A comparison of educational self-regulation strategies and cognitive failures in students afflicted with dysgraphia and normal students

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ABSTRACT
This study seeks to compare educational self-regulatory strategies and cognitive failures in students afflicted with dysgraphia and normal students. This research is a comparative study based upon the case-witness methodology. The research study of this study included all the male students between 9 to 12 years old with and without dysgraphia disorder in Tehran in the academic year 2014-15. The subjects of the study included 30 male students between 9 to 12 with dysgraphia disorder in Tehran selected through multistep cluster sampling and 30 normal students selected based on the cloning method (in terms of age, educational base, soci-economic status). Self-regulation in learning and cognitive failure questionnaires were used to collect data. The results of the MANCOVA multivariable analysis indicated a significant difference between the two groups of the students in terms of self-regulatory learning and cognitive failures (P<0.001). We may conclude that students afflicted with dysgraphia have higher levels of distraction and problems associated with memory which are often ignored in school. On the other hand, self-regulatory management as a key factor plays a major role in the educational success of kids, adolescents and adults.

Keywords: self-regulatory learning, cognitive failure, dysgraphia, students

Introduction
Writing is a complicated neural procedure requiring synchronization of the brain’s multiple mechanisms. Writing requires the stimulation and combination of multiple information resources, attention, memory, motor skills, language and cognition. Dysgraphia is a special learning disability which influences acquisition of the written language and use of written language for thought expression. Dysgraphia is a certain state in which writing the alphabets by hands is damaged in such a way that problems are caused in handwriting and, sometimes, spelling (Key, 2006). Students with dysgraphia have also problems in the following fields: calligraphy and writing coherence, the accuracy and correctness of the alphabets and written vocabularies, matching and synchronizing spelling, appropriate ordering and organization in writing (Deuel, 1995; as quoted by Abkenar, Ashoori, 2013). On the other hand, writing is a really challenging process in many people, especially students with dysgraphia; even skillful writers sometimes face difficulty designing, revising, and evaluating their writings. It is, therefore, no surprise that many of the students have problems with writing; for example, the recent studies have yielded this result that out of each 5 elementary students, only one acquires the knowledge and skills required for writing (Santagelo, Harris & Graham, 2008). The prevalence of dysgraphia is not clear but, similar to dyslexia, it is reported to be 4% of the school-aged children (DSM-IV, 2007; translated by Rezaie, 2009). As the results of studies indicate, students with learning disabilities show significantly higher levels of cognitive failures than normal students (Mikaili, Bagian Kooleh Marz, Maghsoud and Sari Nasirloo, 2013).
One of the variables which can influence the educational performance of the students afflicted with dysgraphia is cognitive failure. Cognitive failures are the mistakes one makes while doing the assignments he is naturally capable of performing. In other words, cognitive failure is a multidimensional structure which includes errors in forming goals, errors in activating schemes and errors in triggering actions (Wallace, Kass & Stanny, 2002). Due to her intervention with daily activities, cognitive failures can cause major problems. Making up for such problems may require a lot of time. In cases when these problems take place in triggering the actions, severe damages and even death might be the result (Dooran, Lang & Weijters, 2010). The majority of the researchers agree on this issue that cognitive failures include distraction, problems associated with memory, inadvertent mistakes and failure in recalling the names (Broadbent, Cooper, Fitzgerald & Parkes, 1982; Mecacci, Right & Rocchetti, 2006; Wallace, Popp & Mondore, 2006). Greater frequencies of cognitive failures have been reported in women than in men. The scores of cognitive failures increase significantly as one grows older (Wallace, Vodanovich & Restino, 2003; Souchay & Isingrini, 2004; Wan, Friedman, Boutros & Crawford, 2008). In the background studies of the research, the link between cognitive failures and various variables such as emotional disorders (Sullivan & Payne, 2007), anxiety and stress (Mahoney, Dalby & King, 1998; Wallace et al, 2006), driving accidents (Larson, Alderton & Neideffer, 1997), exhaustion (Sukai et al, 2004) and strategies to fight stress (Matthews, Coyle & Craig, 1990). Rousselle & Noel (2007) arrived at the conclusion that students with learning disabilities are significantly weaker than normal students in memory functions such as active memory, names memory, faces memory, visual-spatial active memory, and long term memory. Geary (2006; Kroesbergen, Vanluit & Mass, 2004; Swanson & Jerman, 2010) showed in a separate research that students with cognitive failures have more problems acquiring and recalling concepts, difficulties in calculations, memory problems, visual-spatial processing failures, metacognition failures (planning, surveillance and ordering) and utilize immature problem solving strategies. Bagian Kooleh Marz et al (2013) realized in their study that students with learning disabilities suffer from higher levels of cognitive failures and negative emotions than normal students.

