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Measurement of Multiple Intelligences among Sample of Students with Autism, and Intellectual Disability Using Teacher Estimation and Its Relationship with the Variables: The Type and Severity of Disability, Gender, Age, Type of Center

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Abstract

This study aims to measure the multiple intelligence among sample of student with autism disorder and Mental disability by using teacher estimation in multiple intelligence scale and its relationship with the variables: type and severity of disability, gender, and the type of center, the study sample consisted of (81) student with autism and (85) student with mental disability, male and female, who enrolled in private and governmental situations in Amman.

And for achieving the goals of the study the researcher developed the multiple intelligences assessment tool consists of (56) items, were verified validity and reliability of the tool where it was found that with acceptable degrees of reliability and validity.

After processing the data statistically and analyzed, the results indicated that the most visible intelligence in mental disability is of musical intelligence, and in autism student is the kinesthetic intelligence, And Autistic children also showed superiority in arithmetic and kinesthetic intelligence compared with mental disability. Also children with mild disabilities have high performance in all type intelligences.

And there are no differences in type of intelligence according to the gender and this proves that disability affects the brain regardless of the gender. While the adolescents have superiority in each of the linguistic, social and musical intelligence, there are no differences in the multiple intelligences depending on the type of center which the student attends in it.

Keywords: Multiple Intelligence, Mental disability, Autism

1. Introduction

Howard Gardner (1983/1993) developed his theory of Multiple Intelligences (MI) to try and explain the wide range of differences between individuals with regards to learning. Multiple intelligence theory posits a set of human intellectual potentials, about eight intelligence, in every individual. Owing to heredity, early training, or, a constant interaction between these factors, some individuals will develop certain intelligences far more than others; (Gardner, 1983/1993, p. 278).

Gardner defined intelligence "as the capacity to solve problems or fashion products which are valued in one or more cultural settings" (Gardner 1999). Gardner (1983/ 1993) further clarifies this definition of intelligence as:

1. The ability to solve problems that one encounters in real life.

2. The ability to generate new problems to solve.

3. The ability to make something or offer a service that is valued within one's culture (p. 60-61).

2. Literature Review

2.1 Gardner's multiple intelligences

Howard Gardner's multiple intelligences can be summarized as follows:

Linguistic Intelligence (word smart) refers to the ability to use words and language, both written and spoken. Such learners have highly developed auditory skills and are fluent speakers. They think in words rather than pictures. Their skills include listening, speaking, writing, storytelling, explaining and teaching.

Logical Intelligence (logic smart) refers to the ability to reason, apply logic and work with numbers. Such learners think conceptually in logical and numerical patterns, making connections between pieces of information. Their skills include problem solving, classifying and categorizing information, thinking logically, questioning, carrying out investigations, performing mathematical calculations and working with geometric shapes.

Visual-spatial Intelligence (picture smart) refers to the ability to perceive the visual. Such learners tend to think in pictures and need to create vivid mental images to retain information. Their skills include understanding charts and graphs, sketching, painting, creating visual images and constructing, fixing, and designing practical objects.

Musical Intelligence (music smart) refers to the ability to produce and appreciate music. These musically inclined learners think in sounds, rhythms and patterns. They immediately respond to music either appreciating or criticizing what they hear. Their skills include singing, playing musical instruments, recognizing sounds and tonal patterns, composing music and remembering melodies.

Bodily Kinesthetic Intelligence (body smart) refers to the ability to control body movements and handle objects skillfully. Such learners express themselves best through movement. They have a good sense of balance and hand-eye coordination. Through interacting with the space around them, they are able to remember and process information. Their skills include dancing, physical coordination, sports, crafts, acting, miming and using their hands to create or build.

Interpersonal Intelligence (people smart) refers to the ability to relate to and understand other people. These learners are able to sense feelings, intentions and motivations and are adept at recognizing non-verbal language, for example body language. Their skills include seeing things from other perspectives, listening, using empathy, understanding other people's moods and feelings and communicating both verbally and non-verbally.

Intrapersonal Intelligence (self-smart) refers to the ability to understand ourselves, who we are, and what makes us the way that we are. Such learners are able to recognize their own strengths and weaknesses and have a capacity for self-analysis, awareness of their inner feelings, desires and dreams, evaluating their thinking patterns and reasoning with themselves.

