The Level of Cognitive and Linguistic Concepts in Pre-School Children in Jordan and Its Relation to gender and Kindergarten Enrollment Variables

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Abstract

The study aimed at revealing the level of cognitive and linguistic concepts of the pre-school children stage in Jordan and its relation to gender and kindergarten enrollment. To achieve the objectives of the study, the researchers built a test for the cognitive and linguistic capabilities of the pre-school children. After the test's validity and reliability had been assured, the researchers applied the test on a sample consisting of 577 child whose age ranged from 3 to 5 years in Amman Governorate. Results showed the children's level of linguistic and concept development was high in general. There was lack of statistically significant differences attributed to gender variable according to the general conceptual level but at the same time there were still some fields where females showed their superiority. There were also statistically significant differences attributed to kindergarten enrollment variable as the results were in favour of the children who joined kindergarten compared with children who did not.

Keywords: Cognitive and Linguistic Concepts, Preschool

The children pass in their first years by developmental changes in the cognitive, linguistic, motor and social fields where genetic and environmental factors, which are too difficult to be unified for all children , help in developing these changes as there are individual differences in the growth rates but the developmental evolution, in general, is relatively stable and fast (Shankoff & Phillips,2000). In the child's first years, the developmental fields are developed vertically and horizontally and become more complicated by time causing development and experience acquisition and so the cognitive , the motor and linguistic capabilities are developed greatly and they achieve great progress in the stage which Piaget mentioned which is from two years to seven years(Dopyera & Dopeyra,1993). Linguistically, the child tarts forming sentences consists of two words and he can ask questions correctly. Additionally, he can use correctly some of the pronouns and his expression capability is developed. Moreover, he can communicate with others (Santrock, 1983).

The cognitive processes become more complicated concerning the child whose age is three as he can understand the relations between the physical things. He can also predict these relations and organize them logically. In this stage, the child's capability to match and classify things according to their shape and color. The child in this age has the concept of counting but he can count till number ten at four which is full of concepts as time and spatial concepts. Moreover, he can implement instructions and show progress in the concepts of color, sizes and shapes (Shaffer, 2002). At age three, the linguistic development increases and develops; the child can make a sentence consists of more than three words, using pronouns correctly, in addition to his expression capability which gets better (Dopyera & Dopeyra,1993). And at age four, the child can communicate with the adults and speak clearly using complicated and long sentences compared with previous years (Santrock, 1983).

At five, all the developmental concepts becomes more complicated and the children's cognitive skills appear in different concepts as concepts of time, place, sizes, similarities and differences, counting, classification , arrangement, remembering and the capability of thinking and interference is increased (Flavell, Miller & Miller,1993). The linguistic development of child of five increases: quality and quantity, his communication skills increase and he follows instructions correctly. Moreover, his ability to use the language socially increases (Santrock, 1983). Although of the variance in the speed and type of evolution of different developmental fields but they are related to each other and complement each other as well. And even though the children vary in their growth rates but at age 5 they tend to be the same in the extent of their achieving to the developmental capabilities. Therefore, many researchers consider age five as an indicator of the extent of the child's capability to join the school and his ability for learning and there are other researchers who care much about evaluating the level of these capabilities as a standard indicating the child's readiness for learning (Zill & West, 2001). But the evaluation process in this critical stage of development is not easy one and issuing any judgment should be based on the evaluation results and the great development and its overlapping with genetics and environment factors in addition to other variables as gender, training, the parents' scientific qualification which affect the extent and the speed of the child's acquisition of the skills which should be acquired in this age (Stipek, 2002). The methods which are used to reveal the level of the children's acquisition of different developmental skills vary. Interacting with many factors, evaluation has different ways as tests and developmental scales that measure the child based on his age and there are tests that take into account the role of environment and culture of the children and their parents play major role on the evaluation process (Zill & West, 2001). And this is asserted by the some studies' results that there is a difference in the level of the basic skills and learning skills as well attributed to the difference in the children's places of living. The results of Miller & Drazal's study (2013) revealed that the children who live in semi-urban areas showed high levels of learning skills than the children who live in the urban and rural areas.

