

## **Standardization Of Cognitive Assessment System (Cas) For The Ages (7) Years**

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### **Abstract:**

Research aims to know the following, Psychometric characteristics (honesty, stability) of the cognitive assessment system (CAS) of intelligence at the age of seven years. The percentile criteria of the cognitive assessment system (CAS) for intelligence at the age of seven years.

The current research includes children of the second grade of primary school in public and private schools in the governorates of (Baghdad, Diyala, Wasit, Dhi Qar) for the academic year (2020-2021 AD), for the age of seven years.

The researcher determined the research sample in a stratified random manner of equal method, according to methodological and scientific methods, that can adequately represent the community, and accordingly the sample amounted to (800) male and female children distributed according to gender by (400) male and (400) female.

After extracting the psychometric characteristics, the system was applied to a sample of derivation of criteria amounting to (800) boys and girls who were chosen by stratified random method from the governorates (Baghdad-Wasit-Dhi Qar-Diyala) to derive national criteria for testing, and the research reached the following results:

1-The cognitive assessment system for intelligence has good psychometric properties and can be used in the Iraqi environment.

2-There are no differences between males and females in the cognitive assessment system for intelligence.

In light of the research results, the researcher came up with some recommendations and suggestions.

**Keywords:** Standardization of cognitive assessment system (CAS)

### **Research problem:**

The follower of the emergence of traditional intelligence tests in psychology until the seventies can indicate the success achieved by the mental measurement movement in psychology, in order to provide a set of standards and standardized objective tests that are characterized by stability and honesty that could be relied upon in measuring the various mental abilities of individuals, foremost of which are tests intelligence. (Naglieri & Johnson, 2000: 295)

Despite this success achieved by intelligence tests in many fields, the movement of mental measurement and the accompanying emergence of tests to measure intelligence contributed to encouraging researchers to study the nature of this concept in theory and called on many researchers to reconsider what intelligence tests measure. (El-Deeb, 2006: 6)

The cognitive assessment system is one of the means to address the defects of traditional tests that measure intelligence, which prompts its legalization in the Iraqi environment as long as it is not currently available to educational institutions for diagnosis and assessment.

Hence, the problem of the current research stems from the need for standardized tests that accommodate local conditions and are suitable for use in the Iraqi environment, including the cognitive assessment system test.

### **Research importance:**

Intelligence was and still is one of the abilities that have attracted the attention of many psychologists, because it is one of the most important indicators that measure a large activity of complex mental processes such as (attention, remembering, visualization), as well as its close relationship to the process of learning, teaching and academic achievement. (Al-Salihi and Al-Dhahabi, 2010: 284)

Intelligence is not limited to an individual without the other, or to a people without other peoples, but it is something that applies to all human societies, as all individuals possess a certain amount of basic abilities and a certain level in each type of intelligence, which represents a general ability that exists when Individuals to varying degrees and at different levels, and it can be measured honestly and consistently using standardized tests, and based on their results expectations of the child's success in school or the extent of his failure (Qatami, 2010: 207)

The cognitive assessment battery is one of the unconventional methods for measuring intelligence through a new perspective based on cognitive processes. Interconnected and integrated tests based on an integrated theoretical basis of cognitive construction, located under the name of the cognitive assessment system based on the PASS theory). This system was built and developed through theoretical and applied integration in the field of cognitive psychology, and is used to measure planning-attention-synchronization-sequence processes. (El-Deeb, 2006: 9-21)

Das and his colleagues (Das & ect. 1994) paid special attention to the applied aspects of Bass theory. In terms of measurement and evaluation, Das and Naclery prepared the Cognitive Abilities Assessment Battery (CAS) after Kaufman prepared the Children's Mental Abilities Assessment Battery based on Bass Theory. It included an assessment battery. Cognitive abilities tests all of the processes involved in BASS theory, and has enabled psychologists to make significant progress in predicting academic achievement, as well as diagnosing and treating learning disabilities. (Al-Keshki and Hassouna, 2012: 20)

Several studies indicated the diagnostic ability of the CAS system, and the studies indicated that the PASS theory represents a multi-dimensional model that works to clarify the mechanisms of neuropsychological functions, as it sheds light on the strengths and weaknesses of cognitive employment and through how individuals encode information, instead of Limiting themselves to

measuring the amount of information they have and measuring its rate of change (Arafa, 2020: 8)

The study of childhood and attention to it is one of the most important criteria by which society and its development are measured, so all countries of the world worked to provide the appropriate environment for their children to achieve their proper growth, and imposed compulsory education in the primary school stage because education is a basic and one of the requirements for their upbringing and preparation, and educators and psychologists emphasized the necessity of Diagnosing the school readiness of children before they enter school because the diagnosis gives a positive feedback in the process of learning and teaching, as it is possible to classify children during their education and provide appropriate activities and programs for each category, and the teacher also helps in guiding students, which achieves an improvement in their academic levels. (Habib and Kazem, 2018: 94-95)

### **Research aims:**

1-Psychometric characteristics (honesty, stability) of the cognitive assessment system (CAS)) of intelligence at the age of seven years.