Natural Intelligence: this intelligence was proposed in 1999. This area has to do with nurturing and relating information to one's natural surroundings. Examples include classifying natural forms such as animal and plant species and rocks and mountain types. This ability was clearly of value in our evolutionary past as hunters, gatherers, and farmers; it continues to be central in such roles as botanist or chef. This sort of ecological receptiveness is deeply rooted in a "sensitive, ethical, and holistic understanding" of the world and its complexities–including the role of humanity within the greater ecosphere. Gardner (1983/ 1993). According to Gardner, all individuals possess each of these intelligences to some extent, although individuals will differ in the degree of skills and in the nature of their combination. Gardner stresses that it is the interaction between the different intelligences that is fundamental to the workings of the mind and that in the normal course of events, the intelligences actually interact with, and build upon, one another. Howard Gardner later proposed an eighth intelligence, 'naturalistic'.

The main messages arising from Gardner's model are set out below:

- We is all born with a unique mix of all eight intelligences.
- Intelligences combine in complex ways.
- There are many ways to be intelligent within each category.
- Most people can develop each intelligence to an adequate level of competency.
- Schools tend to focus mainly on two intelligences, those associated with academic intelligence, that is, linguistic and logical/mathematical.
- The school curriculum should be better balanced in order to reflect a wider range of intelligences.

2.2 The Implications of MI Theory for Special Education

The influence that MI theory can have on special education goes far beyond the development of new remedial strategies and interventions. If MI theory is implemented on a large scale in both regular and special education, it is likely to have some of the following effects:

1. Fewer referrals to special education --when the regular curriculum includes the full spectrum of intelligences, referrals to special education classes will decline. Most teachers now focus on the linguistic and mathematical intelligence's, neglecting the needs of students who learn best through musical, spatial, bodily-kinesthetic, interpersonal or intrapersonal intelligences. If is these students who most often fail in regular classrooms and are placed in special settings. Once regular classrooms themselves become more sensitive to the needs of different kinds of learners through MI learning programs, the need for special placement, especially for learning disabilities or behavior problems, will diminish.

2. A greater emphasis on identifying strengths --qualitative and authentic measures are likely to have a larger role in special education and may perhaps begin to supplant standardized diagnostic measures as a means of developing appropriate educational programs.

3. Increased self-esteem with more emphasis placed on the strengths and abilities of children with disabilities, students' self-esteem are likely to rise, thus helping to promote success among a broader community of learners.

4. Increased understanding and appreciation of students as students use MI theory to make sense of their individual differences, their tolerance, and understanding. And appreciation of those with special needs is likely to rise, making their full integration into the general classroom more likely (Armstrong, 1999).

2.3 Idiots savants

The first using of term "Idiots savants" was by Down (1887) to describe individuals with developmental disability or individuals who had an IQ below (25) but still seemed to be "knowledgeable Pearson" by appears specific skills (spitz, 1995, Treffert and Wallace,2004),and the most popular pattern of savant skills are presented in the visual arts, drawing (selfe, 1983), musical performance (miller, 1998), and particular arithmetic skills such as calendar calculating, prime number derivation (sacks,1985), savant skills less frequently appear in other areas such as: sensory sensitivity, language and mechanical aptitude (Rimland,1978).

The term "Idiot Savant" means: Idiot: low intelligence, which acceptable for mental retardation in the late 19th century, when the phenomenon was first medically investigated, and from the French, Savoir mean Knowing or “a learned person”, used to describe individuals who had "Extraordinary memory but with great defect in reasoning power", and this term is now little used because of its in appropriate connection and was replaced by the term savant syndrome, as alternatives to traditional terminology.

The individuals who described as Idiot Savant who categorized as " developmental disorder", and its estimated that about 50% of the cases of savant syndrome are from the autistic

population, and the other 50% from the population of developmental disabilities and CNS injuries, and the estimated incidence of savant abilities in the autistic population is about 10%, whereas the incidence in learning disability population is probably less than 1% (Treffert, 2000, Hermelin, 2001, Hiles, 1978).

Savant syndrome generally occurs in people with IQs between 40-70, although it can occur in some with IQs up to (114) or even higher, it disproportionately affects male with four to six male savant for every one female, and it can be congenital or acquired later in life following disease or brain injury (Treffert, 2006).