Results of other studies showed a strong relation between home educational environment and the developmental level. the study of Anders et al (2012) aimed to check relation between home educational environment and the developmental level. The sample of the study consisted of 53 child. Results showed strong relation between educational environment at home and the level of the children's skill of counting. Results also showed a strong correlation between the parents' background and the children's cognitive development, particularly with regard to the linguistic dimension. Many studies and research aimed to build and develop scales of cognitive, linguistic and social development of the children in different ages as the study of Baker (2013) which aimed at checking the ability of Cognitive Developmental Questionnaire in measuring cognitive development fields of the children whose age ranged from 10 to 24 months and it aimed at investigating the psychometric characteristics of the scale. the sample of the study consisted of 35 child aged between (10-24 months). Results showed that the scale has high internal consistency (0.95) and there was a relation between the scale's results and age progress as the correlation coefficient was (0.85). Additionally , results showed the scale's concurrent validity with Mental Scale of the Bayley Scale of Infant Development (BSID- II , 1993) while the reliability coefficient which was calculate by Test and retest method was 0.93.

The study of Cuttini et., al (2012) aimed at checking the efficiency of the Italian copy of Parent Report of Children's Abilities – Revised (PARCA) in evaluating the children's developmental fields. The sample of the study consisted of 120 Italian child;1/4 of the children were born before 28 week, 1/3 were born with a weight less than the norm, 11 children with Cerebral Palsy , six children have movement disorder and two deaf children. Results showed that the scale is reliable(0.80) and valid(0.60) through calculating the internal consistency using Cronbach Alpha and the correlation coefficient between the performance results in the Italian copy PARCA and the performance results in Mental Development Index, MDI, which was (0.60). The study of Feiz et., al (2011), which was applied on a sample consisted of 100 child whose age ranged from 6 to 15, applied Wechsler Intelligence Scale for Children – Third Edition, WISC_R , Cognitive Assessment System ,CAS. Results showed statistical significant relation between the performance results in both scales ranged between (0.27-0,80)in favour of the sub test of Math. Additionally, there was a relation between performance results in both scales and the achievement in favor of Cognitive Assessment System. The study of Aunio & Niemivirata (2010) aimed at revealing the children's early skills of counting to predict the performance level in Math in the first grade and the gender ,age and the parents' scientific qualification variables were controlled. The sample of the study consisted of 212 child who enrolled kindergarten when they were 6 years.

Results showed the performance level in the children's skills of counting in pre-school stage can predict the level of the performance in Math and its skills in the school. Another study conducted by Purpura et., al (2011) aimed to check the early literacy skills' ability in predicting the counting skill. The sample of the study consisted of 69 children whose age ranged from 3 to 5 years. the respondents' counting skills were test using the Preschool Early Numeracy Skills (PENS) Test and the Test of Preschool Early Literacy Skills (TOPEL). These tests were repeated after a year. Results showed a strong correlation between the performance results in the test before and after application.

Previous Studies

As`d's study (1993) aimed at identifying the effect of experience at kindergarten in acquiring basic concepts of the first grade students in Amman. The sample of the study consisted of 313 child. The Jordanian copy of Boehm Basic Concept Test was used. Results showed significant effect in favour of people who enrolled the kindergarten and there were significant differences attributed to gender variable in favour of the females. Nablsi's study (1993) aimed to reveal the effect of gender and kindergarten class arrangement according to the educational basics in the linguistic and movement development of a sample of kindergarten children in Amman. The sample of the study consisted of 40 children representing four kindergartens. Results showed statistical significant differences attributed to the gender whereas there was a significant effect in favour of the kindergarten with educational bases. While the results of the study of Sarsi (1989) showed lack of statistical significant differences attributed to gender variable in the level of the children's arithmetic concepts and revealed statistical significant differences in favour the kindergarten enrollment as the children who enrolled kindergarten showed high performance in the level of the arithmetic concepts than those who did not.