Another variable which is probably observed less frequently in kids and adolescents afflicted with learning disorders is acquisition of education self-regulation. Bandura (1977) believes that self-regulation is utilization of self-guiding, self-control and autonomous abilities and capabilities. According to his view, the above-mentioned abilities differ under the influence of people’s believes about self-efficiency on their various actions and behaviors. Self-regulation is defined as mental efforts made to control internal status, procedures and functions to attain greater goals (Cole, Logan & Walker, 2011). Generally, Zimmerman (1990) has defined self-regulation in learning as the active participation of the learner (behavioral, motivational, cognitive and metacognitive) in learning procedure in order to maximize the learning procedure. Self-regulation of behavior is the term used to describe optimized use of various resources that maximize learning. Motivational self-regulation is the term used to describe the active application of motivational strategies which maximize learning and reduce fear and stress. Cognitive self-regulation is concerned with the active utilization of cognitive strategies (which are exclusive to assignments), while metacognitive self-regulation is a term used to describe the active application of metacognitive strategies (which are surveillance and managerial strategies) maximizing learning. The manner of self-regulating management plays a major role in the educational success of kids, adolescents and adults (Pajares & Valiante, 2005; Caprara, Fida, Delbo & Wicho, 2008) and is associated with health promotion and plays a major role in health control (Bendura, 2005). The results indicate that students with and without learning disabilities have significant differences in terms of educational self-regulation (Fulk, Brigham & Lohman, 1998). Lackaye & Margalit (2006) and Baird, Scott, Dearin & Hamill (2009) showed in their research that students with learning disabilities report lower levels of social and
The results also indicated lower levels of educational self-regulation and greater tendency to cigarette and drugs among students with educational disorders (Graham & Harris, 2003; Wong, Harris, Graham & Botler, 2003; Klassen & Lynch, 2007). Klassen (2010) also showed that normal students have higher levels of educational self-regulation learning than students afflicted with learning disabilities; and lower levels of social and emotional skills in these students are associated with lower levels of educational self-regulation. Swanson, Zinozeng and Jerman (2011) found in their research that those kids who have difficulties in cognitive processes, attention and decoding have more problems in assignments associated with active memory and recalling the verbal cases. Costner & Losier (as quoted by Milyavoskaya & Koestner, 2011) found that cloned regulation has a positive relationship with various indicators of educational development and educational interpretation, while the internalized regulation is associated with the harmful indicators. These results indicate that the relative benefits of internal motivation in promotion of positive compliance in the field of education are less than the cloned regulation. The results have shown that students with learning disorders (dyslexia and dysgraphia) have certain psychological characteristics which distinguish them from others, some of which are: a negative attitude towards themselves and others, no response to others in social interactions, inappropriate self-disclosure patterns (Lakey and Margit, 2006), passivity in learning procedure, problem solving inefficiency, learnt helplessness, incapability in utilizing metacognitive strategies (Latifi, Amiri, Malek Pour & Molavi, 2009), inability in social information processing and comprehension of complex emotions experience (Bauminger, Edelsztein & Morash, 2005). We can also say that these kids suffer from deficiencies in solving interpersonal arguments, problem solving skills, memory, information processing, paying attention to the title of the important and complicated side and the social capability in interpersonal relationships, thus being in a lower level than normal kids (Toro, Weissberg, Guare & Liebenstein, 1990; Jane, 2008). On the other hand, psychological characteristics, behavioral problems, mood states (depression and anxiety), experiencing negative emotions (Kazemi, 2006) and concurrency of other mental disabilities of childhood period with dysgraphia, high prevalence of this disorder in students and the role of self-regulatory strategies and cognition as key factors of success, health promotion and reduction of psychological problems of such students and the research gaps in this field and utilization of the results of this research in pathology of those afflicted with dysgraphia are important necessities of this study. Thus, the goal of the present research is a comparison of educational self-regulatory strategies and cognitive failures in students afflicted with dysgraphia and normal students.

Methodology
Research plan: concerning the nature of this topic and the goals of research, the present study can be categorized as a casual-comparative (post incidental) research.