There's no single theory can explain all savants but there's numerous theories have been put forth to explain this astonishing juxtaposition of ability and disability in the same person depend on observation, imaging and neuropsychological studies, that one mechanism in savants, whether congenital or acquired, is left brain dysfunction with right brain compensation, a form of "paradoxical functional facilitation" as described by Kapur (1996) while Brink (1980) raised that possibility with a case in which left brain injury in child gave raise to some mechanical and other savant skills, Millers work with persons with fronto-temporal dementia (FTD) in whom savant skills appear and sometimes at a prodigious level (Miller et al, 1998, 2000), those results led him to conclude that " loss of function in the left anterior lobe may lead to facilitation of artistic or musical skills", while Hou and others, (2000) believed that the anatomic substrate for the savant syndrome my involve loss of function in the left temporal lobe with enhanced function of the neocortex.

2.4 The Autistic Savant

Autistic savant describes by treffert (2000) (part of savant syndrome) as “a rare, but extraordinary, condition in which individuals with serious mental disabilities, including autistic disorder, have some ‘islands of genius’ that stands in marked incongruous contrast to the overall handicap” (p.15). While it is true that “the majority of autistic savants have low IQs, there are some autistic savants who are highly intelligent” (Exkorn, 2005, p.69).

It has been found that about 10 percent of individuals with autistic savant, who may be intellectually disabled in most ways, show special or even remarkable skills. They can be classified under three categories of autistic savant skills as follows (Exkorn, 2005): (1) Splinter skills: These skills are most common. Autistic savants with splinter skills display obsessive preoccupations with and memorization of trivia and obscure information such as license plate numbers of vehicles and sports statistics,

(2) Talented skills: Autistic savants with talented skills have a more highly developed and specialized skill. For instance, they can be very artistic and paint beautiful sceneries, or for some, have a fantastic memory that allows them to work out difficult mathematical calculations mentally. (3) Prodigious skills: These skills are the rarest. Prodigious savants have spectacular skills that would be remarkable even if they were to occur in non-handicapped individuals. There are only about 25 autistic savants in the world who display prodigious skills, which could include for instance, the capability to play an entire concerto on the piano after listening to it only once.

2.5 Intellectual disability (ID)

Also called intellectual development disorder (IDD) and formerly known as mental retardation (MR), (Tidy, 2013, 2010), and the DSM-5 has replaced it with "intellectual developmental disorder." (American Psychiatric Association, 2013 and Salvador and, et al, 2011). Because of its specificity and lack of confusion with other conditions, is neurodevelopmental disorder characterized by impaired intellectual and adaptive functioning which is defined by an IQ score below 70 as well as a delay in general daily living skills. Other common symptoms include speech delays and lack of social functioning.

3. Methodology

3.1 Problem of the study

The present study aims to find the differences in multiple intelligences among student with autism and students with mental disability depending on the variable: the type of disability, the severity of the disability, gender, age, Type of center in which the student attends.

3.1.1 Questions of the study

The study seeks to answer the following questions:

What is the level of multiple intelligences mentally disabled students and on the eight dimensions?

What is the level of multiple intelligences autism students and on the eight dimensions?

Are there significant differences at the level of significance ($\alpha \leq 0.05$) in the performance of students on multiple intelligences scale and its eight dimensions due to the variable type of disability (mental disability, autism)?

Are there any statistically significant differences at the level of significance ($\alpha \leq 0.05$) in the performance of students on multiple intelligences scale and its eight dimensions due to the variable severity of disability (mild, moderate, severe) disability?

Are there any statistically significant differences at the level of significance ($\alpha \leq 0.05$) in the performance of students on multiple intelligences scale and its eight dimensions due to the variable of student gender (male, female)?

Are there any significant differences at the level of significance ($\alpha \leq 0.05$) in the performance of students on multiple intelligences scale and its eight dimensions due to the variable student age?

Are there any statistically significant differences at the level of significance ($\alpha \leq 0.05$) in the performance of students on multiple intelligences scale and its eight dimensions due to the variable type of center (government, private)?