The study of Marr, Windors & Cermak (2001) aimed to check the changes in the level of the cognitive, visual, and motor concepts in addition to the skills of writing and the relation between the cognitive concepts and the time and spatial concepts of the kindergarten child. The researcher applied Bohem test of Basic concept, the Developmental test of Visual-Motor Integration and the scale of Children's Readiness in printing. The sample of the study consisted of 138 child. Results revealed an increase in the development of the visual and motor skills and writing skills in the kindergarten and the results showed a correlation between the cognitive concepts and the skills of visual-motor skills and the skill of writing. And Stipek & Pyler's study (2001) aimed at identifying the effect of the children's enrollment in kindergarten in the academic performance and social efficiency in the third grade. The sample of the study consisted of 237 child. Results revealed the late age of kindergarten enrollment has negative effect in the child's academic performance in the first school grades. Gullo & Burton (1992) conducted a study aimed to investigate the impact of kindergarten enrollment and the number of learning years before school in addition to gender on the child's readiness for learning. The researchers used the Metropolitan Readiness test and the scale of cooperative preschool child. Results showed lack of differences in learning readiness attributed to gender while there was an effect to the age enrollment in favor of those who enrolled in early age. The study of Vander, Witt, Naquin & Noell (2001) aimed at identifying the children's weak points in the field of arithmetic concepts, writing and reading. Researchers applied tests to reveal learning readiness on a sample consisted of 107. Results showed tests of readiness were effective in revealing the children's weak points in the basic skills.

Objectives of the Study

1- To reveal the level of the cognitive and linguistic concepts of the pre-school child and its relation with some variables.
2- To reveal the differences in the level of the cognitive and linguistic concepts of the children according to difference in their gender and enrollment at the kindergarten.
3- To provide a reliable scale to evaluate the basic concepts' level of pre-school stage that has high degrees of validity and reliability and which its results are trusted.

Significance of the Study

1. To enrich the theoretical literature with the domains of the basic concepts of pre-school child and its relation to some variables.
2. To identify the most significant weak points in the basic concepts of the pre-school children and support the child's strength points earlier.

3. To provide a scale that can be used easily by the educationists and which has acceptable degree of validity and reliability to be used in evaluating the level of the basic concepts of pre-school child.

Questions of the Study

The major question is: "What is the level of the cognitive and linguistic concepts of pre-school child in Jordan?". The sub- questions are as follows:

First: "Are there statistical significant differences at the level of significance ($a \leq 0.05$) on the total degree and the sub-degrees of the Jordanian copy attributed to kindergarten enrollment?".

Secondly: "Are there statistical significant differences at the level of significance ($a \leq 0.05$) on the sub tests and the total degree of the cognitive and linguistic test attributed to gender variable?".

Procedures

First: Sample of the Study

The sample of the study consisted of 577 whose age ranged from 3 to 5 years. Simple rand Method was used in selecting the children who enrolled the kindergartens (289).

Tables 1, 2, 3 illustrated the distribution of the sample according to the study's variables.

Table 1: Distribution of the Sample of the Study

		Frequency	Percent
Valid	Males	312	54.1
	Females	263	45.6
	Total degree	575	99.7
Missing	System	2	0.3
Total		577	100.0

Table 2: Distribution of the Sample of the Study According to Age Variable

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	3	136	23.6	23.6	23.6
	4	231	40.0	40.0	63.6
	5	210	36.4	36.4	100.0
	Total degree	577	100.0	100.0	

Table 3: Distribution of the Sample of the Study According to Kindergarten Enrolment

		Frequency	Percent
Valid	kindergarten enrolment	289	50.1
	At home	288	49.9
	Total degree	577	100.0

Second: Instrument of the Study

The instrument is the cognitive and linguistic ability test of pre-school child which consists of 16 sub tests as follows:

- Colors: consists of six questions representing basic and non basic colors.
- Quantity concepts: it consists of four questions representing concepts of weight, size, distance and tall.
- Counting and letters test consisting of 5 questions representing the numbers and their meanings (1-9).
- Classification test consists of 3 questions representing the child's ability to classify things according to their shape or function or characteristics.
- Time test consists of 4 questions representing the child's ability to distinguish between night, day, ages and four seasons.
- Spatial test consists of 3 questions representing different concepts of place.
- Information test consists of 5 questions representing the child's ability in identifying general and common things and their functions.
- Actions test consists of 2 questions representing the child's ability to distinguish different actions.

- Remembering consists of 9 tests representing the child's ability of audio and visual remembering.
- Arrangement consists of 4 tests representing the child's ability to organize things and arrange them.
- Drawing shapes consists of 4 questions representing the child's ability to draw shapes and lines.
- Opposites consists of 4 questions representing the child's ability to distinguish things and their opposites and to identify similar things.
- Letters consists of 6 tests representing the child's ability to identify the letter and their different shapes.
- Lexical items consists of 6 questions representing the child's ability to figure out the meaning of different words.
- Sentences consist of 4 questions measuring the child's comprehension.
- Expression consists of 11 questions measuring the child's ability to communicate and express himself.