2-The percentile criteria of the cognitive assessment system (CAS) for intelligence at the age of seven years.

### **Research limits:**

The current research is limited to children of the first grade of primary school in public and private schools in the governorates of (Mosul, Baghdad, Wasit, Dhi Qar) for the academic year (2020-2021 AD) for the age of seven years.

### **Define terms:**

The following is a definition of the terms used in the current research title:

1- Standardization: defined by Hills (Hills, 1981):

" The process of standardizing test preparation conditions and applying it to a large group of individuals so that their scores can be compared" (Hills, 1981:1).

2-Cognitive Assessment System (CAS) for Intelligence: Define it (Naglieri & Das, 1991)

"It is one of the unconventional ways to measure intelligence through a new perspective based on cognitive processes (planning-attention-synchronization-sequence)" (Naglieri & Das, 1991: 117).

### **Theoretical framework**

#### **The concept of intelligence:**

The concept of intelligence is one of the concepts that has sparked controversy among many psychologists for many years, in its nature and how to measure it, which made it one of the main goals of psychology, and the concept of intelligence is older in its inception than psychology and its experimental investigations. Then, he was interested in studying the biological and neurophysiological sciences, and then settled in his psychological field, which he studies as a

mental and cognitive aspect of behavior. (Yusuf, 2011: 297)

In the nineteenth century, mental measurement attempts began, and the English scientist Francis Goulten had great credit for the development of mental measurement, and the scientist led the movement of mental measurement in America, and the scientist Krapelin in Germany was interested in collecting batteries of tests to measure some of the most complex mental processes (Al-Ghareeb, 1988: 15 -19)

### **Intelligence theories: PASS Theory- :**

Much research was conducted in the second half of the twentieth century in the interpretation and measurement of intelligence, and most of this research focused on examining specific abilities beyond the concept of general, undifferentiated intelligence. An increasing number of cognitive theorists studied neuropsychology, neuroscience, and higher mental processes in the 1960s. These studies were described as a cognitive revolution, and this movement had a significant impact on theoretical psychology and then in applied psychology, and the first appearance of the impact of the cognitive revolution was when Kaufman published in 1983 tests called the Kaufman Assessment Battery for Children, As well as the publication of the Cognitive Assessment System (CAS) in 1997, which focused on cognition and on neuropsychology and has been described by contemporary scholars as unconventional due to the mechanism linking theory to practice (Rosario& ect., 2015: 251)

PASS theory is one of the modern theories in intelligence that combines the information processing approach with the biological approach that links (information with the biological-neurological bases) of behavior, and this theory stems from a basic idea that intelligence consists of the four cognitive processes (attention, planning, synchronization-relay) which help in:

First: How the child thinks and how to distance this thinking.

Second: To discover the child's strengths and needs, which can be used later in the effective differential diagnosis.

Third: A fair assessment of the child's intelligence.

Fourth: Choosing or designing appropriate interventions.( Rosario & ect., 2015: 250)

The PASS theory of intelligence relied on the three functional Luria units which were assumed to function collectively and are necessary for any kind of mental activity. Naglieri, 1995: 159)

The basis adopted by Naglieri and Das (Naglieri & Das, 1997) in their work is the Luria model, which sees that cognitive processes proceed from three basic angles: (cognitive processes, information processing, neurophysiological functions), which includes (attention), which is the first process of Cognitive processes in the brain, and (synchronization and sequence) represent the second unit in the brain, and (planning) which represents the third unit in the brain. (Rosario &ect., 2015:253)

### **Search procedures:**

#### **First / Research Methodology**

The current research relied on the descriptive analytical approach, which is the approach that depends on the study of reality or phenomenon as it exists in reality and is concerned with being an accurate description and expressing it quantitatively. (Obeidat and others, 2005: 219)

**Second: the research community:**

The current research community includes seven years of age, for the academic year (2020-2021) and of both sexes (males, females).

**Third: The research sample:**

The procedures for codifying the cognitive assessment system (CAS) for intelligence for a seven-year-old require its application on several samples, so the researcher chose a sample of (800) children and students who were chosen randomly from among the children of public and private schools.

**Fourth: The search tool:**

The researcher used the Cognitive Assessment System (CAS), which combines reliable and valid measures of intelligence, in addition to the extreme ease of presentation and scoring.