Sample society and sampling method: the study population of this research included the male third to sixth grade elementary school students of Tehran in academic year 2014-15. In order to sample and select subjects, multistep cluster random sampling methodology is utilized. Out of the 19 educational zones, the third zone was selected and within that zone, 5 male schools were selected randomly to study third, fourth, fifth and sixth grade students. Based on teachers’ ideas and signs of dysgraphia, 30 students suspected of dysgraphia were selected. After administering the diagonal tests (Veksler’s test of kids’ intelligence (2006) validated by Sima Shahim in Shiraz University and Dysgraphia test validated by Fallah Chay (1995)), 30 students with dysgraphia disorder were selected based upon the exit and entrance criteria. 30 normal students were also peered with the group afflicted with dysgraphia based on the age and educational level. Based on DSM-IV-TR, sample selection and data analysis were implemented. Using the homogeneity criteria, the subjects were selected and data collection was implemented. The data were analyzed through analysis of variance.
entrance criteria including diagnosis of disability in writing, aging 9 to 12; having average IQ in Veksler’s intelligence test for children (Shahim, 2006) and absence of neurological and sensory disabilities; B-exit criteria including severe concurrent disorders such as hyperactivity/attention deficit disorder, oppositional defiance disorder (ODD) and depression and having an IQ less than 85 in Veksler’s intelligence test. The following tools were used in the present research.

Structured clinical interview: in order to study the validity and confirm the diagnosis recorded in the file of each student afflicted with dysgraphia, the clinical interview structured based upon DSM-IV-TR was administered on all students.

Veksler’s intelligence test for children (WISC-R): in order to measure the IQ of the subjects afflicted with dysgraphia, Veksler’s revised intelligence scale for students was utilized (Shahim, 2006).

Fallah Chay’s dysgraphia test: this test is used to diagnose and measure the writing ability level of the subjects afflicted with dysgraphia. The validity of dysgraphia test was estimated to be around 86% in Fallah Chay’s research. In this research, dysgraphia test which included 2 texts for each level was utilized. The first test included 50% of the Persian book and the second text included the whole Persian book. Fallah Chay’s writing test is adjusted to the age and level of the elementary students in terms of difficulty.

Educational self-regulation scale: this questionnaire was prepared by Rian and Cannel in 1989. It includes 32 questions and 4 components of external regulation, internalized regulation, cognitive regulation and internal stimulation. Each question is scored based upon the Likert’s four-degree scale (1 to 4) and the scores range from 32 to 128. The validity of the questionnaire is calculated based upon the internal consistency coefficient and the coefficients of Cronbach’s alpha for micro-scales range from 0.69 to 0.75 (Gronic & Rian, 1987). In another research, the consistency coefficient for the micro-scales ranged from 0.62 to 0.82 (Gronic, Rian & Dacy, 1991). Rian and Cannel (1989) studied the internal consistency coefficient of this questionnaire in three urban, rural and sub-urban samples and Cronbach’s alpha coefficients for the micro-scales were reported to range from 0.62 to 0.82. Salarifar, Pour Etemad, Heydari and Asghar Nejad (2011) calculated the validity of this questionnaire based upon internal consistency coefficient where Cronbach’s alpha for the micro-scales was reported to range from 0.73 to 0.79 and the total validity of the scale was also 0.89.

Cognitive failure questionnaire (CFQ): this scale was prepared by Broadbent, Copper, Fitz Gerald and Parkz in 1982. This questionnaire includes 24 articles and the subjects answer these articles in the form of a 5-degree scale (from “never” to “always”). The 24 articles of this questionnaire were distributed among 4 micro-scales including distraction (9 articles), problems associated with memory (7 articles), inadvertent mistakes (7 articles) and inability to remember names (2 articles). Mecacci & Righi (2006) reported a Cronbach’s alpha coefficient of 0.84 for the whole scale. Vallas (2004) reported 0.96 and 0.51 for Cronbach’s alpha coefficient and the validity coefficient of this questionnaire respectively. In an introductory study intended to validate the cognitive failure questionnaire, Abolghasemi (2007) administered this test on 100 people and reported the internal consistency coefficient and retest reliability coefficient of it (one month later) around 0.89 and 0.77 respectively. The correlational coefficient of this test with the metacognition questionnaire was 0.45 and with Nilson’s religious behavior scale (1995) was 0.21. In another research, Abolghasemi and Kiamarsi (2009) reported a Cronbach’s alpha coefficient of 0.84 for the total scale, while this value was reported to be 0.79, 0.64, 0.66, and 0.62 for the micro-scales respectively.