Instructions of Test's Application and Correction

After training the examiners on the evaluation process and providing them with related information, they should follow the following steps:

1. Filling the basic information related to the examiner's age, place of residence, and other variables.
2. Te examiner has to have a warm relation with the examinee to facilitate the communication process.
3. The examiner should commit to the instructions mentioned in every test.
4. Preparing the suitable circumstances for application
5. The examinee should evaluate continuously even after the child's failure in answering the previous question.
6. Recording the students' answers in the answers' sheet directly.
7. The degrees of the sub test are calculated.
8. The total degree is calculated.

Procedures of Building the Instrument:

1- Revising the theoretical literature that addresses the cognitive and linguistic development and revising the previous literature that includes preparing tests and scales aim at measuring the developmental skills and basic concepts that helps greatly in preparing the initial copy of the test.

2- Arranging items of each sub test according to the developmental series of the cognitive and developmental skills from the easiest to the most difficult.

3- Presenting the test to 10 arbitrators representing members academic staff in University of Jordan who are specialized in psychology to express their opinions about the test's items.

4- Items which were agreed upon (80%) were changed, or deleted, or reordered.

Validity & Reliability of the Instrument

First: results concerning the significance of instrument's validity which was checked using the logical and construct validity as it is illustrate as follows:

Logical Validity:

Logical validity was achieved through the procedures followed in the stage of developing the Jordanian copy of the test. The initial copy of the test was presented to a group of arbitrators consisting of 10 members of academic staff in the field of special education and psychology to check the appropriateness of the items linguistically and function and based on their notes, some of the items were adjusted, and others were deleted. The arbitrators' agreement on the scale items was (80).

Construct Validity:

The means and the standard deviations for every age category's performance in the test were calculated as it is illustrated in table 4.

Table 4: Means and Standard Deviation According to Age Variable						
	3		4		5	
	Mean	Std. Deviation	Mean	Std. Deviation	Mean	Std. Deviation
Colors	3.58	1.417	4.30	1.052	4.54	1.198
Quantity concepts	1.68	0.950	2.52	1.067	2.99	0.933
Counting	2.79	1.096	3.41	1.142	4.17	1.026
Classification	1.65	1.028	1.82	0.900	1.94	0.937
Time	2.73	1.057	2.70	1.018	3.07	1.005
Spatial concepts	1.71	0.959	2.19	0.772	2.22	0.727
Information	3.72	1.133	4.17	0.926	4.36	0.898
Actions	0.99	0.725	1.45	0.689	1.55	0.642
Remembering	3.48	2.208	5.21	2.024	6.09	1.829
Arranging	1.51	0.861	1.89	0.794	2.11	0.762
Shapes	1.72	1.257	2.14	1.198	2.46	1.116
Opposites	1.55	1.246	2.23	1.228	3.00	1.087
Letters	2.66	1.307	3.32	1.424	4.13	1.467
Lexical items	3.77	1.316	4.11	1.379	4.66	1.164
sentences	2.68	1.066	3.34	0.786	3.43	0.676
Expression	5.10	2.676	7.01	2.709	8.75	2.244
Total degree	40.04	12.296	51.39	11.247	59.43	10.391

As table 4 illustrated, there were statistical significant differences for the performance in the total degree of the cognitive and linguistic abilities' test attributed to age in favor of the higher age as the mean of the performance of the five –year children was (59.43) which is higher than the means of the children of 4 and 3 as they were respectively (51.39) and (40.04) except the mean of the performance of the children whose age is three in the time test. Concerning the performance in the total degree, it was in favour of the children with 5 years followed respectively by children with 4 and with 3. To check the significance of the differences between these means, One-Way ANOVA was used as it is illustrated in table (5).