**Preparing and legalizing the Cognitive Assessment System (CAS):**

Both (Naglieri & Das) legalized the cognitive assessment system in the United States of America, through a set of controlled procedures and the preparation of (population and society) standards in which the legalization took place, and the system was carefully tested on a sample that takes into account (age, gender, race, Parents' educational level, social class) The system was initially designed on a random sample of ages (5-17) years, and private information was collected from the year (1993-1996) and the total number was (3072) boys and girls, and three types of honesty were extracted.

**Test legalization procedures:**

The researcher took the following steps to legalize the cognitive assessment system (CAS) :

1-Using the Arabized version of the cognitive assessment system that has been Arabized and codified before (Ayman, 2006)

2-Logical analysis of the test items: Logical analysis is necessary at the beginning of preparing the paragraphs or verifying them because it indicates the extent to which the paragraph represents the characteristic that was prepared to measure it, in addition to the fact that the good paragraph in its formulation that is related to the feature contributes to raising its discriminatory power and validity coefficient (Al-Kubaisi, 2001, p. 171).

To achieve this, the paragraphs of the mental ability test were presented to (12) experts who specialize in educational and psychological sciences, to judge the validity of the test paragraphs to measure what was set for measurement and their suitability to the environment to which it will be applied. The system was approved by the experts with a percentage of (100%) of the number of experts, and thus all the test items were considered valid for measuring what they were designed to

be measured according to the experts' opinions.

.3Clarity of instructions and understanding of phrases: Faraj (1980) refers to the need to verify the extent to which the target sample understands the scale's instructions and the clarity of its paragraphs (Faraj, 1980: 160), and to verify the clarity of the instructions, understanding the phrases and the way to answer the test items, and calculating an average The time taken to answer the test items, the test was applied to a sample of (60) boys and girls who were chosen at random.

Statistical analysis sample: The researcher chose (400) boys and girls for the statistical analysis sample for the paragraphs, they were chosen by the stratified random method and according to the following steps:

1-Four Iraqi governorates were chosen at random, which are (Baghdad, Wasit, Diyala and Dhi Qar).

2- Four schools were chosen at random from each governorate.

**Application of the Cognitive Assessment System (CAS) tests:** the tests were applied individually to the sample of (400) boys and girls, in the period between (30/11/2020-9/3/2021), and the children's answers to the test were corrected according to the instructions Each test of the cognitive assessment system by giving (1) one point for the correct answer and zero for the wrong answer.

**Test correction:** After the test was applied to (400) individuals from the research community, the test correction was based on the correction key found in the original test. Special, if each correct answer was given one mark, either the wrong answer or the one that the child did not answer within the specified time for each paragraph was given zero, and because the test consists of (59) items, the maximum score that the child can obtain is (59) degrees and the lowest score (zero).

**First - Validity Test:** Validity is the most important psychometric standard characteristic that must be available in psychological scales (Ebel, 1972:435) and two indicators of validity were extracted for the tests of the current research, namely (apparent honesty, and construct validity). The following is an explanation of how to obtain each index of which:

**A - Face Validity:** It is one of the content validity indicators and indicates the extent to which the test items are related to the variable to be measured (Freeman, 1962: 73), and it was achieved in this study when the test in its initial form was presented to a group of specialized experts to judge the extent The validity of the paragraphs in measuring mental abilities, and all the paragraphs obtained the approval of the specialized experts for their validity to measure what they were designed to measure and at a rate of (100%)

**b- Construction Validity:** The construction validity is described as the most representative type of honesty of the concept of honesty, which is sometimes called concept honesty, or the validity of the hypothetical formation, and it means the extent to which the psychological scale is measured for a hypothetical formation or a particular psychological concept (Rabee, 1994: 98). The construct validity means the degree to which the scale measures a theoretical construct or a specific feature (Anstasi, 1976: 151).

The researcher verified this assumption with the following:

**Factor analysis of the cognitive assessment system for intelligence:** The statistical concept of factor analysis is the analysis of a group of correlation coefficients into a smaller number of factors, and the psychological concept of it is the search for factors that affect the complex phenomena that link each other, and through this approach can identify the factors responsible for Behaviour, instead of multiplicity and saturation becomes relatively limited. (Al-Tamimi, 1993: 75) The researcher used the confirmatory factorial analysis method of the second degree to verify the global structure of the cognitive assessment system for intelligence, which indicates in the light of the theoretical framework that it consists of four operations (planning, attention, synchronization, and sequence), and it involves under Each process has three sub-tests, i.e. (12) sub-tests, and each sub-test is measured by a number of paragraphs, with (59) items for the system, in light of that, the assumed model was built.

