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Comparison of Conception of Space-Time between Dysgraphic Children and Normal Children of Ilam Province, Iran

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Abstract

Dictation is one of prevalent topics in relation to learning disabilities which is considered by the experts and psychologists in the current century. Dysgraphia or disorder in dictation is a major written disorder. The applied studies demonstrate that this disability causes students' fatigue and losing their interest and finally will result in academic failure. The present study was applied with the objective of comparing the conception of space-time between dysgraphic children and normal children in Ilam Province within academic year 91-92 (2012-13). This research according to the nature of question and objectives is causal-comparative study. The data was collected using Wechsler intelligence scale for children revised (WISC-R), Wechsler cube subtest for children and teacher-made distraction test. Fifty students were selected among the boy and girl students of first and second grades of primary school, by random cluster sampling. Summary of results indicated that space and time concepts are understood by dysgraphic children later than normal children. According to the results of this study, it is concluded that the dysgraphic students have problem with space and time elements construction. Summary of results indicates that space and time concepts are perceived by children infected with dysgraphia later than normal children, thus it may be used in preschool children for readiness for reading and writing i.e. focus on perceiving the orientation concepts (up-down, far-near, left-right) as well as attention to physical design and physical space.

Keywords: Conception of Space, Conception of Time, Learning Disability, Dysgraphia

Introduction

One of interesting discussions raised about learning disabilities and considered by plenty of current century experts and psychologists is dysgraphia. Dysgraphia or disorder in dictation is a major disorder in writing (Graham, 2000).

Number of students suffering from behavioral or academic problems is significant. The applied studies demonstrate that some students during learning process get involved in problems (Graham et al, 2001). It may cause their fatigue and losing interest and ultimately will result in academic drop (Tabrizi, 2001). The statistics of students that have a particular learning disorder has been reported equal to 4-12%. Doubtless, the rate of people involving in some learning problems is higher than abovementioned rate. School teachers and children parents often benefit from old and sometimes obsolescent methods. This method in addition to consuming a lot energy and time, not only has no effective result, but also may cause despair, dejection, frustration and nervousness of parents. Disability in written expression is one of most complex problems, it is like as a hank that some students are involved therein. Attaining the written skills by students is subject to having abilities such as movement ability, auditory perception and visual discrimination. Disability in

written expression is one of the most prevalent inabilities of students among all kinds of lingual skills. Even some adults are not able to incorporate an effective written communication with the other unable people. Ability in writing requires a lot of skills related to each others; eloquence in speech, ability in reading, skill in spelling, ability in written expression are assumed as the most important kinds of communication between peoples. Before attaining this skill, it is required the students to develop their skill in listening, speaking and reading. In fact, having problem in each one of these skills underlies the problem in written language (Vallas et al, quoted by Monshi Toosi, 1994).

For attaining the written skill, it is necessary the student to have a sufficient mental ability. Moreover, must show enough interest and motivation for attaining this skill (Kreck & Chalfont, 1948). Nonetheless, what is obvious and we emphasize thereon in connection with dysgraphia is that when non-recognitions (differential language disorders) and developmental disorders of spoken or written language in child are examined, we must again approach to conception of space and time.

The simplest movement is extended over time and includes walking, accelerating and stopping that necessarily are occurred after each other and drawn in the space. It is applicable on intentional movements mean these complex movement periods that have been made for achieving to the completely specified goals. A movement disorder, a movement failure or a movement dislocation whether caused by neural harm or not and amount of this harm, whatsoever, in case of proving demonstrates a disability in organizing the activity related to space and in time (Dadsetan, 2000).

The role of teacher and quality of teaching is one of the effective and very important scholastic factors. Higher teaching quality facilitates the students' learning and makes the feeling of success for them. Teacher's behavior with the students particularly within the first years is very important. General atmosphere of school for learning and motivation for learning is a feature that distinguishes the schools from each other. Furthermore, a school that can provide a successful history of scholastic learning experiences particularly within the primary educational course, will also provide the input emovement characteristics and positive empowerment returns for the students (Blume, translated by Seif, 1984).