Table 5: Differences in the Means Using ANOVA According to Age Variable						
		Sum of Squares	Df	Mean Square	F	Sig.
Colors	Between Groups	78.871	2	39.436	27.417	0.000
	Within Groups	825.614	574	1.438		
	Total	904.485	576			
Quantity concepts	Between Groups	142.807	2	71.403	72.489	0.000
	Within Groups	565.408	574	0.985		
	Total	708.215	576			
Counting	Between Groups	163.215	2	81.608	68.685	0.000
	Within Groups	681.995	574	1.188		
	Total	845.210	576			
Classifying	Between Groups	6.885	2	3.443	3.856	0.022
	Within Groups	512.435	574	0.893		
	Total	519.321	576			
Time	Between Groups	16.941	2	8.470	8.098	0.000
	Within Groups	600.390	574	1.046		
	Total	617.331	576			
Spatial concepts	Between Groups	25.955	2	12.978	20.040	0.000
	Within Groups	371.712	574	0.648		
	Total	397.667	576			
Information	Between Groups	34.505	2	17.252	18.374	0.000
	Within Groups	538.951	574	0.939		
	Total	573.456	576			
Actions	Between Groups	27.607	2	13.803	29.758	0.000
	Within Groups	264.862	571	0.464		
	Total	292.469	573			
Remembering	Between Groups	566.267	2	283.134	70.684	0.000
	Within Groups	2,299.241	574	4.006		
	Total	2,865.508	576			
Arranging	Between Groups	29.685	2	14.842	23.258	0.000
	Within Groups	366.301	574	0.638		
	Total	395.986	576			
Shapes	Between Groups	45.468	2	22.734	16.233	0.000
	Within Groups	803.863	574	1.400		
	Total	849.331	576			
Opposites	Between Groups	180.106	2	90.053	64.334	0.000
	Within Groups	803.475	574	1.400		
	Total	983.581	576			
Letters	Between Groups	185.029	2	92.514	46.327	0.000
	Within Groups	1,146.264	574	1.997		
	Total	1,331.293	576			
Lexical items	Between Groups	70.021	2	35.011	21.058	0.000
	Within Groups	954.322	574	1.663		
	Total	1,024.343	576			
Sentences	Between Groups	51.492	2	25.746	37.790	0.000
	Within Groups	390.381	573	0.681		
	Total	441.873	575			
Expression	Between Groups	952.704	2	476.352	74.526	0.000
	Within Groups	3,362.063	526	6.392		
	Total	4,314.767	528			
Total degree	Between Groups	31,078.920	2	15,539.460	123.761	0.000
	Within Groups	72,071.534	574	125.560		
	Total	103,150.454	576			

It is clear from table 5 the values of F were statically significant at level of significance (a≤0.05) of the performance in the total degree and the sub tests. To find out the sources of the differences between the means, Tukey for post differences was used as it is illustrated in table 6.

Table 6: Post Differences in the Means According to Age Variable

Tukey HSD			
Dependent Variable	Age	Age	
		4	5
		95% Confidence Interval	95% Confidence Interval
		Upper Bound	Lower Bound
Colors	3	-.718(*)	-.962(*)
	4		-0.244
Quantity concepts	3	-.843(*)	-1.314(*)
	4		-.471(*)
Counting	3	-.617(*)	-1.377(*)
	4		-.760(*)
Classification	3	-0.164	-.288(*)
	4		-0.125
Time	3	0.027	-.339(*)
	4		-.365(*)
Spatial concepts	3	-.480(*)	-.518(*)
	4		-0.038
Information	3	-.453(*)	-.641(*)
	4		-0.189
Actions	3	-.461(*)	-.560(*)
	4		-0.100
Remembering	3	-1.730(*)	-2.613(*)
	4		-.883(*)
Arranging	3	-.373(*)	-.600(*)
	4		-.227(*)
Shapes	3	-.422(*)	-.741(*)
	4		-.319(*)
Opposites	3	-.678(*)	-1.453(*)
	4		-.775(*)
Letters	3	-.659(*)	-1.467(*)
	4		-.808(*)
Lexical items	3	-.340(*)	-.885(*)
	4		-.545(*)
Sentences	3	-.655(*)	-.745(*)
	4		-0.089
Expression	3	-1.911(*)	-3.653(*)
	4		-1.742(*)
Total degree	3	-11.357(*)	-19.397(*)
	4		-8.039(*)

Tukey results showed all the differences were in favour of the age category (5 years) followed by children with five while the least mean was for the children with three but their performance's mean in time test was higher than the mean of the performance of children with four. Second: results concerning the scale's reliability which were checked using test-re test method and the internal consistency method using Cronbach ALPHA, as it illustrated as follows:

Test-Retest Reliability

Reliability was achieved through applying test and retest method on a sample consisted of 50 child and results were illustrated in the table 7

Table 7: Values of Correlation Coefficient (Rest-Retest)			
Values	Sub-tests	Values	Subtests
0.45	Remembering	0.71	Colors
0.38	Arranging	0.40	Quality concepts
0.40	Shapes	0.60	Counting
0.52	Opposites	0.35	Classification
0.73	Letters	0.45	Time
0.50	Lexical items	0.55	Spatial concepts
0.40	Sentences	0.35	Information
0.74	Expression	0.61	Actions
0.55	Total degree		

Internal Consistency (Cronbach's Alpha):

Coefficient of Cronbach's Alpha was calculated and the results were illustrated in the following table.

Table 8: Values of Reliability Coefficients Using Cronbach's Alpha			
Sub-tests	Reliability values	Sub-tests	Reliability values
1	0.441	9	0.657
2	0.476	10	0.269
3	0.507	11	0.451
4	0.353	12	0.590
5	0.386	13	0.647
6	0.196	14	0.471
7	0.379	15	0.156
8	0.488	16	0.774
Total degree			0.916

It is clear table 8, that the Jordanian copy of test has an acceptable degree of reliability as the Cronbach's Alpha's coefficient values range from (0.26-0.77) for the sub- dimensions and (0.91) for the total degree indicating that the test has a high degree of reliability.

Third: procedures of the study

1. Official agreements for applying the test on the kindergarten children were obtained and children's parents' who are not enrolled in the kindergarten as well.
2. Scale was applied on a sample consisted of (289) enrolled in kindergarten and which was selected using stratified random sample and (288) who are not.
3. Three examinees were trained to do the application. The applied tests were 610 and 33 were excluded for their incompletion.
4. Collected data were analyzed statistically.

Results

First: results concerning the first question: "What is the level of the cognitive and linguistic concepts of the pre-children school in Jordan?. To answer this question, means and standard deviations of the respondents' performance were calculated as it illustrated in table 9.

Table 9: Means and Standard Deviations of the Performance for the Total Degree and Sub Degrees for Every Age Level

Sub-tests	Three years		Four years		Five years		Total	
	Mean	Std. Deviation	Mean	Std. Deviation	Mean	Std. Deviation	Mean	Std. Deviation
Colors	3.58	1.417	4.30	1.052	4.54	1.198	4.22	1.253
Quantity	1.68	0.950	2.52	1.067	2.99	0.933	2.49	1.109
Counting	2.79	1.096	3.41	1.142	4.17	1.026	3.54	1.211
Classification	1.65	1.028	1.82	0.900	1.94	0.937	1.82	0.950
Time	2.73	1.057	2.70	1.018	3.07	1.005	2.84	1.035
Place	1.71	0.959	2.19	0.772	2.22	0.727	2.09	0.831
Information	3.72	1.133	4.17	0.926	4.36	0.898	4.14	0.998
Actions	0.99	0.725	1.45	0.689	1.55	0.642	1.37	0.714
Remembering	3.48	2.208	5.21	2.024	6.09	1.829	5.12	2.230
Arrangement	1.51	0.861	1.89	0.794	2.11	0.762	1.88	0.829
Shapes	1.72	1.257	2.14	1.198	2.46	1.116	2.16	1.214
Opposites	1.55	1.246	2.23	1.228	3.00	1.087	2.35	1.307
Letters	2.66	1.307	3.32	1.424	4.13	1.467	3.46	1.520
Lexical items	3.77	1.316	4.11	1.379	4.66	1.164	4.23	1.334
Sentences	2.68	1.066	3.34	0.786	3.43	0.676	3.22	0.877
Performance	5.10	2.676	7.01	2.709	8.75	2.244	7.33	2.859
Total degree	40.04	12.296	51.39	11.247	59.43	10.391	51.64	13.382