3.2 Participants and sampling

The sample was distributed as shown in the table (1)

Table 1. The distribution of the sample: Frequencies and percentages according to the study variables

	Categories	Frequency	Percentage
Type of disability	Mental disability	85	51.2
	Autism	81	48.8
Age	child	43	25.9
	Teenagers	84	50.6
	adult	39	23.5
Sex	Male	100	60.2
	female	66	39.8
Severity of disability	Mild mental disability	54	32.5
	Moderate mental disability	45	27.1
	Severe Mild mental disability	67	40.4
Center Type	Governmental Center	75	45.2
	Special center	91	54.8
	total	166	100.0

3.3 Instrumentation

The tool prepared by returning to the available educational literature and the available tools of the multiple intelligences as (Mckenzie, (1999), Armstrong (2000), Niall Douglas, (2006), Shearer, 2001).And the tool items built to fits with the study sample characteristics, where the tool was formed in the initial image of (80) items distributed on the eight intelligences, so that each type of intelligences includes 10 items , and then presented to a group of evaluator were excluded group of items to become in the final form (56) by (7) items for each type of multiple intelligences. A 5-point Likert scale was used as the responses which is ranging from 1= rarely, 2= slightly, 3= sometimes, 4= usually, 5= mostly, so that the highest score obtained by each student is (35) and the less degree (7).

3.3.1 Reliability of the study tool

To ensure the reliability of the tool, the internal consistency was calculated on the exploratory sample from outside the study sample of (20):(10) mentally retarded and (10) autism , by Cronbach's alpha equation, and the table below shows these result, and its considered appropriate ratios for the purposes of this study.

Table 2. Internal consistency coefficient of Cronbach's alpha

Dimensions	Internal consistency
Linguistic Intelligence	0.87
Logical Intelligence	0.83
Visual-spatial Intelligence	0.83
Bodily Kinesthetic Intelligence	0.83
Musical Intelligence	0.86
Interpersonal Intelligence	0.87
Intrapersonal Intelligence	0.86
natural Intelligence	0.85

4. Results

To analyse data, both descriptive analysis (mean, standard deviation, and levels) and inferential analysis (one-way ANOVA) were employed to answer research questions

First question: what is the level of multiple intelligences mentally disabled students and on the eight dimensions? To answer this question the mean and standard deviations of the level of multiple intelligences in mental disability students was extracted, and the table below shows the result.

Table 3. Frequencies and percentages according to the study variables

	Categories	Frequency	Percentage
Type of disability	Mental disability	85	51.2
	Autism	81	48.8
Age	child	43	25.9
	Teenagers	84	50.6
	adult	39	23.5
Sex	Male	100	60.2
	female	66	39.8
Severity of disability	Mild mental disability	54	32.5
	Moderate mental disability	45	27.1
	Severe mental disability	67	40.4
Center Type	Governmental Center	75	45.2
	Special center	91	54.8
	total	166	100.0

The table (3) that the mean ranged between (1.94-2.91), where the musical intelligence came in the first rank with the highest arithmetic mean (2.91), while logical intelligence came in the latest ranked with mean (1.94).

Second question: What is the level of multiple intelligences autism students and on the eight dimensions? To answer this question the mean and standard deviations of the level of multiple intelligences in autism students was extracted, and the table below shows the result.

Table 4. The averages and standard deviation of the level of multiple intelligences in mental disability students in descending order

Rank	Dimensions	standard deviation	mean
1	Musical Intelligence	1.114	2.91
2	Linguistic Intelligence	1.187	2.76
3	Interpersonal Intelligence	1.175	2.76
4	natural Intelligence	1.194	2.69
5	Visual-spatial Intelligence	1.059	2.52
6	Bodily Kinesthetic Intelligence	.979	2.49
7	Intrapersonal Intelligence	1.141	2.43
8	Logical Intelligence	.992	1.94

The table (4) that the mean ranged between (2.88-2.41), where the bodily kinesthetic intelligence came in the first rank with the highest arithmetic mean (2.88), while natural Intelligence came in the latest ranked with mean (2.41).

Third question: Are there any significant differences at the level of significance ($\alpha \leq 0.05$) in the performance of students on multiple intelligences scale and its eight dimensions due to the variable type of disability (mental disability, autism)?

To answer this question the mean and standard deviations for the performance of students on multiple intelligences and eight dimensions according to the variable of the type of disability was extracted, and to indicate the statistical differences between the means the "T" test were used, and the tables below show this.