In this framework, the trainers in an evolutionary activity instead of accumulating the memory of children provide the requirements for promovement of their creativity capabilities. For accomplishment, the teacher instead of offering the premade data to the child helps him/her in recognition and the training leads the child in the correct way proportional to the child activities. Such training includes speaking to the child's language instead of a completely in advance prepared and abstractive language and obliging him/her to listening and repeating, because if the child is not active i.e. is obedient, may not learn merely through hearing the others' words. As our best knowledge, the child's cognitions are resulted from active internalization of all kinds of objects. Thus, it is necessary the school to provide an opportunity to the child to learn proportional to his/her development activity (Piazheh, translated by Mansour & Dadsetan, 1996).

Theoretical analysis

If we request someone to write a word, this verbal request may be construed as an intricate process. Any word consists of several single sounds or phonemes that each one of them is encoded by a letter or combination of letters. Identification of each word is dependent to perception of partial differences between phonemes or audio evidences, e.g. identification of "gari" and "kari", "pish" and "bish", "balal" and "malal", "darz" and "dars". The experienced brain distinguishes these similar phonemes from each other and as the viewpoint of a person whose native language is

Persian, pronouncing each one of these similar words is completely different. Certainly, the brain analyzes the phonemes based on the learning.

After evaluation of phonemes and speech and discrimination of words, the second step for writing the word is encoding the phonemic units (phonemes) as written units (letters). In this step, other cortex sections in visual and spatial regions are also active. The patients that have a lesion in these regions occipital and parietal lobes have normal ability in analysis of verbal phonemes, but have serious problem in discrimination and formation of written letters. It is difficult for them to imagine the structure required for a letter and understand the spatial relationships between elements of a letter and can put the elements beside each other to form the whole word (Mansour & Dadsetan, 1990).

Deficiency in written skill may be arising out of different factors such as shortage of enough experience in writing or lack of correct teaching to this group of students, but these the both factors may be prevented and improved so that upon providing the opportunity for practicing adequately and correct training, the problem may be improved. The other group of problematic factors for attaining the written skill is disability of student in movement control, visual perception, and defect in visual memory or left handed being that each one of these problems is improved in a specific manner (Kreck, 1998).

As our best knowledge, the brain has been mapped in the light of sensory or movement functions with the exact details. Within the last decade, the neurologists and psychologists applied some studies and defined the centers that are responsible for primary functions such as seeing, hearing and other sensory functions and control of different muscular systems of the body. To show these findings, results of psychological analysis of two processes are described: one, voluntary movement and the other speech (speaking) and particularly one of its forms means writing (Mansour, Dadsetan, 1990).

The first part of voluntary movement is a precisely organized system of sensory symptoms. Bernstein the Russian physiologist aiding a series of experiments showed that ordering the voluntary movement is avoided only through efferent impulses-from brain to muscles. The status of muscles is also as above. The brain for planning means correcting the impulses relating to motor system must take a feedback of muscles and joints. The second part of voluntary movement is spatial field. The movement must exactly focus on a specified point of space. Spatial analysis in another region of cortex means third parts of parietal-occipital regions. If these very complex parts of cortex are damaged, a different disorder in voluntary movement is occurred. The sensory base of movement remains intact, but the patient is disabled in precise spatial organization of movement and misses the ability of spatial relations evaluation and mistakes the right for left. Such disease may cause the sufferer fails to find his/her path in a known area or distinguish the clock pointers status or mistake in east and west wards (Mansour & Dadsetan, 1990).

Although sensory and spatial factors are assumed as sight factors in movement organization, but not enough for movement. Any voluntary is the result of a chain of events. Any skilled movement in fact is a movement melody of such transferrable rings. A skilled and organized movement is actualized only when pauses are made in that part of performed movement and the impulse is transferred to another ring (Mansour & Dadsetan, 1996).

Spatial non-organization is the disease that a bullet has been hit to parietal-occipital region of his brain. The patient was asked to draw a design of hospital area. His drawing is exhibited in the right image, but the real design is observed in left image.

It is notable that the completely different section of brain means pre-motor cortex is responsible for transferring the chains of separate movement rings. For the first time Lushly & Fulton understood that this region of brain is damaged and skilled movement misses its integration.

This patient still has his sensory feedback and spatial orientation, but may not stop one of movement stages and enters from one stage to another.