In applying the test, the researcher relied on a sample of (400) male and female students, and the data was analyzed by relying on the statistical program (LISREL). Good matching.

**Correlation of the paragraph with the total score of the test:** It is an indicator of the internal consistency of the items of the scale (Al-Kubaisi, 1987: 174). This indicator was verified by keeping the relevant items statistically significant. Therefore, the items' correlation coefficients with the total score and the discriminatory ability of the items can be among the indicators The validity of the tests in the current research.

**Test stability:** Stability is one of the indicators for verifying the accuracy of the scale and the consistency of its paragraphs in measuring what must be measured (Crocker & Algine, 1986: 125), and the researcher used two methods to find stability:

**A- The method of applying and re-applying the test:** This method reveals the degree of stability of the mental process over time, and measures the external consistency of the paragraphs, and that the stability coefficient resulting from this method is the stability coefficient. (Odeh, 2005: 430) Note that the researcher extracted the reliability coefficient by the re-test method (according to what was stated in the steps of legalizing the cognitive evaluation system from its original author) and to calculate the stability coefficient in this way, the cognitive evaluation system tests were re-applied on a random sample of (120) Boys and girls at the rate of (40) boys and girls for each age, including (20) males and (20) females, after an interval of (21) days from the first application of the tests, then according to the Pearson correlation coefficient between the children's scores in the two applications, and it was found that the stability coefficient It is statistically significant at the (0,01) level, as shown in Table (1).

<b>The cognitive assessment system</b>	<b>Stability coefficient by exam REPETITON</b>
<b>Cognitive assessment</b>	0.86
<b>Planning</b>	0.80
<b>concurrency</b>	<b>0.82</b>
<b>Attention</b>	0.84
<b>Relay</b>	0.81

**b- Kuder-richardson 20 method:** The Kuder-Richardson method is usually referred to by the symbol (KR-20) and this type of consistency represents internal homogeneity. This method depends on the paragraphs' scores, and it assumes that all the paragraphs agree in measuring a common factor, as The concept of homogeneity is taken as a basis for the definition of stability, and to calculate the stability coefficients of the tests, a group of papers from the answers of the members of the statistical analysis sample were subjected to analysis. The number of them was (100) children whose response forms were drawn randomly, and the equation (KR-20) was applied to them, and all the reliability coefficients were statistically significant when Level (0.01), as shown in Table (2):

<b>The cognitive assessment system</b>	<b>Stability coefficient</b>
<b>Cognitive assessment</b>	0.88
<b>Planning</b>	0.82
<b>concurrency</b>	<b>0.84</b>
<b>Attention</b>	0.86
<b>Relay</b>	0.83

**The test in its final form:** After completing the statistical analysis process for the test items, the test in its final form consists of (59) items, Appendix (5). These items are diverse in their formulation and measure various aspects of mental ability. A score of (zero) for the wrong or left out answer, and the total score for the test is calculated by adding the scores that the child gets for his responses for each of the paragraphs, so the highest score that the child can get is (59) degrees, and the lowest score the child gets. It is (zero), and thus the theoretical average of the test is (29.5) degrees, and its application requires (60) minutes of time, and its purpose is to measure the general mental ability (intelligence).

**Presentation, interpretation and discussion of the results:**

This chapter includes a presentation of the findings of the current research according to its objectives, as well as the interpretation and discussion of the results, and recommendations and suggestions.

1-The first objective: (knowing the psychometric characteristics (honesty, stability) of the cognitive assessment system CAS)) of intelligence for a seven-year-old, which was verified in the third chapter by extracting the psychometric characteristics of the paragraphs of the cognitive assessment system (CAS) for intelligence, represented by the difficulty, distinction and effectiveness of the paragraphs Incorrect alternatives, their apparent and practical validity, and their stability.

2- The second goal: the percentile criteria of the cognitive assessment system for intelligence for the seven-year-old. The researcher extracted the percentile criteria and ranks with which the score of each examinee is compared, and the results were as shown in Table (3):



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<b>Variable</b>	<b>Raw Degree</b>	<b>Percentile Rank</b>
<b>Planning</b>	7	5
	8	13
	9	29
	10	51
	11	72
	12	88
	12	96
	14	99
<b>Synchronization</b>	9	10
	10	25
	11	47
	12	70
	13	87
	14	96
	15	99
<b>Attention</b>	8	1
	9	4
	10	11
	11	25
	12	45
	13	66
	14	83
	15	93
	16	98
<b>Relay</b>	8	7
	9	19
	10	37
	11	60
	12	80
	13	92
	14	98
<b>Cognitive assessment</b>	46	14
	47	28
	48	47
	49	66
	50	81
	51	92
	52	97
	55-53	99

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