Table 9 showed the level of the cognitive and linguistic concepts of the pre-children school was moderate while the results concerning the subtests showed the highest means was in favour of the expression (2.85) followed by remembering (2.23) while the lowest mean was for the performance in the action test which was (0.71), and for the performance in the arrangement test (0.82). The previous table also showed the highest means of the levels of the cognitive and linguistic concepts of the children whose age was three was high in favour of the expression (5.10) , followed by lexical items and colors while the lowest means were to the concepts of the actions with (0.99) and the rest of the concepts' levels ranged from low to moderate. Results also showed the highest mean of children of four concerning the ability of expression was (7.01) followed respectively by colors, information and lexical items. Action concept got the lowest mean (1.45) followed respectively by classification and arranging concepts. The highest mean of the children with five years was in favor of the expression concept (8.75) followed respectively by lexical items, colors and information. And the results showed the children whose age was four has the same rank which the children with five years have and the least mean was for the actions concepts field with (1.45) followed respectively by concepts of classification and arrangement. Secondly: results concerning the first sub question: "Are there statistical significant differences at the level of significance in the level of the cognitive and linguistic concepts of the children of preschool attributed to kindergarten enrollment variable? To answer this question, means and standard deviations of the performance in the subtests and the total degree according to kindergarten enrollment variable and table 9 illustrated this.

Table 10: Means & Standard Deviations of the Performance According to Kindergarten Enrollment Variable

	1		2	
	Mean	Std. Deviation	Mean	Std. Deviation
Colors	4.45	1.142	3.99	1.317
Quantity	2.71	1.024	2.28	1.150
Counting	3.79	1.160	3.29	1.212
classification	1.79	0.917	1.86	0.981
Time	2.84	1.032	2.84	1.040
Spatial	2.12	0.812	2.06	0.849
Information	4.19	0.947	4.08	1.045
Actions	1.43	0.695	1.32	0.731
Remembering	5.38	2.048	4.86	2.375
Arranging	1.95	0.789	1.81	0.863
Shapes	2.21	1.216	2.11	1.213
Opposites	2.61	1.268	2.09	1.297
Letters	3.68	1.480	3.24	1.531
Lexical items	4.30	1.305	4.16	1.361
Sentences	3.23	0.861	3.20	0.893
Expression	8.03	2.396	6.65	3.099
Total degree	53.89	12.433	49.39	13.932

It is clear in table 9 that there were apparent differences between the means of the performance of the children who joined kindergarten and between the performance of the children who did not join kindergarten. The means of the performance in the subtests and in the total degree were in general in favour of the children who joined kindergarten as the mean of the performance of the children who joined the kindergarten (53.89) and the children who did not (49.39). To achieve the significance of these differences, T test was used as it is illustrated in table 11.

Table 11: Sources of Differences in The Means According to The Kindergarten Enrollment Using T-Test			
Equal variances assumed			
	Levene's Test for Equality of Variances		t-test for Equality of Means
	T	Df	Sig. (2-tailed)
Colors	4.519	575	0.000
Quantity	4.722	575	0.000
Counting	5.070	575	0.000
Classification	-0.913	575	0.362
Time	0.006	575	0.995
Spatial	0.897	575	0.370
Information	1.330	575	0.184
Actions	1.771	572	0.077
Remembering	2.814	575	0.005
Arranging	2.020	575	0.044
Shapes	0.954	575	0.340
Opposites	4.826	575	0.000
Letters	3.499	575	0.001
Lexical items	1.211	575	0.226
Sentences	0.407	574	0.684
Expression	5.749	527	0.000
Total degree	4.100	575	0.000

Table 10 showed statistical significant differences for the performance in the total degree in favour the children who joined the kindergarten and the differences were statistically significant in favour of the children who joined the kindergarten in their performance in the following fields : colors, quantity concepts , counting, arrangement ,and expression while there were no statistically significant differences between children who joined the kindergarten and who did not in their performance in the following tests: classification, time, spatial concepts , information , actions, shapes, lexical items, sentences. Thirdly, results concerning the second sub question: "Are there statistical significant differences at the level of significance in the level of the cognitive and linguistic concepts of the children of preschool attributed to gender variable?. To answer this question, means and the standard deviations of the respondents' performance were calculated as it is illustrated in table 12