Any movement must be a function of a fixed program or intent. This programming or intention is supplied within the frontal lobe of brain (located within the third part). If the frontal lobes are damaged, the sensory base, spatial organization and plastic virtue of movement will last, but meaningless repeat of pre-performed movements or involuntary responses to the extrinsic stimulus are replaced to purposeful actions. Total purposeful behavior and conduct of patient is disordered (Mansour & Dadsetan, 1990).

Dyslexic child and subsequently dysgraphic children have majorly problems for spatial orientation, discrimination of right and left, up and down, sequence of letters and words, coordination between eye and hand, relationship between self and the others' physical organs (Faryar & Rakhshan, 1994).

When children before learning the reading and writing, writes a word in fact draw it. Moreover, because they have no precise orientation, sometimes their writing is similar to some writing that reflected on the mirror. For instance, Mohammad is drawn as …….commonly, these minor children may not understand the spatial justification of shapes and images and when they begin to write, write the letters falsely instead of each other. Gradually when the child is grown, accepts the spatial justification of objects as a dimension and learning four directions helps this quality. So, whatever the child is grown needs fewer sign sheets for distinguishing the familiar objects (Azimi, 1993).

Graus (1983 quoted by Key, 2000) believes that time shortage or lowly practice of texts is one of factors effective on writing. It is notable that the health central nervous system, health cognitive ability, health lingual skills, motivation, growth of skills, practice skills and emotional stability are assumed as requirements of written language (Duvall, 1994, quoted by Key, 2000).

Spatial-time organization means collection of rules and visualization that enable the people to place the consecutive (visual) spatial experiences in a united reference framework and accordingly can predict and interpret the spatial designs properties that have not been directly experienced (Splak, Landau, Glitmann, 1984 quoted by Landau, 1985).

Dysgraphia

Spatial learning disorder is a general term that is referred to a heterogeneous group of disorders that are appeared as serious difficulties in perceiving and listening, speaking, reading, writing, reasoning or mathematical capabilities (Hamil et al, 1981).

The ability of understanding the relationship between objects that occupy a space is called spatial ability. This ability is measured in plenty of INTELLIGENCE test, so that the examinee is asked to model the patterns correctly (Williams, translated by Behpazhouh et al, 1996).

Dysgraphia is applied to children that despite of having a normal intelligence write very badly (Seif, Naraghi and Naderi, 2005).

Dysgraphia test is performed as below: 30-50 words are selected based on the class level and a dictation test from those words is provided. The students that those weak grades are 20% lower than other class are called dysgraphic (Faryar & Rakhshan, 2004). Kephart offered four extensions important in the training progress as follows (Rakhshan & Faryar, 2001):

Balance and maintain of body status: This movement extension deals with activities, which help the child to get familiar with the gravity and keep its relationship thereto. Gravity is an essential force and origin and basis of learning, hence it is very important the child to learn how to get aware of gravity, for example when a child stands straightly or walks or takes common steps and upraises his head from the ground.

Contact: The child may acquire information about his peripheral environment by contact and through their manipulation such as taking and releasing the objects, looking, listening and tasting etc.

Movement and displacement: The movement and displacement enables the child to observe the relationship between an object to the other objects in space and time. Movement pattern such as crawling, running and toddling allow the child to move in the space and place for restoring the relationships between objects and seeking for what exists around him. Then, he moves his body for discovering what out of his access.

Taking and throwing: three above extensions are static, but this extension is dynamic. Here, the child aiding movement activities such as pulling, pressuring, throwing and hitting learns something about objects movement in the space and place.

Aiding four movement extensions, the child gradually acquires information about time and space and ultimately gets aware of making the space and time and the world he lives therein (Kephart, 1963, quoted by Rakhshan and Faryar, 2001).

The children that are not successful in visual reminder of letters and words, probably have problems in written learning. The children having problems in visual memory may speak, read and copying, but may not memorize the words and letters or produce them again. Velacas & Karapitas (2003) in a study titled "Defect of visual memory and formation of conception of time in 6.6 to 12.5 years old children suffering from dysgraphia" concluded that these children suffer from cognitive problems under effect of visual memory more than normal children.

Researches done by Van Halt & Diana indicated that people suffering from dysgraphic learning impairment have weaker function than normal people in spelling skill including distinguishing the alphabet, distinguish of words, reading the words, distinguishing the similar and different words, associating each phoneme upon hearing its letter, spelling the simple words, spelling while writing, spelling the difficult problems (Van Halt & Diana, 2002).