Table 5. The averages and standard deviation of the level of multiple intelligences in autism students in descending order

Rank	Dimensions	mean	standard deviation
1	Bodily Kinesthetic Intelligence	2.88	.927
2	Visual-spatial Intelligence	2.69	.878
3	Musical Intelligence	2.64	.994
4	Linguistic Intelligence	2.55	.771
5	Intrapersonal Intelligence	2.46	.843
6	Logical Intelligence	2.44	.656
7	Interpersonal Intelligence	2.43	.691
8	natural Intelligence	2.41	.714

It appears from the table (5) there are no statistically significant differences ($\alpha \leq 0.05$) due to the effect of the type of disability in all dimensions of multiple intelligence scale except the logical intelligence and bodily kinesthetic intelligence, in favor of autism students.

Fourth question: "Are there any statistically significant differences at the level of significance ($\alpha \leq 0.05$) in the performance of students on multiple intelligences scale and eight dimensions due to the variable of severity of disability?

To answer this question the mean and standard deviations for the performance of students on multiple intelligences and eight dimensions according to the variable of the severity of disability was extracted, and to indicate the statistical differences between the means the "T" test were used, and the tables below show this.

Table 6. The mean, standard deviations and "T" test for the effect of type of disability on the performance of students on multiple intelligences scale and eight dimensions

		NUM	mean	standard deviation	"T" value	Freedom degrees	statistical significance
Linguistic Intelligence	mental disability	85	2.76	1.187	1.384	164	.168
	Autism	81	2.55	.771			
Logical Intelligence	mental disability	85	1.94	.992	-3.768	164	.000
	Autism	81	2.44	.656			
Visual-spatial Intelligence	mental disability	85	2.52	1.059	-1.182	164	.239
	Autism	81	2.69	.878			
Bodily Kinesthetic Intelligence	mental disability	85	2.49	.979	-2.605	164	.010
	Autism	81	2.88	.927			
Musical Intelligence	mental disability	85	2.91	1.114	1.618	164	.108
	Autism	81	2.64	.994			
Interpersonal Intelligence	mental disability	85	2.76	1.175	1.878	164	.062
	Autism	81	2.46	.843			
Intrapersonal Intelligence	mental disability	85	2.43	1.141	-.023	164	.982
	Autism	81	2.43	.691			
natural Intelligence	mental disability	85	2.69	1.194	1.823	164	.070
	autism	81	2.41	.714			

It appears from table (6) Variation ostensibly in means and standard deviations for the performance of students on multiple intelligences and eight dimensions due to the differences in severity of the disability, and to state the statistical significance differences between means the Unilateral variation analysis were used as shown in Table (7).

Table 7. The mean, standard deviations and "T" test for the effect of severity of disability on the performance of students on multiple intelligences scale and eight dimensions

	Categories	NUM	mean	standard deviation
Linguistic	Mild mental disability	54	3.30	.990
Intelligence	Moderate mental disability	45	2.70	.815
	Severe mental disability	67	2.12	.828
	Total	166	2.66	1.009
Logical	Mild mental disability	54	2.66	.821
Intelligence	moderate mental disability	45	2.07	.891
	Severe mental disability	67	1.87	.750
	Total	166	2.18	.878
Visual-spatial	Mild mental disability	54	3.12	.876
Intelligence	moderate mental disability	45	2.72	.820
	Severe mental disability	67	2.11	.914
	Total	166	2.60	.976
Bodily	Mild mental disability	54	3.05	.941
Kinesthetic	moderate mental disability	45	2.71	.844
Intelligence	Severe mental disability	67	2.36	.975
	Total	166	2.68	.970
Musical	Mild mental disability	54	3.29	1.099
Intelligence	moderate mental disability	45	3.01	.860
	Severe mental disability	67	2.21	.884
	Total	166	2.78	1.062
Interpersonal	Mild mental disability	54	3.21	.977
Intelligence	moderate mental disability	45	2.96	.878
	Severe mental disability	67	1.91	.724
	Total	166	2.62	1.034
Intrapersonal	Mild mental disability	54	2.94	.911
Intelligence	moderate mental disability	45	2.50	.946
	Severe mental disability	67	1.96	.725
	Total	166	2.43	.945
natural	Mild mental disability	54	3.18	.827
Intelligence	moderate mental disability	45	2.78	.934
	Severe mental disability	67	1.89	.738
	Total	166	2.55	.996

It appears from table (7) there is statistically significant differences at the level of significance (α≤ 0.05) due to the severity of disabilities in all dimensions, and to state the statistical marital differences between the means were used posteriori comparisons manner scheffe as shown in the table (7).