	Table 12: Means & Standard Deviations According to the Gender Variables			
	Males		Females	
	Mean	Std. Deviation	Mean	Std. Deviation
Colors	4.10	1.263	4.37	1.228
Quantity	2.47	1.085	2.51	1.139
Counting	3.49	1.231	3.61	1.186
Classification	1.77	0.981	1.89	0.909
Time	2.81	1.056	2.88	1.010
Special concepts	2.10	0.803	2.07	0.864
Information	4.11	1.027	4.16	0.964
Actions	1.38	0.702	1.37	0.730
Remembering	5.02	2.246	5.24	2.210
Arranging	1.81	0.839	1.97	0.810
Shapes	2.04	1.224	2.31	1.188
Opposites	2.38	1.286	2.32	1.333
Letters	3.44	1.491	3.48	1.558
Lexical items	4.29	1.317	4.16	1.353
Sentences	3.23	0.857	3.20	0.901
Expression	7.26	2.930	7.40	2.775
Total degree	51.07	13.602	52.33	13.107

Table (11) showed differences in the means of the performance in the sub tests and the total degree between males and females as the mean of the performance in the total degree of the exam indicates the females' performance was higher than the males'. The performance in the sub tests was in favour the males in the following dimensions: spatial concepts, actions, opposites, lexical items and sentences while the other subtests were in favour the females. And to identify the significance of the differences in the means between males and females, T-test was used as it illustrated in table 13.

Table 13: Differences Sources in the Means According to Gender Variable Using T-Test			
Equal variances assumed			
	Levene's Test for Equality of Variances		t-test for Equality of Means
	T	Df	Sig. (2-tailed)
Colors	-2.585	575	0.010
Quantity	-0.418	575	0.676
Counting	-1.196	575	0.232
Classification	-1.413	575	0.158
Time	-0.883	575	0.378
Spatial concepts	0.381	575	0.703
Information	-0.540	575	0.590
Actions	0.133	572	0.894
Remembering	-1.166	575	0.244
arranging	-2.327	575	0.020
Shapes	-2.704	575	0.007
Opposites	0.481	575	0.631
Letters	-0.286	575	0.775
Lexical items	1.168	575	0.243
Sentences	0.463	574	0.643
Expression	-0.561	527	0.575
Total degree	-1.130	575	0.259

The table showed lack of statistical significant differences between the mean of the males' performance and the mean of the females' performance in the total degree of the exam but there were statistical significant differences in the following sub-tests as: colors, arrangement, shapes and all of which were in favour of the females.

Discussion

The study aimed at revealing the level of the cognitive and linguistic concepts using the test of the cognitive and linguistic capabilities to the preschool children in Jordan and its relation to gender and kindergarten enrollment. Discussion of the results of the first sub- question: Are there statistical significant differences at the level of significance ($a \leq 0.05$) on the total degree and the sub-degrees of the Jordanian copy attributed to enrollment at the kindergarten variable?". Results showed statistical significant differences in the total degree in favour of the children who joined the kindergarten. And statistical significant differences were in favour of the children who enrolled kindergarten in their performance in the following sub-tests: colors, quantity concepts, counting, remembering, arranging and expression. While there were no statistical significant differences between those who did not join the kindergarten in their performance in the following tests: classification, spatial concepts, information, actions, shapes, lexical items and sentences. It is expected to have statistical significant differences between children joined kindergarten and between who did not but in this study there were no statistical significant differences which indicate the necessity to restudy these differences by investigating the impact of the interaction with other variables that may explain this variance as type of kindergarten, parents' academic level, type of curricula, the child rank in the family.

Discussion of the results of the second sub-question: Are there statistical significant differences at the level of significance ($a \leq 0.05$) in the total degree and the sub-degrees of the cognitive and linguistic capabilities' test attributed to gender variable? Results showed lack of statistical significant differences between the mean of the males' performance and the mean of the females' performance in the performance in the total degree in the test but regarding the sub-tests there were statistical significant differences in the following sub-tests: colors, shapes, arrangement which were all in favor the females. This conclusion agrees with the results of some studies as the study of Lynn, Raine, Venables & Mednick (2005) which aimed to examine the differences between 1400 males and females aged three in the Boehm Test of Basic Concept. Results showed the females' performance was higher than the males' performance in the intelligence tests with its all dimensions except the Math dimension. Generally, results showed that the females' cognitive performance was higher than the males performance.

Although the results of this study are compatible with other studies' results, but one should be careful when generalization the results. And it is necessary to recheck the test's results' reliability and validity by applying it on other similar samples in Jordan in addition to find out criterion that can help in revealing the children's developmental late and distinguishing between them according to the cognitive and linguistic capabilities .

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