Another study done by Goodman & Robert Ann (1996) indicated that dictation is a complex action that includes application of some distinct processing structures. They examined 60 patients suffering from dysgraphia who are under treatment and results of their examination indicated that patients with brain injury have problems in relation to spatial visualization and consequently have not efficiency in dictation test. They believed that for curing the dictation impairment of patients with brain injury, their spatial concepts must be strengthened such as writing COTE instead of COAT.

Coilion and Morday, in another study, which applied 527 students of 4^{th}, 5^{th} and 6^{th} grades of Indian public school, concluded that the girls have better performance than boys in copying and handwriting speed and understood that the people suffering from learning disorder particularly dysgraphia have weaker performance than normal children in handwriting and copying speed (Coilion & Morday, 2004).

Summary of research provided by Zandieh (2000) titled "Comparison of verbal and nonverbal intelligence between dyslexic and dysgraphic and normal students of third grade elementary school in Tehran Dist. 10 showed that dysgraphic students were different from normal students in the light of nonverbal intelligence and normal students had higher nonverbal intelligence mean.

Yaryari (1998) in a study titled "Design and execution of a training plan for rehabilitation of developmental dyslexia-dysgraphia of 8-12 years old students in Tehran suffering from learning disorders, concluded that multisensory training method based on psychological and neuropsychological results and preparation of modern tools in this field may improve the reading and writing ability of students suffering from dyslexia and dysgraphia.

Some findings demonstrate that students suffering from reading and writing disorders have problems for inhibition in comparison with normal children and this harm may cause their distraction. As a result, their performance in beginning and transformation is weaker than normal children.

Finally, Michel Bust and Boshes (1969) concluded that the teacher's judgment about the specified behavioral characteristics of children and determination of disable children in learning is more valid than plenty of nervous or psychic tests. They focused on 5 major characteristics of children including audition comprehension and perception, colloquial language, orientation, behavior and movement characteristic. Ultimately, mean value of normal children was equaled to 81 and dysgraphic children 61 (quoted by Faryar & Rakhshan, 2001).

Methodology

Considering the nature of study questions and objectives, it is a causal-comparative research, because the studied event has occurred formerly and the researcher attempts to study the dependent variables to identify the independent variables.

Population, sample and sampling procedure

The studied population consists of girl and boy students of first and second grades of elementary schools in Natanz and Badrood Counties and its suburban within academic year 87-88 (2008-09).

The examinees (sample) size is 55 including 30 students suffering from dysgraphia (14 girls and 16 boys) and 25 normal students (12 girls and 13 boys).

Cluster sampling method was used in this study. Whereas Natanz, Badrood and its suburban includes two independent education departments, at first a list of girls and boys elementary schools were prepared. Later, 4 boys schools and 3 girls schools were selected randomly. Altogether, 8 boys schools and 6 girls schools were selected and out of each one of schools, 1 first grade and 1 second grade class were selected.

Instrument

Wechsler intelligence scale for children (WISC-R)

Dictation test (teacher-made)

Interview

One of the most common general intelligence tests for 5-15 year old children is Wechsler intelligence scale for children which is usually implemented by experienced psychological testers (WISC, 1949).

This test includes 5 verbal subtests and practical 5 subtests and 2 optional tests that upon its implementation, a general intelligence quotient, a verbal intelligence quotient and a practical intelligence quotient may be obtained. Although this test has been designed essentially as a mean for general measurement of intelligence, but some physicians use each one of its tests as a diagnostic mean (Anasthasy, 1968; Glosser & Zimmermann, 1967).

Translation and goodness of fit of Wechsler intelligence scale tests for children (revised 1) were conducted within 1994 and 1995 under supervision of a group of psychological and educational science experts of Shiraz University. Reliability of this scale was calculated according to retest and reliability coefficient was varied from 0.44 to 0.94 (mean: 0.73). To determine the validity of this scale, correlation between subtests was estimated (Shahim, 1994).

Considering the examinees age who had studied at first and second grades of elementary school, some words were selected out of the whole Persian Literature book of each grade.