Table 8. The Unilateral variation analysis of the effect of the severity of disability on the students' performance on the multiple dimensions scale and its eight dimensions

		Sum of squares	freedom Degrees	Average squares	"F" value	Statistical significance
Linguistic Intelligence	Between groups	41.345	2	20.673	26.633	.000
	Within groups	126.519	163	.776		
	Total	167.864	165			
Logical Intelligence	Between groups	19.460	2	9.730	14.705	.000
	Within groups	107.849	163	.662		
	Total	127.309	165			
Visual-spatial Intelligence	Between groups	31.775	2	15.888	20.654	.000
	Within groups	125.383	163	.769		
	Total	157.158	165			
Bodily Kinesthetic Intelligence	Between groups	14.399	2	7.199	8.324	.000
	Within groups	140.985	163	.865		
	Total	155.384	165			
Musical Intelligence	Between groups	37.995	2	18.997	20.913	.000
	Within groups	148.071	163	.908		
	Total	186.065	165			
Interpersonal Intelligence	Between groups	57.361	2	28.680	39.260	.000
	Within groups	119.074	163	.731		
	Total	176.435	165			
Intrapersonal Intelligence	Between groups	29.353	2	14.676	20.260	.000
	Within groups	118.075	163	.724		
	Total	147.428	165			
natural Intelligence	Between groups	53.098	2	26.549	39.107	.000
	Within groups	110.656	163	.679		
	Total	163.754	165			

It appears from table (7):

- There are statistically significant differences at (α≤ 0.05) between the mild mental disability and both moderate and severe mental disability, in favor of mild mental disability, although there are statistically significant differences at (α≤ 0.05) between severe and moderate mental disability in favor of moderate mental disability in linguistic and intrapersonal intelligence.

- There are statistically significant differences at (α≤ 0.05) between mild mental disability and both moderate and severe mental disability, in favor of mild mental disability in logical

intelligence.

- There are statistically significant differences at (α≤ 0.05) between severe mental disability and both mild and moderate mental disability, in favor of mild and moderate mental disability in visual-spatial, musical, interpersonal and natural intelligence.

- There are statistically significant differences at (α≤ 0.05) between mild mental disability and severe mental disability, in favor of mild mental disability in bodily kinesthetic intelligence.

Fifth question: "Are there any statistically significant differences at the level of significance (α≤ 0.05) in the performance of students on multiple intelligences scale and eight dimensions due to the variable of student gender (male, female)?

To answer this question the mean and standard deviations for the performance of students on multiple intelligences and eight dimensions according to the variable of student gender was extracted, and to indicate the statistical differences between the means the "T" test were used, and the tables below show this.

Table 9. Comparisons dimensional scheffe way on effect of the severity of disability

		mean	Mild	moderate	Sever
Linguistic	Mild	3.30			
Intelligence	moderate	2.70	.60*		
	Severe	2.12	1.17*	.57*	
Logical	Mild	2.66			
Intelligence	moderate	2.07	.59*		
	Severe	1.87	.79*	.20	
Visual-spatial	Mild	3.12			
Intelligence	moderate	2.72	.41		
	Severe	2.11	1.02*	.61*	
Bodily	Mild mental disability	3.05			
Kinesthetic	moderate mental disability	2.71	.34		
Intelligence	Severe	2.36	.69*	.35	
Musical	Mild	3.29			
Intelligence	moderate	3.01	.28		
	Severe	2.21	1.08*	.80*	
Interpersonal	Mild	3.21			
Intelligence	moderate	2.96	.25		
	Severe	1.91	1.30*	1.05*	
Intrapersonal	Mild	2.94			
Intelligence	moderate	2.50	.44*		
	Severe	1.96	.98*	.54*	
natural	Mild	3.18			
Intelligence	moderate	2.78	.40		
	Severe	1.89	1.29*	.89*	

* Statistically significant at the level of (α≤ 0.05)

It appears from table (9) there is no statistically significant difference at ($\alpha \leq 0.05$) due to the effect of student gender in all scale dimensions.