Data collection methodology
After making the arrangements and gaining the required permissions, we went to Tehran’s center of learning disabilities and obtained the list of all students of that center by considering the disorder. After sampling and in order to confirm the diagnosed problem, the files of all members of the sample (the results of diagonal tests, intelligence test, teachers’ reports, etc) were investigated and all members of the
sample were subjected to clinical interview based on DSM-IV-TR criteria for learning disabilities. Finally, some people were removed from the research and replaced by other samples. After identifying students afflicted with dysgraphia, the goal of the research was explained to them and questionnaires were distributed among them. They were asked to read the questions carefully and choose the answers based upon their features and leave no questions unanswered. The information was gathered in forms of groups from the selected schools. Finally, the collected data were subjected to statistical analysis through multivariable variance analysis (MANCOVA). Assuring people about the secrecy of their information and freedom of choice for participation in the research were among the moral points the researchers were bound with.

Results

As we see in table 1, the mean (and standard deviation) in students afflicted with dysgraphia is 60.81 (3.31) for total educational self-regulation and 74.01 (5.15) for cognitive failure. The mean (and standard deviation) in normal students is 68.39 (7.12) for educational self-regulation and 59.17 (6.41) for cognitive failure (table 1).

Table 2. the results of the significance test of multivariable variance analysis (MANCOVA) on the scores of educational self-regulation and cognitive failure in students with and without dysgraphia

<table>
<thead>
<tr>
<th>status</th>
<th>test</th>
<th>value</th>
<th>DF of error</th>
<th>DF of hypothesis</th>
<th>F</th>
<th>P</th>
<th>Eta square</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bartlet’s Pillai</td>
<td>0.546</td>
<td>51</td>
<td>8</td>
<td>15.263</td>
<td>0.001</td>
<td>0.546</td>
<td></td>
</tr>
<tr>
<td>Wikl’s lambda</td>
<td>0.213</td>
<td>51</td>
<td>8</td>
<td>15.263</td>
<td>0.001</td>
<td>0.546</td>
<td></td>
</tr>
<tr>
<td>Hetling effect</td>
<td>32.245</td>
<td>51</td>
<td>8</td>
<td>15.263</td>
<td>0.001</td>
<td>0.546</td>
<td></td>
</tr>
<tr>
<td>root on</td>
<td>32.245</td>
<td>51</td>
<td>8</td>
<td>15.263</td>
<td>0.001</td>
<td>0.546</td>
<td></td>
</tr>
</tbody>
</table>
As it is seen in table 2, the influence of group on the linear combination of dependent variables is significant ($P<0.001$, $F=15.263$ and Wikle’s Lambda = 0.213). In other words, there is a significant difference between students with and without dysgraphia disorder in at least one dependant variable. Prior to using multivariable variance analysis parametric test, Box and Levin tests were utilized to observe its suppositions and the condition of homogeneity of variance/covariance matrices was fulfilled ($P=0.075$, $F=2.163$, BOX=6.356). Based on Levin’s test and lack of her significance for all variables, the condition of equality of variances of the groups studied is fulfilled.

### Table 3. the results of Levene’s test for equality of the group’s variances

<table>
<thead>
<tr>
<th>Levene’s</th>
<th>DF1</th>
<th>DF2</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>external regulation</td>
<td>1</td>
<td>58</td>
<td>1.326</td>
<td>0.113</td>
</tr>
<tr>
<td>internalized regulation</td>
<td>1</td>
<td>58</td>
<td>0.958</td>
<td>0.312</td>
</tr>
<tr>
<td>cognitive regulation</td>
<td>1</td>
<td>58</td>
<td>0.683</td>
<td>0.419</td>
</tr>
<tr>
<td>internal stimulation</td>
<td>1</td>
<td>58</td>
<td>0.885</td>
<td>0.372</td>
</tr>
<tr>
<td>distraction</td>
<td>1</td>
<td>58</td>
<td>0.754</td>
<td>0.399</td>
</tr>
<tr>
<td>problems associated with memory</td>
<td>1</td>
<td>58</td>
<td>0.315</td>
<td>0.589</td>
</tr>
<tr>
<td>inadvertent mistakes</td>
<td>1</td>
<td>58</td>
<td>1.365</td>
<td>0.103</td>
</tr>
<tr>
<td>not remembering the names</td>
<td>1</td>
<td>58</td>
<td>1.712</td>
<td>0.99</td>
</tr>
</tbody>
</table>