Firstly, several teachers out of different schools that taught at first and second grades were asked to participate in dictation test. Each teacher offered a sample of dictation test and the words

with higher frequency were selected as final dictation test. After selection of dictation test, educational department of first and second grade elementary school teachers observed them and final test was provided after modification.

In this study, firstly an initial diagnostic interview concerning problems and characteristics of students suffering from dysgraphia was provided from teacher of each selected class to select a suitable sample of this group.

Variables:

Independent variable: conception of space, conception of time

Dependent variable: dysgraphia

Moderator variable: sex and socioeconomic class

Control variable: age of examinees and their academic grade

Procedure

In this study, to calculate the difference between two dysgraphic and normal groups in respect of conception of space and time formation, Wechsler intelligence scale for children, subtest of cubes design was used so that a notebook was provided to these groups and they should make the shapes based on shapes in this notebook within the specified time as per answer sheet.

Results

In this section, tables, diagrams, frequency and their rate were extracted from SPSS. T-student formula was used for data analysis.

Table 1. Frequency and rate of students sex in dysgraphic and normal groups

Variable	Group	Frequency	Rate
Sex	Boy	25	45.5
	Girl	30	54.5
Academic grade	First	31	56.4
	Second	24	43.6
orthographic status	Dysgraphic	26	47.3
	Normal	29	52.7
Total		55	100

According to results inserted in table 1, in two normal and dysgraphic groups, 45.5% of boy students and 55.5% of girl students constituted the study sample. 56.4% of students studied in first grade and 43.6% thereof in second grade; moreover 47.3% of students were placed in dysgraphic group and 52.7% thereof constituted the normal group.

As it is observed in table 2, independent t-student test on two dysgraphic and normal groups shows that the error difference between dysgraphic and normal groups in relation to putting together design 1 in Wechsler cube is not significant ($df=53$, $P>0.05$). Comparison between these groups' mean value indicate that correct making of design 1 in Wechsler cube shows no significant difference between normal group and dysgraphic group and the obtained difference is accidental. But this test confirms a significant difference between dysgraphic children and normal group in relation to designs 2,3,4,5 and 6 of Wechsler cubes ($df=53$, $P<0.05$). This test also demonstrated that mean value of designs 2,3,4,5 and 6 of Wechsler INTELLIGENCE test in normal children is significantly more than dysgraphic children (more correct).

In addition, no significant difference observed between mean of design 7 in dysgraphic and normal groups ($df=53$, $P>0.05$).

Table 2. Independent t-test for error difference between dysgraphic and normal groups in relation to correct making of design 1 in Wechsler cube

Test design	Group variable	Frequency	Mean	St.d	Lyons variance homogeneity test		T	df	Sig
					F	Sig			
Design 1	Dysgraphic	26	1.88	33	19.282	0.0001	-1.806	53	0.083
	Normal	29	2	0.00					
Design 2	Dysgraphic	26	1.73	0.53	46.955	0.0001	-2.573	53	0.02*
	Normal	29	2	0.00					
Design 3	Dysgraphic	26	1.23	0.59	8.769	0.005	-4.772	53	0.001*
	Normal	29	1.86	0.35					
Design 4	Dysgraphic	26	2.35	2.06	84.694	0.0001	-4.023	53	0.001*
	Normal	29	4.10	0.90					
Design 5	Dysgraphic	26	0.62	1.47	5.435	0.024	-5.188	53	0.001*
	Normal	29	2.97	1.88					
Design 6	Dysgraphic	26	0.000	0.00	35.080	0.0001	-3.839	53	0.001*
	Normal	29	1.38	1.93					
Design 7	Dysgraphic	26	0.00	0.00	14.777	0.0001	-1.797	53	0.083
	Normal	29	1.10	1.93					

Table 3. Independent t-test for false words difference in dictation test between dysgraphic and normal groups

Group statistical index	Lyons variance homogeneity test		Frequency	Mean	Standard deviation	T	df	Sig
	F	Sig						
Dysgraphic	1.456	0.233	26	17.23	4.45	10.452	53	0.000
Normal			29	5.69	3.64			

As it is observed in table 3, independent student t-test shows significant difference between dysgraphic and normal group in relation to the false words difference (df=53, P<0.01), and comparison between mean values of these groups indicated that error in dysgraphic group is more than normal group.