Sixth question: "Are there any statistically significant differences at the level of significance ($\alpha \leq 0.05$) in the performance of students on multiple intelligences scale and eight dimensions due to the variable of student age?

To answer this question the mean and standard deviations for the performance of students on multiple intelligences and eight dimensions according to the variable of student age was extracted, and to indicate the statistical differences between the means the "T" test were used, and the tables below show this.

Table 10. The mean, standard deviations and "T" test for the effect of student gender on the performance of students on multiple intelligences scale and eight dimensions

	gender	NUM	mean	standard deviation	"T" value	Freedom degrees	statistical significance
Linguistic	male	100	2.63	1.010	-.436	164	.664
Intelligence	female	66	2.70	1.013			
Logical	male	100	2.24	.893	1.086	164	.279
Intelligence	female	66	2.09	.854			
Visual-spatial	male	100	2.61	.999	.040	164	.968
Intelligence	female	66	2.60	.947			
Bodily	male	100	2.71	.989	.501	164	.617
Kinesthetic Intelligence	female	66	2.63	.948			
Musical	male	100	2.74	1.025	-.634	164	.527
Intelligence	female	66	2.84	1.120			
Interpersonal	male	100	2.60	.977	-.191	164	.849
Intelligence	female	66	2.63	1.123			
Intrapersonal	male	100	2.47	.912	.795	164	.428
Intelligence	female	66	2.35	.997			
natural	male	100	2.56	.992	.151	164	.880
Intelligence	female	66	2.53	1.010			

It appears from table (10) there is statistically significant differences at ($\alpha \leq 0.05$) due to the effect of student age in all scale dimensions, and to state the statistical significance differences between means the Unilateral variation analysis were used as shown in Table (11).

Table 11. The mean, standard deviations and "T" test for the effect of student age on the performance of students on multiple intelligences scale and eight dimensions

	Categories	NUM	mean	Standard deviation
Linguistic Intelligence	Children	43	2.87	1.131
	Teenagers	84	2.75	.986
	Adults	39	2.24	.797
	Total	166	2.66	1.009
Logical Intelligence	Children	43	2.08	1.000
	Teenagers	84	2.22	.866
	Adults	39	2.22	.768
	Total	166	2.18	.878
Visual-spatial Intelligence	Children	43	2.72	1.110
	Teenagers	84	2.66	.940
	Adults	39	2.35	.868
	Total	166	2.60	.976
Bodily Kinesthetic Intelligence	Children	43	2.94	1.009
	Teenagers	84	2.63	.955
	Adults	39	2.49	.924
	Total	166	2.68	.970
Musical Intelligence	Children	43	3.24	1.045
	Teenagers	84	2.72	1.092
	Adults	39	2.39	.828
	Total	166	2.78	1.062
Interpersonal Intelligence	Children	43	2.82	1.108
	Teenagers	84	2.67	1.023
	Adults	39	2.27	.907
	Total	166	2.62	1.034
Intrapersonal Intelligence	Children	43	2.56	1.037
	Teenagers	84	2.41	.942
	Adults	39	2.31	.849
	Total	166	2.43	.945
Natural Intelligence	Children	43	2.69	1.137
	Teenagers	84	2.59	.974
	Adults	39	2.31	.851
	Total	166	2.55	.996

It appears from table (11) there is statistically significant differences at ($\alpha \leq 0.05$) due to the effect of student age in linguistic, musical, interpersonal intelligence, and to state the statistical marital differences between the means were used posteriori comparisons manner scheffe as shown in the table (12).

Table 12. The unilateral variation analysis of the effect of the severity of student's age on the performance on the multiple dimensions scale and its eight dimensions