### Table 4. the results of multivariable variance analysis on the mean of self-regulation and cognitive failure

<table>
<thead>
<tr>
<th>variable</th>
<th>sum squares of squares</th>
<th>df</th>
<th>mean squares of squares</th>
<th>F</th>
<th>P</th>
<th>ES</th>
</tr>
</thead>
<tbody>
<tr>
<td>external regulation</td>
<td>223.236</td>
<td>1</td>
<td>223.236</td>
<td>72.214</td>
<td>0.001</td>
<td>0.472</td>
</tr>
<tr>
<td>internalized regulation</td>
<td>114.745</td>
<td>1</td>
<td>114.745</td>
<td>55.321</td>
<td>0.001</td>
<td>0.356</td>
</tr>
<tr>
<td>cognitive regulation</td>
<td>196.789</td>
<td>1</td>
<td>196.789</td>
<td>66.645</td>
<td>0.001</td>
<td>0.399</td>
</tr>
<tr>
<td>internal stimulation</td>
<td>125.876</td>
<td>1</td>
<td>125.876</td>
<td>62.417</td>
<td>0.001</td>
<td>0.335</td>
</tr>
<tr>
<td>educational self-regulation</td>
<td>456.854</td>
<td>1</td>
<td>456.854</td>
<td>0.456</td>
<td>0.001</td>
<td>0.512</td>
</tr>
<tr>
<td>distraction</td>
<td>203.148</td>
<td>1</td>
<td>203.148</td>
<td>70.349</td>
<td>0.001</td>
<td>0.456</td>
</tr>
<tr>
<td>problems associated with memory</td>
<td>227.854</td>
<td>1</td>
<td>227.854</td>
<td>78.471</td>
<td>0.001</td>
<td>0.519</td>
</tr>
<tr>
<td>inadvertent mistakes</td>
<td>212.365</td>
<td>1</td>
<td>212.365</td>
<td>66.198</td>
<td>0.001</td>
<td>0.398</td>
</tr>
<tr>
<td>not remembering the names</td>
<td>112.356</td>
<td>1</td>
<td>112.356</td>
<td>19.546</td>
<td>0.009</td>
<td>0.310</td>
</tr>
<tr>
<td>cognitive failure</td>
<td>495.845</td>
<td>1</td>
<td>495.845</td>
<td>163.365</td>
<td>0.001</td>
<td>0.547</td>
</tr>
</tbody>
</table>

Based on the results of MANCOVA test, there is a significant difference between normal and dysgraphic students in terms of education self-regulation ($P<0.001$, $F(57 and 1)=126.456$) and cognitive failure ($P<0.001$, $F(57 and 1)=163.365$). Students afflicted
with dysgraphia showed lower levels of educational self-regulation and higher levels of cognitive failures.**

**Conclusion and discussion**

The goal of this research was to compare the educational self-regulation and cognitive failure in normal and dysgraphic students. The results indicate a significant difference between normal and dysgraphic students in terms of educational self-regulation. In other words, students afflicted with dysgraphia had lower levels of educational self-regulation than normal students. These results are in line with the studies conducted by (). In an attempt to describe these results, we can say that learning self-regulation is an important issue for human learning (Chen, 2002; as quoted by Omen chi, 2006). Successful students display structured self-regulatory learning strategies and stimulation patterns while doing their assignments (e.g. attempt for success, enjoying challenges of action, appropriate use of learning strategies, setting special goals and displaying a high level of the sense of self-efficacy). On the other hand, unsuccessful students make less effort in learning and have less desire to do the activities. They are incapable of setting special goals and learning strategies, have low levels of self-efficacy and rarely attain high levels of success (Bambouti, 2008). As a matter of fact, students afflicted with dysgraphia have low levels of learning self-regulation because they are incapable of adjusting performance and retaining their lesson goals. Zimmerman (2002) believes only those students who are aware of existence of self-regulation strategies, use their capabilities to attain the goals specified in activity and monitor themselves in doing an assignment can benefit from self-regulatory strategies. These students use cognitive and metacognitive strategies for a longer time, have greater vigilance than others and their peers usually refer to them (Pintrich and Dergrot, 1990). However, development of self-regulatory skills is influenced by cognitive factors such as metacognition science, awareness and work memory; motivation and emotional factors such as interest and value of job and behavioral factors such as time and management’s efforts (quoted by Klassen, 2010) and these factors are weak in students with learning disabilities. As a matter of fact compared to their peers, students afflicted with learning disorders show some sort of unwillingness to educational activities (Plata, Trusti and Glasco, 2005), display low levels of self-monitoring and self-efficacy, and benefit from less metacognitive strategies. In fact, such students consider the assignments as some sort of threat and do not display the required perseverance and stubbornness. Generally, learning self-regulation makes one consider himself capable, self-efficient and independent (Walterz, 2003); while students with learning disabilities have lower levels of learning self-regulation than normal students because they have less self-efficacy and self-value (Bayerd et al., 2009).