As it is observed in table 4, independent student t test between mean value of all subscales of dictation tests in dysgraphic and normal groups show that the error difference between two groups is significant (df=53, P<0.05) and comparison between mean in these groups indicates that the error in dictation tests (visual memory, auditory memory, training type, visual discrimination, auditory sensitivity and attention type) obtained from dysgraphic group is more than normal group.

In consideration of table 5, normal students comparing to dysgraphic students have used lower time for execution of Wechsler cubes in designs 1, 2, 3, 4 and 5. Consequently, it is concluded that a significant difference exists between normal and dysgraphic students in terms of Wechsler cubes execution time in the said designs, with 99% confidence level.

Table 4. Independent t-test for error in dictation test (for each test type) between dysgraphic and normal group

Test type	Group variable	Frequency	Mean	St.d	Lyons variance homogeneity test		T	df	Sig
					F	Sig			
Visual memory	Dysgraphic	29	2.21	1.82	2.142	0.149	8.556	53	0.001*
	Normal	26	7.92	2.94					
Auditory memory	Dysgraphic	26	0.19	0.49	23.428	0.000	1.995	53	0.01*
	Normal	29	0.00	0.00					
Training type	Dysgraphic	26	3.42	1.81	0.282	0.598	4.572	53	0.001*
	Normal	29	1.10	1.93					
Visual discrimination	Dysgraphic	26	0.15	0.46	7.151	0.010	2.226	53	0.001*
	Normal	29	0.04	0.19					
Auditory sensitivity	Dysgraphic	26	3.27	2.49	2.142	0.149	4.629	53	0.001*
	Normal	29	0.83	1.07					
Attention type	Dysgraphic	26	0.73	0.67	0.006	0.937	2.671	53	0.001*
	Normal	29	0.41	0.73					

Table 5. Comparison of normal and dysgraphic students in terms of Wechsler cubes making period

Test design	Group variable	Frequency	Mean	St.d	T	df	Sig
Design 1	Dysgraphic	24	33	7.5	4.115	51	0.0001
	Normal	29	25.38	5.93			
Design 2	Dysgraphic	20	37.20	4.20	5.896	47	0.0001
	Normal	29	29.93	4.30			
Design 3	Dysgraphic	10	39.50	4.53	3.239	33	0.001
	Normal	25	33.96	4.68			
Design 4	Dysgraphic	15	42.07	6.36	3.493	41	0.001
	Normal	28	33.54	9.56			
Design 5	Dysgraphic	4	72.25	2.36	4.799	23	0.004
	Normal	21	55.29	15.27			
Design 6	Dysgraphic	2	70	7.07	0.732	6	0.476
	Normal	6	65.83	65.6			

But, results of above table in relation to design 6 indicate that although normal students in comparison with dysgraphic students used lower time for execution of Wechsler cubes in design 6, but considering the significance level of t test, it is to say that with confidence level of 95%, no significant difference exists between normal and dysgraphic students in the light of Wechsler cubes execution time in design 6.

Conclusion and discussion

Considering the study results, first hypothesis concerning formation of conception of space in dysgraphic children later than normal children is confirmed.

According to tables and diagrams related to Wechsler cubes design test and distraction test, it was observed that a significant difference exists between mean errors in two groups of normal children and dysgraphic children, and upon providing independent t test (Lyons) on mean value of false responses, it was specified that the obtained t is higher than t in the table in consideration of significance level (α=0.01) and degree of freedom 53. Therefore, this hypothesis of study is accepted, i.e. a significant difference exists between normal and dysgraphic children groups in respect of false responses in confidence level of 99%, and these differences are observed in cases such as turning the pieces within the space, dispersing the pieces, lack of frame for made shape, making an empty space between pieces, making empty space instead of white color in pattern, displacing the point and reverse writing a part of word. In all of foregoing states, performance of normal children is better than dysgraphic children (mean false responses of normal children have been lower than dysgraphic children), thus it may be assumed as an evidence for delayed formation of conception of space in dysgraphic children.

Results of the present study is consistent with the results of the study done by Michel Bust and Boshes (1969) in North Western University. They indicated that the judgment of teacher about specified behavioral characteristics of children as well as determination of disable children in learning is more valid than plenty of nervous tests or psychic tests. They focused on 5 major characteristics of children including audition comprehension and perception, colloquial language, orientation, behavior and movement characteristic. Ultimately, mean value of normal children was equaled to 81 and dysgraphic children 61 (quoted by Faryar & Rakhshan, 2001).