		Sum of squares	freedom Degrees	Average squares	"F" value	Statistical significance
Linguistic Intelligence	Between groups	9.296	2	4.648	4.778	.010
	Within groups	158.567	163	.973		
	Total	167.864	165			
Logical Intelligence	Between groups	.594	2	.297	.382	.683
	Within groups	126.714	163	.777		
	Total	127.309	165			
Visual-spatial Intelligence	Between groups	3.422	2	1.711	1.814	.166
	Within groups	153.736	163	.943		
	Total	157.158	165			
Bodily Kinesthetic Intelligence	Between groups	4.428	2	2.214	2.391	.095
	Within groups	150.956	163	.926		
	Total	155.384	165			
Musical Intelligence	Between groups	15.199	2	7.600	7.250	.001
	Within groups	170.866	163	1.048		
	Total	186.065	165			
Interpersonal Intelligence	Between groups	6.759	2	3.379	3.246	.041
	Within groups	169.677	163	1.041		
	Total	176.435	165			
Intrapersonal Intelligence	Between groups	1.277	2	.638	.712	.492
	Within groups	146.151	163	.897		
	Total	147.428	165			
natural Intelligence	Between groups	3.240	2	1.620	1.645	.196
	Within groups	160.513	163	.985		
	Total	163.754	165			

It appears from table (12):

- There are statistically significant differences at (α≤ 0.05) between the adults and both children and teenagers, in favor of children and teenagers in linguistic and intrapersonal intelligence.

- There are statistically significant differences at (α≤ 0.05) between the children and both teenagers and adults, in favor of teenagers and adults in musical intelligence.

Seventh question: "Are there any statistically significant differences at the level of significance (α≤ 0.05) in the performance of students on multiple intelligences scale and eight dimensions due to the variable of type of center?

To answer this question the mean and standard deviations for the performance of students on multiple intelligences and eight dimensions according to the variable of type of center was extracted, and to indicate the statistical differences between the means the "T" test were used, and the tables below show this.

Table 13. Comparisons dimensional scheffe way on effect of the student age

		mean	Children	Teenagers	Adults
Linguistic intelligence	Children	2.87			
	Teenagers	2.75	.12		
	Adults	2.24	.63*	.50*	
Musical intelligence	Children	3.24			
	Teenagers	2.72	.51*		
	Adults	2.39	.85*	.33	
interpersonal intelligence	Children	2.82			
	Teenagers	2.67	.14		
	Adults	2.27	.55*	.41*	

*** Statistically significant at the level of (α≤ 0.05)**

It appears from table (13) there are no statistically significant differences at (α≤ 0.05) due to the effect of type of center in all scale dimensions.

Table 14. The mean, standard deviations and "T" test for the effect of type of center on the performance of students on multiple intelligences scale and eight dimensions

	Type of center	NUM	mean	standard deviation	"T" value	Freedom degrees	statistical significance
Linguistic intelligence	Government Center	75	2.69	.974	.351	164	.726
	Special Center	91	2.63	1.041			
Logical Intelligence	Government Center	75	2.23	.885	.565	164	.573
	Special Center	91	2.15	.876			
Visual-spatial Intelligence	Government Center	75	2.65	.943	.599	164	.550
	Special Center	91	2.56	1.006			
Bodily Kinesthetic Intelligence	Government Center	75	2.72	.947	.426	164	.670
	Special Center	91	2.65	.994			
Musical intelligence	Government Center	75	2.71	1.027	-.782	164	.435
	Special Center	91	2.84	1.092			
interpersonal intelligence	Government Center	75	2.55	.983	-.711	164	.478
	Special Center	91	2.67	1.077			
Intrapersonal Intelligence	Government Center	75	2.45	.958	.303	164	.762
	Special Center	91	2.41	.939			
natural Intelligence	Government Center	75	2.62	.959	.776	164	.439
	Special Center	91	2.49	1.028	.781		

5. Discussion and Conclusion

Because groups of individuals with mental retardation and autism are usually found to obtain consistently low part scores across cognitive ability measures like IQ test, some may presume that they will also obtain low scores with minimal variation in performance in multiple intelligence. In light of this presumption, we sought to investigate the group and individual performance of children with mental retardation and autism using well-validated measures of multiple intelligence, And the results showed superiority of the mentally retardation in the musical intelligence while autistic children excel in kinesthetic intelligence, this is in line with the theoretical literature which proved to outweigh those children in the Performing skills.

Autistic children also showed superiority in arithmetic and kinesthetic intelligence compared with mental retardation. Also children with mild disabilities have high performance in all type intelligences.

And there are no differences in type of intelligence according to the gender and this proves that disability affects the brain regardless of the gender. While the adolescents have superiority in each of the linguistic, social and musical intelligence, there are no differences in the multiple intelligences depending on the type of center which the student attends in it.

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