The results also indicated a significant difference between normal and dysgraphic students in terms of cognitive failure. In other words, students afflicted with dysgraphia suffered from higher levels of cognitive failure than their normal counterparts. These results are in line with the study conducted by (). In an attempt to describe these results, we can say that cognitive awareness covers our emotions and experiences and cognitive experience or cognition adjustment or control procedures are a group of cognitive procedures which guide one’s thoughts in problems solving and decision making situations and result in better performance of memory (Larkin, 2009). Thus, cognitive awareness helps one have a higher speed of decision making. One’s knowledge of cognitive strategies will bring him some sort of metacognition which is focused on metacognitive strategies. Thus, the individual who has greater knowledge about this component has a more complete surveillance while utilizing metacognitive strategies and chooses the most effective strategy based upon the nature of assignment. What’s more, he keeps monitoring his performance and changes his strategies to attain his goal if necessary. Thus, one’s knowledge of cognitive strategies is associated with the better performance of decision making for writing and cognitive processing suitable with the type of assignment (Artino, 2008).

In another attempt to describe the results of this study, we may say that cognition is defined as one’s knowledge of what he knows and a range of
executive functions such as attention, surveillance, control, planning, and error diagnosis (Salivan, 2006). The information created by cognition is usually experienced in the form of mental emotions which can influence behavior (Aspada et al, 2006). Someone with weak cognitive knowledge is not aware of what he knows and cannot utilize executive functions. Thus, he will probably have more errors in educational procedures (Biabangard, 2002). On the other hand, since inability in writing lesson materials prevents correct information processing and results in errors (because it reduces cognitive abilities), this circle of incorrect processing of error will render individuals unable to write (Spada et al, 2006). People with greater cognitive failures cannot perform well in doing the assignments assigned to them because they are suffering from distraction and memory problems. This ill performance increases the level of their errors. As students afflicted with dysgraphia are not aware of their emotions and cognitions and can’t use executive functions correctly, they will probably face errors and doubts and suspensions in social and educational situations more frequently (Ashoori and Vakili, 2009). As a matter of fact, cognitive failure means one’s inability in completing assignments which he is naturally capable of doing. Cognitive failure is associated with how one learns an important incident, short term memory’s capacity, reduction of the consciousness level and distracted attention (Morten, 2010). Various studies have yielded a positive and significant relationship between cognitive failure and performance in assignments (Manly, 1999; Roberton, 1997). Based on the results of this study, it seems those people who have more mental ruminations about the benefits of worrying, worries about controlling ability, and worries about their cognitive abilities and functions are more probable to display cognitive failure and, as a result, dysgraphia. The results also indicate that cognitive failures have a significant influence on educational performance and dysgraphia among students suffering from it (Maths, Koy and Carik, 1990).

Finally, the small volume of the sample and the impossibility of comparing it against girls aging 9 to 12 afflicted with dysgraphia were the most important limitations of this study. We hope to be able to make this comparison in future researches. Supports of teachers and schools for those students with learning disabilities and teaching self-efficiency and self-regulation skills can play a major role in increasing the compliance and self-regulatory skills of such students.

References


Mikaili, Niloufar; Bagian Kooleh Marz, Mohammad Javad; Maghsood, Nader and Sari Nasirloo, Karim (2013). A comparison of cognitive failure and negative and positive emotions in students with and without learning disabilities. Exceptional people psychology quarterly. To be published.


Santangelo, T., Harris, K. R., Graham, S. (2008). Using Self-regulated strategy development to support students who have Trouble Getting Thanks into Words: Remedial and Special Education. 29, 2. 78-89.