Regarding the mean score test of the two groups in the present study , it is inferred that normal students in comparison with the students infected with dysgraphia have a quicker and more active performance upon observing the pattern, so that made the shape either by planning and drawing the imaginary lines on the pattern or through frequent trial and error. Thus, after lot turnings in the surface and in space or putting together the pieces in all directions, they renovated the offered designs, whilst dysgraphic children turned the pieces in the surface or space with lower attention or slowly and usually they moved the pieces without purposelessly.

Dysgraphic children have problem in elements structuring in the space, because have no schema of complex patterns, thus have problem in coordinating the pieces. They cannot organize the elements for making the pattern or a part of pattern. False conclusion will create additional problems that releasing therefrom is not possible due to a perceptional consequence e.g. in pattern 6, they use one piece or four red pieces with 90 degree angle or one red piece and three white pieces.

According to the results of study, second hypothesis concerning formation of conception of time in dysgraphic children later than normal children is confirmed.

According to tables and diagrams related to cubes design observations test and distraction test, differences are observed between mean errors in two groups of normal children and dysgraphic children. Therefore, independent t test indicated that the obtained t is higher than t in the table in consideration of significance level (α=0.01) and degree of freedom 53. Therefore, this hypothesis of study is accepted, i.e. a significant difference exists between normal and dysgraphic groups regarding the false responses in confidence level of 99%.

The researches applied by Kreg and Galager (1993) shows that disability in attention and transfer of information from short-term memory to long-term memory is very important. One of the important elements in memory is ability of paying attention and care in performing the tasks; normal children showed better learning ability than the dysgraphic children. Dysgraphic children for

learning should focus on the dictation, otherwise will not learn the respective contents and consequently not write. Summary of study is consistent to the findings of present study.

Dysgraphic child has problems for perceiving the spontaneous tone of sentences that shows a rhythm or time interval. Because, they usually for writing the words, add or delete the letters to/from the words' first, middle and end part, e.g. writing "defa" instead of "defae" or writing "mukhalef" instead of "mokhalef".

The time coordinates the movements and plays the role to movement as space to objects. The space coordinates the positions of object; an object that its displacements are followed by subsequent and distinct spatial states that time coordinates them. The children learn that events have temporal sequence and learn that a series of specified movements must be performed following each other for conducting the activities.

Vertical sort of pieces, sorting the pieces from upper row, sorting the piece so that a part of shape is correct, adding the letter to the word (first, middle, end), deleting letter from word (first, middle, end), wiring the word separately instead of writing without space and vice versa and bad handwriting are observed. In all above stages, performance of normal student is better than dysgraphic student (i.e. mean false responses of normal children have been lower than dysgraphic children), hence demonstrates the delay of conception of time formation in dysgraphic children.

Results obtained from this study demonstrate that students suffering from dysgraphia similar to normal students have natural intelligence (IQ: 90 to up). Therefore, in measures performed for child testing, some writers (Villem, 1999) emphasize on necessity of precise neurological diagnosis, cortex actions test, psychological test (determination of IQ, evaluation of physical design in the light of lateral superiority and spatial-temporal construction and personality evaluation) and full test of spoken and auditory language. Some other authors (Dubre, 1989) through precise analysis of reading diagnose this abnormality and some other authors (Halley, 1999) suggest that the child to be tested at the same state and avoid from any excess in experiments and assessments (Faryar & Rakhshan, 2005).

In consideration of the applied studies, it is concluded that conception of space and time formation in children is an important agent for progress and success of elementary students, particularly first and second grades, in the works and academic affairs.

The environment that child lives therein including social, familial and school environments are effective on formation of conception of space and time. In the school, the teachers who communicate with dysgraphic students can design their educational and curricular plans and provide the requirements for strengthening the dysgraphic problems and even treatment of students' dysgraphia.

Results of study show that formation of conception of space and time in children suffering from dysgraphia is later than normal children, thus it may be used for preschool children to make them ready for reading and writing, i.e. focus on perception of orientation concepts (up, down-far, near-right, left), as well as attention to physical design and physical space.

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