4).

- *4th Common Characteristic:* The comparatively lower achievements in «Cancellation» Subtest: Executant abilities such as speed in taking decision, visual-motor coordination, visual-motor processing, ability in visual detection, are assessed in this Subtest. Even if these abilities are slightly above the Mean, they note down the lowest achievements in comparison with the other measurements to gifted persons. It is, also, noteworthy that this Subtest has the lowest loading in general intelligence, which means that it has the most limited assessment possibility on the Full-Scale Intelligence Quotient comparing with the other Subtests of Wechsler Scales (this low loading is noted in almost all Subtests of the Processing Speed Index, presenting the lowest score on the Subtest «Cancellation») (23,4).
- *5th Common Characteristic:* The consistently higher achievements of General Ability Index (GAI) comparing to these of Cognitive Proficiency Index (CPI): It is supposed that cognitive abilities of more complex projects such as verbal apprehension, visual-spatial process, and fluid reasoning (GAI's measurements), seemed to be in a higher level from other simpler cognitive processes, which mainly constitute executant processes such as working memory and speed processing (CPI's measurements). Namely, the solution of more complex cognitive projects notes down higher achievements in gifted

Discussion

Considering the above, it is important to notice that intellectual's ability assessment in gifted persons is a remarkably interesting as composite procedure. On an entirely psychometric approach, based on the above-mentioned common characteristics of gifted persons in all age groups, dominates the view that the most proper way to assess general intellectual functioning of high intelligent persons, it is not mainly through the Full-Scale Intelligence Quotient measurement (FSIQ), but the assessment of the most complex, complicated and higher-order intellectual abilities, as this is determined from the General Ability Index (GAI). Furthermore, survey has shown that Wechsler Subscales with higher loadings in General Intelligence, such as Vocabulary, Similarities, or Information, tend to appear extremely high scores on gifted persons. According to Weschler, the higher loadings in General Intelligence

(G Factor), demonstrate that these measurements investigate mainly essentials abilities of cognitive function. On the other hand, subscales with lower loadings in General Intelligence (G Factor), such as Cancellation, Symbol Search, and Coding, appear significantly lower-order achievements. According to Wechsler, these measurements estimate mainly processing abilities, which don't have the same importance as the primary cognitive abilities. Thus, these measurements demonstrate lower achievements on gifted persons (24,25,26).

A noteworthy element in Greek weighting of the three WECHSLER Scales is that gifted persons' achievements follow similar characteristics. This element is demonstrated from examinees' achievements who have achieved Full Scale Intelligence Quotient over 120, something that one can check at the «Administration and Scoring Manual» of the three Wechsler Scales. For instance, according to the Greek WISC-V standardized edition, the 68,9% of children with FSIQ \geq 120 demonstrated on Fluid Reasoning Index (FRI) higher-order achievements than the Processing Speed Index (PSI), while only 26,2% from the same group demonstrated higher-order achievements on PSI than FRI (27, p.333). Consequently, the psychometric findings of the American weightings can be generalized to the Greek weightings, too. The age limits for these 3 Scales, referring to gifted examinees, are the following: WAIS-IV 16-64 years old, WISC-V 6-16 years old, WPPSI-III 4-7 years old and 3 months (24,25,26).

This review may contribute to the assessment and measurement of intelligence among all aged groups, as it describes giftedness in a clearly qualitative way and not only with the most common and easy to use method of a quantitative assessment. Giftedness is analyzed and approached through abilities with fundamental and processing characteristics. Additionally, it is of vital importance that, according to this approach, intelligence is not «static», but it might be evolved if the person follows training programs. For that reason, intelligence should be re-assessed every two years.

Unfortunately, there is not a specific and complete package of tests (test battery) to assess giftedness. The importance and value of psychometric tests is indisputable but not panacea. Clinicians, who assess gifted children, ought to create an appropriate and complete test battery with credibility, validity, and diagnostic accuracy. Furthermore, the examinee's age, growing level,

ethnicity, race, maternal language, and lingual fluency should be considered, too.

Finally, any relevant socio-cultural factors should be considered for the selection of the proper assessment tests. The findings of the above review should be taken into consideration for future research. A validated and complete test battery that will reduce limitations on gifted persons' assessment, should be developed. The assessment and categorization of gifted students into groups will give clinicians the opportunity to focus on specific educational programs to improve gifted persons' intelligence, contributing effectively to their progression.

Conclusions

The analysis of the primary cognitive abilities of gifted, comparing to general population, using Wechsler Intelligence Scales and Tripartite Model of Giftedness is mentioned in the above review.

According to review's findings, Pfeiffer's Tripartite Model of Assessment Giftedness does not simply recognize persons or students with extremely high abilities, but it indisputably contributes to the following seven crucial points:

1. Data's collection to incorporate gifted students in special schools or educational programs.
2. The understanding of the unique abilities and weaknesses of extremely intelligent children.
3. The assessment of gifted children in domains such as creativity or critical thinking through modification of their curriculum.
4. Contributes to the detection and assessment of «twice exceptional learners» (children with high intelligence and special learning disability, simultaneously).
5. Detects factors which may lead gifted children to decreased achievement than the one expected or/and to lack of motivations.
6. Provides information to parents concerning their children's homeschooling.
7. Determines the appropriate ranking assessment and provide help to parents to take decisions concerning the educational acceleration of their children.

Additionally, it was attempted a more qualitative approach on specific cognitive achievements of gifted persons, mainly through the analysis of the most particular measurements of high intelligence. The assessment of general intellectual functioning of high intelligent persons should focus not only on the Full-Scale Intelligence Quotient measurement (FSIQ) or General Ability Index (GAI), but also on the assessment of the most complex and complicated intellectual abilities. General Intelligence (G Factor) measurement, demonstrates that this method of assessment giftedness, investigates mainly essentials/fundamental abilities of cognitive function.

This review constitutes an effort to analyze the primary cognitive abilities of gifted, comparing to general population. It is also attempted a more qualitative approach on specific cognitive achievements of gifted persons, mainly through the analysis of the most particular measurements of high intelligence. Here, it is important to mention that, according to Wechsler, the fluctuation among aliquot achievements on cognitive abilities is similar among all ages. Further empirical research to confirm all above findings should be conducted.

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